Danmarks Nationalbank

# Danish Government Borrowing and Debt

2006

DANISH GOVERNMENT BORROWING AND DEBT 2006
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**Explanation of symbols**
- \- Magnitude nil
- 0 Less than one half of unit employed
- • Category not applicable

In tables figures may not add because of rounding.

This publication is based on information available up to 31 January 2007.

This publication is a translation of "Statens låntagning og gæld 2006".

Cover photo: Ulrik Samsøe Figen, Stickelsberg Bureau.

# Contents

# Highlights of Government Debt Policy

The government debt policy has been adjusted in recent years to reflect the falling debt and low borrowing requirement. In the coming years, the government debt policy will continue to focus on the challenges presented by the decreasing central-government debt. The overall objective is still to cover the central government's financing requirement at the lowest possible long-term borrowing costs, while taking the degree of risk into account. At the same time, the intention is to create a framework for a well-functioning government securities market for Danish and international market participants and investors.

## LOWER CENTRAL-GOVERNMENT DEBT AND FALLING INTEREST COSTS

Large government surpluses in recent years have contributed to a significant decrease in central-government debt. As a reflection of high economic growth, the debt has fallen strongly in the last two years. In addition, there has been substantial income from pension-fund tax and North Sea activities in view of respectively the development in the financial markets and the high oil prices. At end-2006, the central-government debt was DKK 328 billion, cf. Table 1. This is equivalent to DKK 60,000 per capita, or approximately 20 per cent of GDP. The central-government debt has almost halved since 1997, cf. Chart 1.

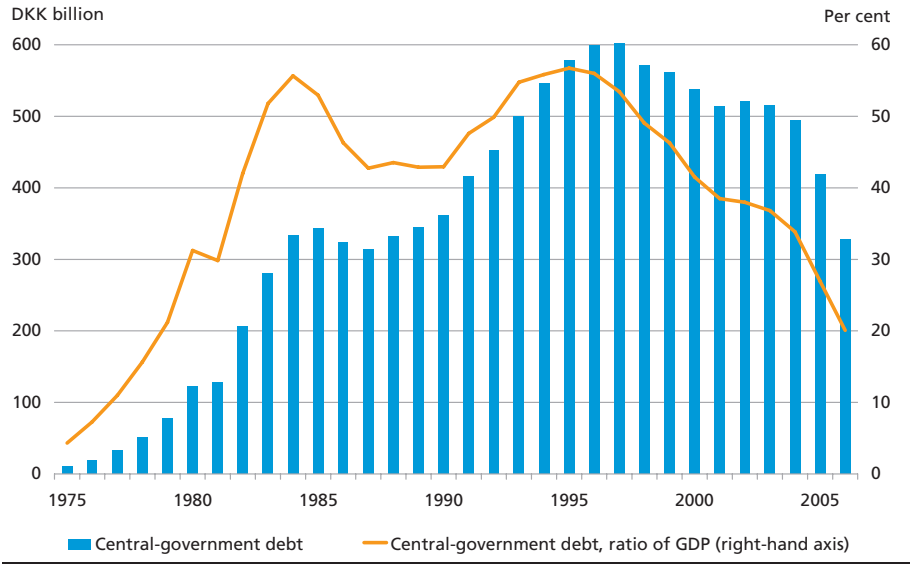
Around half of the decrease in the central-government debt since 1997 relates to revenue from North Sea activities and extraordinary factors such as sale of government-owned companies, cf. Chart 2. This has contributed to a substantial reduction of the central government's net interest payments. In 1997, interest costs amounted to DKK 44 billion, while by 2006 this figure declined to DKK 17 billion.

CENTRAL-GOVERNMENT DEBT — Table 1

| DKK billion | End-2006 |
|---|---|
| Domestic debt | 454 |
| Foreign debt | 80 |
| Total liabilities | 534 |
| Government funds[1] | -135 |
| Central government's account with Danmarks Nationalbank | -71 |
| Total assets | -206 |
| Total central-government debt | 328 |

[1] The assets of the Social Pension Fund, the High-Technology Foundation and the Financing Fund.

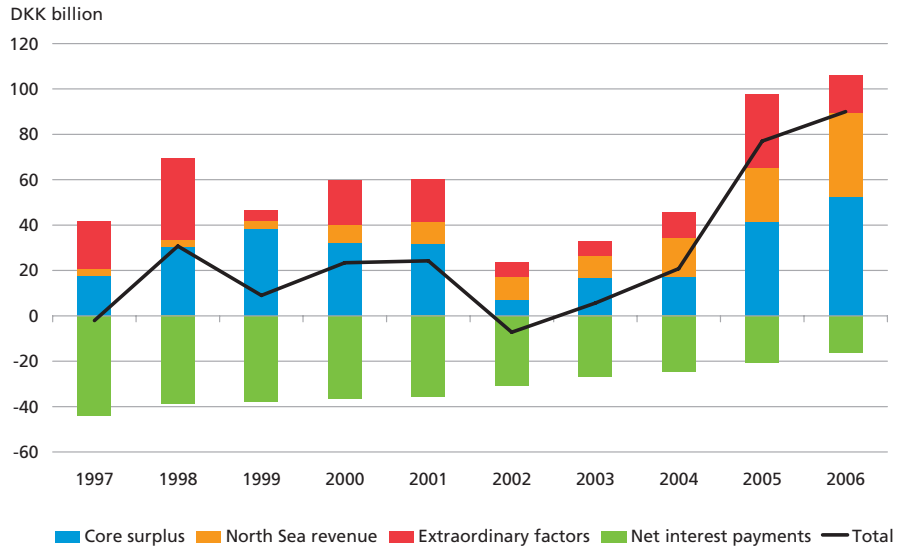
CENTRAL-GOVERNMENT DEBT, 1975-2006 Chart 1




Note: The central-government debt includes the assets of SPF as of 1 January 1982.

At the beginning of the period, the diminishing interest costs were mainly attributable to falling market interest rates, but in recent years the decreasing debt has been the primary factor behind the lower interest costs, cf. Chart 3.

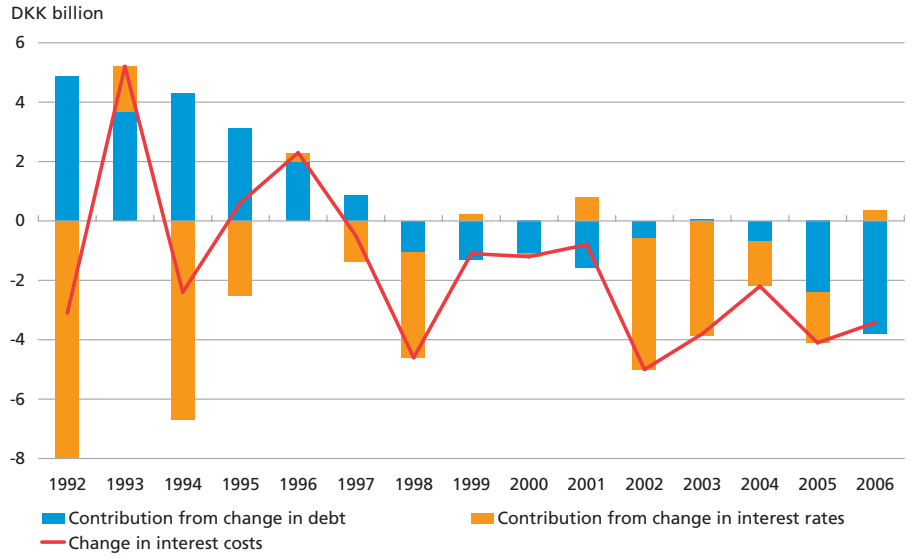
BREAKDOWN OF THE DECREASE IN CENTRAL-GOVERNMENT DEBT Chart 2




Note: North Sea revenue comprises taxes and duties related to oil extraction (excluding corporate tax revenue). Extraordinary factors are "One-off measures and extraordinary factors" excluding "Adjustment regarding North Sea revenue". The core surplus is calculated residually.

Source: Central-government accounts, *Budget Outlook*, December 2006, and *Finance Bill,* 2007.

BREAKDOWN OF ANNUAL CHANGE IN INTEREST COSTS Chart 3




Note: The contribution from the change in the central-government debt is the change in the debt multiplied by the average interest rate on the debt in the previous period. The contribution from the change in interest rates is the residual.

## MARKET IMPLICATIONS OF THE FALLING CENTRAL-GOVERNMENT DEBT

### Concentration of the issuance policy

A diminishing central-government debt leads to adjustments in the structure and range of instruments in the government securities market. The government debt policy has been adjusted on an ongoing basis to support liquidity in government securities. A few years ago, government issues comprised T-bills, 2-, 5- and 10-year domestic government bonds and 5-year euro loans. In 2006, the prospect of a sustained government surplus led to a decision to focus the issuance strategy on the 10-year domestic government bond series. The choice of the 10-year segment reflects that the central government normally has a comparative advantage in the long maturity segment in view of its high credit standing. Furthermore, the 10-year maturity segment is considered to be one of the most important segments internationally. As part of the concentration of the issuance policy, the T-bill programme was downscaled in 2006, and the central government's foreign borrowing programme was suspended.

### Focus on the buy-back policy

The central government conducts buy-backs in securities to the extent that market prices are deemed to be fair compared to market prices in the key on-the-run issues. As the central-government debt decreases,

there is an increasing risk of a shortfall in the buy-back series. In this situation it is important for Government Debt Management to have some leeway in its buy-back activities. As an example, a new buy-back facility has been introduced.

### Market interest rates

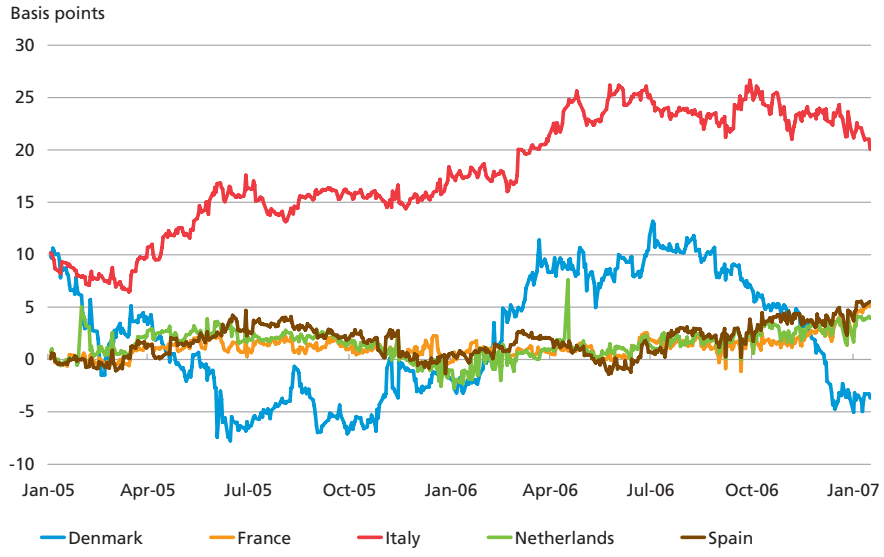
As the central-government debt has fallen, the supply of Danish government securities in the financial markets has diminished. This is among other things reflected in a narrowing of the yield spread between Danish and German government securities. The yield spread was negative for most of 2005, but widened after Danmarks National-bank's unilateral raising of the monetary-policy interest rates in February 2006. Following the publication of positive government budget prospects towards the end of the year, the yield spread again became negative, cf. Chart 4.

## STRATEGY 2007

### Issuance strategy

In 2007, a government budget surplus approximately equivalent to redemptions of the central-government debt is expected, so that the central-government borrowing requirement is zero. The issuance strategy

10-YEAR YIELD SPREADS VIS-À-VIS GERMANY — Chart 4




Note: Yield spreads are adjusted for differences in maturity. Denmark, France, the Netherlands and Spain are rated Aaa/AAA. Italy is rated Aa2/A+.
Source: Bloomberg.

entails restructuring from borrowing in T-bills to borrowing in the 10-year maturity segment. The T-bill programme is being reduced, corresponding to an expected net financing contribution of around DKK -20 billion. Issuance in 4 per cent bullet loans 2017 continues, and the outstanding volume in 4 per cent bullet loans 2010 is expected to reach a minimum of DKK 35 billion in 2007, cf. Box 1.

**Interest-rate risk**

The interest-rate risk on the central-government debt is managed by a strategic benchmark for the duration of the debt portfolio. In 2007, the target band for the duration is 3 years ± 0.5 year, which is unchanged from the most recent years.

As its debt diminishes, the central government can assume a higher interest-rate risk, i.e. reduce the duration. There are two arguments for not reducing the target band for duration in 2007. Firstly, the yield curve is flat, so that the expected cost savings from reducing the duration are very small compared to the increased risk. Secondly, the level of interest rates is low, and model projections show that the probability of rising interest rates exceeds the probability of falling interest rates.

STRATEGIC BENCHMARKS FOR 2007 — Box 1

**Issuance and liquidity:**

- 4 per cent bullet loans 2017 is built up to a final outstanding amount of around DKK 50 billion.
- In 2007, 4 per cent bullet loans 2010 is built up to a final outstanding amount of minimum DKK 35 billion.
- The net financing contribution from the T-bill programme is expected to be around DKK -20 billion. Two new T-bills are opened in 2007.
- In the event of special market conditions in secondary trading, smaller issues in the other bullet loans maturing after 2007 are possible.
- The central government may buy back in all government securities except the key on-the-run issues (4 per cent bullet loans 2010 and 4 per cent bullet loans 2017).

**Risk management:**

- In 2007 the interest-rate risk is managed within a duration band of 3 years ± 0.5 year.

# Main Principles

CHAPTER 1

# Main Principles of Government Debt Management

*Government Debt Management at Danmarks Nationalbank manages the central-government debt on behalf of the Ministry of Finance. The central government borrows in the financial markets in order to meet its financing requirement covering maturing loans and budget deficits.*

*The overall objective of the government debt policy is to cover the central government's financing requirement at the lowest possible long-term borrowing costs, while taking the degree of risk into account. Furthermore, the aim is to facilitate the central government's access to the financial markets in the longer term and to support a well-functioning domestic financial market.*

*The government debt policy is based on well-reputed, international principles for good governance of debt management, including openness, credibility, clearly defined objectives and a clear division of responsibilities.*

## RESPONSIBILITIES OF GOVERNMENT DEBT MANAGEMENT 1.1

Government Debt Management manages the central-government borrowing and debt on behalf of the Ministry of Finance:

- Government Debt Management issues government bonds and T-bills to cover the central-government financing requirement. The financing requirement is determined by the central government's current revenue and expenditure, as well as maturing debt.
- Government Debt Management manages the assets of four government funds[1] that are included in the central-government debt.
- Government Debt Management ensures that the central government's account with Danmarks Nationalbank does not show a deficit.[2] Government Debt Management compiles the central-government financing requirement on the basis of the budget forecasts from the Ministry of Finance, and via government issues it ensures that the

[1] The Social Pension Fund, the Financing Fund, the National Advanced Technology Foundation and the Preventive Measures Fund (as from 2007).

[2] According to Article 101 of the EU Treaty, the central government's account with Danmarks Nationalbank cannot show a deficit.

balance of the central government's account can cover the government's current payments.
- Government Debt Management monitors and manages risk on the total government debt portfolio (the central government's domestic and foreign debt, the central-government account with Danmarks Nationalbank, the assets of the four government funds, and re-lending by the central government).
- Government Debt Management undertakes settlement and bookkeeping of transactions.
- Government Debt Management aims to ensure a transparent and liquid market for Danish government securities, e.g. via market-making agreements with primary dealers in Danish government securities.

Government Debt Management furthermore is responsible for access to central-government re-lending and guarantees for a number of primarily government-owned companies. Government Debt Management also acts as adviser to the Ministry of Finance on various issues, particularly those concerning other financial risks to the central government, e.g. interest-rate risk in relation to the financing of subsidised housing.

## OBJECTIVES AND STRATEGY 1.2

The overall objective of the government debt policy is to cover the central-government financing requirement at the lowest possible long-term borrowing costs, while taking the degree of risk into account. Furthermore, the aim is to facilitate the central government’s access to the financial markets in the longer term and to support a well-functioning domestic financial market.

### STRATEGIC BENCHMARKS Box 1.1

The *strategic benchmark for issuance* concerns the central government's issuance volume and choice of debt instruments and e.g. includes a target for the issuance volume in specific government securities. The strategic benchmark for issuance is determined on the basis of a range of factors such as market conditions and the central government's expected borrowing requirement.

The *strategic benchmark for risk management* relates to the management of interest-rate risk on the overall government debt portfolio. The benchmark comprises a target band for the Macauley duration. The benchmark for the year is inter alia determined on the basis of quantitative analyses of interest-rate risk in Government Debt Management's CaR model.

The strategy for management of central-government debt is agreed at quarterly meetings between the Ministry of Finance and Government Debt Management on the basis of a strategy proposal prepared by Government Debt Management. At the meetings, the Ministry of Finance authorises Government Debt Management to implement the agreed strategy, which among other things provides a strategic benchmark for the key on-the-run issues, and the risks that may be assumed, cf. Box 1.1. At the meeting in December, the overall strategy for the following year is agreed upon, and at the subsequent three quarterly meetings any further specifications and adjustments of the overall strategy for the year are adopted. Government Debt Management reports to the Ministry of Finance on the implementation of the strategy on a monthly basis, and also presents a report at the quarterly meetings.

To support the openness and credibility of government debt policy, the government debt strategy is announced to the market immediately after the government debt meetings in June and December. The strategies are assessed on an ongoing basis in order to ensure the best possible fulfilment of the objectives and that Danish government debt management complies with international standards formulated by e.g. the World Bank, IMF and the OECD.

## GOVERNMENT DEBT MANAGEMENT PORTFOLIOS 1.3

The central-government debt comprises domestic and foreign debt, the assets of four government funds and the balance of the central government's account with Danmarks Nationalbank:

- The domestic debt is denominated in Danish kroner.
- The foreign debt is denominated in foreign currency. The main part of the foreign debt is raised in order to maintain a foreign-exchange reserve and is denominated in euro.
- Except for a small portfolio of Danish mortgage-credit and index-linked bonds held by the Social Pension Fund, the assets of the four government funds managed by Government Debt Management are placed in Danish government securities.
- The central government's liquid funds are held in an account with Danmarks Nationalbank and accrue interest at the discount rate.
- The central government's domestic and foreign debt, the assets of the government funds, the central government's account and the central government's re-lending are subject to coordinated management, i.e. taking due account of the overall costs and risks.

CENTRAL-GOVERNMENT DEBT AND THE GOVERNMENT DEBT PORTFOLIO Table 1.3.1

| DKK billion | End-2006 |
|---|---|
| Domestic debt | 454 |
| Foreign debt | 80 |
| Government funds | -135 |
| Central government's account with Danmarks Nationalbank | -71 |
| Central-government debt | 328 |
| Central-government re-lending | -34 |
| Central-government debt, including re-lending | 294 |

At end-2006, the central-government debt amounted to DKK 328 billion, equivalent to 20 per cent of GDP, cf. Table 1.3.1. In addition to managing the central-government debt, Government Debt Management is responsible for the central government's re-lending. Re-lending is part of the debt portfolio, but is not included in the definition of central-government debt. The government debt including re-lending amounted to DKK 294 billion, or 18 per cent of GDP, at the end of 2006.

Government Debt Management uses only standardised, well-known financial instruments in relation to issuance, management of the assets of the government funds and swap agreements used in the management of the government's interest-rate risk and foreign-exchange exposure. This reduces operational risk. The central government's credit risk on swap agreements is limited by only transacting swaps with counterparties with high credit ratings that have signed a unilateral collateral agreement. Legal risk is minimised by using standardised contracts.

## DOMESTIC AND FOREIGN FUNDING RULES 1.4

The Danish government and Danmarks Nationalbank have agreed on the framework for the distribution of the central government’s domestic and foreign borrowing. The domestic and the foreign funding rules support the separation of fiscal and monetary policy, cf. Box 1.2.

Under the domestic funding rule, the central government issues debt denominated in kroner to cover its current deficit and redemptions of the domestic debt. This means that, viewed over the full year, the central government's payments in principle have no impact on domestic liquidity, and the separation of fiscal and monetary policy is supported.

The foreign debt is issued in order to maintain the foreign-exchange reserve. In principle, the central government issues debt denominated in foreign currency equivalent to the redemptions of the foreign debt.

FUNDING RULES FOR CENTRAL-GOVERNMENT BORROWING Box 1.2

The basic principles of the funding rules have formed the basis for government debt policy since 1983. The funding rules are formulated in the "*Agreement on the division of work in the area of government debt between Danmarks Nationalbank and the Ministry of Finance*", 13 November 2006[1]:

"The scope of central-government borrowing is determined by the norm for central-government borrowing set out in an agreement concluded between the government and Danmarks Nationalbank.

The norm has two parts: one norm for domestic borrowing and one norm for foreign borrowing.

The norm for domestic borrowing prescribes that domestic borrowing in Danish kroner for the year as a whole shall be equivalent to the central government's overall financing requirement (the gross financing requirement) less repayments on the foreign debt. In the planning of domestic borrowing it is possible to take into account, within the same year, the situation on the loan market and the balance of the central government's account with Danmarks Nationalbank. At no time may the central government's account with Danmarks Nationalbank be overdrawn, cf. Article 104[2] of the Maastricht Treaty which prohibits monetary financing.

In addition, it is possible to raise domestic loans in kroner if the foreign government debt is reduced equivalently. The norm for foreign borrowing prescribes that the central government's repayments on the government debt in foreign currency (the foreign government debt), including early redemptions and buy-backs, shall normally be refinanced by foreign borrowing.

The central government's foreign borrowing is justified by the consideration of maintaining an adequate foreign-exchange reserve. Thus situations may arise in which the foreign borrowing norm is deviated from. In situations where the foreign-exchange reserve decreases by more than is appropriate, it may be necessary for the central government – out of concern for the exchange-rate policy – to raise extraordinary loans abroad in order to strengthen the foreign-exchange reserve. On the other hand, it is possible, in situations where the foreign-exchange reserve increases by more than is considered necessary in relation to the foreign-exchange policy, to reduce the foreign norm (nominal debt), provided that the central government's account with Danmarks Nationalbank is assessed as being sufficiently large."

[1] See www.nationalbanken.dk under Government debt.
[2] Equivalent to article 101 of the EU Treaty.

Borrowing in foreign currency does not influence domestic liquidity, but is included directly in the foreign-exchange reserve.

According to Article 101 of the EU Treaty, the central government's account with Danmarks Nationalbank cannot show a deficit. Central-government borrowing is planned to ensure an appropriate balance on the central government's account which can absorb fluctuations in central-government receipts and payments. Uncertainty concerning the balance of the central government's account is e.g. related to predicting the size of receipts from taxes and duties. In the light of for example

market conditions, the central government may continue to issue government securities even though the borrowing requirement for the year has been financed.

When central-government debt is declining, the domestic funding rule in principle entails an increasing foreign-debt share of the total central-government debt. From a government debt policy viewpoint, reduction of the central-government debt gives reason to consider adjustment of the foreign central-government debt. As from 2007, the agreement between Danmarks Nationalbank and the Ministry of Finance has been amended so that it is now possible to reduce the foreign debt via an equivalent increase in debt denominated in kroner, provided that the foreign-exchange reserve gives scope for this.

## FRAMEWORK OF GOVERNMENT DEBT MANAGEMENT IN DENMARK 1.5

The Minister of Finance is authorised by law to raise government loans and has the overall and political responsibility for central-government borrowing and debt, including relations with the Folketing (Parliament), cf. Box 1.3. The day-to-day management of the central-government debt, as well as related tasks, are conducted by Government Debt Management on behalf of the Ministry of Finance, and in accordance with the government debt strategy agreed with the Ministry of Finance.

The distribution of responsibilities between Government Debt Management and the Ministry of Finance is governed by the "*Agreement on the division of work in the area of government debt between Danmarks Nationalbank and the Ministry of Finance*".[1] The

ACT ON THE AUTHORITY TO RAISE LOANS ON BEHALF OF THE CENTRAL GOVERNMENT Box 1.3

Under the Danish Constitution, debt can be issued by the central government according to law. The statutory basis for central-government borrowing is set out in the "*Act on the authority to raise loans on behalf of the central government*" of 1993[1], which authorises the Minister of Finance to raise loans on behalf of the central government for a maximum amount of DKK 950 billion. This amount is the upper limit for domestic and foreign debt. In connection with current debt management, the Minister of Finance is moreover authorised to enter into swap agreements and other financial transactions. The central government's costs of borrowing, i.e. interest costs and capital losses on issues and buy-backs, must be appropriated under the annual finance acts.

[1] Act No. 1079 of 12/22/1993 as subsequently amended. The Act is available at www.nationalbanken.dk under Government debt.

[1] The agreement is published at www.nationalbanken.dk under Government debt.

framework for management of the assets of the Social Pension Fund is laid down in the "*Regulations governing the management of the Social Pension Fund*".[1] Other tasks undertaken by Government Debt Management on behalf of the Ministry of Finance relating to the management of the assets of the three other government funds and the management of re-lending and government guarantees are specified in separate agreements.

The internal structure of Government Debt Management reflects international standards and recommendations. Government Debt Management is divided into front, middle and back offices with separate functions. A clear separation of functions and clear procedures reduce operational risks and facilitate internal control. A well-defined division of responsibilities ensures that tasks related to the management of government debt are undertaken independently of other activities at Danmarks Nationalbank, and that various categories of professional expertise are utilised in the best possible way.

The middle office formulates the general principles concerning government debt policy and prepares proposals for borrowing strategies and risk management prior to the quarterly government debt meetings. With due consideration of current market conditions the middle office also lays down monthly guidelines for the front office with regard to issuance, buy-backs and swap transactions in accordance with the overall objectives for government debt and the agreed strategies. In addition, the middle office undertakes the overall management of re-lending and government guarantees, represents Danmarks Nationalbank on the Board of the Social Pension Fund and has an advisory role regarding the financing of subsidised housing.

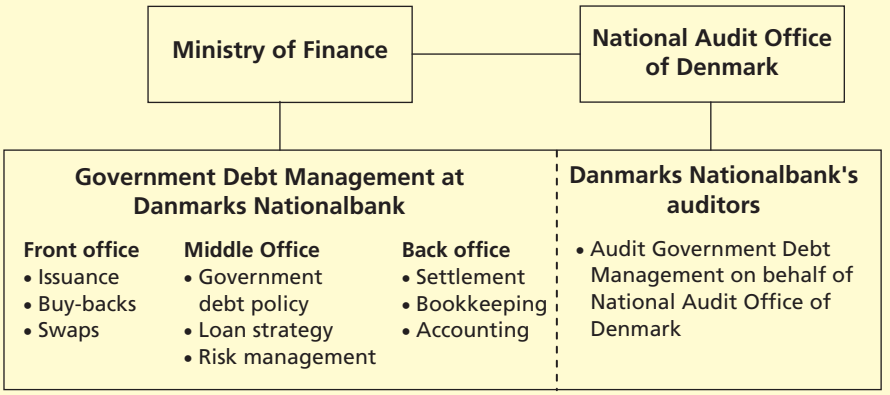
The front office is responsible for the operational element of the government debt policy, including issuance of government securities, buy-backs and execution of swap transactions, within the framework of the monthly guidelines. It also undertakes disbursement of re-lending and issue of government guarantees.

The back office undertakes settlement of payments, including servicing of debt and swaps, and prepares the accounts together with the Danish Agency for Governmental Management.

Government Debt Management is audited by Danmarks National-bank's auditors on behalf of the National Audit Office of Denmark. The National Audit Office of Denmark reviews the accounts of government institutions, i.e. checks that they are without significant errors and discrepancies. The National Audit Office of Denmark may in addition

[1] The regulation is published at www.nationalbanken.dk under Government debt.

STRUCTURE OF GOVERNMENT DEBT MANAGEMENT Box 1.4




assess whether the funds received by government institutions are applied in the best possible way. The results of its investigations are published at www.rigsrevisionen.dk.

Box 1.4 summarises the structure of Government Debt Management.

## INFORMATION ON THE CENTRAL-GOVERNMENT DEBT 1.6

An important element of the government debt policy is to give market participants and the general public access to information on the central-government borrowing strategies, borrowing requirement, etc., as well as information of a more general nature on the framework for government debt management. A wide range of information is published on a regular basis, cf. Box 1.5.

An overview of the information regularly published on central-government borrowing and debt is presented in the Appendices.

SOURCES OF INFORMATION ON DANISH GOVERNMENT BORROWING AND DEBT Box 1.5

For information on Danish government borrowing and debt, see:

- Danmarks Nationalbank's news service (DN News)
- Danmarks Nationalbank's website, www.nationalbanken.dk under Government debt[1]
- The annual publication *Danish Government Borrowing and Debt*
- The semi-annual announcement *Danish Government Debt Management Strategy*
- The Ministry of Finance's *Budget Outlook*, www.fm.dk
- Danish and international news agencies, e.g. Bloomberg, Reuters, Ritzau, etc.

For information on the market for Danish government securities, see:

- The MTS website, www.mtsdenmark.dk
- The Copenhagen Stock Exchange's website, www.omxgroup.com.

[1] Danmarks Nationalbank also offers an e-mail news service. To subscribe, see www.nationalbanken.dk.

# Report Section

CHAPTER 2

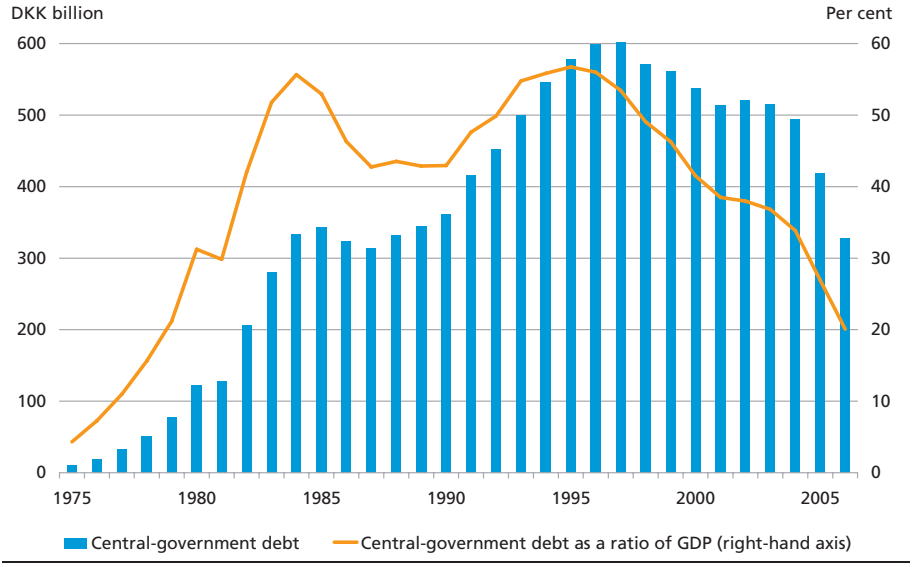
# Government Debt and Interest Costs

*In 2006, the central-government debt decreased by DKK 90 billion to DKK 328 billion as a result of the government surplus. This corresponds to a reduction by approximately DKK 17,000 per capita. In view of the significant debt reduction, the central government's interest costs fell by DKK 3.4 billion to DKK 17.3 billion in 2006. The average interest rate on the central-government debt was 4.6 per cent in 2006, which is equivalent to the 2005 level.*

## CENTRAL-GOVERNMENT DEBT AND INTEREST COSTS 2.1

The central-government debt is compiled as the total domestic and foreign debt less the balance of the central government's account with Danmarks Nationalbank and the assets of the Social Pension Fund (SPF), the Financing Fund and the High-Technology Foundation. The debt is compiled at nominal value, cf. Box 2.1. Central-government debt as a share of GDP has been declining since 1995 and the ratio was 20 per cent at end-2006, cf. Chart 2.1.1.

CENTRAL-GOVERNMENT DEBT, 1975-2006 Chart 2.1.1




Note: The central-government debt includes the assets of SPF as of 1 January 1982.

COMPILATION OF CENTRAL-GOVERNMENT DEBT AND INTEREST COSTS Box 2.1

The central-government debt is compiled in the central-government accounts as the nominal value of domestic and foreign debt less the balance of the central government's account with Danmarks Nationalbank and the assets of the Social Pension Fund (SPF), the Financing Fund, the High-Technology Foundation and the Preventive Measures Fund (as from 2007). The distribution of domestic and foreign borrowing is based on currency denomination. Domestic debt is denominated in kroner, while foreign debt is denominated in foreign exchange.

**Interest costs**

Interest costs related to the central-government debt comprise interests, distributed capital losses on issue, realised exchange-rate losses and capital losses on buy-backs. Interest and capital losses on issue are accrued on the basis of an earnings principle. The interest costs are compiled as a share of the interest credited for the year, using day-counting principles. The capital loss on issue is the difference between the nominal value and the market value on issue, and is distributed linearly on the term to maturity of the loan. On buy-back, the remaining distributed capital losses on issue are brought forward to the current year.

**Re-lending**

The compilation of the central-government debt does not include the central government's claims on companies that receive re-lending. Re-lending increases the central-government debt since it is financed from the central government's current borrowing. Interest costs on government issues to finance re-lending are also included in the compilation of interest costs while interest revenue to the central government in connection with re-lending is not included.

**Compilation at market value**

A number of OECD countries have increased focus on compilation of the central-government debt at market value. However, only a few countries, e.g. New Zealand, compile the central-government debt at both nominal and market value. Market-value principles imply that value of the debt is dependent on market interest rates. However, if the debt is traded around par, the difference between nominal and market values is limited. Compilation at market value becomes more relevant if an increasing share of the debt is bought back before maturity, or if asset portfolios that typically have a higher turnover rate than debt portfolios are built up.

The central-government debt compiled at nominal value was DKK 327.7 billion, equivalent to around DKK 60,000 per capita, at end-2006. The central-government debt fell by DKK 90 billion compared to 2005, cf. Table 2.1.1, equivalent to a decrease by around DKK 17,000 per capita.

The central-government debt compiled at market value was DKK 342 billion at end-2006, cf. Table 2.1.2. This is close to the debt's nominal value, reflecting that the government bonds are on average traded close to par. Since 2005, the market value of the debt has decreased by DKK 104 billion, of which DKK 14 billion can be attributed to the lower market value of the outstanding bonds as a result of rising interest rates in 2006, cf. Chapter 3.

CENTRAL-GOVERNMENT DEBT AT NOMINAL VALUE, 2004-06 Table 2.1.1

| DKK billion | 2004 | 2005 | 2006[1] |
|---|---|---|---|
| Domestic debt | 604.6 | 516.5 | 454.0 |
| Foreign debt | 83.9 | 90.7 | 79.8 |
| Central government's account with Danmarks Nationalbank[2] | -57.6 | -53.3 | -71.4 |
| The Social Pension Fund[3] | -136.9 | -133.2 | -128.9 |
| The High-Technology Foundation | • | -1.8 | -4.3 |
| The Financing Fund | • | -0.9 | -1.4 |
| Central-government debt | 494.1 | 417.9 | 327.7 |
| Outstanding re-lending[4] | -19.1 | -23.1 | -34.0 |
| Central-government debt adjusted for re-lending | 475.0 | 394.8 | 293.8 |

Source: Central-government accounts 2004 and 2005. For 2006, figures are provisional.

[1] As from 2006, the Mortgage Bank of the Kingdom of Denmark is included in the central-government debt, which increases the debt by DKK 0.4 billion. The amount is not included in the above figures.

[2] For 2006, the account is compiled in accordance with the monthly balance sheet of Danmarks Nationalbank.

[3] SPF's portfolio of index-linked bonds is compiled at indexed value.

[4] Re-lending to Ørestadsselskabet I/S, A/S Storebælt, A/S Øresund, Energinet.dk and Danmarks Skibskredit A/S.

In 2006, interest costs totalled DKK 17.3 billion, cf. Table 2.1.3, down by DKK 3.4 billion from 2005. The average interest rate on the central-government debt was 4.6 per cent in 2006, which is equivalent to the 2005 level.[1] This reflects that the slightly higher level of interest rates in 2006 was offset by the redemption of debt issued at higher interest rates.

CENTRAL-GOVERNMENT DEBT AT MARKET VALUE, 2004-06 Table 2.1.2

| DKK billion | 2004 | 2005 | 2006[1] |
|---|---|---|---|
| Domestic debt | 655.0 | 564.2 | 480.2 |
| Foreign debt | 80.9 | 87.6 | 78.5 |
| Central government's account with Danmarks Nationalbank[2] | -57.6 | -53.3 | -71.4 |
| The Social Pension Fund | -154.0 | -149.4 | -139.2 |
| The High-Technology Foundation | • | -2.0 | -4.5 |
| The Financing Fund | • | -1.0 | -1.5 |
| Central-government debt at market value | 524.2 | 446.2 | 342.0 |
| Outstanding re-lending | -21.5 | -25.6 | -36.0 |
| Central-government debt adjusted for re-lending | 502.8 | 420.6 | 306.0 |

Note: Market value is calculated on the basis of the official stock-exchange prices at year-end in accordance with the accounting policies for the central-government accounts. Unlisted instruments, e.g. swaps, are priced at market value in accordance with current market interest rates.

Source: Danmarks Nationalbank.

[1] As from 2006, the Mortgage Bank of the Kingdom of Denmark is included in the central-government debt, which increases the debt by DKK 0.4 billion. The amount is not included in the above figures.

[2] For 2006, the account is compiled in accordance with the monthly balance sheet of Danmarks Nationalbank.

[1] The average interest rate is calculated as the total interest costs divided by the average of the central-government debt at the beginning and end of the year (nominal value).

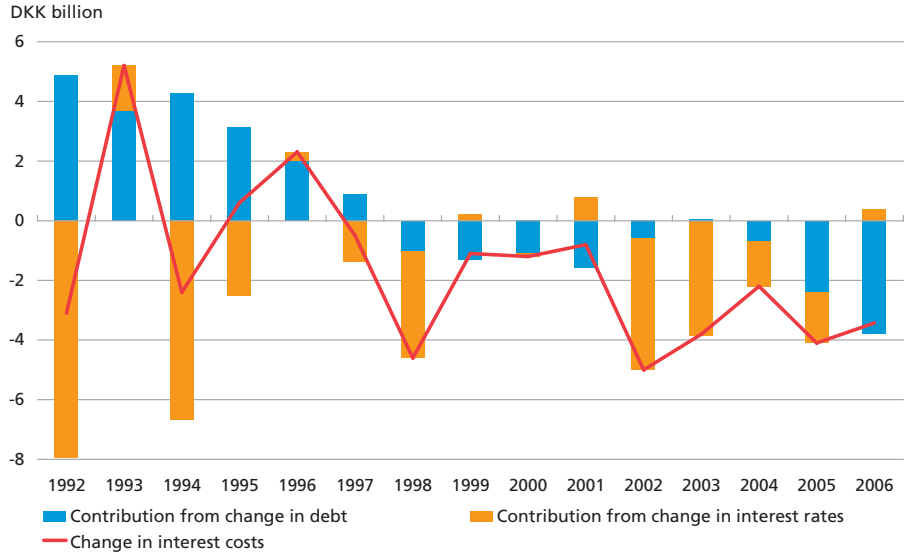
INTEREST COSTS ON THE CENTRAL-GOVERNMENT DEBT, 2004-06 Table 2.1.3

| DKK billion | 2004 | 2005 | 2006 |
|---|---|---|---|
| *Interest costs* | | | |
| Domestic debt | 33.2 | 27.8 | 23.0 |
| Foreign debt | 1.7 | 1.7 | 2.2 |
| *Interest income* | | | |
| Central government's account with Danmarks Nationalbank | -1.7 | -1.1 | -1.2 |
| The Social Pension Fund | -8.3 | -7.6 | -6.6 |
| The High-Technology Foundation | • | 0.0 | -0.1 |
| The Financing Fund | • | 0.0 | 0.0 |
| Interest costs on the central-government debt | 24.9 | 20.7 | 17.3 |
| Interest income from re-lending | -0.8 | -0.9 | -1.2 |
| Interest costs on the central-government debt adjusted for re-lending | 24.1 | 19.8 | 16.1 |

Source: Central-government accounts 2004 and 2005. For 2006, figures are provisional.

In recent years, the level of interest rates has in general been falling, which has contributed to lower interest costs for the central government, cf. Box 2.2. The diminishing central-government debt has also contributed to reduced interest costs. A breakdown of the development in interest costs shows that in most recent years the reduction is primarily attributable to the falling central-government debt, cf. Chart 2.1.2.

BREAKDOWN OF ANNUAL CHANGE IN INTEREST COSTS Chart 2.1.2



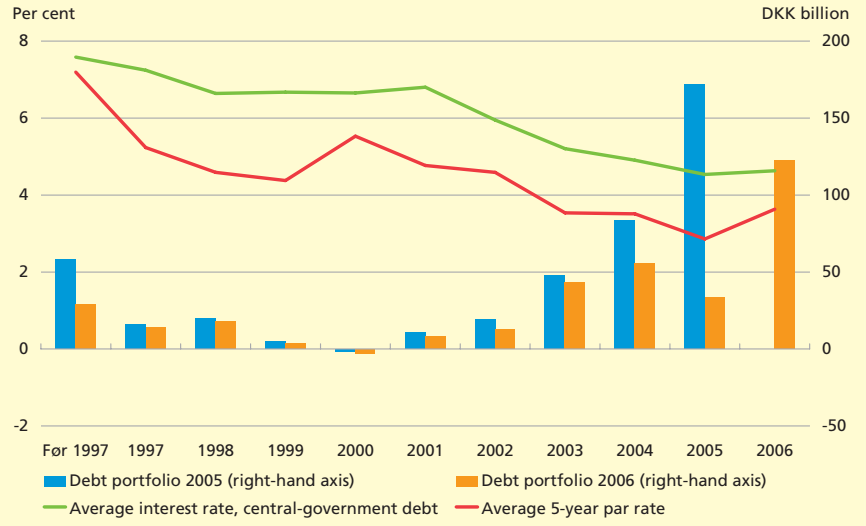

Note: The contribution from the change in the central-government debt is the change in the debt multiplied by the average interest rate on the debt in the previous period. The contribution from the change in interest rates is the residual.

## DEVELOPMENT IN MARKET INTEREST RATES AND INTEREST COSTS — Box 2.2

The central-government debt portfolio comprises government bonds and swaps. The interest on the central-government debt reflects the interest rates prevailing when the debt was issued and the swaps were transacted. The Chart below shows the distribution by year of interest-rate fixing of the central-government debt at end-2005 and end-2006. The interest-rate fixing is defined as the year of issue of fixed-rate debt, or the latest interest-rate fixing for floating-rate debt.

The large share of the debt for which an interest rate was fixed in 2005/06 can be attributed to the considerable volume of interest-rate swaps, for which a new interest rate is fixed every six months, in the central government's debt portfolio. The Chart also shows that for a considerable share of the debt, the interest rate was fixed in previous years and thus reflects historical market conditions.

DEBT PORTFOLIO BY INTEREST-RATE FIXING AND AVERAGE INTEREST RATE




Note: The average interest rate on the central-government debt is calculated as interest costs for the year divided by the average central-government debt at the beginning and end of the year. The average interest rate and the average of the 5-year par rate for "before 1997" are calculated as averages for the period 1994-96.

Source: Bloomberg and own calculations.

Changes in market interest rates affect the interest costs on the central-government debt in step with the fixing of interest rates for the debt. In a period of falling interest rates, which has generally been the case since 1994, it takes time for the lower level of interest rates to fully pass through to the average interest rate on the debt when accrual principles are applied to the accounts.

EMU DEBT Box 2.3

The EMU debt is compiled in accordance with the EU Treaty. The EMU debt comprises the debt of the central, regional and local governments, etc. The debt is compiled on a gross basis, but the general-government sector may consolidate debt positions. This means that the government securities portfolios of the government funds are deducted from the debt. On the other hand, SPF's portfolio of mortgage-credit and index-linked bonds and the balance of the central government's account with Danmarks Nationalbank are not deducted.

## GROSS GENERAL-GOVERNMENT DEBT (EMU DEBT) 2.2

The European Commission and the Ecofin Council monitor the development in the budgetary situation of the EU member states in order to assess fiscal discipline. This assessment is based on the criteria set out in the EU Treaty and in the Stability and Growth Pact. As a general rule, the general-government deficit may not exceed 3 per cent of GDP, and the general-government debt, defined as EMU debt, cf. Box 2.3, may not exceed 60 per cent of GDP. The EMU debt of the general-government sector at end-2006 is estimated at approximately DKK 460 billion or 28 per cent of GDP, cf. Table 2.2.1.

Denmark has by and large shown a general-government surplus since 1997. The general-government surpluses have contributed to reducing Denmark's EMU debt to around 28 per cent of GDP, while the average EMU debt in the euro area has been stable at around 70 per cent, cf. Chart 2.2.1.

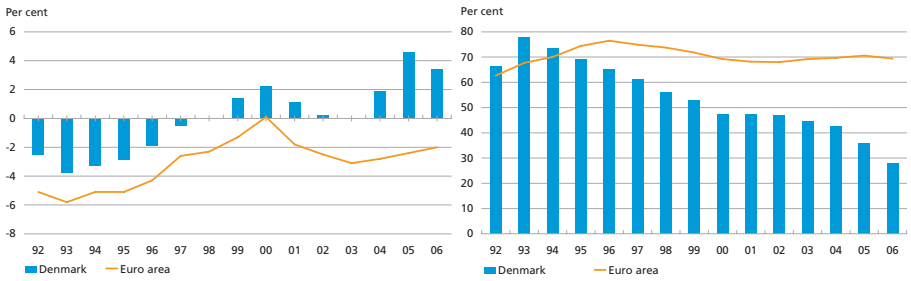
Denmark and Ireland differ from the euro area in that both countries have low general-government debt and have seen a strong reduction of the debt in recent years. This has resulted in significant adjustments to the government debt policies of the two countries, cf. Chapter 10 on the experiences of other countries with falling central-government debt.

GENERAL-GOVERNMENT BUDGET BALANCE AND EMU DEBT, 2004-06 Table 2.2.1

| | 2004 | 2005 | 2006 |
|---|---|---|---|
| General-government balance in DKK billion..... | 27.9 | 71.8 | 56.2 |
| General-government balance, percentage of GDP .. | 1.9 | 4.6 | 3.4 |
| EMU debt in DKK billion ..... | 624.9 | 557.5 | 461.5 |
| EMU debt, percentage of GDP ..... | 42.6 | 35.9 | 28.1 |

Note: The figures for 2006 are based on an estimate calculated in the autumn of 2006. Subsequent improvements in the general-government balance are not included.
Source: Ministry of Finance, *Economic Survey*, December 2006.

GENERAL-GOVERNMENT BALANCE AND EMU DEBT AS A RATIO OF GDP Chart 2.2.1




Source: The European Commission's autumn 2006 forecast.

CHAPTER 3

# Borrowing in 2006

*In 2006, Danish government finances showed a substantial surplus, resulting in a net financing requirement of DKK -92.8 billion, equivalent to a budget surplus of approximately 6 per cent of GDP. The estimate of the budget surplus was adjusted upwards during the year in step with higher expectations of growth in the Danish economy, and the borrowing requirement was thereby gradually reduced. This led to a downscaling of the T-bill programme, while the issuance strategy for government bonds was maintained. The adjustment of the programme was also related to diminishing demand for T-bills.*

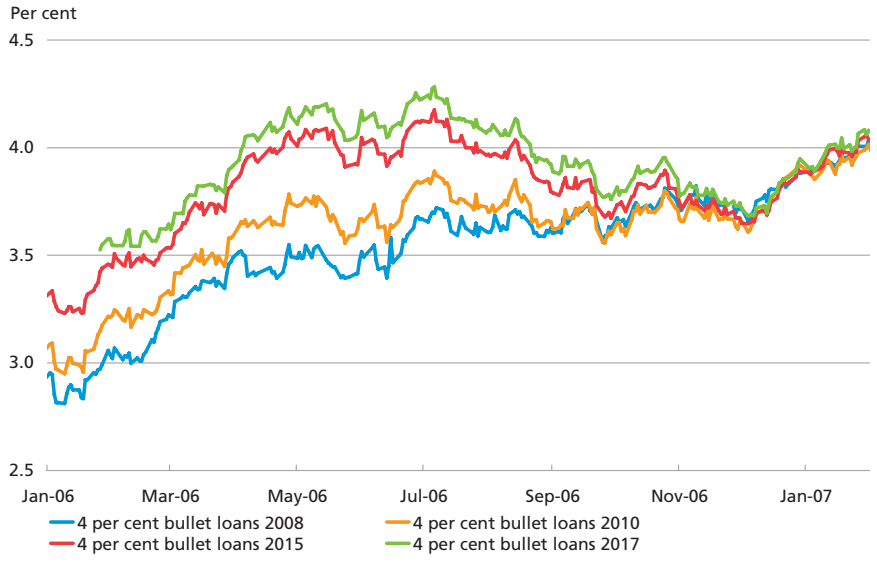
*Sale of government bonds totalled DKK 32 billion, of which sale in the 10-year maturity segment constituted DKK 25 billion. Sale of government securities exceeded the borrowing requirement by DKK 18 billion, primarily as a result of higher revenue than expected towards the end of the year. This increased the balance of the central government's account to DKK 71 billion at end-2006.*

## DEVELOPMENT IN INTEREST RATES 3.1

The 1st half of 2006 was characterised by rising interest rates, cf. Chart 3.1.1. In the 2nd half of 2006, long-term interest rates fell by around 30 basis points, while short-term interest rates continued to rise, reflecting expectations of higher monetary-policy interest rates.

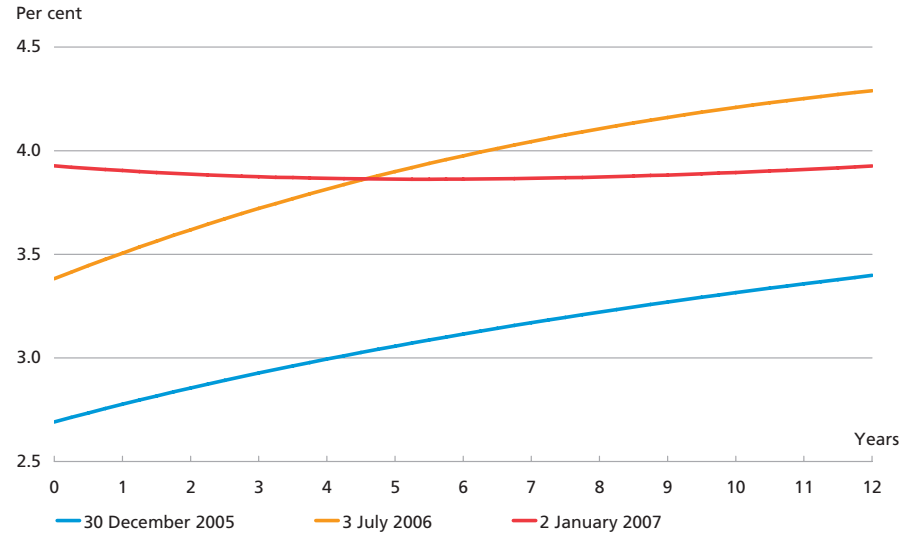
The development in interest rates in the 1st half of 2006 resulted in an upward parallel shift in the yield curve of around 50 basis points, while the development in the 2nd half of 2006 led to a continued flattening of the yield curve, cf. Chart 3.1.2. At the end of the year, interest rates were just below 4 per cent for all maturity segments.

YIELDS TO MATURITY FOR BENCHMARK SECURITIES — Chart 3.1.1

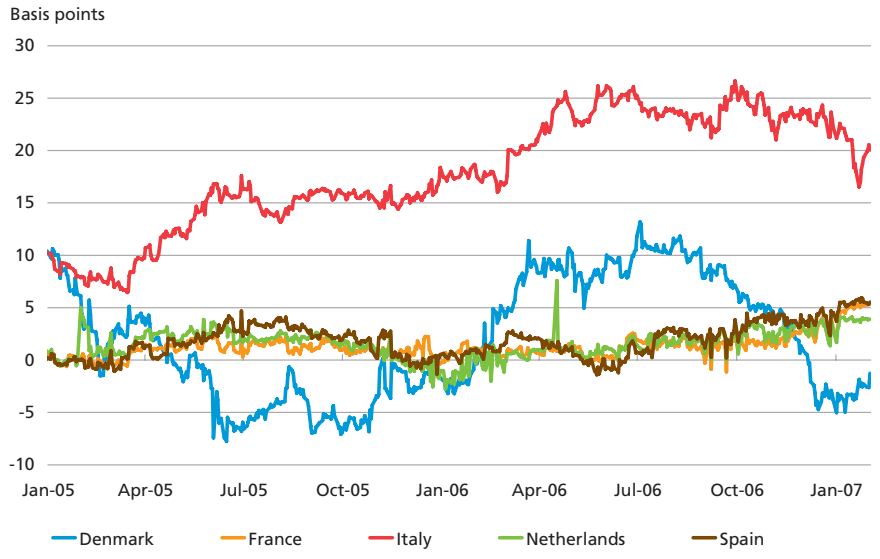



In 2005, the yield spread was predominantly negative, but widened after Danmarks Nationalbank's unilateral raising of the monetary-policy interest rates in February 2006. After the publication of the positive government budget prospects towards the end of 2006, the yield spread again became negative, cf. Chart 3.1.3.

GOVERNMENT ZERO-COUPON YIELD STRUCTURES — Chart 3.1.2



10-YEAR YIELD SPREADS VIS-À-VIS GERMANY Chart 3.1.3




Note: The yield spreads are adjusted for differences in maturity. Denmark, France, the Netherlands and Spain are rated Aaa/AAA. Italy is rated Aa2/A+.
Source: Bloomberg.

## OWNERSHIP DISTRIBUTION OF DANISH GOVERNMENT SECURITIES 3.2

In 2006, there was an increase in the share of Danish government securities held by the life insurance and pension (L&P) sector, cf. Table 3.2.1. The L&P sector mainly invested in short-term government bonds, while in longer maturities selling 5 per cent bullet loans 2013 and buying 4 per cent bullet loans 2017. The L&P sector and the public sector, primarily the Social Pension Fund, together own around 60 per cent of domestic Danish government securities.

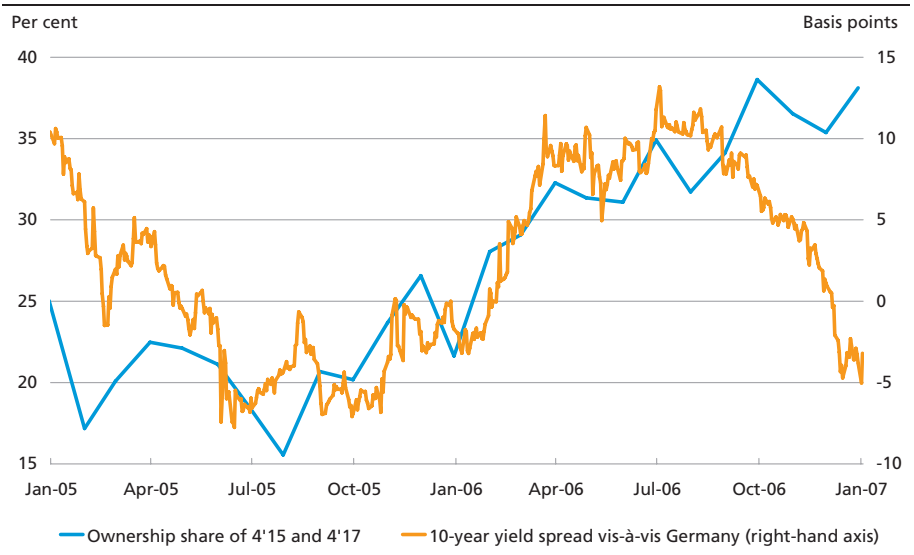
Non-resident ownership of Danish government securities declined in 2006. This reflects a lower ownership share of short-term securities, including T-bills, and an increase in the ownership share of long-term

OWNERSHIP DISTRIBUTION OF DOMESTIC GOVERNMENT SECURITIES Table 3.2.1

| Per cent of nominal outstanding volume | Dec 2005 | Dec 2006 |
|---|---|---|
| Financial institutions, including Danmarks Nationalbank | 20 | 16 |
| Life insurance companies and pension funds | 24 | 28 |
| Non-financial enterprises | 3 | 2 |
| General government | 25 | 28 |
| Households, etc. | 1 | 1 |
| Non-residents | 26 | 24 |
| Not stated | 1 | 1 |
| Total | 100 | 100 |

Source: Danmarks Nationalbank, *Securities Statistics*.

NON-RESIDENT OWNERSHIP SHARE OF LONG-TERM DANISH GOVERNMENT SECURITIES AND THE 10-YEAR YIELD SPREAD VIS-À-VIS GERMANY Chart 3.2.1




Note: 4'15 and 4'17 are, respectively, 4 per cent bullet loans 2015 and 4 per cent bullet loans 2017. The ownership share is adjusted for SPF's portfolio of government bonds. The 10-year yield spread is adjusted for differences in maturities.
Source: Bloomberg and Danmarks Nationalbank, *Securities Statistics*.

government securities. Non-resident ownership of securities with long maturity increased in step with the widening of the yield spread in the 1st half of 2006, cf. Chart 3.2.1. However, the ownership share did not decline in the 2nd half of 2006 even though the yield spread narrowed.

## BORROWING REQUIREMENT 3.3

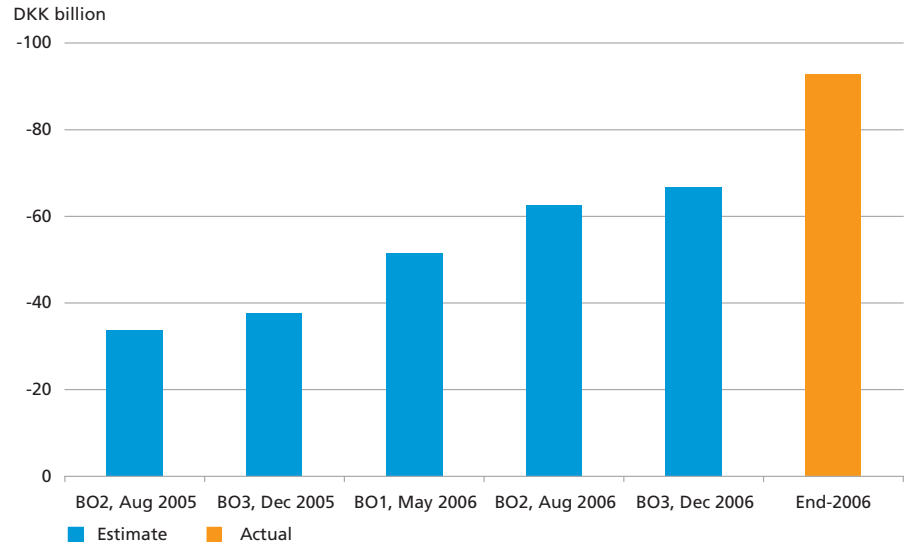
Danish government finances showed a substantial surplus, resulting in a net financing requirement of DKK -92.8 billion in 2006. The estimate of

CENTRAL-GOVERNMENT BORROWING REQUIREMENT IN 2006 Table 3.3.1

| DKK billion | |
|---|---|
| Net financing requirement[1] | -92.8 |
| Redemptions on debt, etc.[2] | 88.0 |
| Borrowing requirement | -4.8 |
| Financing of borrowing requirement: | |
| Sale of government bonds, market value | 32.1 |
| Net financing contribution from T-bill programme | -19.0 |
| Reduction of the balance of the central government's account | -17.9 |

1 Based on Danmarks Nationalbank's data at year-end. The figure may deviate from the figure in the government accounts.
2 Including buy-backs in securities maturing in subsequent years, net bond purchases by government funds and net payments on the central government's currency swaps.

DEVELOPMENT IN EXPECTED NET FINANCING REQUIREMENT FOR 2006 Chart 3.3.1




Note: End-2006 is according to Danmarks Nationalbank's monthly statement.
Source: Ministry of Finance's *Budget Outlook*, August 2005 till December 2006.

the government budget surplus was adjusted upwards during the year, reflecting higher expectations of growth in the Danish economy, cf. Chart 3.3.1. In addition, revenues from pension-fund tax and North Sea activities exceeded expectations. The improved government surplus led to a downward adjustment of the borrowing requirement during the year. In view of higher than expected revenue towards the end of the year, the sale of government securities exceeded the borrowing requirement, cf. Table 3.3.1, and the balance of the central government's account therefore increased by DKK 18 billion, to DKK 71 billion at end-2006.

## BORROWING 3.4

The low borrowing requirement in 2006 led to a reduction of the T-bill programme, while the issuance strategy for government bonds was maintained, cf. the strategic benchmarks in Box 3.1.

### Domestic government bonds

The central government's borrowing requirement in 2006 was financed solely via the issuance of domestic government bonds. Government bonds for DKK 32 billion at market value were sold, of which most in the 10-year maturity segment, cf. Table 3.4.1.

STRATEGIC BENCHMARKS FOR 2006 Box 3.1

**Interest-rate exposure:**

- Macauley duration of 3 years ± 0.5 year.
- Day-to-day management of duration based on a duration measure calculated at a fixed discount rate and a balance of the central government's account of DKK 30 billion. The target band for this duration is 3 years ± 0.25 year.

**Liquidity:**

- The final outstanding volume in 4 per cent bullet loans 2010 is built up to a minimum of DKK 35 billion.
- The final outstanding volume in 4 per cent bullet loans 2015 is built up to a minimum of DKK 60 billion.
- The final outstanding volume in 4 per cent bullet loans 2017 is built up to around DKK 50 billion, of which approximately DKK 25 billion is expected to be issued in 2006.
- In the event of unusual market conditions, the central government may issue for small amounts in government securities maturing after 2006.
- Net financing contribution of zero from the T-bill programme.[1]

[1] In October, the target for the net financing contribution of the T-bill programme was adjusted downwards to DKK -15 billion.

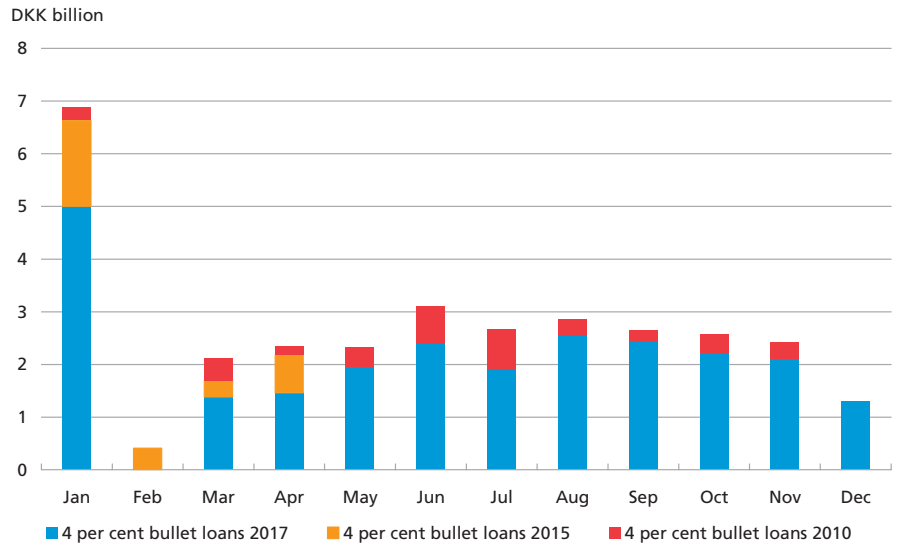
On 26 January 2006, 4 per cent bullet loans 2017 was opened as the new key on-the-run issue in the 10-year maturity segment. Since then, the sale has been evenly distributed over the year, cf. Chart 3.4.1. The new series acquired benchmark status in the 10-year maturity segment in October 2006.

The distribution of sale in 2006 reflects focus on building up the outstanding volume in the new series, 4 per cent bullet loans 2017. In addition, the outstanding volume in the "old" 10-year series, 4 per cent

DOMESTIC GOVERNMENT ISSUES IN 2006 Table 3.4.1

| DKK million | Issuance | | Nominal outstanding, end-2006 |
|---|---|---|---|
| | Nominal | Market value | |
| 4 per cent bullet loans 2010 | 3,850 | 3,905 | 31,890 |
| 4 per cent bullet loans 2015 | 3,090 | 3,220 | 60,000 |
| 4 per cent bullet loans 2017 | 24,700 | 25,008 | 24,700 |
| Total bullet loans | 31,640 | 32,133 | |
| T-bills | 60,860 | 59,338 | 42,660 |
| Redemptions | -78,292 | -78,292 | |
| T-bills, net | -17,432 | -18,954 | |
| Domestic sales of government securities, total | 14,208 | 13,179 | |

SALE OF GOVERNMENT ISSUES, 2006 Chart 3.4.1




bullet loans 2015, was built up to the announced minimum of DKK 60 billion. Finally, 4 per cent bullet loans 2010 were issued.

**T-bills**

Issuance of T-bills in 2006 totalled DKK 59.3 billion at market value, while redemptions totalled DKK 78.3 billion. The net financing contribution from the T-bill programme was thus DKK -19.0 billion. The reduction of the T-bill programme in 2006 was related to the limited demand at the T-bill auctions during the year, partly due to market expectations of higher monetary-policy interest rates. Furthermore, the T-bill programme was scaled down in step with the decreasing debt.

In 2006, the T-bill programme was used actively in the central-government cash management, in order to avoid a low balance of the central government's account in August and November. At the T-bill auction with settlement at the beginning of July, an extra T-bill maturing on 1 December 2006 was opened.

**Foreign borrowing**

In contrast to previous years, no euro loans were issued and no currency swaps transacted in 2006. The central government's Commercial Paper programmes, which are a contingency for short-term borrowing for the foreign-exchange reserve or the central-government account, were tested, but were not otherwise applied in 2006.

## BUY-BACKS 3.5

The central government undertakes buy-backs of government securities in the secondary market in order to support liquidity in the key on-the-run issues and to smooth the domestic redemption profile. In addition, the government funds primarily place their assets in government bonds. Government securities that have not been bought back for the government funds are normally cancelled after the transaction.

The diminishing government debt and the concentration of the debt on fewer securities reduce the number of outstanding government securities as well as the outstanding volume. This increases the risk of a shortfall in the market, limiting the buy-back opportunities in 2006. Experiences abroad concerning buy-backs in periods with decreasing debt show that the issuer typically pays a premium on large buy-backs due to a shortfall in the market. Government Debt Management in Denmark only buys back if the market prices are deemed to be fair in relation to the prices of government issues.

BUY-BACKS BY THE CENTRAL GOVERNMENT AND NET BUY-BACKS BY THE GOVERNMENT FUNDS IN 2006 Table 3.5.1

| DKK million, market value | Central government | SPF | Financing Fund | High-Technology Foundation | Total buy-backs from the market |
|---|---|---|---|---|---|
| 8 per cent bullet loans 2006 | 593 | - | - | - | 593 |
| 3 per cent bullet loans 2006 | 4,579 | -2,064 | -36 | 309 | 2,789 |
| Buy-backs maturing in 2006 | 5,172 | -2,064 | -36 | 309 | 3,381 |
| 7 per cent bullet loans 2007 | 16,756 | 15,831 | 303 | 928 | 2,156 |
| 6 per cent bullet loans 2009 | - | 2,417 | 306 | 919 | 3,641 |
| 6 per cent bullet loans 2011 | - | 3,549 | - | - | 3,549 |
| 5 per cent bullet loans 2013 | 1,467 | 9,310 | 308 | 1,131 | 12,215 |
| 4 per cent bullet loans 2015 | - | 675 | - | 177 | 853 |
| 7 per cent bullet loans 2024 | 74 | 1,883 | - | - | 1,957 |
| 5 per cent serial loans 2007 | 0 | - | - | - | 0 |
| 4 per cent serial loans 2017 | 0 | - | - | - | 0 |
| 3.5 per cent perpetuals 1886 | 16 | - | - | - | 16 |
| Buy-backs maturing after 2006 | 18,312 | 2,004 | 917 | 3,154 | 24,387 |
| Buy-backs of domestic government securities, total | 23,485 | -60 | 881 | 3,463 | 27,769 |
| 3.125 per cent euro loans 2009 | 634 | - | - | - | 634 |
| Multi-currency perpetuals[1] | 14 | - | - | - | 14 |
| Foreign government securities, total | 648 | - | - | - | 648 |

Note: A negative sign indicates net sales. The government funds only sell government securities to the central government.

[1] Perpetuals: 3 per cent 1894, 3.5 per cent 1901 and 3.5 per cent 1909.

It is important for Government Debt Management to ensure flexibility in connection with buy-back transactions. Consequently, a new buy-back facility was introduced on MTSDenmark in October 2006, partly in response to recommendations from market participants. This facility enables buy-backs in addition to the current tap buy-backs. The introduction of an exchange facility, whereby Government Debt Management would be able to transact both buy-backs and issuance of Danish government securities at the same time, is also being considered. The objective is to increase the number of buy-back methods and thus the flexibility of the central government's buy-backs.

In 2006, buy-backs from the market totalled DKK 28 billion at market value, cf. Table 3.5.1. Buy-backs have mainly been in 5 per cent bullet loans 2013. In addition to buy-backs in domestic securities, the central government bought back almost half of the outstanding volume of perpetuals during 2006. Finally, EUR 85 million (DKK 634 million) was bought back in 3.125 per cent euro loan 2009.

## INTEREST-RATE SWAPS 3.6

Interest-rate swaps are used to manage the central government's interest-rate risk. This means that the issuance strategy can focus on building up liquid series, and interest-rate swaps can be used to achieve the target for duration. In 2006, interest-rate swaps totalling DKK 17.9 billion were transacted, cf. Table 3.6.1.

### Duration

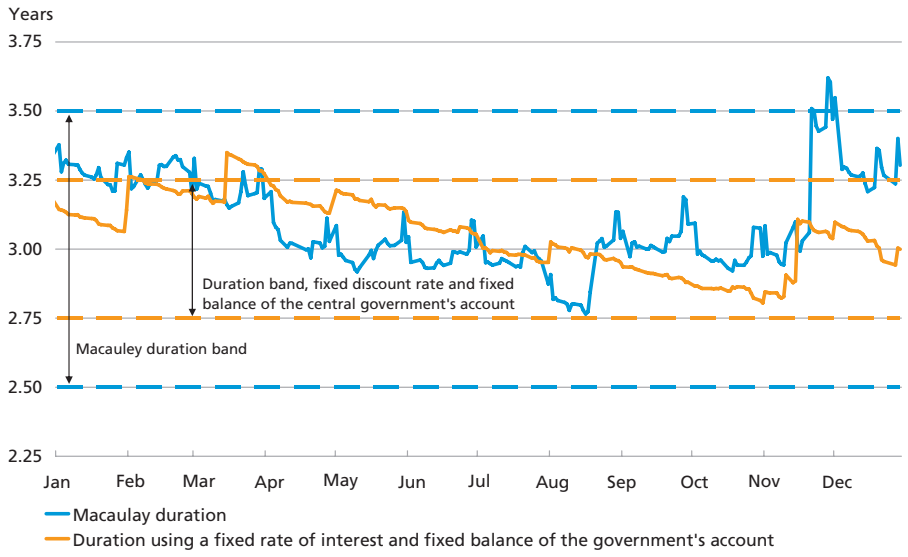
The duration of the government debt portfolio is calculated as the Macauley duration and the duration is managed within a band determined annually in connection with the government debt meeting in December. In 2006, the band was 3 years ± 0.5 year.

CENTRAL GOVERNMENT'S TRANSACTION OF INTEREST-RATE SWAPS FROM FIXED TO FLOATING RATES, 2006 Table 3.6.1

| DKK billion | 5-year | 10-year | Total |
|---|---|---|---|
| 1st quarter | 2.4 | 3.9 | 6.3 |
| 2nd quarter | 0.4 | 3.7 | 4.1 |
| 3rd quarter | - | 3.0 | 3.0 |
| 4th quarter | - | 4.5 | 4.5 |
| Interest-rate swaps, total | 2.8 | 15.1 | 17.9 |

Note: The Table indicates the notional principals of the interest-rate swaps transacted.

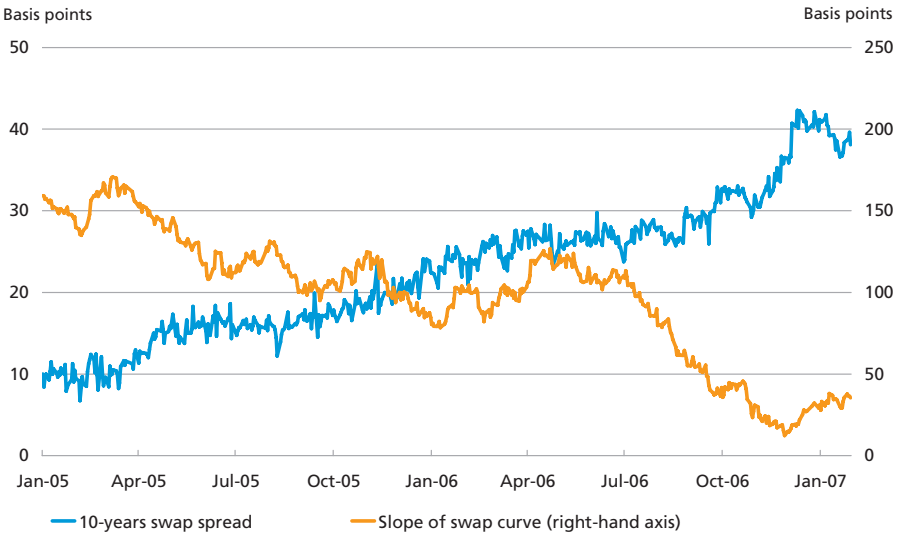
DURATION BANDS AND DURATION IN 2006 Chart 3.6.1




The duration was mainly in the middle range of the band in 2006, cf. Chart 3.6.1. In the 1st half of 2006, the strategy was to reduce the duration towards 3 years, but at the end of the year a tactical decision was taken to increase the duration to the upper range of the band. This should be seen against the flat yield curve and the relatively low level of long-term interest rates, cf. Chapter 11 for an evaluation of the duration management in 2006.

BALANCE OF THE CENTRAL GOVERNMENT'S ACCOUNT, 2006 Chart 3.6.2

DANISH 10-YEAR SWAP SPREAD AND SLOPE OF THE SWAP YIELD CURVE Chart 3.6.3




Note: The slope of the swap curve is calculated as the difference between the 10-year swap rate and 6-month Cibor rate, while the swap spread is the difference between the 10-year swap rate and the 10-year government par rate.
Source: Bloomberg.

The Macauley duration of the central-government debt was above the duration band at the end of November, cf. Chart 3.6.1, reflecting an increase in the balance of the central government's account by almost DKK 50 billion on 21 November following receipts of corporate and hydrocarbon tax, cf. Chart 3.6.2. These receipts alone increased the duration by 0.45 year. Given its temporary character, it was decided not to eliminate this fluctuation by transacting further interest-rate swaps.

The duration of the central-government debt is expected to become more volatile as the debt decreases since the central government's account makes up a larger share of the portfolio.

The 10-year swap spread[1] widened in 2006, cf. Chart 3.6.3, indicating an increase in the payment for credit risk. Viewed in isolation, this has made it more favourable to transact interest-rate swaps. On the other hand, the swap curve flattened in the 2nd half of 2006. The immediate compensation for the interest-rate risk incurred by the central government on swapping from a fixed to a floating rate of interest was hereby reduced.

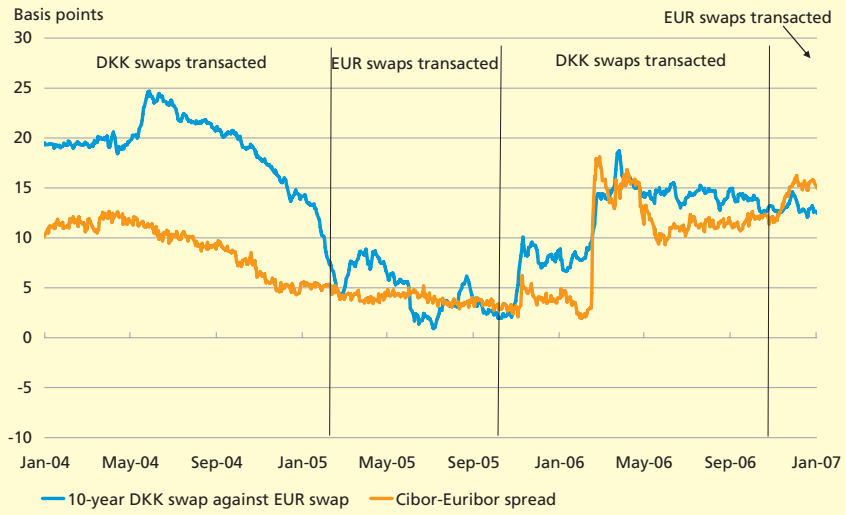
Interest-rate swaps are transacted in both kroner and euro. The choice of swaps in kroner or euro is based partly on an assessment of their

[1] The swap spread is the difference between the 10-year swap rate and the 10-year government par rate.

CONSIDERATIONS ON TRANSACTING INTEREST-RATE SWAPS IN KRONER OR EURO — Box 3.2

The relative advantages of transacting interest-rate swaps in kroner or euro can be analysed by assessing the difference between the krone and euro swap rates relative to the difference between 6-month Cibor and 6-month Euribor. For instance, if the 10-year krone swap rate is 4.08 per cent and the euro swap rate is 3.96 per cent, 12 basis points can be gained by receiving a fixed krone interest rate rather than a fixed euro interest rate. On the other hand, Cibor, not Euribor, is payable every six months. If Cibor is on average less than 12 basis points higher than Euribor, the interest-rate swap in kroner will be more favorable.

RELATIVE PRICE CONSIDERATIONS, INTEREST-RATE SWAPS IN KRONER OR EURO




Note: All interest rates are adjusted for differences in maturity and shown as 5-day moving averages.
Source: Bloomberg and own calculations.

relative advantages, and partly on the liquidity in the Danish swap market. If the central-government transactions are deemed to have an impact on price formation in the Danish swap market, the transactions are conducted in the euro market.

In 2006, until mid-October, the central government transacted contracts in the Danish swap market totalling DKK 13.6 billion, after which all contracts were in euro. The reason is that in the period until October 2006 the pricing of krone-denominated interest-rate swaps was deemed to be attractive relative to euro-denominated interest-rate swaps, cf. Box 3.2.

CHAPTER 4

# Strategy 2007

*In the light of the low borrowing requirement, issuance in 2007 is concentrated on domestic securities, primarily in the 10-year maturity segment. The T-bill programme will be reduced and is expected to increase the issuance requirement in government bonds by around DKK 20 billion. The central government's foreign borrowing programme has been suspended.*

*The building up of 4 per cent bullet loans 2017 continues. In addition, the intention in 2007 is to reach the declared minimum issuance of DKK 35 billion in 4 per cent bullet loans 2010. Securities are bought back to the extent that market prices are deemed to be fair.*

## KEY ELEMENTS OF THE ISSUANCE STRATEGY 4.1

**Issuance**

The solid government budget surpluses in recent years – particularly in 2005 and 2006 – have reduced the central-government debt considerably and required ongoing adjustment of the issuance strategy. The Ministry of Finance expects a large government budget surplus again in 2007.

In this light, the issuance strategy for 2007 is focused on the 10-year maturity segment. The choice of this segment reflects three considerations. Firstly, the central government normally has a comparative advantage in the long maturity segment in view of its high credit standing. Secondly, the 10-year maturity segment is considered to be one of the most important segments internationally. Thirdly, market participants have expressed an interest in a liquid 10-year point on the government yield curve, rather than shorter issues where several alternatives to government securities are available. As part of the concentration of the issuance policy, the T-bill programme is being reduced. The negative financing contribution resulting from this reduction is covered by issuing government bonds.

**Buy-backs**

Government Debt Management buys back government securities in the market on an ongoing basis either for cancellation in order to support

the build-up of new government securities, or to meet the placement requirements of the government funds managed by Government Debt Management.

In future, Government Debt Management will continue to buy back securities to the extent that market prices are deemed to be fair compared inter alia to market prices in the key on-the-run issues. As the outstanding amount in government securities decreases, there is a risk that in the coming years it will be more difficult to undertake buy-backs. In addition, the funds' buy-backs are subject to the risk of increased "predictability". In the coming years, the overall placement requirement of the government funds is an average of DKK 10-15 billion. The assets of the Social Pension Fund are primarily placed in Danish government bonds. The other funds may only invest in Danish government bonds.

**The central government's account**

Central-government borrowing is planned to ensure an appropriate balance of the central government's account which can absorb fluctuations in the central government's payment flows. The fluctuations can be wholly or partly offset by adjusting the current issues and e.g. raising liquid funds by moving the issuance forward or postponing buy-back of government securities.

Against the backdrop of the concentration of central-government issuance and lower gross issuance activity, this is no longer possible to the same extent as before. As a result, a larger "buffer" on the central government's account is required. A larger buffer will also mean that a temporary small balance on the central government's account will not limit the central government's opportunities for buy-backs, or to undertake re-lending.

## STRATEGIC BENCHMARKS IN 2007 4.2

**Borrowing requirement**

In 2007, the Ministry of Finance expects a government budget surplus of DKK 58 billion, which by and large corresponds to redemptions on central-government debt, so that the borrowing requirement is zero, cf. Table 4.2.1.[1]

The adjustment of the T-bill programme is expected to entail a net financing contribution of around DKK -20 billion, financed via issuance of

[1] The borrowing requirement is updated on an ongoing basis at www.nationalbanken.dk under Government debt.

CENTRAL-GOVERNMENT BORROWING REQUIREMENT IN 2007 Table 4.2.1

| DKK billion | Total |
|---|---|
| Borrowing requirement, cf. *Budget Outlook*, December 2006 | 0.1 |
| Subsequent buy-backs of issues with redemption in 2007 | -0.5 |
| Borrowing requirement[1] | -0.4 |
| *Financing of borrowing requirement:* | |
| Issuance in government bonds | 19.6 |
| Net financing contribution from T-bill auctions | -20.0 |

[1] As of 31 December 2006.

government bonds, cf. below. This brings the issuance requirement in government bonds to DKK 20 billion.

**Strategic benchmark for issuance and liquidity in 2007**

The building up of 4 per cent bullet loans 2017 continues, and the building up of 4 per cent bullet loans 2010 continues in order to reach the declared minimum outstanding amount of DKK 35 billion in 2007, cf. the benchmark strategy described in Box 4.1. In the event of special market conditions, issues in the other government securities maturing after 2007 are possible.

The downscaling of the T-bill programme corresponds to a net financing contribution of around DKK -20 billion in 2007, and is intended to increase the issuance requirement in government bonds. As a consequence, two instead of four T-bills per year will be opened:

- At the auction with settlement date on the first banking day in May 2007, SKBV08-I is opened, to be redeemed on the first banking day in June 2008. The maturity is 13 months from the outset, to facilitate the transition to the downscaled programme.
- At the auction with settlement date on the first banking day in December 2007, SKBV08-II is opened, to be redeemed on the first banking day in December 2008. The maturity is 12 months.
- Issuance in T-bills may take place at all auctions until maturity.

The central government may undertake buy-backs in all domestic and foreign government securities, except key on-the-run issues. The aim is to support the building up of the 10-year issue or to reduce the balance of the central government's account. Another aim is to meet the placement requirements of the government funds.

The central government's foreign borrowing programme, which previously comprised 5-year euro loans, has been suspended. Foreign redemptions are financed via domestic issues, possibly in combination with currency swaps.

STRATEGIC BENCHMARKS FOR 2007 Box 4.1

**Issuance and liquidity:**

- 4 per cent bullet loans 2017 is built up to a final outstanding amount of around DKK 50 billion.
- In 2007, 4 per cent bullet loans 2010 is built up to a final outstanding amount of minimum DKK 35 billion.
- The net financing contribution from the T-bill programme is expected to be around DKK -20 billion. Two new T-bills are opened in 2007.
- In the event of special market conditions in secondary trading, smaller issues in the other bullet loans maturing after 2007 are possible.
- The central government may buy back in all government securities except the key on-the-run issues (4 per cent bullet loans 2010 and 4 per cent bullet loans 2017).

**Risk management:**

- In 2007 the interest-rate risk is managed within a duration band of 3 years ± 0.5 year.

## Strategic benchmark for risk management in 2007

The interest-rate risk on the central-government debt is managed on the basis of a strategic benchmark for the duration of the debt portfolio, i.e. a Macauley duration of the liabilities and assets of the overall debt, cf. Chapter 8. A duration band of 3 years ± 0.5 year is maintained as the strategic benchmark for 2007. The target band allows tactical positions to be taken during the year within the strategic benchmark. Risk management is based on transaction of interest-rate swaps in order to separate issuance strategy and risk management.

As from 2007, a narrower, quarterly target band for the Macauley duration of ± 0.25 year is applied in the day-to-day risk management. This target band is within the strategic benchmark for the year. The band is determined at the government debt meetings with the Ministry of Finance. The narrower target band can underpin a new framework for evaluation of duration decisions, cf. Chapter 11.

Government Debt Management no longer applies Macauley duration with a fixed discount rate and a fixed balance of the central government's account in its risk management.[1] A technically defined fixed balance on the central government's account has proved difficult to apply in practice in the light of recent years' large fluctuations in the balance. For some periods, the level of the Macauley duration thus varies considerably from the level of the Macauley duration calculated with a fixed balance and a fixed interest rate.

[1] The Macauley duration with a fixed discount rate and a fixed balance of the central government's account had been applied since 2004

CHAPTER 5

# Issuance of and Trading in Danish Government Securities

*Danish government securities are issued to primary dealers on MTSDenmark. The primary dealers have an obligation to quote current bid and ask prices within fixed maximum spreads and for minimum amounts. Market making contributes to a transparent and well-functioning market for Danish government securities.*

*In 2006, the average daily turnover on MTSDenmark was approximately DKK 1.4 billion, which was lower than in 2005. Other countries have also seen a decrease in turnover. The decreasing turnover in Denmark should be viewed against the background of the declining government debt.*

## PRIMARY DEALER SYSTEMS FOR DANISH GOVERNMENT SECURITIES 5.1

Danish government securities are issued to and bought back from banks that have entered into primary dealer contracts. The primary dealers resell the government securities to a broad range of investors. On entering into a primary dealer contract, a bank acquires the right to buy government securities on issue and to be counterparty in buy-back transactions. At the same time the primary dealers have an ongoing obligation to undertake market making in government securities. Under the agreement, the primary dealers must quote current bid and ask prices within fixed maximum spreads and for minimum amounts, cf. Box 5.1.

Government Debt Management has concluded primary dealer contracts for government bonds and T-bills. The primary dealer contract for government bonds was established in connection with the introduction of MTS in the Danish bond market in 2003. As of 1 January 2007, the system comprises 12 banks. As from 2007 Dresdner Bank has changed status from primary dealer to market taker. In 2005, a primary dealer system was also established for T-bills. It currently has 10 participants, cf. Table 5.1.1. In addition, some primary dealers have entered into agreements comprising market making in the central government's euro loans.

PRIMARY DEALER CONTRACTS Box 5.1

Government Debt Management has concluded primary dealer contracts for government bonds and T-bills. The rights and obligations of the primary dealers are specified in the primary dealer contract, which can be found at the Government Debt Management website (see www.nationalbanken.dk under Government debt). In principle, the primary dealer contract for Danish government securities contains the same elements as equivalent contracts in other EU member states.

The principal rights of primary dealers are:

- Use of the title Primary Dealer in Danish government bonds/T-bills
- To be a counterparty to the central government's issuance and buy-back transactions
- Use of the securities lending facilities of the central government and the Social Pension Fund.

The principal obligations of primary dealers are:

- Current quotation of prices for at least 5 hours a day between 9.00 a.m. and 4.30 p.m. in government bonds that are bullet loans and/or T-bills within fixed maximum spreads and for minimum amounts, cf. the Table below
- To be an active counterparty in issuance and buy-back transactions
- Promotion of Danish government securities
- To support a well-functioning market for Danish government securities.

Primary dealers in T-bills must quote prices for all T-bills (MTSDKT) with a remaining term to maturity of more than 1 month. Primary dealers in government bonds must quote prices in the central-government benchmark and key on-the-run issues (MTSDKB). Market making in other government bonds (MTSDKL) rotates between the primary dealers in government bonds so that there are always at least five market makers in each series. In practice, most primary dealers undertake market making in all government bonds comprised by the primary dealer system.

MARKET-MAKING OBLIGATIONS FOR VARIOUS TERMS TO MATURITY

| | T-bills | Benchmark securities | | | Other government bonds | | |
|---|---|---|---|---|---|---|---|
| Maturity segment ..... | < 1 yr | 2 yrs | 5 yrs | 10 yrs | 2 yrs | 5 yrs | 10 yrs |
| Maximum spread ..... | 4 bp | 3 ticks | 5 ticks | 7 ticks | 5 ticks | 8 ticks | 10 ticks |
| Minimum amount, DKK million ..... | 100 | 80 | 40 | 50 | 60 | 20 | 20 |

Note: < 1 year comprises maturities from 1 month to 13 months; 2 years is the segment from 13 months to 3.5 years; 5 years is the segment from 3.5 to 6.5 years; 10 years is the segment from 6.5 to 13.5 years. Each segment may comprise several government securities. 7 per cent bullet loans 2024 is included in other government bonds, the maximum spread is 20 ticks and minimum amount is DKK 10 million.

As the 10-year benchmark security reached a sufficient outstanding volume in 2006, it was agreed with the primary dealers to raise the minimum amount to be quoted by the primary dealers in the security from DKK 40 million to DKK 50 million as from 2007. This change contributes to additional liquidity in the 10-year benchmark.

PRIMARY DEALERS IN DANISH GOVERNMENT SECURITIES, BEGINNING OF 2007 Table 5.1.1

| Primary dealers in government bonds | Primary dealers in T-bills | Market takers |
|---|---|---|
| ABN Amro | Arbejdernes Landsbank | BNP Paribas |
| Barclays | Danske Bank | Citibank |
| Danske Bank | Fionia Bank | DGZ Bank |
| Deutsche Bank | HSH Nordbank | Dresdner Bank |
| Fionia Bank | JP Morgan | Fortis |
| HSH Nordbank | Jyske Bank | Merrill Lynch |
| JP Morgan | Nordea | |
| Morgan Stanley | Nykredit | |
| Nordea | SE-Banken | |
| Nykredit | Sydbank | |
| SE-Banken | | |
| Sydbank | | |

The primary dealers are both Danish and international banks. A number of the international banks are primary dealers in several countries, cf. Chapter 12.

**MTSDenmark**

After consultation with the primary dealers it has been agreed that issuance and electronic market making takes place in a dedicated market segment – MTSDenmark. Besides the primary dealers, market takers can also be connected to MTSDenmark. A market taker can trade at prices quoted by others, but cannot itself quote prices. As of 1 January 2007, six banks were connected to MTSDenmark as market takers, cf. Table 5.1.1.

MTSDenmark is a market segment on MTSAM, cf. Box 5.2. The Board of MTSAM takes the overall and strategic decisions, while the individual MTSAM market segments regulate their respective market structures. On MTSDenmark, the regulations are governed by a Committee comprising Government Debt Management, primary dealers and representatives of MTS S.p.A. and MTSAM.

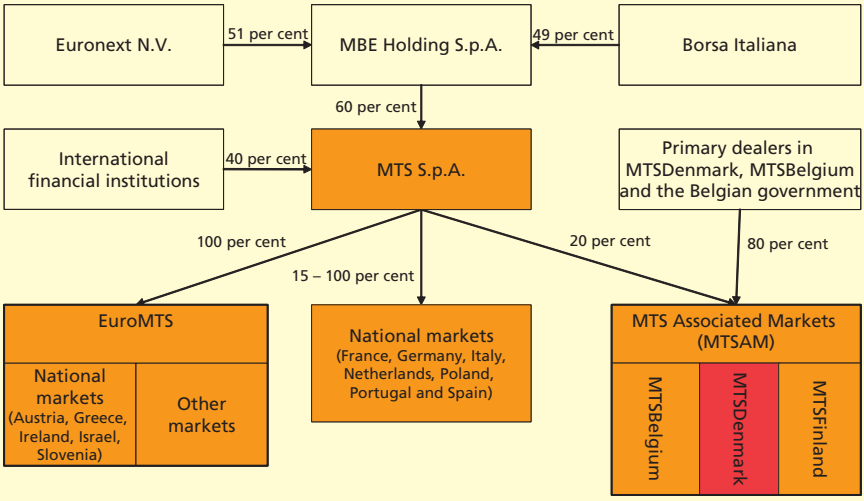
EuroNext and Borsa Italiana acquired control of MTS S.p.A. in 2005. MTS S.p.A. plans to make individual offers to the local MTS market segments to take over the shares in the local companies held by banks and issuers. The companies will hereby be controlled by MTS S.p.A., which currently holds between 15 and 30 per cent of the shares in these local companies. Government Debt Management in Denmark holds no shares in MTSAM.

For Government Debt Management it is important that after a possible change of ownership, MTSAM will still have a structure on

THE MTS SYSTEM STRUCTURE Box 5.2

MTS S.p.A. manages the electronic trading platform Telematico. It was founded in 1988 in order to increae transparency in the Italian market for government securities. In 1997, the company was privatised and sold to a group of large international financial institutions. In 1999, MTS S.p.A. established EuroMTS, where e.g. the largest European benchmark securities are traded. MTS S.p.A. also holds ownership interests in the local MTS companies that use Telematico. These platforms have been established to enhance the transparency and efficiency of trading in the government securities issued, including those without benchmark status. In 2005, a consortium comprising Euronext and Borsa Italiana acquired control of MTS S.p.A. The ownership structure of MTS is illustrated below.

MTS OWNERSHIP STRUCTURE




Note: Markets under EuroMTS and MTSAM are divisions of the companies.
Source: MTS Group annual report, www.mtsgroup.org.

which issuers and primary dealers decide on the market structure of the segments in which they are represented.

A key element of the MTSDenmark infrastructure is clearing and settlement. Market participants can choose VP Securities Services (VP), Euroclear or Clearstream as their preferred clearing house for straight-through processing of transactions concluded on MTSDenmark. This set-up reduces the entry barriers to MTSDenmark since new market participants can join MTSDenmark without having to adjust their internal settlement processes.

SECURITIES LENDING IN 2005 AND 2006 Table 5.1.2

| DKK billion | 2005 | 2006 |
|---|---|---|
| Central government | 18.7 | 83.9 |
| SPF | 20.1 | 49.8 |
| Securities lending, total | 38.8 | 133.7 |

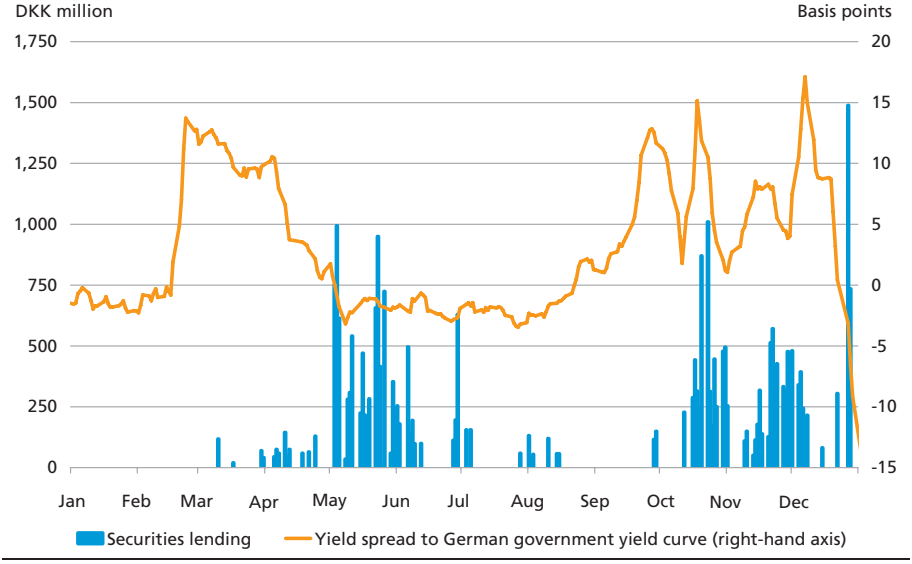
Note: The amounts indicate accumulated securities lending over the full year.

## Securities lending facility

Primary dealers have access to the securities lending facilities of the central government and the Social Pension Fund (SPF). The central government's securities lending facility normally comprises key on-the-run issues. SPF can lend all government securities in the SPF portfolio that are bullet loans with a remaining term to maturity of more than 1 month. Lending of securities is collateralised by other government securities. The objective of the securities lending facilities is to support and strengthen market efficiency for trading in government securities.

The securities lending facilities support liquidity in the secondary market for government securities. This makes it easier for primary dealers to undertake market marking and reduces the risk of distorting price formation. In 2006, SPF's securities lending facility was expanded to include securities with a remaining term to maturity of 1 month or more

YIELD SPREAD TO THE GERMAN GOVERNMENT YIELD CURVE AND SECURITIES LENDING FOR 7 PER CENT BULLET LOANS 2007, 2006 Chart 5.1.1




Note: The yield spread to the German zero-coupon yield curve. 5-day moving average.
Source: Bloomberg and Danmarks Nationalbank.

(previously 13 months). The terms and conditions for use of the facilities are presented in the Appendices.

In 2006, securities lending by the central government and SPF totalled DKK 133.7 billion, compared with DKK 38.8 billion in 2005, cf. Table 5.1.2. The major part of the lending was in 4 per cent bullet loans 2010 and 7 per cent bullet loans 2007. Lending in these securities primarily took place at times when the securities became more expensive in relation to the German government yield curve, cf. Chart 5.1.1 as regards 7 per cent bullet loans 2007. This reflects a risk of more frequent periods of scarcity in the private market for securities lending as the central-government debt declines. The result is increasing demand for the lending facilities of the central government and SPF.

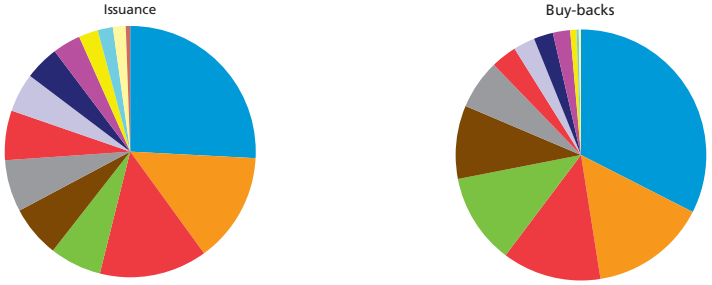
## GOVERNMENT BONDS 5.2

### Issuance and buy-backs

Danish government bonds are issued to primary dealers via MTSDenmark. After the opening auction, issuance takes place by tap sale, whereby sales are dispersed over the year. Tap sale takes place electronically directly in the secondary market at market prices quoted by the primary dealers. In connection with the issuance, Government Debt Management has market taker status, i.e. sales are effected at the best bid price. All primary dealers therefore have equal opportunities to buy government bonds on issue.

To avoid influencing the market, issuance takes place when the underlying interest is significant, i.e. when the bid-ask spread is narrow. In 2006, three banks acquired more than 50 per cent of the total issues, while the six largest participants purchased approximately 70 per cent of the issues, cf. Chart 5.2.1. This is equivalent to the level in the preceding year.

ISSUANCE AND BUY-BACKS BY PRIMARY DEALERS, 2006 Chart 5.2.1




Source: MTSDenmark.

The buy-backs are transacted on MTSDenmark with the primary dealers as counterparties. Buy-backs in securities with a remaining term to maturity of more than 13 months take place on the MTSDKL segment, where government securities are purchased at the current market price (best ask price) on an ongoing basis, or via the new buy-back facility, cf. below. For government securities maturing in less than 13 months, buy-backs take place in a specific buy-back segment (MTSDBB), since these securities are not subject to market making.

Buy-backs are concentrated on fewer primary dealers than issuance. Six primary dealers are counterparties to around 90 per cent of the buy-backs.

**New buy-back facility**

As the central-government debt declines, it is useful to expand the range of buy-back instruments. This increases flexibility in connection with the central government's buy-backs from the market. In 2006, Government Debt Management introduced a new buy-back facility to supplement the existing tap buy-backs. The buy-back facility is a further development of the auction system used for issuance of T-bills and e.g. allows primary dealers to sell larger volumes of government bonds to Government Debt Management.

The facility was used for the first time in October 2006, and up to 31 January 2007 it was used five times with an average trading volume of DKK 250 million. It is the intention to use the facility regularly and at short notice. The results are published via the MTSDenmark website. In 2007, Government Debt Management is considering extending its range of instruments further to include an exchange facility.

**Electronic trading and market making on MTSDenmark**

A key element of the primary dealer contract is the ongoing market-making obligation. Market making by primary dealers gives the market access to current prices for the individual government securities. Market

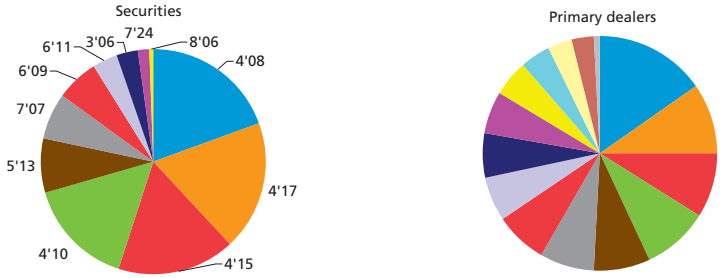
TRANSPARENCY, BID-ASK SPREAD AND DEPTH IN GOVERNMENT BONDS, 2006 Table 5.2.1

| Benchmark securities | 2 year | 5 year | 10 year |
|---|---|---|---|
| Average order coverage, per cent ..... | 93 | 92 | 93 |
| Average spread between bid and ask prices, ticks ..... | 2 | 3 | 5 |
| Average depth in best price, DKK million ..... | 201 | 116 | 91 |

Note: The average daily order coverage is calculated as the part of the trading day (9.00 a.m. to 4.30 p.m.) during which current prices are available. The average spread between bid and ask prices is calculated as a weighted average of the daily intraday spreads between the best bid and ask prices. The average depth is calculated as the average of the daily intraday observations for the average depth in the best bid and ask prices.

Source: MTSDenmark.

TURNOVER IN GOVERNMENT BONDS BY SECURITY AND PRIMARY DEALER, 2006 Chart 5.2.2




Source: MTSDenmark.

participants have thereby access to pre-trade information on the prices at which the market is willing to buy or sell. This transparency reduces risk premiums and helps to improve liquidity in the market.

The average order coverage, defined as the part of the trading day where bid and ask prices are available, was around 93 per cent in 2006, cf. Table 5.2.1. This is a minor reduction from 2005. The average order coverage conceals fluctuations during the day. Inter alia, there is a tendency for the price pattern to be less pronounced towards the end of the day. Furthermore, market participants refrain from quoting prices for brief periods, e.g. in connection with the announcement of key figures, publications, etc.

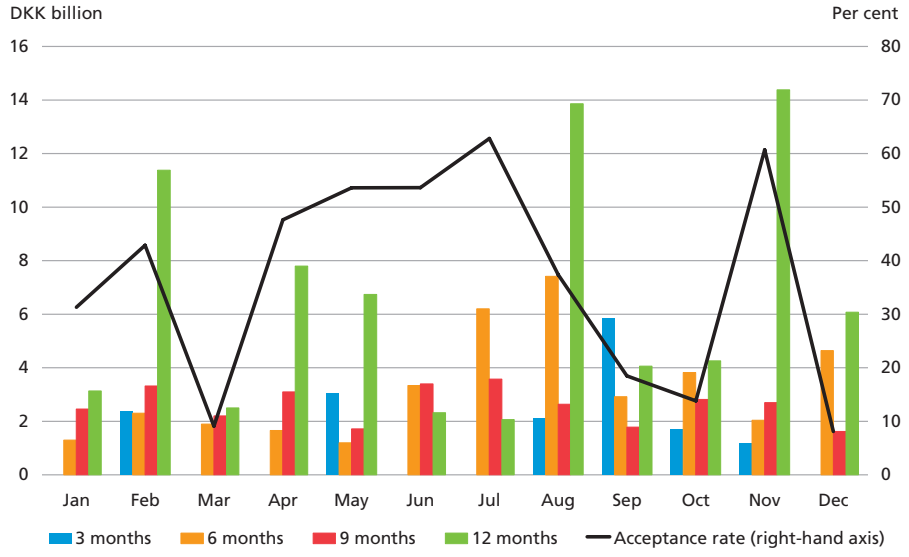
Turnover was concentrated in the benchmark and key on-the-run issues since around 70 per cent of turnover was in the 2-, 5- and 10-year benchmark securities, cf. Chart 5.2.2. Trading was more or less equally distributed among primary dealers in Danish government bonds. Six of the primary dealers in Danish government bonds accounted for just under 60 per cent of turnover, which is equivalent to the level in 2005.

## T-BILLS 5.3

### Issuance of T-bills

T-bills are sold in monthly auctions on MTSDenmark to a group of counterparties comprising 10 primary dealers. The auctions are based on uniform pricing, i.e. all accepted offers are concluded at the same rate of interest – the cut-off yield. This auction method entails that all primary dealers have the opportunity to participate without running a risk of paying more than the other bidders.

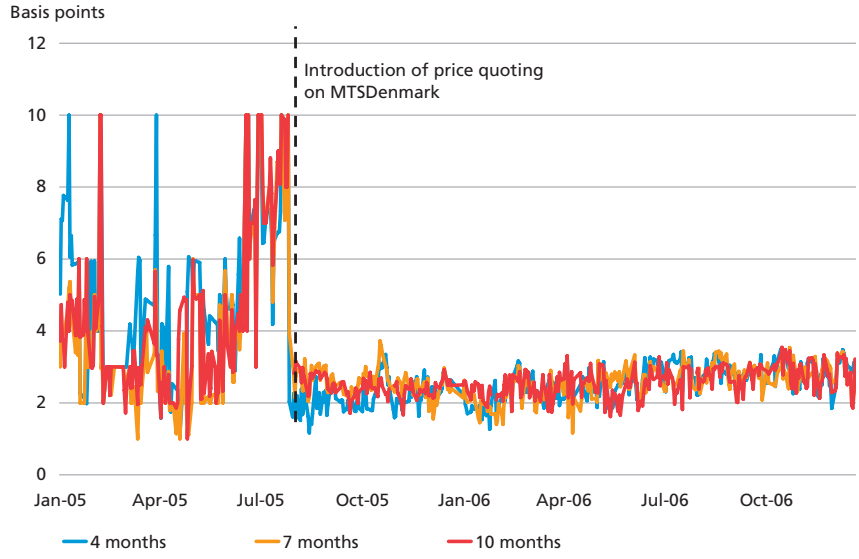
BID VOLUME AND ACCEPTANCE RATE, 2006 Chart 5.3.1




Note: 3 months includes securities with a remaining term to maturity of 3 and 4 months; 6 months includes securities with a remaining term to maturity of 5, 6 and 7 months; 9 months includes securities with a remaining term to maturity of 8, 9 and 10 months; and 12 months includes securities with a remaining term to maturity of 11 and 12 months.

Source: Danmarks Nationalbank and MTSDenmark.

BID-ASK SPREAD FOR T-BILLS IN THE INTERDEALER MARKET BY REMAINING TERM TO MATURITY, 2005-06 Chart 5.3.2




Note: The bid-ask spread is calculated as a time-weighted average of the best bid and ask prices and has been adjusted for maturity by linear interpolation.

Source: Danmarks Nationalbank and MTSDenmark.

The bid volumes in the auctions were larger in the 2nd half of 2006, cf. Chart 5.3.1. The average bid volume in the auctions fell by DKK 8 billion compared to 2005 to DKK 14 billion in 2006. The declining demand should be viewed against the background of market expectations of higher monetary-policy interest rates. At the same time, Government Debt Management reduced issuance of T-bills as a consequence of the downward adjustment of the central government's borrowing requirement. The combination of declining demand and downscaling of the programme entailed an acceptance rate in 2006 at the same level as the year before.

There is still a tendency for concentration of participation in the auctions, but this does not seem to have influenced price formation. The three largest market participants purchased around 80 per cent of the total volume issued. Comparison of prices in T-bill auctions and prices in the secondary market immediately after the auctions still points to efficient price formation in the auctions.

**Secondary trading and market making on MTSDenmark**

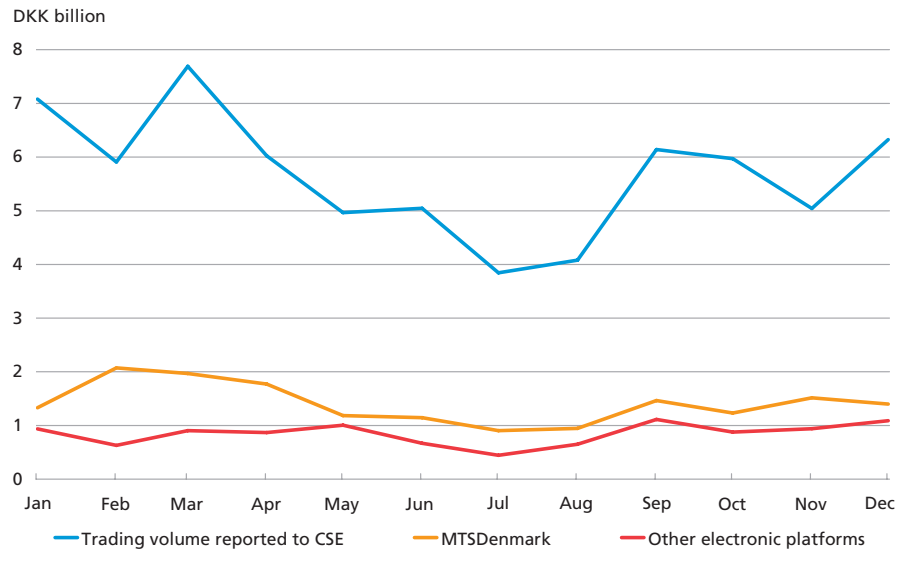
The introduction of electronic trading and market making in T-bills has increased transparency. Participants have current access to pre-trade information, which improves their opportunities to monitor price developments. The higher order coverage shows that tradable bid and ask prices are displayed in the system throughout most of the trading day. Since the introduction of market making on MTSDenmark, the average bid-ask spread has been reduced substantially, cf. Chart 5.3.2.

## TURNOVER IN DANISH GOVERNMENT SECURITIES 5.4

In the interdealer market, Danish government securities are traded at MTSDenmark and ICAP/BrokerTec[1]. Besides the interdealer market, trading in Danish government securities takes place on electronic trading platforms in dealer-to-customer systems such as Bloomberg, TradeWeb and BondVision. These systems typically operate with quote-on-request agreements, i.e. the market dealers quote a price on the basis of a specific inquiry from a customer interested in buying or selling government securities. Since several dealers operate on these platforms, price formation is usually efficient because the dealers compete for customers. In addition, Government Debt Management has established a price-quoting system on the Copenhagen Stock Exchange. Finally,

[1] ICAP/BrokerTec is an electronic interdealer platform that is represented in several government securities markets.

AVERAGE DAILY TURNOVER IN DANISH GOVERNMENT SECURITIES, 2006 Chart 5.4.1




Note: Trading volume reported to the Copenhagen Stock Exchange (CSE) comprises data for all trading, irrespective of origin, to be reported by members of the CSE. Trading on MTSDenmark comprises data for the trading volume on MTS. Turnover on the other electronic platforms is based on figures from TradeWeb, BondVision and ICAP/BrokerTec.

Source: MTSDenmark, TradeWeb, BondVision, ICAP/BrokerTec and CSE.

considerable volumes of Danish government securities are traded on electronic single-dealer platforms[1] and in the over the counter (OTC) market.

**Electronic trading in Danish government securities**

Most of the electronic trading in Danish government securities in the interdealer market takes place via MTSDenmark. In 2006, the average daily turnover on MTSDenmark was around DKK 1.4 billion, cf. Chart 5.4.1.

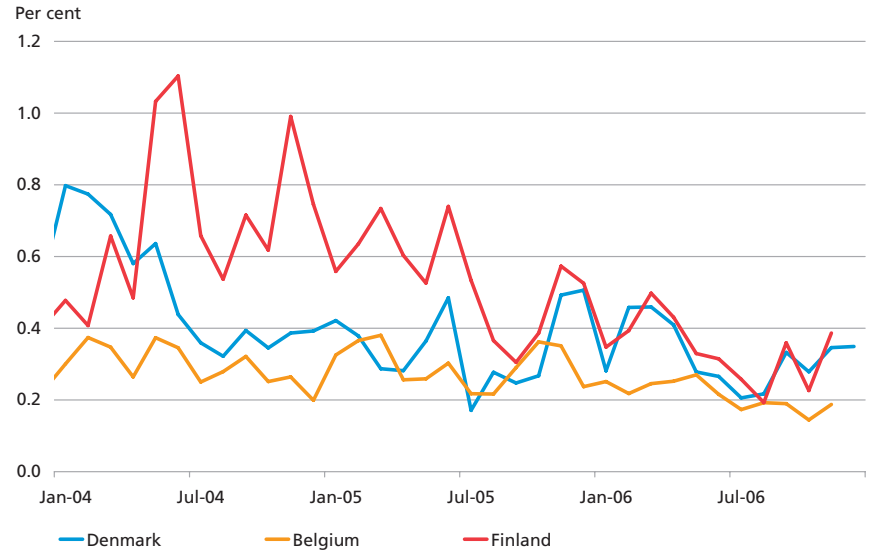
Since the introduction of electronic platforms in the Danish market towards the end of 2003, electronic trading has expanded considerably. Previously, most trading took place OTC, which generally reduces transparency because market participants have less access to pre-trade information.

According to market participants, the OTC market has grown recently, however. Among other things, investors increasingly wish to have direct contact with dealers. On average, the tickets traded OTC are larger than

[1] Single-dealer platforms are operated as dedicated trading systems between a market participant and its customers.

AVERAGE DAILY MTS TURNOVER IN GOVERNMENT SECURITIES AS A SHARE OF TOTAL OUTSTANDING VOLUME

Chart 5.4.2




Source: MTS, Bank of Finland and Danmarks Nationalbank.

on electronic platforms[1] and OTC trading often takes place on the basis of information from the electronic platforms.

Turnover on MTSDenmark fell compared to the 2005 level. This tendency has been general across several MTS markets, including the other MTSAM segments (MTSBelgium and MTSFinland). The falling turnover in Denmark reflects, inter alia, the limited supply of government bonds due to the diminishing government debt. Measured as a share of the total outstanding volume, turnover on MTSDenmark has been more or less constant since mid-2004, cf. Chart 5.4.2.

**Price-quoting system on the Copenhagen Stock Exchange**

Parallel with the introduction of the wholesale market MTSDenmark, Government Debt Management also introduced a price-quoting system on the Copenhagen Stock Exchange (CSE). The system allows small investors to trade Danish government securities in an electronic market corresponding to the wholesale electronic market. A group compricing six banks (Danske Bank, Fionia Bank, Jyske Bank, Nordea, Nykredit and Sydbank) has an obligation to quote current prices in Danish government bonds on the CSE. This gives small investors access to a transparent and efficient market for government bonds.

[1] Celent (2004): Electronic Trading in European Fixed Markets.

The participants in the price quoting system are obliged to quote prices for all government bonds that are bullet loans with a remaining term to maturity of more than 13 months. Current price quotation entails that participants must quote bid and ask prices within fixed spreads and for fixed amounts during 95 per cent of the trading day from 9.00 a.m. to 4.30 p.m.

Members of the CSE bond sub-segment can trade at the quoted prices. They can also place their own orders in the system. Finally, other investors can place trading orders via their bankers. The trading rules are designed so that any order exceeding DKK 1,000 may influence the prices in the trading system.

The price-quoting system gives investors current access to prices in the system. Since the system was introduced in December 2003, participants have on average had access to pre-trade information for approximately 95 per cent of the trading day. Combined with the option to place their own orders via a bank, this gives small investors an opportunity to trade in an efficient market.

## MARKET IN FINANCIAL INSTRUMENTS DIRECTIVE 5.5

In 2007, a number of rules governing securities trading will be amended in connection with the implementation of the Market in Financial Instruments Directive (MiFID).

The transparency provisions of MiFID apply only to equity investments. Two years after the adoption of the Directive, the EU Commission is to investigate the possibility of extending the provisions to other financial instruments than equities. In the meantime, it is for the national supervisory authorities to lay down rules concerning the obligation to publish information for other securities than equities. The Danish Financial Supervisory Authority has prepared a bill on implementation of MiFID under which trading in government securities is not subject to the transparency rules.

There is a high degree of transparency in the market for Danish government securities. This reflects that via the widespread use of electronic trading systems market participants contribute to establishing current price patterns reflecting market participants' interest in trading government securities. Publication rules for trading in government securities are not deemed to contribute further to transparency in the market.[1]

[1] See Danmarks Nationalbank's full consultation response (in Danish only) to the Danish Financial Supervisory Authority at www.nationalbanken.dk under Press room and Jesper Ulriksen Thuesen, New Regulatory Framework for European Securities Markets, *Monetary Review 1*, 2007, Danmarks Nationalbank.

CHAPTER 6

# Management of the Government Funds

*Government Debt Management at Danmarks Nationalbank administers the assets of the Social Pension Fund (SPF), the Danish National Advanced Technology Foundation (the High-Technology Foundation) and the Financing Fund for increased distributions from the Danish National Research Foundation (the Financing Fund). As from 2007, the assets of the Preventive Measures Fund are also managed by Government Debt Management. The assets of the government funds are included in the total central-government debt and are managed on a consolidated basis with other financial assets and liabilities of the central government within Government Debt Management.*

*In 2006, DKK 9.6 billion was transferred from SPF to the Ministry of Social Affairs and at the end of 2006 SPF's assets totalled DKK 132.1 billion. The central government contributed DKK 2 billion to the High-Technology Foundation and DKK 0.6 billion to the Financing Fund in 2006. The assets of the High-Technology Foundation and the Financing Fund totalled respectively DKK 4.4 billion and DKK 1.5 billion at year-end.*

## THE SOCIAL PENSION FUND 6.1

The assets of the Social Pension Fund (SPF) are managed with respect to the overall government debt policy, cf. Box 6.1. The SPF assets are included in the compilation of the total government debt. The risk on SPF's transactions is assessed separately, but is included in the risk management of the total debt.

SPF'S REVENUE AND EXPENDITURE Table 6.1.1

| DKK billion | 2006 |
|---|---|
| *Revenue* | |
| Interest, etc. | 6.6 |
| *Expenditure* | |
| Transfer to the Ministry of Social Affairs | 9.6 |
| Pension-fund tax | 0.3 |
| Net | -3.3 |

Note: Provisional figures from the central-government accounts.

THE SOCIAL PENSION FUND — Box 6.1

The Social Pension Fund (SPF) was established by law in 1970, when a special national retirement pension contribution was introduced. The proceeds were allocated to SPF and invested in bonds. With effect from 1 January 1982, the Act was amended and the payments to SPF ceased. SPF continued as an asset of the central government.

SPF is part of the remit of the Ministry of Social Affairs and the Ministry of Finance. The governance of SPF is undertaken by a committee with representatives from the Ministry of Finance, the Ministry of Social Affairs and Government Debt Management at Danmarks Nationalbank. The principles for the management of SPF's assets are set out in a regulation.[1]

The revenue from SPF's bond portfolio after payment of pension-fund tax is used to finance pension improvement measures or is allocated to SPF. SPF's core capital can be used to finance pension improvements, should the cost of such measures exceed SPF's revenue. SPF's operating budget is part of the central-government accounts. The Finance Act stipulates the amount to be transferred from SPF to the Ministry of Social Affairs on a current basis to cover the costs of pension improvement measures.

[1] The regulation is available at www.nationalbanken.dk under Government debt.

SPF's assets are invested in listed bonds, primarily government bonds. However, SPF does not invest in the key on-the-run securities. In addition to government bonds, SPF holds a portfolio of mortgage-credit and index-linked bonds for approximately DKK 10 billion.

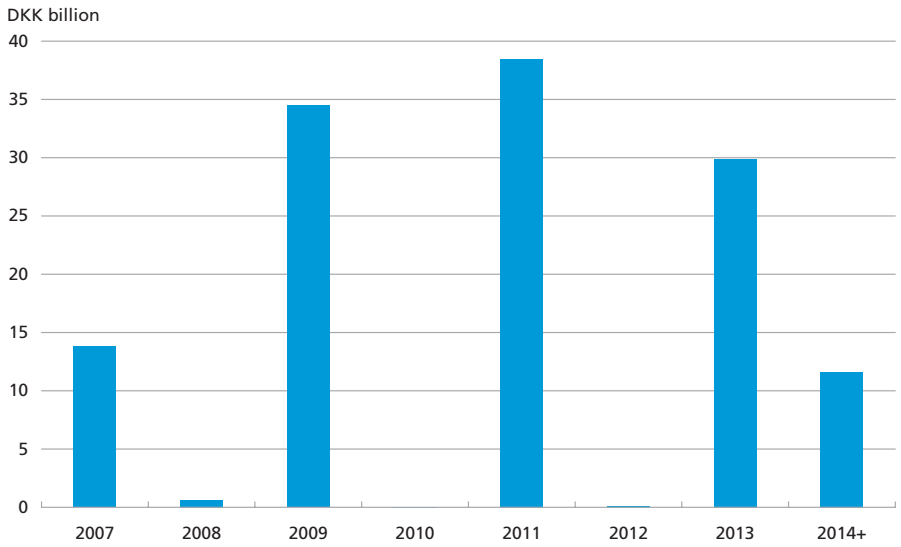
For 2006, SPF's revenue on its bond portfolio less the amount transferred to the Ministry of Social Affairs and the pension-fund tax was DKK -3.3 billion, cf. Table 6.1.1. In addition, the net sale of bonds from SPF's portfolio was DKK 3.4 billion at market value.

THE FUNDS' BOND PORTFOLIOS BY BOND TYPES, END-2006 — Table 6.1.2

| Nominal value, DKK billion | SPF | High-Technology Foundation | Financing Fund | Share of outstanding volume (per cent) |
|---|---|---|---|---|
| 7 per cent bullet loans 2007..... | 13.8 | 0.9 | 0.3 | 43 |
| 4 per cent bullet loans 2008..... | 0.6 | - | - | 1 |
| 6 per cent bullet loans 2009..... | 34.4 | 1.7 | 0.6 | 55 |
| 6 per cent bullet loans 2011..... | 38.3 | - | - | 63 |
| 5 per cent bullet loans 2013..... | 29.8 | 1.5 | 0.6 | 41 |
| 4 per cent bullet loans 2015..... | 0.7 | 0.2 | - | 1 |
| 7 per cent bullet loans 2024..... | 1.8 | - | - | 7 |
| Government bonds, total ..... | 119.4 | 4.3 | 1.4 | |
| Mortgage-credit bonds, etc.[1] ..... | 2.7 | • | • | |
| Index-linked bonds[2] ..... | 6.9 | • | • | |
| Total ..... | 128.9 | 4.3 | 1.4 | |

[1] Mortgage-credit bonds, etc. comprises mortgage-credit bonds as well as municipal and Fisheries Bank bonds other than index-linked bonds.
[2] Indexed value.

SPF'S BOND PORTFOLIO BY YEAR OF MATURITY Chart 6.1.1




At end-2006, SPF's bond portfolio totalled DKK 128.9 billion, cf. Table 6.1.2, and the balance of the SPF account was DKK 3.2 billion. SPF holds a relatively large share of total outstanding volume in several government bond series.

The ongoing management of SPF's assets is aimed at smoothing the investment requirement so as to avoid investment of substantial amounts at times when market conditions are less favourable. Sale in even years of the relatively large holdings of government bonds maturing in odd years can help to smooth the investment requirement, cf. Chart 6.1.1.

The duration of SPF's bond portfolio was 4.4 years at the end of 2006, cf. Table 6.1.3. The duration of SPF's bond portfolio is included in the duration of the total central-government debt portfolio.

DURATION OF SPF'S BOND PORTFOLIO Table 6.1.3

| Years (year-end) | 2004 | 2005 | 2006 |
|---|---|---|---|
| Government bonds | 4.0 | 4.2 | 4.1 |
| Mortgage-credit bonds, etc. | 0.2 | 0.6 | 1.2 |
| Index-linked bonds | 10.2 | 10.5 | 10.7 |
| Total portfolio | 4.1 | 4.4 | 4.4 |

Note: For callable mortgage-credit bonds an option-adjusted duration is applied, and the duration of index-linked bonds is calculated using an inflation assumption of 2 per cent per annum.

## THE HIGH-TECHNOLOGY FOUNDATION, THE FINANCING FUND AND THE PREVENTIVE MEASURES FUND 6.2

The principles for the management of the High-Technology Foundation, the Financing Fund and the Preventive Measures Fund are described in Box 6.2.

The accumulation of the funds' assets is stipulated in the annual Finance Act. The explanatory notes to the High-Technology Foundation Act state that the aim is to build up the Foundation's core capital to at least DKK 16 billion by 2012. Each year, the amount stipulated in the annual Finance Act is transferred from the High-Technology Foundation and the Financing Fund to the Ministry of Science, Technology and Innovation. In 2006, the central government contributed DKK 2 billion to the High-Technology Foundation and DKK 0.6 billion to the Financing Fund.

At the end of 2006, the assets of the High-Technology Foundation and the Financing Fund were respectively DKK 4.4 billion and DKK 1.5 billion. The revenue of the funds was respectively DKK 94 million and DKK 31 million in 2006.

The funds' assets are invested so as to achieve an equal distribution on short-, medium- and long-term bonds. The duration of the funds' portfolios is included in the duration of the total central-government debt portfolio.

The Preventive Measures Fund was established to forestall and prevent physical and mental impairment as part of the government's welfare reform at the beginning of 2007 with an initial capital contribution of DKK 3 billion. Of this amount, DKK 2.8 billion is expected to be invested in Danish government bonds, while DKK 200 million is transferred to the

THE HIGH-TECHNOLOGY FOUNDATION, THE FINANCING FUND AND THE PREVENTIVE MEASURES FUND Box 6.2

The High-Technology Foundation Act[1] was adopted in December 2004. The objective of the High-Technology Foundation is to strengthen growth and employment by supporting Denmark's further development as a high-technology society. The Financing Fund was established under the 2005 Finance Act to support basic research in Denmark. Each year, the amount stipulated in the annual Finance Act is transferred from the High-Technology Foundation and the Financing Fund to the Ministry of Science, Technology and Innovation. In 2007, the Preventive Measures Fund[2] was established with the objective of supporting projects to prevent the physical and psychological attrition of the labour force. The capital of the funds is invested in Danish government bonds. On investing the capital of the funds, the aim is to achieve a high return while keeping risk at a reasonable level.

[1] Act no. 2, Act on the High-Technology Foundation of 16 December 2004.
[2] Act no. 89, Act on the Preventive Measures Fund of 25 January 2007.

Ministry of Employment in 2007. As from 2008, an annual transfer of DKK 350 million will be made and no further capital will be built up in the Preventive Measures Fund. The investment strategy for the Preventive Measures Fund reflects the disbursements from its capital.

CHAPTER 7

# Government Loan Guarantees and Re-lending

*Government Debt Management is responsible for government loan guarantees and re-lending to a number of companies. Most government loan guarantees and re-lending are to government-owned companies involved in large infrastructure projects.*

*At the end of 2006, government loan guarantees amounted to DKK 67 billion and re-lending to DKK 34 billion, of which DKK 4.6 billion to Danish Ship Finance. Government-guaranteed loans were reduced by DKK 8 billion in 2006, while re-lending increased by DKK 11 billion. As the debt decreases, re-lending accounts for an increasing proportion of the government debt portfolio. Re-lending increases the central government's issuance requirement, which contributes to building up liquidity in the key on-the-run issues.*

## PURPOSE AND FRAMEWORK 7.1

A number of companies may raise government-guaranteed loans or raise loans directly from the central government via re-lending. These are typically government-owned companies whose purposes and borrowing frameworks are defined in a specific act or the Finance Act. Government loan guarantees or re-lending enable the companies to achieve favourable borrowing terms, since they can benefit from the central government's high credit standing.

GOVERNMENT-OWNED COMPANIES WITH ACCESS TO GOVERNMENT LOAN GUARANTEES OR RE-LENDING Table 7.1.1

| | Re-lending | Government loan guarantees |
|---|---|---|
| The Danish Broadcasting Corporation | X | X |
| The Danish State Railways | - | X |
| Energinet.dk | X | - |
| The Danish North Sea Fund | X | - |
| The Great Belt Bridge | X | X |
| The Ørestad Development Corporation | X | X |
| Øresund Landworks | X | X |
| The Øresund Link Consortium | - | X |

Eight government owned companies have access to government-guaranteed loans or loans from the central government via re-lending, cf. Table 7.1.1. Some of these companies can also borrow in the market without government guarantees.

The companies listed below are partly or fully owned by the Danish government:

- Ørestad Development Corporation (*Ørestadsselskabet I/S*) – a general partnership owned by the City of Copenhagen (55 per cent) and the Danish government (45 per cent)
- Øresund Landworks (*A/S Øresund*) and the Great Belt Bridge (*A/S Storebælt*) – via Sund & Bælt Holding A/S 100 per cent government-owned limited-liability companies
- Energinet.dk and the Danish State Railways (*DSB*) – independent public enterprises
- Danish Broadcasting Corporation (*Danmarks Radio*) – an independent public institution
- Danish North Sea Fund (*Nordsøfonden*) – a government fund
- Øresund Link Consortium (Øresundsbro Konsortiet), which operates the Øresund Bridge (*Øresundsbron*) – jointly owned by the Danish and Swedish governments.

In addition to government-owned companies, Danish Ship Finance (*Danmarks Skibskredit A/S*) has access to a re-lending facility, cf. *Danish Government Borrowing and Debt 2003*, Chapter 10.

General guidelines have been established for the companies' activities in the credit markets, cf. Box 7.1. The aim is to ensure that the companies do not assume financial risks that the central government itself will not assume. Furthermore, the companies may not conclude highly complex loan agreements, nor may they issue debt in conflict with political signals that trading or financial dealings with a country or an investor group are unacceptable.

**The role of Government Debt Management**

Government Debt Management holds annual meetings with the companies that have access to loan guarantees and re-lending. At these meetings, the companies provide information on their borrowing and risk management in relation to their loan portfolios. Planned borrowing is also described. There are ongoing contacts with the companies, for example in connection with enquiries concerning re-lending. Furthermore, the companies inform Government Debt Management of their financial management via financial reports and statements of their expected borrowing requirements.

GUIDELINES FOR BORROWING BY THE COMPANIES Box 7.1

The guidelines for borrowing by the companies are stated in a set of agreements comprising three elements:

- An agreement between the ministry in question and Danmarks Nationalbank
- An agreement between the ministry in question and the individual company
- A list of acceptable loan types, which is issued and updated by Government Debt Management
- With respect to the Øresund Bridge, a tripartite agreement has also been concluded between the Øresund Bridge, Riksgäldskontoret (the Swedish National Debt Office) and Government Debt Management.

The list of acceptable loan types is based on the following criteria:

- Transactions must be customary, i.e. known and used in the market by reputed borrowers
- Transactions must be built up from simple elements that make them transparent
- It is emphasised that the management of the credit risk should be founded on a rating-based limit system
- Collateral Security Agreements (CSA) are concluded to minimise the credit risk at all times
- The currency exposure of the loan portfolio should as a general rule be limited to euro (or Swedish kronor in the case of the Øresund Bridge).

It is the responsibility of the companies to comply with legislation and rules concerning financial management. The auditors of the companies confirm annually that the companies are in compliance with the borrowing guidelines.

In connection with amendments to existing agreements or inclusion of new companies, Government Debt Management assists in the preparation of new agreements.

**Re-lending operations**

The central government's re-lending mirrors loans in existing government securities, so that coupon rates, interest-payment dates and redemption dates correspond to the characteristics of underlying government securities. Government Debt Management determines a list of government loan types in which re-lending is possible (the re-lending list). The re-lending list comprises all government bonds that are bullet loans in the maturity segments between 2 and 10 years. The list may be deviated from in special cases.

When a company requests re-lending in a government series, Government Debt Management sets the price of the loan on the basis of the current market conditions. The proceeds of the loan are paid from the central government's account. The derived borrowing

requirement is financed via the key on-the-run issues, i.e. no issuance takes place specifically to cover the re-lending. Re-lending is part of the consolidated risk management of the central-government debt, cf. Chapter 8.

## COMPARISON OF GOVERNMENT LOAN GUARANTEES AND RE-LENDING 7.2

Government loan guarantees and re-lending typically provide lower financing costs for the companies compared to private borrowing without any guarantee. The lower costs reflect the central government's assumption of the credit risk for which the companies would otherwise have to pay in the market. The central government's exposure to a potential loss in the event that the company defaults on its loans is the same for government guarantees and re-lending. Therefore, loan guarantees and re-lending are in principle equivalent with regard to the central government's credit risk, cf. *Danish Government Borrowing and Debt 2004*, Chapter 9.

Some companies have access to both government-guaranteed loans and re-lending. The borrowing terms in connection with re-lending reflect the price of the central government's bullet loans, on which a liquidity premium is normally available. On raising government-guaranteed loans in the private market, the companies may conclude borrowing arrangements targeted at specific investors' interests.

In addition, government loan guarantees and re-lending are distinguished by the fact that re-lending contributes to building up liquidity in the key on-the-run issues because it increases the central government's issuance requirement.

## GOVERNMENT LOAN GUARANTEES 7.3

At the end of 2006, the companies eligible for government guarantees had issued government-guaranteed debt totalling DKK 67.1 billion, cf. Table 7.3.1. This is a decrease from DKK 75.4 billion in 2005, due, inter alia, to restructuring of government-guaranteed loans to re-lending, cf. below. In addition to the government guarantees managed by Government Debt Management, the government has provided guarantees for a further approximately DKK 100 billion, e.g. in connection with subsidised housing, export credits and international institutions, cf. the government accounts.

The Mortgage Bank of the Kingdom of Denmark (*Hypotekbanken*) was liquidated as of 1 January 2006, and its liabilities comprising

CENTRAL-GOVERNMENT LOAN GUARANTEES Table 7.3.1

| DKK billion | New guaranteed loans in 2006 | End-2006 |
|---|---|---|
| Sund & Bælt Holding | - | - |
| The Great Belt Bridge | 0.0 | 28.4 |
| Øresund Landworks | 0.0 | 3.3 |
| The Øresund Link Consortium | 3.3 | 20.7 |
| The Danish Broadcasting Corporation | 0.4 | 2.9 |
| The Danish State Railways | 0.6 | 11.8 |
| Total | 4.3 | 67.1 |

government-guaranteed loans were transferred to the central government. The Mortgage Bank's loans are thus no longer part of the central government's loan guarantees, but are included directly in the central-government debt. By the end of 2006, the loans of the Mortgage Bank are transferred to Government Debt Management for management as part of the central-government debt.

## RE-LENDING TO GOVERNMENT-OWNED COMPANIES 7.4

In 2006, new re-lending issued to government-owned companies totalled DKK 10.3 billion, cf. Table 7.4.1. Re-lending for DKK 1.2 billion was redeemed, and at the end of 2006 the stock of re-lending totalled DKK 29.4 billion. Re-lending, primarily in long-term government bonds, was granted to the Great Belt Bridge, Øresund Landworks and Energinet.dk. In one case, Energinet.dk's re-lending was in 7 per cent bullet loans 2024, a series not usually on the re-lending list, provided that it was swapped for inflation exposure. The reason is that the company's infrastructure investments are expected to have a lifetime of 30-40 years, and its revenue is subject to price-index adjustment.

The significant increase in re-lending is related to extensive restructuring by the Great Belt Bridge and Øresund Landworks of government-guaranteed loans in the market to re-lending, since the companies deemed re-lending to have been favourably priced in 2006.

RE-LENDING, NOMINAL VALUE Table 7.4.1

| DKK billion | Issued in 2006 | Portfolio 2006 |
|---|---|---|
| The Great Belt Bridge | 6.7 | 8.2 |
| Øresund Landworks | 1.8 | 6.0 |
| The Ørestad Development Corporation | - | 13.4 |
| Energinet.dk | 1.9[1] | 1.9 |
| Total | 10.3 | 29.4 |

[1] Re-lending to Energinet.dk included 7 per cent bullet loans 2024, which is traded significantly above par. The market value of the re-lending issued to Energinet.dk in 2006 was DKK 2.3 billion.

Energinet.dk and the Danish North Sea Fund gained access to re-lending in 2006. The Danish North Sea Fund did not make use of this option in 2006, but plans to do so in 2007.

Total re-lending to government-owned companies in 2007 is expected to be approximately DKK 9 billion, of which DKK 5 billion is refinancing of existing re-lending.

## RE-LENDING TO DANISH SHIP FINANCE 7.5

In 2003, Danish Ship Finance gained access to a special re-lending facility in connection with the adoption by the Folketing (Parliament) of a temporary operating subsidy for Danish shipyards. This facility is subject to a system of agreements equivalent to the system applying to government-owned companies.

Danish Ship Finance has access to re-lending in kroner or dollars, structured as 12-year serial loans with semi-annual payments. The central government transacts currency swaps between kroner and dollars in connection with the re-lending in dollars so that it does not have any exchange-rate exposure on this re-lending. The pricing of the loan is determined on the basis of the central government's borrowing terms, including the swap terms.

In 2006, Danish Ship Finance obtained re-lending totalling USD 411 million, equivalent to DKK 2.5 billion. At end-2006, its re-lending was DKK 4.6 billion. In 2007, Danish Ship Finance plans to obtain re-lending for USD 247 million, equivalent to DKK 1.4 billion.

Re-lending can be granted to Danish Ship Finance until 31 December 2012. By concluding a forward rate agreement with the central government, Danish Ship Finance can lock the interest rate on re-lending for up to three years prior to disbursement. This means that re-lending can be disbursed up to 31 December 2015.

CHAPTER 8

# Risk Management

*Interest-rate risk is managed by a strategic benchmark for the duration of the debt portfolio. The target band for duration in 2007 is 3 years ± 0.5 year, which is unchanged from the most recent years. The diminishing debt enables the central government to assume a higher interest-rate risk, i.e. shorter duration. In 2007 two reasons underpin an unchanged target band for duration. Firstly, the flat yield curve entails only a minor expected cost saving from shortening duration relative to the higher risk. Secondly, the level of interest rates is low and model projections indicate that the probability of increasing interest rates exceeds the probability of falling interest rates. At the beginning of 2007, the duration of the debt portfolio was in the upper range of the band.*

*The central government holds foreign debt in order to maintain the foreign-exchange reserve. To minimise the exchange-rate risk, the central government's foreign debt portfolio is exposed solely in euro.*

*Credit risk related to the central government's swap portfolio is minimised by observing well-defined principles for management of the credit risk. The counterparties are required to have high credit ratings, and swaps are only transacted with counterparties that have signed unilateral collateral agreements. The central government's credit exposure has been around DKK 6 billion in recent years. 2006 saw a general improvement in the credit ratings of the central government's counterparties.*

*Operational risk is minimised via the division of functions and the use of simple, well-known financial instruments and well-documented procedures.*

## INTEREST-RATE RISK 8.1

Interest-rate risk is the risk of higher financing costs on the central-government debt as a result of the development in interest rates. The interest-rate risk on the central-government debt is managed on a consolidated basis according to the Asset Liability Management (ALM) principle. This entails that the interest costs on liabilities and the interest revenue from assets are viewed on a consolidated basis, cf. Box 8.1. The liabilities comprise domestic and foreign government debt. The assets

RE-LENDING AND CONSOLIDATED RISK MANAGEMENT Box 8.1

Re-lending to government-owned companies is financed via domestic borrowing, which increases the central government's liabilities. At the same time, re-lending constitutes a claim on the government-owned company and thus an asset of the central government, although it is not included in the definition of the central-government debt. However, re-lending does not increase the interest-rate risk for the central government since the loan is serviced by the government-owned company. Risk management is therefore based on the risk on the central-government debt, including the assets related to re-lending.

Furthermore, the central government grants re-lending to Danish Ship Finance (Danmarks Skibskredit A/S) normally in dollars. This re-lending is financed via domestic borrowing combined with currency swaps from kroner to dollars. On a consolidated basis, the central government thus assumes neither interest-rate nor exchange-rate risk on re-lending in dollars.

comprise the central government's account with Danmarks Nationalbank, the portfolios of four government funds managed by Government Debt Management, and re-lending to government-owned companies and Danish Ship Finance (*Danmarks Skibskredit A/S*).

The key strategic benchmark for the central government's interest-rate risk is the duration of the total debt portfolio. Duration increases with the fixed-interest period, which makes it a summary measure of the trade-off between costs and risks. The shorter the duration, the higher the interest-rate risk on the central-government debt. The reason is that short-term interest rates fluctuate more than long-term interest rates, and that short-term bonds are subject to more frequent fixing of new interest rates that are unknown. On the other hand, financing in short-term bonds is normally associated with lower expected interest costs as interest rates normally increase with the term to maturity.

**Separation of issuance strategy and interest-rate risk**

In Denmark, the issuance strategy is separated from the management of the duration of the central-government debt by means of interest-rate swaps. The advantage of this separation is that the issuance strategy can be targeted at building up large, liquid government bonds in the key maturity segments where the central government has a comparative advantage. The central government hereby achieves lower borrowing costs.

Every year, a duration level of the central-government debt in the subsequent year is determined. The decision is taken on the basis of a long-term analysis of the development in the interest costs on the central-government debt, the interest-rate fixing, cf. Box 8.2, as well as simula-

DEFINITION OF KEY RISK AND EXPOSURE TERMS Box 8.2

**Interest-rate fixing.** The proportion of the debt for which a new, unknown interest rate is fixed within a given year. The interest-rate fixing is calculated as the issuance of government securities for the year, adjusted for re-lending, and the holdings of interest-rate swaps at the beginning of the year, less the balance of the central government's account at year-end. A general increase in the level of interest rates by 1 percentage point will increase the interest costs in that year by approximately 1 per cent of the interest-rate fixing.

**Duration.** The duration of the debt is calculated as Macauley duration. In Danish government debt management, duration is applied as a measure of the average fixed-interest period. Long duration means that for a large proportion of the debt, the interest rate is locked for a long time. Long duration is thus associated with low risk.

**Expected interest costs.** The mean of the interest-cost scenarios in CaR.

**Absolute CaR.** A risk measure that indicates the maximum interest costs with a probability of 95 per cent in a year. Calculated as the 95th percentile of the interest-cost scenarios in CaR.

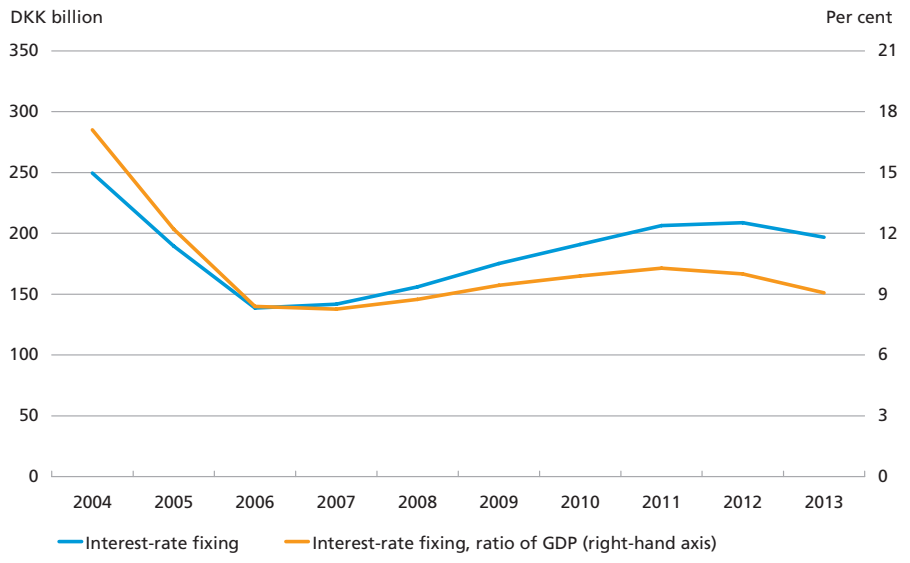
tions using the Cost-at-Risk (CaR) model. The CaR model is used to quantify expected interest costs and interest-rate risks, subject to various assumptions of duration.

**Analysis of the interest-rate fixing**

The duration of the debt portfolio does not include information on the absolute interest-rate exposure or its dispersion over time. Consequently, low interest-rate exposure, i.e. long duration, does not rule out high exposure relative to the development in the level of interest rates in a single year. The duration of the central-government debt is therefore supplemented with a projection of the interest-rate fixing.

Even though the central-government debt is decreasing, the interest-rate fixing in the coming years for an unchanged duration of 3 years is increasing, cf. Chart 8.1.1. This is because maturing government securities are financed by issuing new 10-year government bonds which have a long term to maturity and thereby long duration. A relatively large number of swaps that shift the exposure from long-term to short-term interest rates is therefore required to keep the duration of the central-government debt unchanged. In previous years, issuance was to a greater extent distributed on bonds with shorter maturities than 10 years. As a consequence of the diminishing borrowing requirement and the objective of building up liquid benchmark series, it is no longer expedient to spread issuance across several maturity segments.

INTEREST-RATE FIXING FOR CONSTANT DURATION OF 3 YEARS Chart 8.1.1




**Cost-at-Risk analysis of the strategic duration benchmark in 2007**

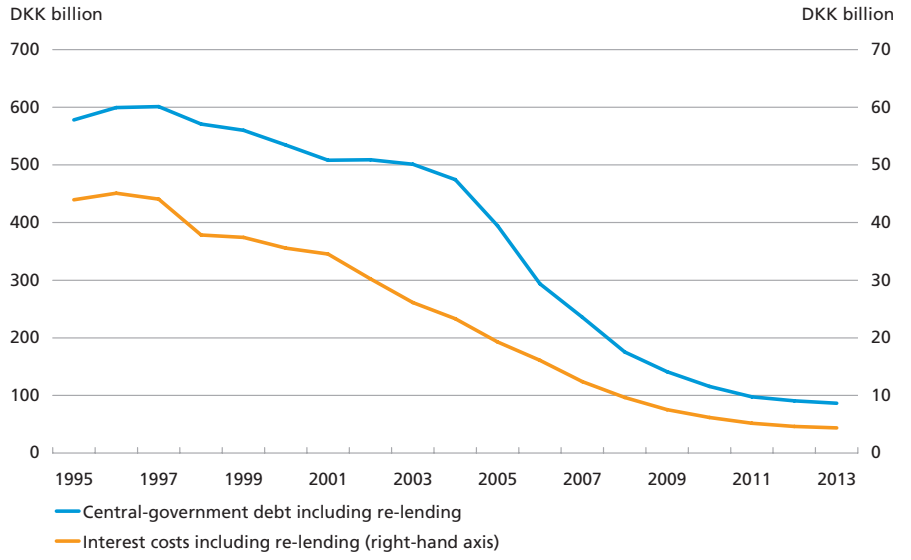
The CaR model is used to analyse the trade-off between interest costs and interest-rate risks on the central government's debt portfolio. In the CaR model, the interest costs in the medium term are simulated using 2,500 scenarios for the development in the level of interest rates. Based on these scenarios, the expected interest costs and the risks on the interest costs in terms of absolute CaR are calculated, cf. Box 8.2.

The CaR simulations are based on the existing debt portfolio, technical budget projections from the Ministry of Finance, and a strategy for future borrowing and buy-back. By adjusting the swap strategy, it is possible to vary the duration, and thus the interest-rate exposure, in the individual CaR simulations. Interest-rate swaps facilitate the design of the issuance strategy irrespective of the required duration.

The decrease in the central government's debt in recent years, combined with the low level of interest rates, has entailed lower interest costs, cf. Chart 8.1.2. The absolute interest-rate risk is therefore lower. According to the technical budget projection by the Ministry of Finance, the central-government debt will diminish in the coming years. This helps to explain the falling trend for interest costs over the simulation horizon. Contrary, a projected general increase in the level of interest rates by Government Debt Management's interest-rate model has the opposite effect. The impact of the reduction in the government debt dominates in the projection, which contributes to explaining why both expected interest costs and absolute CaR decline over the simulation horizon, cf. Chart 8.1.3.

CENTRAL GOVERNMENT'S DEBT AND INTEREST COSTS ADJUSTED FOR RE-LENDING

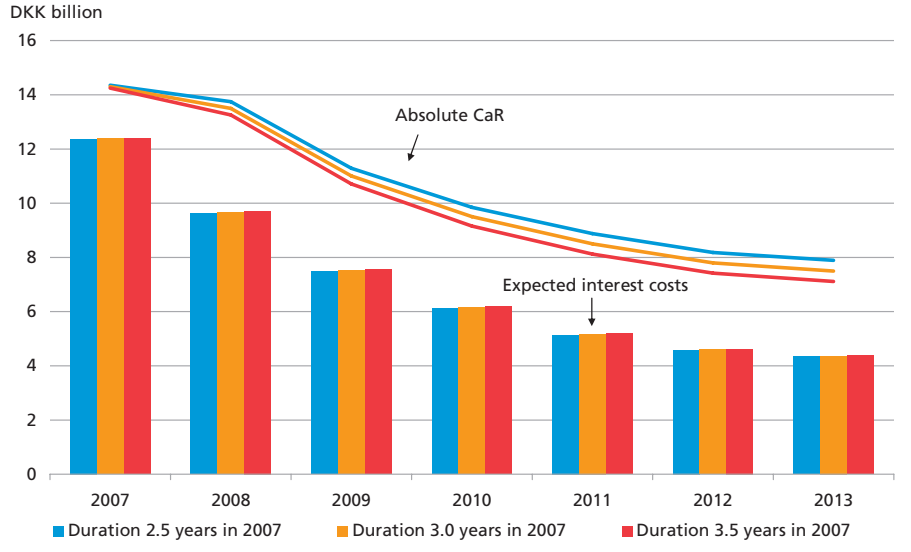
Chart 8.1.2




The diminishing government debt allows the central government to assume a higher interest-rate risk, i.e. to reduce duration. Changes in duration are analysed by adjusting the volume of transacted interest-rate swaps. A reduction in duration by 0.5 year in 2007 requires additional

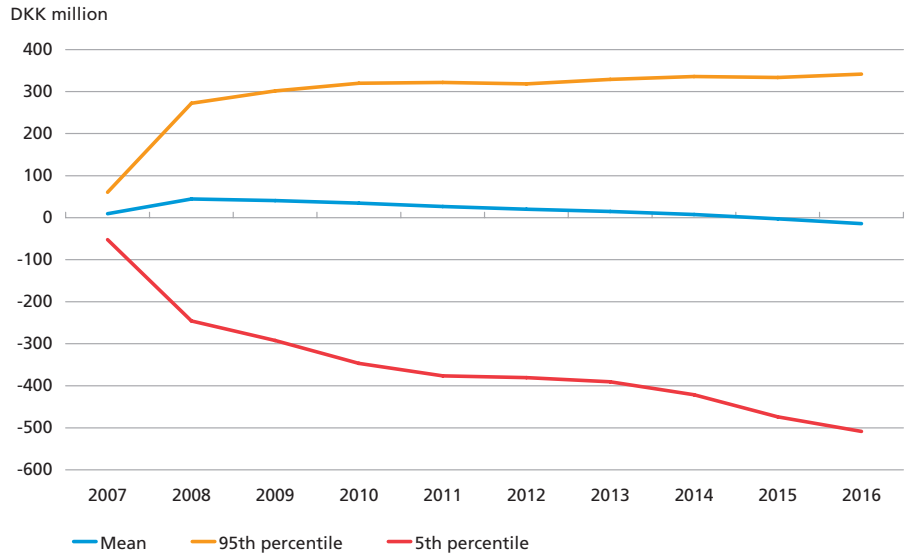
EXPECTED INTEREST COSTS AND ABSOLUTE CaR

Chart 8.1.3




Note: Interest costs on central-government debt including re-lending.

EXPECTED COST SAVINGS AND RISK VIA TRANSACTION OF INTEREST-RATE SWAPS FOR DKK 15 BILLION IN 2007 Chart 8.1.4




Note: Mean CaR is the expected cost savings. 95 percentile is the maximum cost savings with 95 per cent probability. 5 percentile is the maximum cost savings with 5 per cent probability in a year.

interest-rate swaps for an amount of DKK 15 billion in 2007. At present, however, the expected cost saving from shortening duration is found to be limited.

The CaR model calculates the effect of shortening duration by 0.5 years in 2007 on interest costs and the interest-rate risk. The immediate cost savings of transacting interest-rate swaps is limited due to the flat yield curve. The expected savings in 2008 is DKK 45 million, cf. Chart 8.1.4. This should be viewed in conjunction with a 5 per cent probability of a loss of more than DKK 245 million. In the subsequent years, the expected savings is smaller and the risk is higher. This reflects that Government Debt Management's interest-rate model indicates a rise in short-term interest rates in the projection. The small expected gain means that even minor increases in short-term interest rates have a strong impact on the advantage of transacting interest-rate swaps in 2007. In view of the above, it has been decided to maintain the strategic benchmark for duration unchanged at 3 years ± 0.5 year in 2007.

## EXCHANGE-RATE RISK 8.2

The central government holds foreign debt in order to maintain the foreign-exchange reserve. Exchange rate risk is the risk that the value of

the central-government debt in kroner increases as a result of changes in exchange rates. The foreign government debt is exposed solely in euro, which entails a low exchange rate risk due to Denmark's fixed exchange-rate policy vis-à-vis the euro. In addition, Danmarks Nationalbank's foreign-exchange reserve is predominantly exposed in euro.

Re-lending to Danish Ship Finance is normally denominated in dollars, but the exchange-rate risk is hedged by transacting currency swaps from kroner to dollars, whereby the payment flow corresponds to the redemptions on the re-lending. Overall, the central government's re-lending in dollars therefore does not entail any exchange-rate risk.

In 2006, Defence Command Denmark (Ministry of Defence) was given access to an exchange-rate hedging facility with Danmarks Nationalbank. Via the facility the central government can hedge the value in kroner of its future military expenditure in US dollars. The resulting exposure for Danmarks Nationalbank is hedged as part of the ongoing risk management.

## CREDIT RISK 8.3

Credit risk is the risk of financial loss as a consequence of a counterparty's default on its payment obligations. The central government uses swaps to manage the interest-rate and exchange-rate risk on the government debt. When a swap is transacted, its market value is zero, but over time the market value may become either positive or negative for the central government, depending on the development in interest and exchange rates. If the market value develops in favour of the central government it will have a credit exposure on the counterparty. If the counterparty goes into liquidation or defaults on the contract, the central government may lose its claim on the counterparty. The framework for the central government's credit management is described in Box 8.3. The detailed framework is presented in the Appendices.

In 2006, it was decided to reduce the swap lines for certain special-purpose-vehicle counterparties of the central government, cf. Box 8.4. The amendment to the principles for the central government's extension of credit lines is an element of a more general assessment of the credit lines extended to the central government's swap counterparties. The assessment of the framework continues in 2007.

### The central government's swap portfolio in 2006

At end-2006, the principal of the central government's swap portfolio totalled DKK 157.8 billion, cf. Table 8.3.1. The central government transacted interest-rate swaps in kroner and euro for a total principal of DKK

CENTRAL-GOVERNMENT CREDIT RISK MANAGEMENT Box 8.3

The central government's credit risk is minimised by observing well-defined credit management principles. The key principles are:

- Counterparties must have high credit ratings
- Swaps are transacted only with counterparties that have signed a unilateral collateral agreement (CSA)
- The credit exposure for a counterparty must be kept within relatively narrow swap lines
- Positive and negative market values are subject to netting at counterparty level
- Swaps can be terminated if the counterparty's rating falls below a certain level (rating triggers).

According to the central government's credit management principles, the counterparty must be rated at least Aa3/AA- by minimum two well-reputed rating agencies. For interest-rate swaps in kroner or currency swaps between kroner and euro, however, counterparties with a rating of minimum A3/A- are permitted. Since counterparties must maintain a high credit rating throughout the lifetime of the swap, the probability of losses is kept at a low level. If a counterparty defaults on its payment obligations, the unilateral collateral agreement (CSA) limits the central government's loss. The collateral agreements with the central government entail that the counterparty must deposit collateral if the market value of the swap portfolio exceeds a threshold that is determined by the credit rating of the counterparty.

The central government's credit exposure on a counterparty is calculated as the market value minus pledged collateral plus the calculated potential credit exposure, which takes account of further increase in the market value of the swap portfolio over a horizon of one month. Only positive values entail credit exposure. The central government's credit exposure on a counterparty is a measure of the expected maximum positive market value of all swaps, less collateral, transacted with the counterparty. This is equivalent to the expected maximum loss to the central government as a consequence of a counterparty's default on its payment obligations. The credit exposure is not allowed to exceed an authorised swap line determined by the rating and equity capital of the counterparty.

All agreements concluded between the central government and swap counterparties are based on the standardised ISDA Master Agreement. The master agreement includes provisions on netting and rating triggers. Netting entails that claims and losses on the total portfolio of swaps with a counterparty are set off against each other. Rating triggers entitle either party to terminate all swaps if the rating of the other party falls below a certain level (normally A3/A-). Whether it is an advantage for the central government to terminate all swaps with a counterparty depends on the central government's credit exposure, the portfolio's remaining term to maturity, the costs of termination, and how losses can otherwise be avoided, e.g. by increasing the pledged collateral.

17.9 billion in 2006. The central government transacted currency swaps for DKK 2.4 billion in connection with re-lending to Danish Ship Finance. The central government solely uses plain vanilla interest-rate and currency

THE CENTRAL GOVERNMENT'S SPECIAL PURPOSE VEHICLE COUNTERPARTIES Box 8.4

**Special Purpose Vehicle structure**

A Special Purpose Vehicle (SPV) is a company established by one or more parent companies for the purpose of executing and guaranteeing derivatives transactions. Due to its financial structure, SPVs normally have the highest possible rating (triple-A). An SPV is legally separated from all other companies in the same group, which means that its capital cannot be claimed by the parent company or other group companies if they encounter financial difficulties. An SPV hedges its entire market risk via the parent company, and the SPV's capital base is adjusted on an ongoing basis to ensure sufficient cover for the SPV's financial obligations at all times. The rating agencies therefore consider the risk of the SPV defaulting on its financial obligations to be limited.

As opposed to banks, SPVs are only subject to partial financial supervision. An assessment of an SPV's credit standing is therefore based primarily on the rating agencies' assessments and ongoing monitoring of the SPV.

**Consequences of default**

There are two types of SPV. One is terminated if a trigger event[1] occurs, entailing settlement of all outstanding contracts with the SPV's counterparties on market terms (termination structure). The other type of SPV in principle continues to meet its obligations until expiry (continuation structure). In connection with an SPV with a termination structure, the swap counterparty assumes a risk related to the parent company's credit rating since e.g. downgrading of the parent company may in some cases trigger termination (trigger event). The ratings reflect the probability that the SPV is able to meet its financial obligations irrespective of any trigger events, and not the risk of termination. There is a risk that all outstanding contracts have to be settled at an inexpedient time for the counterparty and that the termination of a large SPV will affect market prices, resulting in reinvestment at less favourable prices.

**Significance to the central government's credit management**

As an element of a more general assessment of swap lines for the central government's counterparties, the swap lines for SPVs subject to a termination structure have been reduced by DKK 500 million, corresponding to one notch lower than the level that would have been the result based solely on ratings. The assessment includes the factors which could call for a reduction of the credit exposure on SPVs with a termination structure. The assessment of lines for the central government's counterparties continues in 2007.

[1] A trigger event means a predefined event (e.g. default or downgrading to below a certain threshold level of the SPV or a group company), which entails termination of all outstanding contracts with counterparties.

swaps in its risk management, but the portfolio includes three old structured swaps that all expire in 2007.

## Market value of the swap portfolio

The development in the market value of the central government's swaps reflects fluctuations in interest and exchange rates. The market value, and thereby the credit exposure, for example increases when long-term

CENTRAL-GOVERNMENT SWAP PORTFOLIO, 2004-06, YEAR-END — Table 8.3.1

| | 2004 | 2005 | 2006 |
|---|---|---|---|
| Number of counterparties | 26 | 25 | 24 |
| Number of swaps | 329 | 351 | 396 |
| | Principal, DKK billion | | |
| Interest-rate swaps, Danish kroner | 59.7 | 61.5 | 75.1 |
| Interest-rate swaps, other currencies | 47.4 | 58.6 | 61.6 |
| Curency swaps, DKK-EUR and EUR-DKK | 16.2 | 16.9 | 14.2 |
| Currency swaps, DKK- USD[1] | 0.5 | 2.7 | 4.9 |
| Currency swaps, other | 14.8 | 8.8 | 1.8 |
| Structured swaps | 0.2 | 0.2 | 0.2 |
| Principal, total | 138.8 | 148.7 | 157.8 |

[1] In connection with re-lending to Danish Ship Finance.

interest rates decrease since the central government receives long interest on the interest-rate swaps transacted. The market value of the central government's portfolio of currency swaps is primarily affected by currency swaps in dollar. The market value increases when the dollar depreciates since the central government pays dollars net in the currency swaps transacted. The central government has a large portfolio of euro currency swaps. As a consequence of the fixed exchange rate policy vis-à-vis the euro, the fluctuation in the market value of these swaps is modest.

The market value of the central government's swap portfolio fell by DKK 6 billion in the 1st half of 2006, primarily as a consequence of increasing interest rates. In the 2nd half of 2006, the market value rose by DKK 2 billion and at year-end the value reached DKK 3.7 billion, cf. Table 8.3.2. The market value can fluctuate strongly from year to year, and especially reflects the development in interest rates, since interest-rate swaps account for the largest share of the portfolio.

**Credit exposure on the swap portfolio**

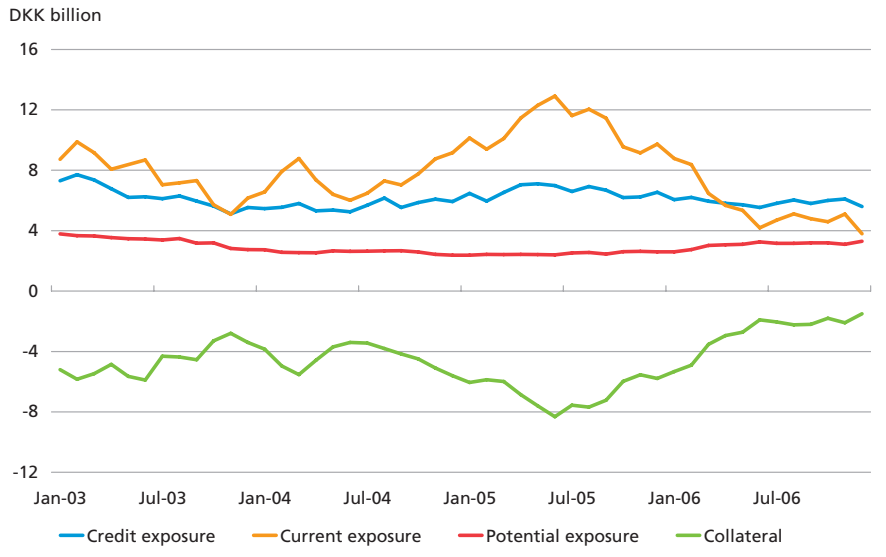
The credit exposure on the swap portfolio is calculated on the basis of the portfolio's current market value, the value of pledged collateral and

MARKET VALUE (NET) OF THE SWAP PORTFOLIO, 2003-06, YEAR-END — Table 8.3.2

| DKK billion | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|
| Interest-rate swaps | 6.4 | 9.9 | 9.8 | 3.5 |
| Currency swaps | -4.2 | -3.9 | -2.1 | 0.2 |
| Structured swaps | 0.1 | 0.0 | -0.0 | -0.0 |
| Total | 2.3 | 5.9 | 7.7 | 3.7 |

Note: The net market value of the swap portfolio is the sum of the market values of the individual swaps.

CREDIT EXPOSURE ON THE CENTRAL GOVERNMENT'S SWAP PORTFOLIO Chart 8.3.1




a supplement (potential exposure) to take account of potential future fluctuations in the market value.

In 2006, the credit exposure on the swap portfolio fell by DKK 0.9 billion to DKK 5.6 billion. This is attributable to a decline in the current exposure (positive market value) by DKK 5.9 billion[1], which was partly offset by a decrease of DKK 4.3 billion in the pledged collateral and an increase of DKK 0.7 billion in the potential exposure. The risk associated with the significant changes in the current exposure is limited by the central government's collateral agreements, cf. Chart 8.3.1. The central government's credit exposure has thus remained almost constant at around DKK 6 billion in the last four years.

COVERAGE OF SWAP PORTFOLIO BY COLLATERAL AGREEMENTS, DISTRIBUTED BY RATING, END-2006 Table 8.3.3

| Rating | Number of counterparties | Principal, DKK billion | Collateral agreements, per cent | Credit exposure, DKK billion |
|---|---|---|---|---|
| AAA | 5 | 38.2 | 97 | 1.3 |
| AA | 8 | 46.0 | 99 | 2.0 |
| AA- | 6 | 67.5 | 100 | 2.0 |
| A+ | 1 | 4.1 | 100 | 0.2 |
| A | 3 | 1.9 | 97 | 0.1 |
| A- | 1 | 0.2 | 0 | 0.0 |
| Total | 24 | 157.8 | 99 | 5.6 |

[1] The market value of the central government's swap portfolio does not correspond to the current exposure since the market value is adjusted for negative market values across counterparties.

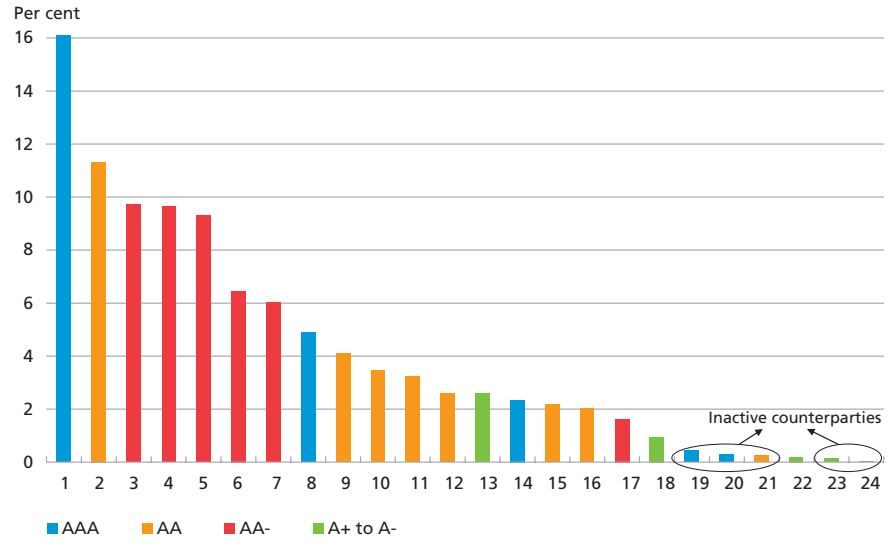
The central government concluded unilateral collateral agreements (CSA) with its counterparties at the end of the 1990s, and today 99 per cent of the central government's total swap portfolio in terms of swap principals is subject to collateral agreements, cf. Table 8.3.3. The proportion of the swap portfolio not covered by collateral agreements decreases as old swaps with counterparties that have not signed collateral agreements expire. These are for minor amounts, and the last swap without a collateral agreement will expire in 2009.

**Dispersion and rating of the central government's swap counterparties**

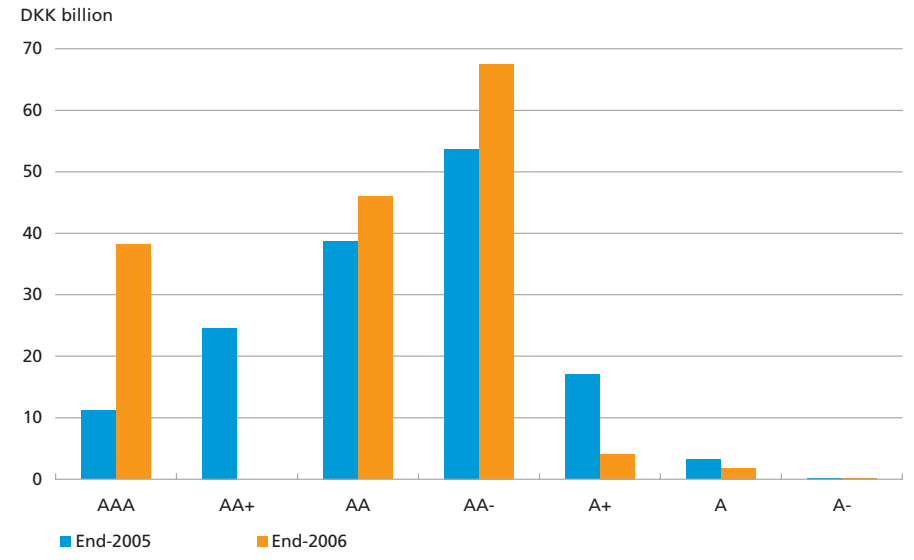
The central government seeks to minimise the risk of losses by using a large number of counterparties. Furthermore, a wide range of swap counterparties contributes to ensuring better prices. At end-2006, the central government had outstanding swaps with 24 counterparties, of which five are no longer used due to the absence of collateral agreements. The central government's swaps are distributed on the remaining 19 counterparties, cf. Chart 8.3.2. One counterparty has a slightly larger market share which should be seen in the light of its high credit rating. The 12 most frequently used counterparties are rated AA- or higher.

2006 was generally characterised by upgrading of the central government's counterparties. This improved the credit quality of the swap portfolio, cf. Chart 8.3.3. Seven counterparties were upgraded, while two were downgraded by either Fitch, Moody's or Standard & Poor's. In four cases, the upgrading resulted in an increase in swap lines and threshold

MARKET SHARES AND RATINGS OF THE CENTRAL GOVERNMENT'S 24 SWAP COUNTERPARTIES — Chart 8.3.2



PRINCIPALS OF THE SWAP PORTFOLIO BY COUNTERPARTY RATINGS Chart 8.3.3




values. The downgraded counterparties were two German Landesbanks, of which one was downgraded twice and the other once. Their downgrading had no impact on the central government since its swaps with the banks are still covered by government guarantees equivalent to a triple-A rating. The central government will not transact any new swaps with the banks due to the absence of collateral agreements.

## OPERATIONAL RISK 8.4

The Bank for International Settlements (BIS) has defined operational risk as "…the risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events".[1]

Operational risk is minimised by applying a number of different measures. Government Debt Management is divided into front, middle and back offices with separate functions. A clear division of functions reduces operational risk and facilitates internal control. Moreover, only standardised, well-known financial instruments are used, and legal risk is minimised by exclusively using standardised contracts.

Clear procedures have been defined for the individual tasks, and all procedures are maintained on an ongoing basis and hereafter approved by the manager in charge. The procedures of Government Debt Management are subject to electronic review and approval in a defined workflow.

[1] *Sound Practices for the Management and Supervision of Operational Risk*, Basel Committee on Banking Supervision, February 2003.

# Special-Topic Section

CHAPTER 9

# Management of the Central Government's Interest-Rate Risk

*The risk management of central-government debt has been developed considerably in recent years, both internationally and in Denmark. Cost-at-Risk (CaR) models were first created in Denmark around 10 years ago, and many countries have subsequently developed their own CaR models to describe the trade-off between costs and risks.*

*The Danish CaR model initially covered only the domestic debt, but now comprises the overall central-government debt. Today, the interest-rate risk on the central-government debt is managed on a consolidated basis, i.e. the risk analysis includes all of the assets and liabilities that constitute the central-government debt.*

*CaR models provide a systematic approach to quantification of the trade-off between costs and risks. However, CaR models cannot describe the optimum government debt policy. The models are based on a number of simplified assumptions, including the development in budget surplus, debt structure and the development in interest rates. The modelling of interest-rate developments in particular is key to the trade-off between costs and risks in the model. Improvement of the interest-rate model used by Government Debt Management has therefore been a focus area in recent years.*

## STRATEGIC BENCHMARK FOR INTEREST-RATE RISK 9.1

The overall objective of Government Debt Management is to achieve the lowest possible long-term borrowing costs, while taking the degree of risk into account. It is therefore very important to consider an appropriate trade-off between costs and risks in the planning of the government debt policy. The predominant risk factor related to Danish government debt is the interest-rate risk, i.e. the risk of higher interest costs as a result of the development in interest rates.

Duration is the key strategic benchmark in the management of interest-rate risk on the central-government debt. Every year in December, a target band is set for the duration of the central-govern-

ment debt in the subsequent year. The decision is based on a long-term analysis of the development in the central-government debt's interest costs, the annual interest-rate exposure (interest-rate fixing), and the trade-off between costs and risks based on the CaR model. The analyses are supplemented with stress testing of future budget surpluses and changes in the yield curve. Government Debt Management is authorised to manage duration within a fixed band, which has been 3 years ± 0.5 year in the most recent years. The development in duration is discussed at the quarterly meetings with the Ministry of Finance.

**Consolidated risk management**

The central-government debt is compiled as the nominal value of domestic and foreign debt less the assets of the government funds and the balance of the central government's account with Danmarks Nationalbank. The central-government debt is compiled excluding the assets related to re-lending.

Accrual of interest costs is applied to risk management on the same basis as the definition of costs applied to the government accounts. The central government's assets related to re-lending are taken into account because the central government's "real" interest costs remain unchanged in connection with re-lending, since the interest payable to the central government is borne by the recipients.

Today, the risk on the central-government debt is managed on a consolidated basis, i.e. both the assets and liabilities of the central-government debt are included in the risk analysis. Consolidated risk management entails that the central government can reduce the overall interest-rate risk by either increasing the duration of its liabilities or shortening the duration of its assets. For example, an increase in the balance of the central government's account will reduce the exposure of the total costs in relation to an increase in the short-term interest rates.

**Delineation of risk management**

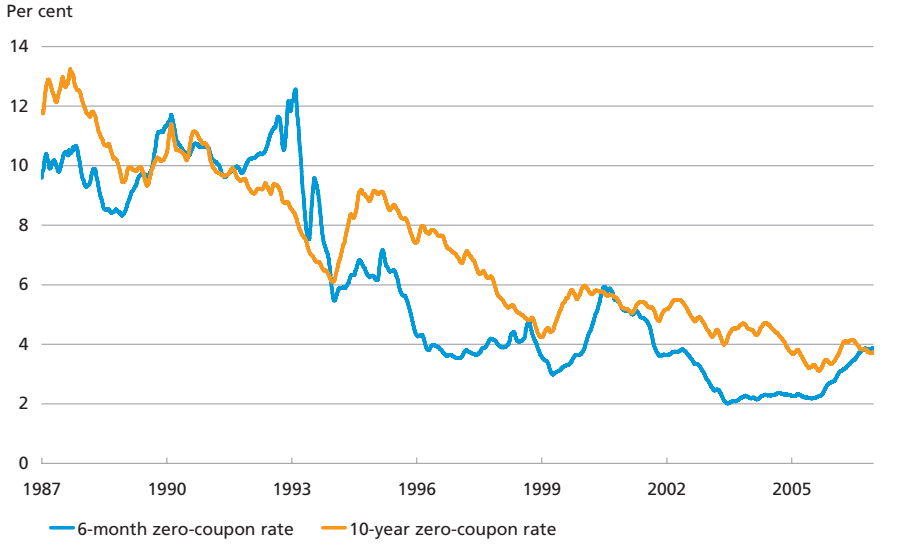
In Denmark, Government Debt Management solely considers the risks and costs associated with the government debt portfolio. However, the central government's overall budget, and thus its debt, is also exposed to interest costs that are not managed by Government Debt Management. For example, the central government is exposed to considerable interest-rate risk in connection with its financing of the subsidised housing sector. However, the central government adheres to the principle that the interest-rate risk on these areas should be in line with the interest-rate risk on the central-government debt.

## TRADE-OFF BETWEEN COSTS AND RISKS 9.2

The interest costs and interest-rate risks on the debt portfolio are closely related to the rate of pass-through of interest-rate fluctuations to costs. There is normally a trade-off between interest costs and interest-rate risks, so that typically the central government can reduce the expected interest costs by assuming a higher interest-rate risk. The trade-off between costs and risks can be attributed to the normally positive slope of the yield curve, i.e. the costs of borrowing in short-term bonds are lower than the costs of borrowing in long-term bonds, cf. Chart 9.2.1. In some periods, this relation has not applied. Around 1993, the yield curve was inverted for a prolonged period as a consequence of the considerable increase in short-term interest rates in conjunction with the turmoil in the foreign-exchange markets. At the beginning of 2007, the yield curve was flat, so short-term borrowing was not associated with significant savings compared to long-term borrowing.

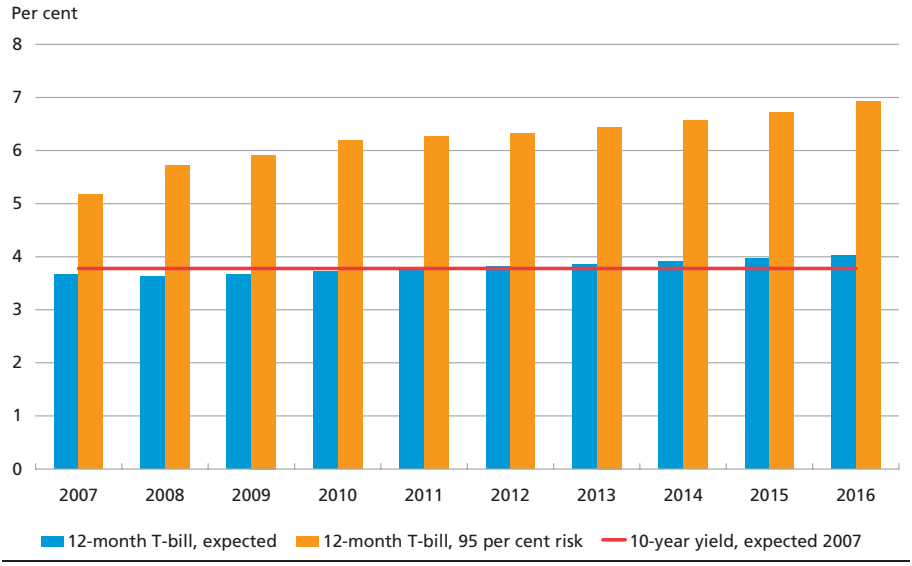
Borrowing in short-term bonds is associated with higher risk than borrowing in long-term bonds. This is because short-term interest rates fluctuate more than long-term interest rates, and short-term bonds more frequently entail refinancing at unknown future interest rates. For example, the interest rate on 12-month T-bills is typically lower than the interest rate on 10-year government bonds. However, over a 10-year period the costs of borrowing in T-bills are not necessarily lower. The

ZERO-COUPON RATES ON GOVERNMENT SECURITIES Chart 9.2.1




Note: 30-day moving averages.

EXPECTED INTEREST RATE AND INTEREST-RATE RISK Chart 9.2.2




Note: Based on Government Debt Management's interest-rate model, November 2006.

current fixed 10-year interest rate should be compared with the average return on T-bills over the next 10 years. Even though financing in T-bills is normally associated with gains over 10 years, there is a risk of considerably higher costs.

Chart 9.2.2 is based on interest-rate input from the interest-rate model estimated by Government Debt Management at the end of 2006. The example shows a minor expected advantage of a few basis points from financing debt via T-bills rather than 10-year government bonds. The reason is that the 10-year interest rate was only slightly higher than the short-term interest rate, and that the interest-rate model projected an increase in the short-term interest rate. The expected advantage should be compared with the 5 per cent probability that annual interest costs will be at least 2.5 percentage points higher for short-term than for long-term borrowing. The choice of financing strategy today therefore depends on both the expectations of and the uncertainty concerning future interest-rate developments.

**Separation of issuance strategy and risk management**

In principle, the central government's interest-rate risk can be managed via the issuance strategy and the buy-back policy. For example, the interest-rate risk could be reduced by buying back short-term bonds and issuing long-term bonds. In Denmark, the issuance strategy is separated from the management of the duration of the government debt by

means of interest-rate swaps. The upside is that the issuance strategy can be targeted at building up liquid government bonds in the key maturity segments where the central government has a comparative advantage. This results in lower borrowing costs for the central government. The aim of the central government's buy-back strategy is to support the building up of liquid benchmark bonds and to smooth the central government's redemption profile.

The central government's interest-rate risk is managed within a duration band for the central government's debt portfolio via interest-rate swaps. In a typical interest-rate swap the central government receives a 10-year swap rate and pays 6-month Cibor rate. A 10-year interest-rate swap thus transforms a 10-year government bond into a short-term loan that is subject to interest-rate adjustment every 6 months. Interest-rate swaps reduce the expected interest costs, but induce a higher interest-rate risk. A combination of 10-year issuance and interest-rate swaps is typically cheaper than direct short-term issuance, cf. Box 9.1.

## MEASURES OF INTEREST-RATE EXPOSURE 9.3

The central government's interest-rate exposure can be measured in various ways. However, all the exposure measures describe the central government's sensitivity to changes in the level of interest rates. In order to quantify the central government's interest-rate risk, the probability of interest-rate changes needs to be taken into account. The expectations to developments in interest rates and interest-rate risks are thus decisive to how the trade-off between costs and risks is assessed today.

**Duration**

The key strategic benchmark for the central government's interest-rate risk is the duration of the central-government debt, including assets from re-lending. Duration is an expression of the average fixed-interest period for the debt portfolio and is therefore a summary measure of the trade-off between costs and risks. A debt portfolio with long duration primarily consists of long-term government bonds associated with low risk and higher expected interest costs. If the uncertainty concerning the future development in interest rates increases, an unchanged duration entails a higher interest-rate risk. The absolute risk is also dependent on the size of the debt.

**Interest-rate fixing**

The duration of the debt portfolio does not contain information on the absolute interest-rate exposure or its dispersion over time. The measure is therefore supplemented with the interest-rate fixing, cf. Box 9.2.

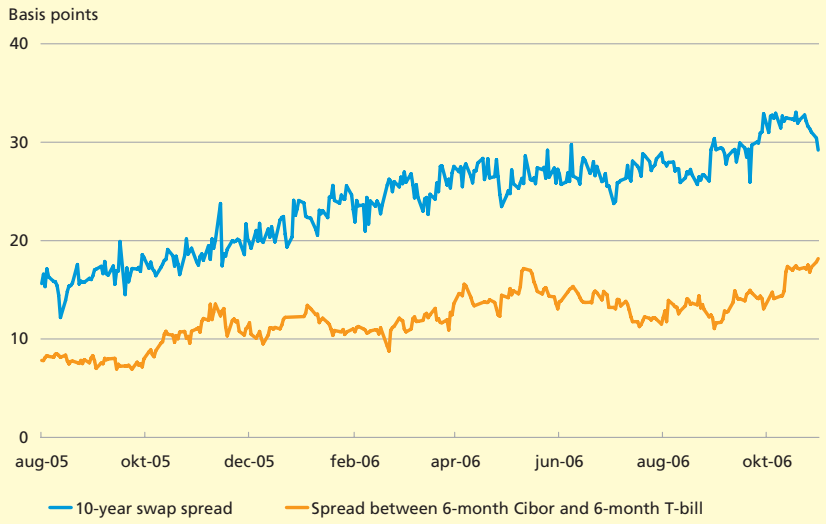
## COMPARATIVE ADVANTAGE OF ISSUANCE AND INTEREST-RATE SWAPS Box 9.1

The central government can reduce interest costs by issuing 10-year government bonds and transacting 10-year interest-rate swaps, instead of borrowing directly in T-bills, without changing the interest-rate risk on the government debt. The issue of a 10-year government bond combined with a 10-year interest-rate swap entails the following costs:

The central government receives a 10-year swap rate
The central government pays a 10-year bond yield
The central government pays 6-month Cibor
= The central government pays 6-month Cibor less the 10-year swap spread

Instead of paying the 6-month T-bill rate, the central government can pay 6-month Cibor less the 10-year swap spread. Issuing long and then swapping thus gives an immediate advantage if the 10-year swap spread exceeds the spread between 6-month Cibor and the 6-month T-bill rate. The advantage was almost 15 basis points in 2006, cf. the Chart below. However, it must be emphasised that the advantage is a "snapshot" on the transaction of the swap and may change during the swap's term.

10-YEAR SWAP SPREAD AND SPREAD BETWEEN 6-MONTH CIBOR AND 6-MONTH T-BILL RATE




Source: Bloomberg and MTSDenmark.

On transacting swaps the central government assumes a credit risk. However, the risk is assessed to be very limited due to the central government's rules for credit management, cf. Chapter 8. The central government has not suffered any losses on its swap counterparties as a result of credit risk.

INTEREST-RATE FIXING Box 9.2

The interest-rate fixing is the share of the debt for which a new interest rate is to be fixed in a given year. The interest-rate fixing is calculated on a consolidated basis as:

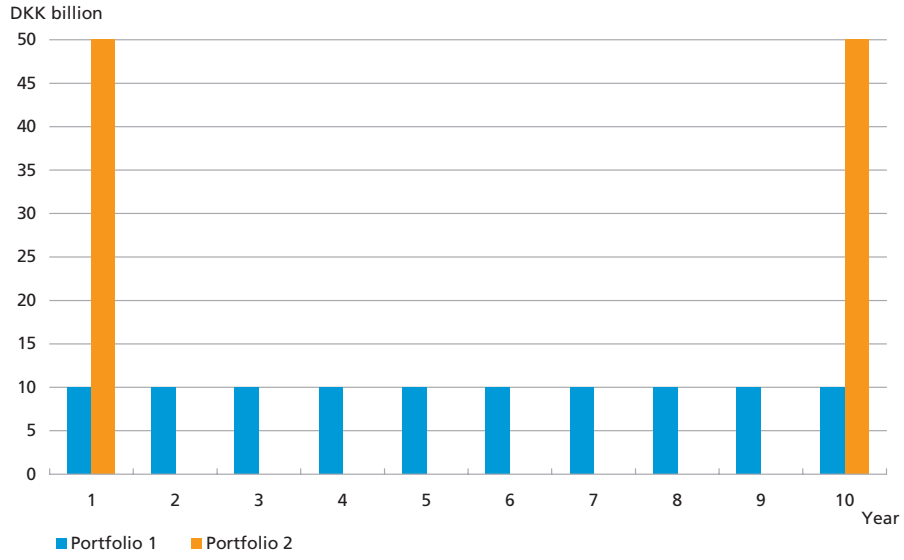
Interest-rate swaps, holdings at the beginning of the year
+ sales of T-bills
+ sales of government bonds (excluding re-lending)
– balance of the central government's account at year-end

The interest-rate fixing primarily comprises holdings of interest-rate swaps and sales of T-bills. As a result, the central government is primarily exposed to fluctuations at the short end of the yield curve. The balance of the central government's account reduces the risk associated with fluctuations in the short-term interest rates. The interest-rate fixing does not take account of the possibility that new interest rates are fixed several times within a year, or that the balance of the central government's account fluctuates during the year.

The central government is exposed to fluctuations at the long end of the yield curve via the issuance of bonds. The transaction of interest-rate swaps in connection with bond issuance only affects the interest-rate fixing in subsequent years. If the issuance of 10-year government bonds amounts to DKK 10 billion in a given year, and 10-year interest-rate swaps are transacted for DKK 5 billion, the interest-rate fixing increases by DKK 10 billion in that year, and by DKK 5 billion in the following nine years.

The interest-rate fixing denotes the part of the debt for which a new interest rate is to be fixed in a given year. The interest-rate fixing entails that a rise in the level of interest rates by 1 percentage point will

ANNUAL REFIXING OF A DEBT PORTFOLIO OF DKK 100 BILLION Chart 9.3.1



increase the interest costs for the government debt adjusted for re-lending by approximately 1 per cent of the interest-rate fixing.

The central government disperses its interest-rate exposure over several years in order to avoid refixing a very large proportion of the debt in a single year when interest rates may be particularly high. Chart 9.3.1 shows two portfolios of equal size and with by and large the same duration. The refixing of portfolio 1 is distributed evenly over 10 years, at an annual amount of DKK 10 billion. The refixing of portfolio 2 is concentrated on two years at an amount of DKK 50 billion on each occasion. The central government's borrowing and buy-back policy is targeted at smoothing the central government's redemption profile, so that the interest-rate fixing is almost constant (portfolio 1).

## RISK MANAGEMENT MODELS 9.4

It is difficult to set up exact measures of the trade-off between costs and risks that is acceptable to the central government. Decisions on the trade-off are based on a large number of factors that cannot be captured in a simple formula. The development of CaR models contributes significantly to quantifying the trade-off between costs and risks for various strategies, but the limitations of the models should be kept in mind. A CaR model is a simplified representation of reality, and the model results are based on a number of assumptions of future borrowing and interest-rate developments. The CaR results are therefore only one of several factors determining the central government's strategy.

CaR models should be sufficiently complex to describe the most important risks on the government debt. However, they should not be so complex that the results cannot be explained. The primary purpose of CaR models is to give a clear, transparent presentation of the relationship between costs and risks.

## THE SCENARIO MODEL AND THE CaR MODEL 9.5

A strategy for the structure of the government debt that minimises the actual interest costs cannot be determined in advance since future interest rates are unknown. A strategy is determined on the basis of a trade-off between costs and risks for various strategies. Prior to analysis of risks in the CaR model, it is necessary to construct a basic future issuance and buy-back scenario that is consistent with the expected

future financing requirements. The risk is then analysed in the CaR model by calculating the future interest costs of different interest-rate scenarios.

Government Debt Management has developed the CaR model over the last 10 years. In the first years, the CaR model was applied solely to the management of the interest-rate risk on the domestic debt and to determining the borrowing strategy. The model was gradually expanded to include foreign debt and the assets of the central-government debt, so that today a consolidated model is applied to measuring the trade-off between costs and risks.

The diminishing financing requirement has reduced the scope for variation in the issuance policy. The CaR model is now to a greater extent applied to decisions on duration rather than analyses of the issuance strategy. Estimates of the development in and the structure of the debt, as well as future interest rates, are required in order to calculate the central government's future interest costs.

**Time horizon**

The Danish CaR model has a time horizon of 10 years. This reflects a medium-term strategy approach. In addition, the longest maturity in the issuance is 10 years, and 10-year interest-rate swaps are predominently used to manage duration. It was decided not to opt for a longer horizon since estimates of interest rates and the development in and structure of the debt become too uncertain.

**Development in the debt**

The future interest costs depend on the development in the government budget balance. In the CaR model, a basic scenario for the budget balance in the subsequent years is applied. The scenario is based on estimates from the *Economic Survey* (Ministry of Finance). The projection is uncertain for longer horizons. The government budget balance depends on such factors as cyclical developments and financial-market trends. The starting point is therefore the structural budget balance, i.e. the budget balance adjusted for temporary fluctuations.

**Debt structure**

The structure of the debt depends on the existing debt portfolio and the future issuance, buy-back and swap strategies. In periods of major changes in the central-government debt, the strategy must be adjusted on an ongoing basis. The scenario model includes the issuance and buy-back strategy that is consistent with the expected future borrowing requirement.

The objective of the *issuance strategy* is to build up new government bonds to a size that ensures liquidity and thereby low borrowing costs. In the light of the low borrowing requirement, the future issuance in the scenario model is concentrated in 10-year securities that are built up to approximately DKK 50 billion over a 2 year period.

The objective of the *buy-back strategy* in the scenario model is to ensure that the security series achieve the required size. Securities are bought back with a view of smoothing the central government's redemption profile. A smooth redemption profile means that the central-government debt is repaid relatively evenly. This reduces the risk of refinancing a large proportion of the debt in years when interest rates are particularly high.

The *swap strategy* determines the duration of the portfolio. In the scenario model, duration is managed solely via the interest-rate swap strategy. A change in duration from 3 to 2.5 years implies an increase in the amount of interest-rate swaps. The issuance and buy-back strategies are in principle kept unchanged. As the debt is reduced, the exposure of the duration of the debt portfolio increases. As a result, fewer interest-rate swaps are required to change the duration of the central-government debt. The risk associated with changing the duration of the debt portfolio thus diminishes as the debt is reduced.

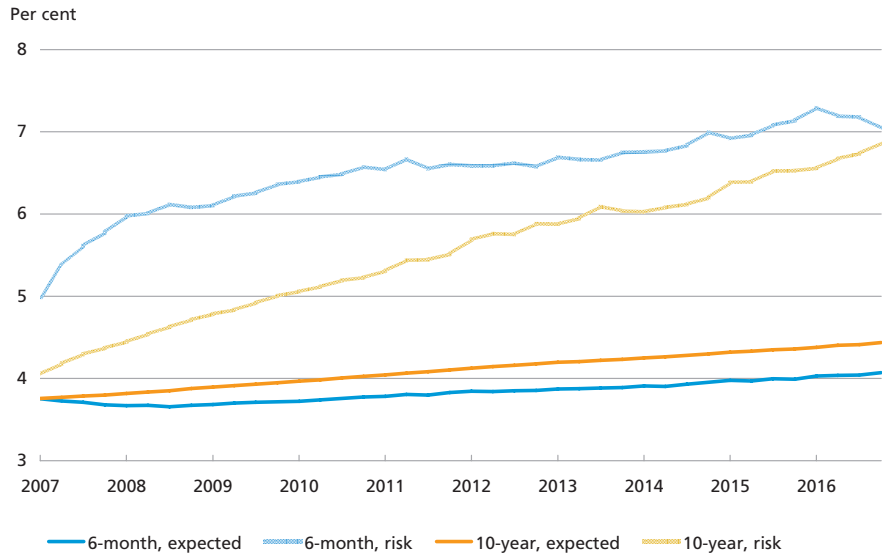
**Interest-rate input**

The input of interest rates is key to the trade-off between costs and risks. In recent years, Government Debt Management has applied a two-factor Cox-Ingersoll-Ross (CIR) interest-rate model, cf. *Danish Government Borrowing and Debt 2005,* Chapter 10. The interest-rate model is estimated on the basis of historical yield curves since 1987. The model's projection of interest rates is based on the current level of interest rates and will in overall terms stay within the same "band" as in the estimation period.

The current interest-rate model is characterised by two key elements. Firstly, the projection of the expected level of interest rates will tend to move towards the historical average, which has been around 6 per cent for the last 20 years. Secondly, the adjustment to the long-term level of interest rates is slow. This reflects the gradual decrease in interest rates during most of the historical period, i.e. a sluggish adjustment to the long-term level of interest rates.

All interest-rate models are exposed to structural breaks, i.e. the past development in interest rates is not necessarily the best indication of the future development. Denmark has seen a strong decline in nominal interest rates from around 10 per cent at the end of the 1980s to around

PROJECTION OF 6-MONTH AND 10-YEAR INTEREST RATES , EXPECTED AND 95 PER CENT RISK Chart 9.5.1




Note: Based on Government Debt Management's interest-rate model, November 2006. The expected development in interest rates is the average of 2,500 interest-rate scenarios. The risk of interest-rate increases is the 95 percentile in the 2,500 interest-rate scenarios.

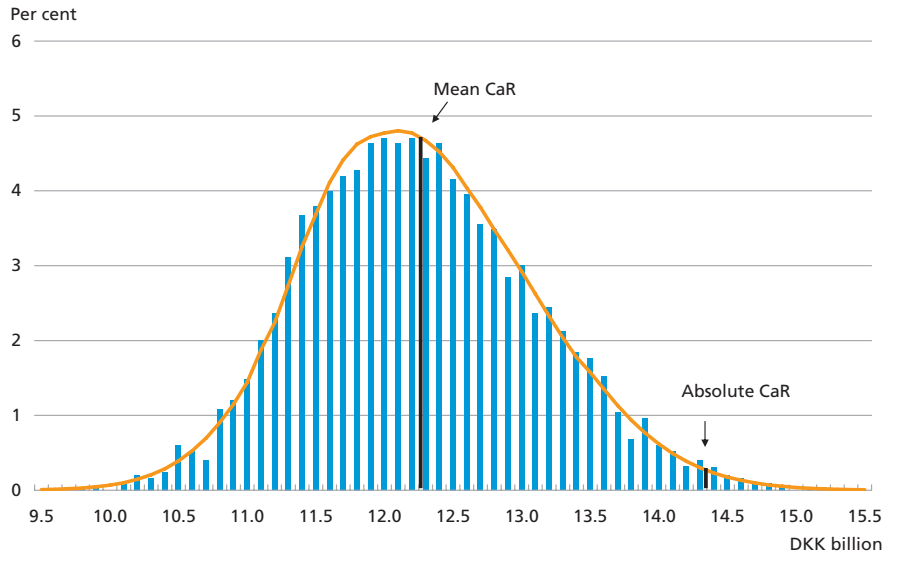
4 per cent since 2000. Part of the decline can be attributed to lower inflation and the stronger credibility of the Danish fixed-exchange-rate policy.

Structural shifts are not modelled directly in the interest-rate model, but only indirectly via the current slope of the yield curve. For example, the present flat yield curve means that the short-term interest rate only increases slowly in the projection, cf. Chart 9.5.1. In the past, short-term interest rates have been considerably higher than today, and strong, unexpected increases have been observed in some periods. This is reflected in the projections of the interest-rate model where the risk of a rapid increase in short-term interest rates is greater than the risk of increases in long-term interest rates. In the longer term, the risk profiles of short- and long-term interest rates tend to converge due to the relatively close historical correlation between the interest rates.

## CaR RESULTS 9.6

Since the interest-rate input is decisive to the trade-off between costs and risks in the CaR model, the implementation and development of interest-rate models have been in special focus in recent years. The average interest-rate scenario is significant to the calculation of the

DISTRIBUTION OF INTEREST COSTS, 2007 Chart 9.6.1




expected interest costs, while the uncertainty (volatility) of the future development in interest rates determines the risk of increasing interest costs.

Once the development in the debt and the issuance, buy-back and swap strategy has been determined, the future interest costs for various interest-rate scenarios can be calculated. The CaR model applies 2,500 different interest-rate scenarios. The results are compiled into two key figures that are calculated for each year:

- *Mean CaR*: expected interest costs
- *Absolute CaR*: maximum interest costs with a probability of 95 per cent.

The risk on the central government's interest costs is described as absolute CaR. The probability limit chosen is 95 per cent. This figure indicates the highest interest costs, disregarding worst-case scenarios. The extremes can be described by increasing the probability threshold or via stress testing. The distribution of interest costs in 2007 is shown in Chart 9.6.1.

Costs and risks are calculated for various duration scenarios. Changes in duration are analysed by adjusting the strategy for interest-rate swaps. The CaR model calculates the effect on interest costs and interest-rate risk in the next 10 years, cf. Chart 8.1.4 in Chapter 8. The central government's choice of duration is based on an overall assessment of the development in the size of the debt, the interest-rate fixing and the trade-off between costs and risks as analysed in the CaR model.

CHAPTER 10

# Experience with Falling Central-Government Debt

*The central-government debt decreased from approximately 55 per cent of GDP in 1997 to 20 per cent of GDP in 2006. A falling central-government debt has an economic impact from lower interest costs and thereby a higher budget surplus, but also market implications due to changes in the structure and supply of instruments in the financial market.*

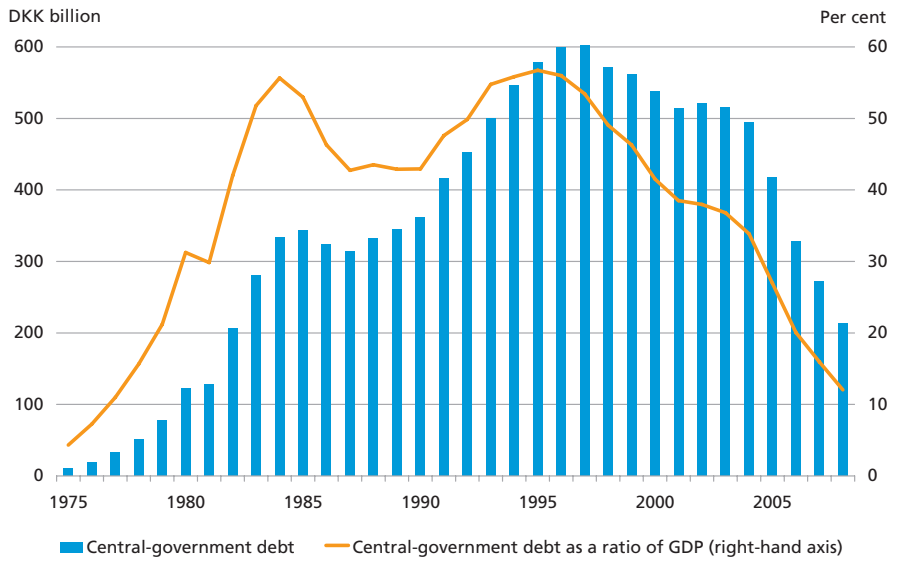
*In the coming years, there is prospect of government budget surpluses. However, in the longer term there is uncertainty of the implications of increased life expectancy and the ageing of the population in terms of reduced public revenue and increased public expenditure. Even though central-government debt is eliminated for a period, there may be a resumed borrowing requirement at a later time.*

*In a number of countries, the central-government debt has diminished or is around zero. Many countries have continued to issue government bonds despite the absence of a borrowing requirement. As a consequence, the central-government debt is reduced by building up assets rather than reducing liabilities. Some countries assess the existence of a government bond market to be prerequisite to maintaining a well-functioning domestic financial market. Other countries have placed their current budget surpluses in funds in order to strengthen the central government's fiscal discipline and as a provision for higher future expenditure.*

## ADJUSTMENTS TO GOVERNMENT DEBT POLICY IN DENMARK 10.1

Almost every year since 1997 has seen a government budget surplus, and the central-government debt has decreased from approximately DKK 600 billion to approximately DKK 330 billion in 2006, cf. Chart 10.1.1. The decline has been particularly strong in the last two years, reflecting high growth and low unemployment. In addition, the central government has recorded substantial revenue from pension-fund taxes and North Sea activities as a consequence of developments in the financial markets and the high oil prices.

CENTRAL-GOVERNMENT DEBT, 1975-2008 Chart 10.1.1




Note: The estimates for 2007 and 2008 are based on *Budget Outlook*, December 2006. The central-government debt includes the assets of SPF as of 1 January 1982.

The government debt policy has been adjusted on an ongoing basis to maintain the overall objectives of Government Debt Management:

- To cover the central-government financing requirement at the lowest possible long-term borrowing costs, while taking the degree of risk into account
- To support a well-functioning domestic financial market
- To facilitate the central government's access to the financial markets in the longer term.

CENTRAL-GOVERNMENT DEBT Table 10.1.1

| DKK billion | End-1997 | End-2006 |
|---|---|---|
| Domestic debt | 674 | 454 |
| Foreign debt | 104 | 80 |
| Total liabilities | 777 | 534 |
| Government funds[1] | -147 | -135 |
| Central government's account with Danmarks Nationalbank[2] | -29 | -71 |
| Total assets | -176 | -206 |
| Total central-government debt | 601 | 328 |

[1] The Social Pension Fund, the High-Technology Foundation and the Financing Fund.
[2] For 2006 the central government's account with Danmarks Nationalbank is compiled on the basis of Danmarks Nationalbank's monthly balance sheet.

Central-government debt comprises domestic and foreign debt less the assets of the government funds administered by Government Debt Management, and the balance of the central government's account with Danmarks Nationalbank. The decrease in the debt primarily reflects a reduction of the domestic debt, cf. Table 10.1.1.

The government debt policy has been subject to ongoing adjustment in order to support liquidity in government securities. A few years ago, the central government issued T-bills, 2-, 5- and 10-year domestic government bonds and 5-year euro loans. The prospect of sustained government budget surpluses led to adjustment of the issuance strategy in 2006 to focus on issuance in 10-year domestic government securities.

## GOVERNMENT DEBT POLICY IN THE LIGHT OF FALLING DEBT 10.2

A falling central-government debt has economic consequences such as lower interest costs and thereby a higher budget surplus, but also market implications due to the changes in the structure and supply of instruments in the financial market.

In coming years, there is prospect of government budget surpluses. However, in the longer term there is uncertainty of the implications of increased life expectancy and the ageing of the population in terms of reduced public revenue and increased public expenditure. Even if central-government debt is eliminated for a period, there may be a resumed borrowing requirement at a later time. Subject to the assumption that fiscal policy remains unchanged, several analyses indicate that from 2015-20 the current budget surpluses will change to deficits.[1]

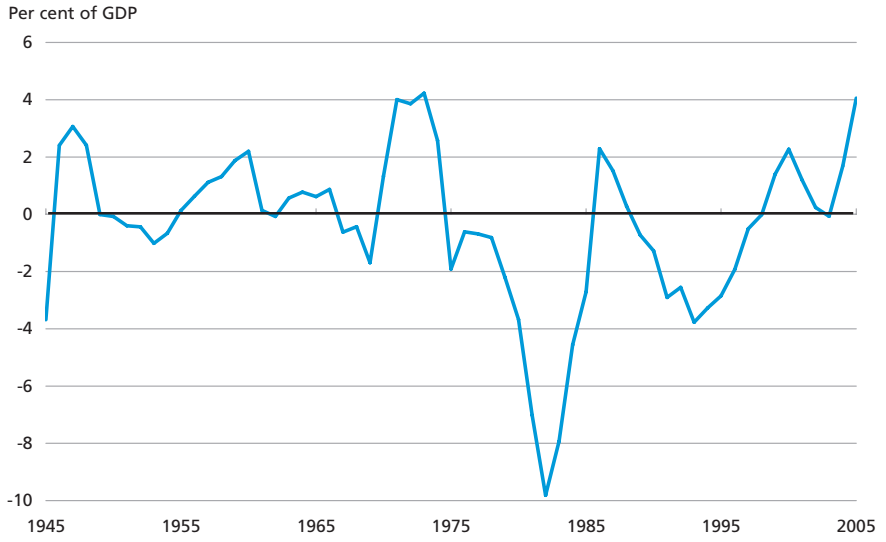
In the shorter term, the development in the debt is influenced by inter alia cyclical trends, which are generally subject to considerable uncertainty. The government budget has in recent years become more sensitive to fluctuations in e.g. oil prices and the securities markets. In addition, the timing and size of revenue from sale of government-owned companies affect the budgetary course.

Historically, there have been prolonged periods with budget surpluses and budget deficits, cf. Chart 10.2.1. The fluctuations cannot be attributed solely to cyclical factors. Structural changes play a key role, e.g. the expansion of the public sector in the 1970s and 1980s increased the central-government debt.

Today's fiscal-policy management focuses on the structural budget balance, i.e. the surplus adjusted for cyclical factors, North Sea revenue,

[1] Long-term Economic Projection 2006 – including assessment of the welfare reform, DREAM (in Danish), November 2006 at www.dreammodel.dk and Future Welfare – Our Choice (in Danish), the final report of the Welfare Commission, January 2006 at www.velfaerd.dk.

GENERAL GOVERNMENT BUDGET BALANCE, 1945-2005 Chart 10.2.1

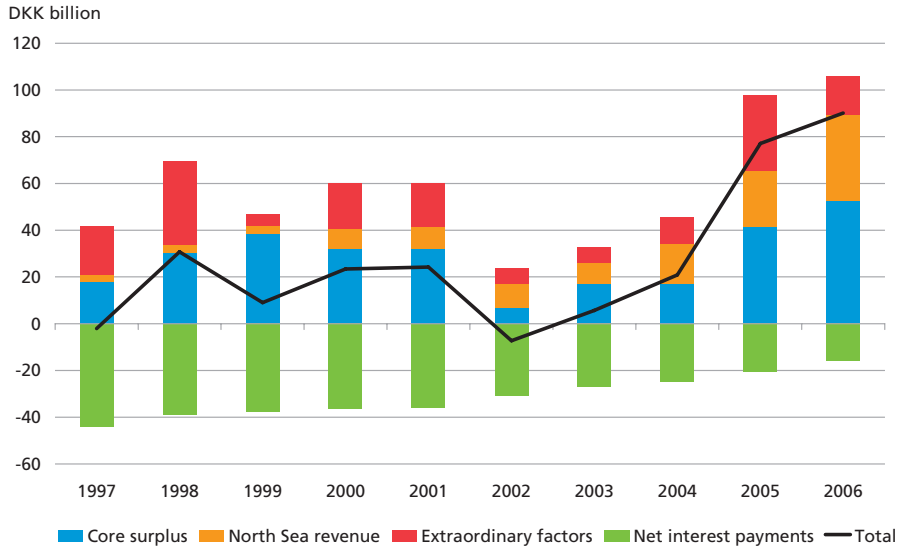



Source: Kim Abildgren, Estimates of the Danish general government budget balance and the cyclical budget volatility 1875-2005, *Nationaløkonomisk Tidsskrift*, Vol. 144, No. 3, 2006, pp. 287-303.

extraordinary factors and net interest payments, cf. *Budget Outlook*, December 2006.

Chart 10.2.2 presents a breakdown of the decrease in the central-government debt. The core surplus is calculated as the decrease in the

BREAKDOWN OF THE DECREASE IN THE CENTRAL-GOVERNMENT DEBT Chart 10.2.2




Note: North Sea revenue comprises direct and indirect taxes from oil explorations (excluding corporate tax revenue). Extraordinary factors are "Non-recurring improvements and extraordinary factors", excluding "Adjustment regarding North Sea revenue". The core surplus is calculated residually.

Source: The central-government accounts, *Budget Outlook*, December 2006, and *Finance Act*, 2007.

central-government debt excluding North Sea revenue, extraordinary factors and net interest payments. The core surplus mirrors cyclical fluctuations, and has been approximately DKK 30 billion on average, i.e. a sound structural budget surplus. Around half of the reduction of the central-government debt since 1997 can be attributed to North Sea revenue and extraordinary factors such as sale of government-owned companies.[1] This has contributed to reducing the central government's net interest payments and thus make a positive contribution to the government budget surplus in the coming years.

The possible consequences for the government debt policy are analysed below in two debt scenarios:

1. The central-government debt is redeemed, and the central government builds up assets.
2. The central-government debt is reduced temporarily after which the central government builds up debt.

**1. The central-government debt is redeemed, and the central government builds up assets**

In the first scenario, the government budget surplus is maintained and the central-government debt is thus gradually redeemed, so there is no actual need to issue government bonds. If the government budget surplus is maintained after elimination of the central-government debt, the central government builds up assets. Today's objective to achieve the lowest possible borrowing costs on the central-government debt can thus in the longer term be to achieve the highest possible return on the central-government's assets.

Some factors may advocate placing part of the government budget surplus in assets before the liabilities have been fully redeemed. This means that the central government's liabilities are not reduced at the same rate as the overall central-government debt. If the budget surplus is large, e.g. as a consequence of substantial non-recurring revenue, buying back a large volume of government bonds may be expensive, especially if the volume of outstanding government bonds is modest. This is one of the factors behind the increase in the balance of the central government's account in recent years.

In a situation where the debt is low or non-existing, the central government's payment flows will still require management during the year and from year to year. One reason is that the government budget surplus mirrors cyclical fluctuations. In some periods, the central government needs to invest its budget surplus, while in other periods it needs

[1] *Budget Outlook*, December 2006, Appendix 1.

to issue debt in order to finance its budget deficit, unless the central government has built up a sufficiently large, liquid portfolio of assets, that it can draw from.

**2. The central-government debt is reduced temporarily after which the central government builds up debt**

In the second scenario, the reduction of the debt is temporary. If the budget surplus is temporary, it may be advantageous to maintain an issuance programme to facilitate the central government's access to the financial markets in the longer term. Maintaining an issuance programme allows the central government to reduce its debt primarily by building up assets. The central government's costs and risks are already subject to consolidated management of the assets and liabilities. Temporary accumulation of assets will therefore not increase the financing costs or the risks.

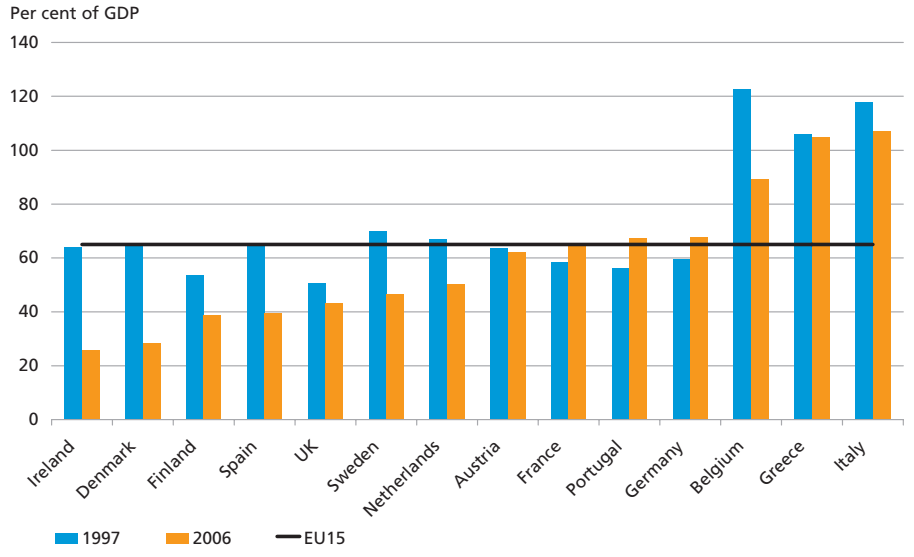
If the central government's issuance programme is suspended, re-establishment in the bond market may be expensive. Re-establishment costs can relate to several factors. Firstly, the market may require a premium due to uncertainty related to the expected liquidity in the new issues. Secondly, there are costs associated with the reconstruction of market making and primary dealer systems, inaccurate pricing, re-establishment of IT systems for electronic trading, clearing and settlement, as well as building up market know-how among investors, etc. These costs are difficult to quantify with great accuracy.

## INTERNATIONAL EXPERIENCE WITH FALLING DEBT 10.3

The development in the government debt of Denmark and Ireland has diverged from other EU member states over the last 10 years. The EMU debt of the two countries decreased from approximately 65 per cent of GDP in 1997 to approximately 25 per cent of GDP in 2006, cf. Chart 10.3.1. Both the low level of debt and the rapid change in the debt have required significant adjustments to the two member states' government debt policies. In small countries a need to adjust the issuance policy can emerge sooner due to their limited volume of outstanding government bonds. This makes it more difficult to build up large, liquid key on-the-run series.

In several non-European countries, reduction of the central-government debt is in line or further ahead of the reduction in Denmark. A common characteristic of these countries is that they have opted for continued issuance of government bonds despite very low or non-existing debt.

EMU DEBT IN EU-15 MEMBER STATES, 1997 AND 2006 Chart 10.3.1




Note: Excluding Luxembourg. In EU-15 member states the debt as a ratio of GDP was approximately 65 per cent in both 1997 and 2006.
Source: The European Commission's autumn 2006 forecast.

Two key arguments are primarily stated in favour of continued issuance of government bonds:

- To support or build up a well-functioning domestic financial market
- To support fiscal discipline and make provision for future costs.

**Support or build up a well-functioning domestic financial market**

Government bonds play a role in the financial markets as liquidity and hedging instruments, and as the underlying assets in a number of derivative instruments. Government bonds are key investment objects for risk-averse investors and are also used by central banks. Finally, government bonds are used to estimate a risk-free zero-coupon yield curve for pricing of other financial instruments.

The economic advantage of continuing to issue government bonds, even though the central-government debt has been eliminated, depends on how advanced a country's financial system is as well as the availability of substitutes. A domestic government bond market is particularly important in countries with emerging financial systems, e.g. developing countries. However, several industrialised countries have maintained or built up a domestic government bond market despite the absence of central-government debt.

*Australia* has maintained an issuance programme even though its central-government debt is close to zero. In 2002, the Australian Office of

Financial Management (AOFM) prepared a report in the light of the decrease in the central-government debt from approximately 20 per cent of GDP in 1995 to approximately 5 per cent of GDP in 2002.[1] The report concluded that the financing costs for Australia's private sector would probably be higher without a liquid government yield curve. This reflects assessment of the domestic financial market as incomplete, e.g. in relation to futures markets, so that the private sector would face higher costs of risk management. In addition, the report found that a less diversified market would increase the financial system's vulnerability in periods of instability.

In addition, since 1998 the AOFM has held liquid assets with the Reserve Bank of Australia in view of the continued issuance of government bonds despite the absence of a borrowing requirement. These assets are used to support the central government's cash management. In view of the sustained budget surplus, it was decided in 2004 to place a share of the assets in a fund (Future Fund) in order to make provision for future pension obligations.[2]

The ongoing management of Denmark's government debt policy will draw on experience from other countries with diminishing government debt. The objective is to create a framework that supports a well-functioning domestic financial market.

**Support fiscal discipline and make provision for future costs**

If the government budget surplus is maintained after redemption of the central-government debt, the central government accumulates assets. A number of countries have opted to build up funds before elimination of the central-government debt. The overall arguments in favour are that building up a fund can enhance fiscal discipline and thereby contribute to ensuring a sustainable budget in the longer term since most countries face increased expenditure in step with increased life expectancy and the ageing of the population.

In 2001, *Ireland* established the National Pensions Reserve Fund (NPRF) to make provision for future pension obligations and public expenditure related to demographic trends. The fund's capital is tied up until 2025. On establishment of NPRF, the Minister for Finance stated: "If we do nothing to anticipate this development now, the consequence will be either that taxes will have to rise dramatically to meet increased pension costs or else the value of pensions in real terms will have to be reduced."[3]

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1 Review of the Commonwealth Government Securities Market, 2002, www.debtreview.treasury.gov.au.

2 Debt management in a low debt environment: The Australian government's debt management framework, *Treasury Working Paper*, 2005-02.

3 www.nprf.ie.

NPRF operates on commercial terms, i.e. has an objective of the highest possible return relative to risks. Ireland's National Treasury Management Agency is responsible for NPRF's investments and risk management. NPRF invests in shares, bonds and real assets, including real estate and commodities.

*New Zealand* has moved from a net debt of approximately 25 per cent of GDP in 1997 to a small portfolio of net assets in 2006. This reflects respectively assets and liabilities of approximately 20 per cent of GDP. New Zealand expects a sustained budget surplus in the coming years. In 2006, the focus of the government debt policy changed from reducing the central government's liabilities to maintaining a portfolio of outstanding government bonds at 20 per cent of GDP. Instead, financial consolidation is achieved by placing the budget surplus in an asset portfolio (New Zealand Superannuation Fund), primarily to provide for future expenditure as a consequence of the ageing of the population.[1]

*Norway* has net assets primarily as a result of its substantial revenue from oil exploration. The central government's assets are placed in the Government Pension Fund (Statens Pensjonsfond). The purpose of the Fund is to ensure fiscal discipline in the management of public expenditure, and to make provision for the expected increase in pension expenditure. The Ministry of Finance is responsible for the management of the Fund and sets out guidelines for its investment policy. The Fund comprises a foreign portfolio managed by Norges Bank Investment Management and a domestic portfolio managed by the National Insurance Scheme Fund (Folketrygdfondet). The assets are invested in both shares and bonds.[2]

Even though the Norwegian central government holds net assets, the Ministry of Finance continues to issue both government bonds and T-bills. Market transactions in connection with sale of government securities are delegated to Norges Bank, and a primary dealer system has been established. Outstanding government bonds account for almost 10 per cent of GDP.

1 Budget 2006, Executive Summary, May 2006, www.treasury.govt.nz.
2 The National Insurance Scheme Fund: www.ftf.no, Norges Bank: www.norges-bank.no/kapitalforvaltning and the Ministry of Finance: www.dep.no/fin.

CHAPTER 11

# Performance Evaluation of Government Debt Policy

*This Chapter describes a preliminary framework for an internal evaluation of the activities of Government Debt Management to follow up on decisions relating to the management of the central-government debt. The duration during the year, as well as the transactions carried out in connection with issuance, buy-backs and interest-rate swaps, are subject to evaluation.*

*The interest-rate risk is managed by a strategic benchmark for duration. Since 2004, this has been 3 years ± 0.5 year. The evaluation of the duration is based on an assessment of the actual duration compared to an alternative in which interest-rate swaps are transacted to achieve a duration of 3 years. This enables quantification of the value of having a duration in the upper or lower range of the band. In 2006, the duration was in the upper range of the band for most of the period. This was an expedient decision in view of market developments. The analyses are supplemented with evaluation of the duration in the period 2004-06.*

*Evaluation at transaction level shows that, all in all, issuance, buy-backs and interest-rate swaps took place at expedient times in 2004-06 compared with a strategy whereby the transactions are distributed evenly.*

## GENERAL EVALUATION PRINCIPLES 11.1

Decisions in the area of government debt management are evaluated against the overall objective of achieving the lowest possible long-term borrowing costs while taking the degree of risk into account. The objective is applied in relation to management of interest-rate risk, as a measure of the duration of the central-government debt (strategic benchmark). A precise and explicit formulation of the objective is the basis for more systematic evaluation that allows for quantification of the consequences of the decisions made.

So far, Government Debt Management has primarily applied qualitative assessments to monitor the ongoing management of duration, cf. Box 11.1. In future, the intention is increasingly to supplement these assessments with a more systematic framework for evaluation of

PRINCIPLES FOR EVALUATION IN THE AREA OF GOVERNMENT DEBT Box 11.1

In recent years, government debt managers worldwide have focused on evaluation. For example, various evaluation methods have been discussed by the OECD's Working Party on Government Debt Management, which has set up a common frame of reference in this area. In several OECD countries, various evaluation principles are applied. As a reference, there are three main approaches:

**Evaluation:** Focus on a qualitative assessment of the elements of the strategy. The assessment is kept at a relatively abstract level with no actual comparison of the results achieved, and the assessment is based primarily on a descriptive presentation.

**Performance measurement:** On the basis of measurable criteria, a specific assessment is made of the transactions performed. This method focuses primarily on quantification of transactions during the year, with less focus on the context in which they were carried out. This entails a risk of unilateral focus on the value in each year.

**Performance evaluation:** Combination of the above two principles, i.e. quantitative and qualitative assessment of the strategy. This avoids excessive focus on the gain from individual transactions, while also measuring the results achieved.

The assessment of Danish government debt policy focuses on the principles underlying performance evaluation, i.e. a concrete and measurable reference is set as the basis for quantification of the results. This supplements a more qualitative assessment of the results achieved in the period. Focus is thus on explaining and highlighting the consequences of the decisions. Decisions made at three levels are assessed:

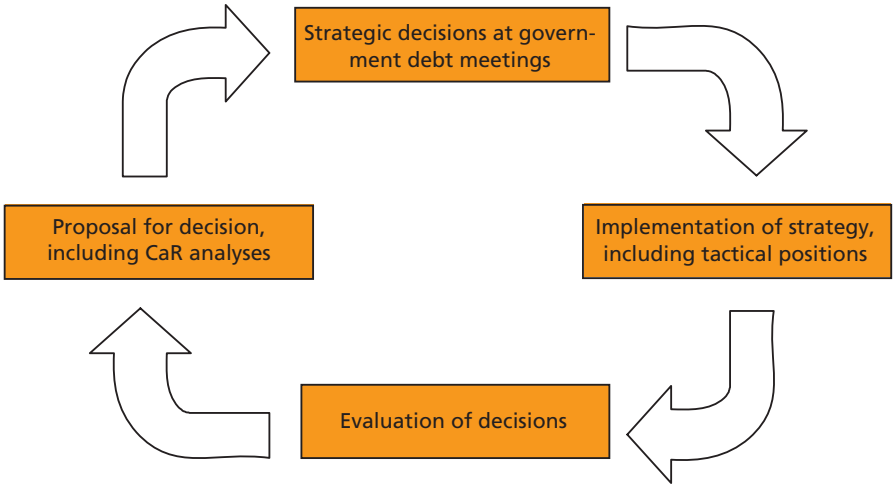
- *Strategic level*: The overall framework for duration management of central-government debt. In future, more systematic evaluation will contribute to determining the strategic benchmark for the duration of the central-government debt.
- *Tactical level*: Management of duration within the agreed strategic band for tactical positions. Evaluated by calculating the value of deviating from the central value of the strategic benchmark.
- *Operational level*: Conclusion of the specific transactions in connection with issuance, buy-backs and use of interest-rate swaps. Evaluated by calculating the value of the timing of Government Debt Management's transactions.

decisions by Government Debt Management. Systematic evaluation facilitates more consistent follow-up on decisions relating to management of the central-government debt.

The evaluation points forwards as well as backwards since the retrospective assessment contributes to a more informed decision on duration in the coming years. The duration is chosen on the basis of analyses of the interest-rate risk and the trade-off between costs and risks, e.g. using the CaR model, cf. Chart 11.1.1.

Based on the analyses, a strategic benchmark is determined after discussion with the Ministry of Finance at the government debt meeting

RELATIONSHIP BETWEEN FUTURE-ORIENTED DECISIONS AND EVALUATION Chart 11.1.1




in December. The strategic benchmark comprises a central value for the duration and a duration band. During the year, Government Debt Management may take tactical positions by deviating from the central value of the duration band. The subsequent assessment will show whether the tactical positions were expedient.

Since the analyses can support the future choice of duration band, the evaluation can also contribute to a more informed choice of strategic benchmark going forward. Evaluation of the strategic duration decision naturally also comprises evaluation of the CaR model. The latter is not part of this analysis. This Chapter focuses on the tactical and operational decisions.

Evaluation of historical decisions made under uncertainty concerning e.g. the future market development should be subject to caution. The results of the evaluation should be seen in the light of the uncertainty prevailing at the time when the decision was taken. In addition, the decisions typically have an impact more than one year into the future. It is therefore important to show the results over an extended period.

Furthermore it can be difficult to assess whether objectives that are hard to quantify have been met. For example, it is not easy to assess whether the secondary objective to support a well-functioning domestic financial market has been achieved. Two areas are evaluated in the following: risk management of central-government debt; and government debt transactions.[1] This is achieved by assessing both the

[1] Issues by auction are not evaluated in this section; this applies to both T-bill auctions and opening auctions.

significance of the choice of duration, and the terms on which the central government's issuance, buy-backs and interest-rate swaps were transacted. First, an evaluation is conducted for 2006, and then it is extended to the period 2004-06.

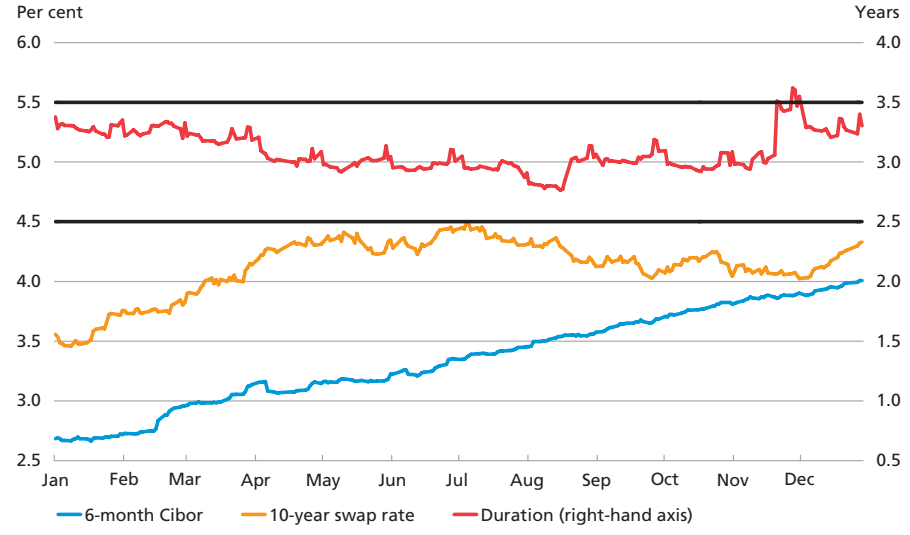
## EVALUATION OF DURATION MANAGEMENT IN 2006 11.2

The duration of the central-government debt is managed within a band that is determined at the government debt meeting in December. In 2006, this band was 3 years ± 0.5 year. The duration at the beginning and end of 2006 was above the central value of 3 years, cf. Chart 11.2.1. In the 1st half of the year, the strategy was to reduce the duration to below the central value, but as the spread between short-term and long-term interest rates narrowed, a tactical decision was made to be in the upper range of the band towards the end of the year.

The evaluation is conducted by comparing the value of the realised development in duration with two alternative scenarios:

- *Scenario 1*: Duration is maintained at the central value of the duration band throughout the period
- *Scenario 2*: Average duration for the period is equivalent to the central value of the duration band.

INTEREST RATES AND DURATION IN 2006 Chart 11.2.1




Note: The duration band was 3 years ± 0.5 year in 2006.
Source: Bloomberg and Danmarks Nationalbank.

METHODS FOR EVALUATING DURATION MANAGEMENT Box 11.2

Duration management is evaluated using two scenarios. Both scenarios show the value of deviating from the central value of the strategic duration band in the period.

1. Duration is maintained at the central value of the duration band throughout the period. To achieve this, interest-rate swaps are transacted every month. Opposite swaps may be transacted so that the central government receives interest at a fixed rate on some swaps in the fictive portfolio and pays interest at a fixed rate on others.
2. The average duration for the period is the central value of the duration band. The fictive interest-rate swaps that ensure an average duration of 3 years are distributed evenly on all months in the period.

In both scenarios, the transacted interest-rate swaps in the fictive portfolio influence the duration in the subsequent period. The calculations are based on the following assumptions:

- Only domestic 10-year interest-rate swaps with semi-annual interest-rate adjustment of the floating leg are used
- No transaction costs
- All swaps are transacted on the last trading day of the month.

The market value of the fictive swap portfolios is projected on the basis of the actual development in market interest rates. The total value of the fictive swap portfolio is calculated as the realised accumulated interest payments and the market value of the swap portfolio at the end of the period.

The two alternative scenarios are achieved by transacting interest-rate swaps in a fictive portfolio, cf. Box 11.2. The advantage of changing the duration is assessed on the basis of the value of the fictive swap portfolio.

On evaluation of the fictive swap portfolio, the advantage cannot be compiled until expiry of the interest-rate swap contract, when the interest-rate development throughout the lifecycle of the swap is known. However, it is possible to estimate the value of the swap portfolio before expiry. The development in the variable interest rate (Cibor) since the inception of the swap contract determines the so far realised value of the contract. The value of the swap in the remaining term to maturity depends on the future, unknown interest rates. To include this effect, the market value of the swap at the end of the period is calculated. The market value is calculated on the basis of the yield curve, which reflects the market's expectations of future short-term interest rates.

It should be noted that in practice it would not be possible to replicate the calculated values in the two scenarios. For example, transaction costs have not been taken into account, nor has any impact on the market price from implementing the scenarios been included in the calculation.

**Scenario 1: Duration of 3 years in every month of 2006**

To maintain a duration of 3 years throughout 2006, extra interest-rate swaps totalling DKK 11.9 billion would be required.[1] The total value of this fictive swap portfolio would be approximately DKK -0.9 billion at end-2006. This is attributable to two circumstances. Firstly, the difference between 6-month Cibor and 10-year swap rates narrowed significantly from a level of around 100 to around 30 basis points in 2006. Secondly, at the end of the period swap rates rose to around the highest level in the period, cf. Chart 11.2.1, which reduces the market value.

**Scenario 2: Average duration of 3 years in 2006**

In 2006, the average duration was 3.13 years. This means that extra interest-rate swaps for DKK 10.9 billion, or DKK 0.9 billion per month, would be required in order to reduce the average duration to 3 years. This fictive swap portfolio would have a value of approximately DKK -100 million at end-2006.

**Comparison of the results**

The results show that a duration in the upper part of the band has been expedient for the central government. The difference between the value of the two fictive swap portfolios can be explained by the following elements. In scenario 1, a far greater number of interest-rate swaps are concluded, on which 10-year interest is both paid and received. The scenario assumes that speculative positions between months are taken to a greater extent.

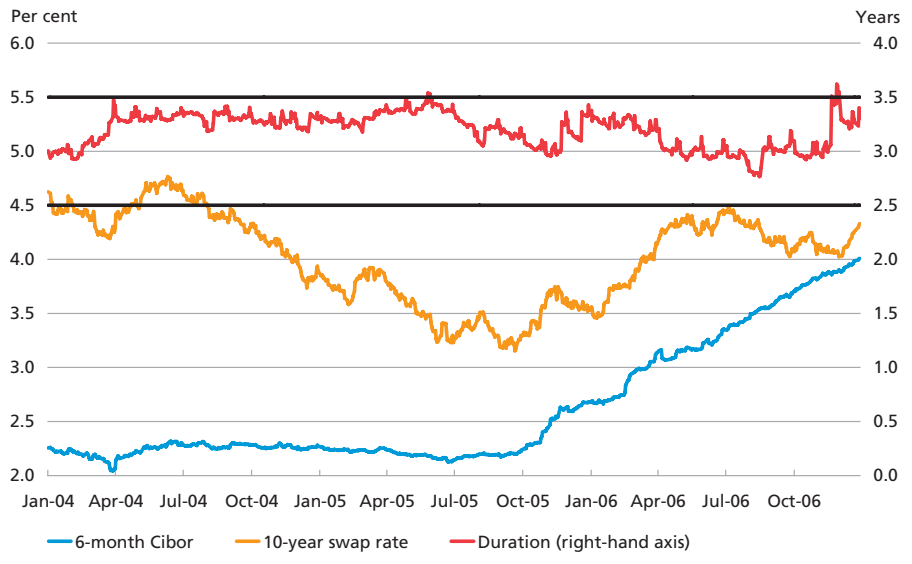
In scenario 2, the fictive swap portfolio that ensures an average duration of 3 years is assumed to be distributed evenly across the period. This means that fewer interest-rate swaps are transacted, on which the central government only receives 10-year swap interest, and the timing effect is not taken into account.

## EVALUATION OF DURATION MANAGEMENT IN 2004-06 11.3

The following section applies the same two methods to evaluate duration management in the period 2004-06. In these 3 years, the strategic benchmark remained constant at 3 years ± 0.5 year, cf. Chart 11.3.1. The realised duration in the 3 years was primarily in the upper range of the band. This reflects a tactical decision to remain in the upper

[1] This comprises DKK 47.5 billion in swaps whereby the central government receives interest at a fixed rate and DKK 35.6 billion in swaps in the opposite direction.

INTEREST RATES AND DURATION, 2004-06 Chart 11.3.1




Note: The duration band was 3 years ± 0.5 year in 2004-06.
Source: Bloomberg and Danmarks Nationalbank.

range of the band based on market conditions, including a narrow swap spread, falling market interest rates and a gradual flattening of the yield curve.

**Scenario 1: Duration of 3 years in every month of 2004-06**

To maintain duration of 3 years at the end of each month, interest-rate swaps totalling DKK 16 billion (net) would be required.[1] The development in the value of the fictive swap portfolio is influenced primarily by the high duration at the beginning of the period. In order to reduce the duration to 3 years, it would therefore be necessary to transact a relatively large number of interest-rate swaps whereby 10-year swap interest is receivable and floating 6-month Cibor payable. Since swap rates were at a high level in 2004, while Cibor rates were at a relatively low level in the period, the fictive swap portfolio has a value of approximately DKK 0.9 billion at end-2006.

**Scenario 2: Average duration of 3 years for the whole period**

The average duration was 3.2 years in 2004-06. To reduce the duration to 3 years, extra interest-rate swaps for DKK 24 billion, equivalent to DKK 0.7 billion per month, would be transacted. This fictive swap portfolio would have a value of DKK -30 million at the end of 2006.

[1] Comprises DKK 112.6 billion in swaps whereby the central government receives interest at a fixed rate, and DKK 96.4 billion in swaps in the opposite direction.

METHOD FOR EVALUATING SALES, BUY-BACKS AND INTEREST-RATE SWAPS Box 11.3

Evaluation using the *monthly reference* is based on the average interest rates for the individual securities in each month. The monthly averages are compared with the weighted average of the yields to maturity at which the central government has actually concluded transactions. For each month, a spread to the monthly reference for issuance, buy-backs and interest-rate swaps is calculated and translated into a value in kroner. The monthly reference is a theoretical alternative that is not necessarily achievable since market conditions must be taken into account, cf. *Danish Government Borrowing and Debt 2004*, Chapter 8.

### Comparison of the results

The difference between the results of the two scenarios is primarily attributable to the timing of the swaps transacted in the two fictive swap portfolios. In scenario 1, adjustment of the duration would primarily have taken place at the beginning of the period, when a large number of swaps would have been transacted. In retrospect, the timing was favourable because 10-year swap rates were high and Cibor rates low. Scenario 2, on the other hand, implies an even distribution of interest-rate swaps over the 3 years. This would have made it necessary to transact more interest-rate swaps in 2005 and 2006 when conditions were not as favourable as in 2004, cf. Chart 11.3.1.

## ISSUANCE, BUY-BACKS AND INTEREST-RATE SWAPS IN 2006 11.4

This section evaluates the central government's ongoing transactions in the market. The transactions are compared with a reference whereby the transactions within each month are distributed evenly on all trading days. The timing of the transactions within the month is hereby evaluated.

By comparing the actual transactions with the reference, it is possible to assess whether Government Debt Management has issued, bought back and transacted interest-rate swaps on appropriate days. The method of evaluating the transactions is described in Box 11.3.

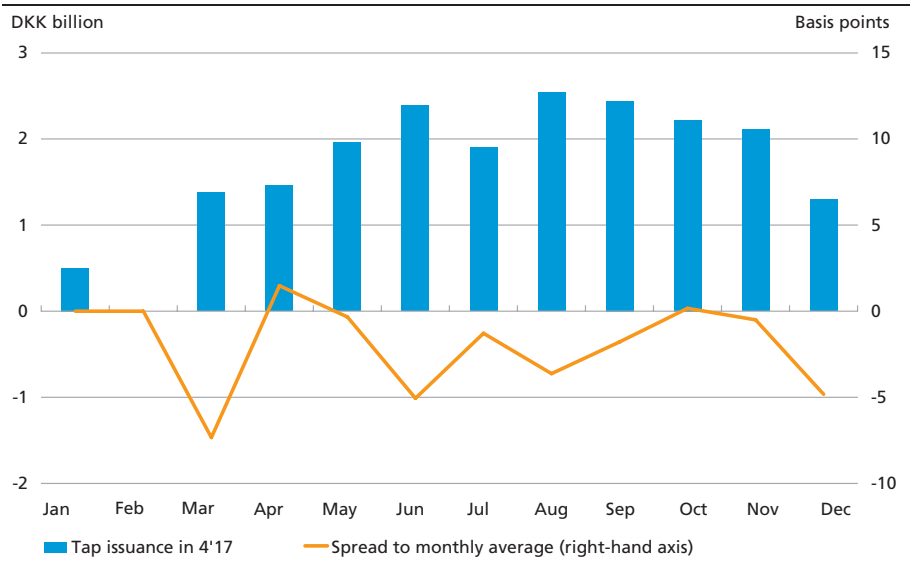
### Tap issuance

In 2006, the central government issued in three government bond series. Chart 11.4.1 shows the breakdown of tap sales by month in 2006 for the

ISSUANCE IN 2006 RELATIVE TO THE MONTHLY REFERENCE Table 11.4.1

| DKK million | 4'10 | 4'15 | 4'17 | Total |
|---|---|---|---|---|
| Total tap issuance | 3,850 | 3,090 | 20,200 | |
| Spread to monthly average (basis points) | -0.4 | -1.3 | -2.2 | |
| Value of spread | 0.7 | 3.4 | 38.4 | 42.5 |

ISSUANCE AND SPREADS TO MONTHLY AVERAGE INTEREST RATES IN 2006, 10-YEAR SEGMENT — Chart 11.4.1




Source: MTSDenmark and Danmarks Nationalbank.

key on-the-run issue, 4 per cent bullet loans 2017, as well as the spread to the average interest rate in each month. In general, issuance took place at below-average interest rates.

The value of trading on favourable days for all issues is stated in Table 11.4.1, which also shows the average spreads to the monthly averages. The total value of the realised transactions in relation to the monthly reference is DKK 43 million.

**Buy-backs from the market by the central government and the government funds**

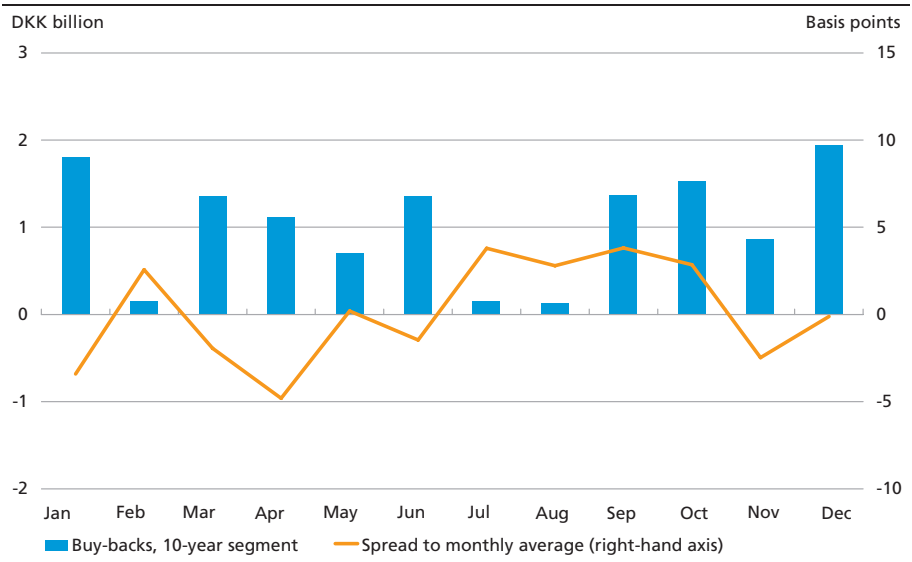
Buy-backs from the market in the 10-year segment are shown in Chart 11.4.2. In some months, buy-backs were below average, and in other months above. Overall, buy-backs have taken place on days with slightly above-average interest rates and the value of the buy-backs is DKK 3 million, cf. Table 11.4.2.

BUY-BACKS IN 2006 RELATIVE TO THE MONTHLY REFERENCE — Table 11.4.2

| DKK million | 2-year | 5-year | 10-year | Total |
|---|---|---|---|---|
| Total buy-backs from the market | 6,440 | 4,960 | 12,500 | |
| Spread to the market average (basis points) | 3.1 | 3.4 | -0.6 | |
| Value of spread | 3.6 | 7.1 | -7.9 | 2.7 |

BUY-BACKS AND SPREADS TO MONTHLY AVERAGE INTEREST RATES IN 2006, 10-YEAR SEGMENT

Chart 11.4.2

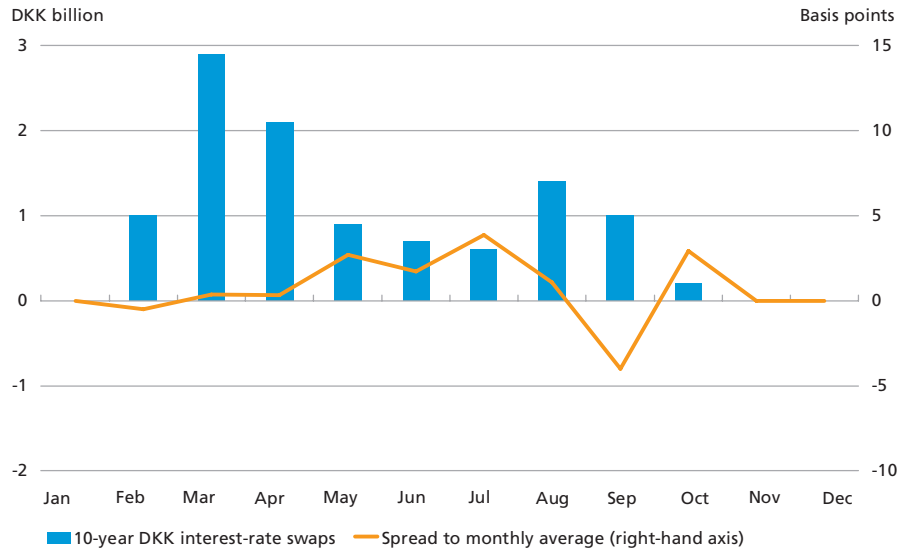



Source: MTSDenmark and Danmarks Nationalbank.

The above results are based on partial analyses and do not take account of the interaction between issuance and buy-backs. The central government's buy-backs are a precondition for maintaining liquid issues and should therefore be viewed in this context, cf. Box 11.4.

INTEREST-RATE SWAPS IN KRONER AND SPREADS TO MONTHLY AVERAGE INTEREST RATES IN 2006

Chart 11.4.3




Source: Bloomberg and Danmarks Nationalbank.

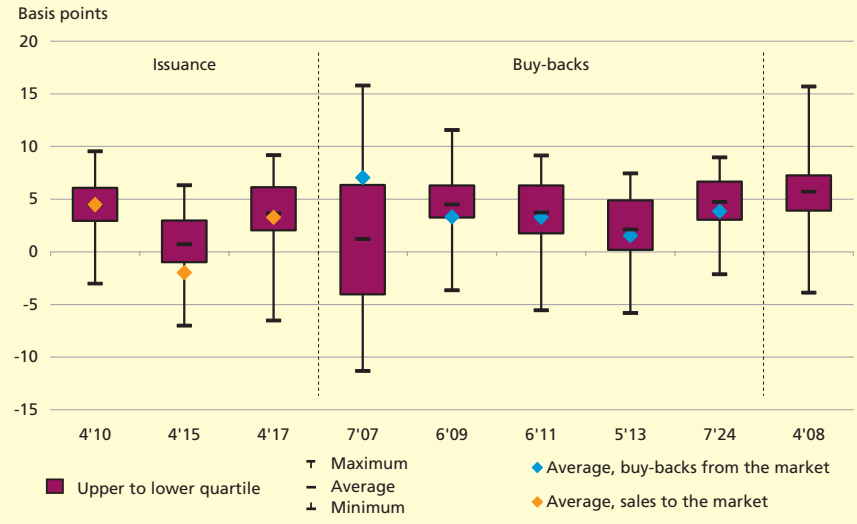
EVALUATION OF THE CENTRAL GOVERNMENT'S SALES AND BUY-BACK ACTIVITIES RELATIVE TO THE GERMAN GOVERNMENT YIELD CURVE Box 11.4

By calculating spreads to the German government yield curve it is possible to assess whether Danish government securities with different maturities are relatively cheap or expensive.

Due to the negative correlation between interest rates and prices, it is advantageous to buy back securities at times when the spread is wide, and to issue securities when it is narrow.

For all on-the-run issues, issuance has, on average, taken place when the yield spread has been narrow, i.e. below the average for the year, cf. the Chart below. Buy-backs are transacted at spreads that are respectively above and below the average for the year.

BOX PLOT OF THE DAILY YIELD SPREADS OF DANISH GOVERNMENT SECURITIES TO THE GERMAN GOVERNMENT YIELD CURVE IN 2006




Source: Nordea Analytics and own calculations.

## Interest-rate swaps

As regards interest-rate swaps, Chart 11.4.3 shows that the fixed leg of 10-year interest-rate swaps is predominantly locked to a higher rate of interest than the monthly average. The value of transacting on expedient days is calculated to total DKK 16 million in Table 11.4.3.

INTEREST-RATE SWAPS IN 2006 RELATIVE TO THE MONTHLY REFERENCE Table 11.4.3

| DKK million | 5-year, DKK | 10-year, DKK | 10-year, EUR | Total |
|---|---|---|---|---|
| Total interest-rate swaps | 2,800 | 10,800 | 4,287 | |
| Spread to monthly average (basis points) | 6.6 | 0.5 | 1.2 | |
| Value of spread | 7.6 | 4.2 | 4.0 | 15.8 |

Overall, the realised tap issuance, buy-backs and interest-rate swaps have been transacted on better terms than in the monthly reference. The total value was DKK 61 million in 2006.

## ISSUANCE, BUY-BACKS AND INTEREST-RATE SWAPS IN 2004-06 11.5

In 2004-06, the central government sold government bonds totalling DKK 140 billion by tap sale. In the same period, buy-backs in the market amounted to DKK 113 billion and interest-rate swaps to a total of DKK 48 billion. The value of the realised transactions in relation to the monthly reference is shown in Chart 11.5.1.

In all 3 years, tap sales took place on better average terms than if they had been distributed evenly on each month. For buy-backs and interest-rate swaps, the results fluctuate. Over the whole period, the central government bought back and transacted interest-rate swaps on slightly better terms than in the monthly reference. Over the 3-year period, the value of the realised transactions was DKK 116 million compared with the monthly reference.

VALUE OF ISSUANCE, BUY-BACKS AND INTEREST-RATE SWAPS RELATIVE TO THE MONTHLY BENCHMARK, 2004-06 Chart 11.5.1


Source: Bloomberg and Danmarks Nationalbank.

## PERFORMANCE EVALUATION IN A FUTURE PERSPECTIVE 11.6

In future, the assessment of the decisions during the year will to a greater extent be based on a systematic framework. In addition, evaluation of risk management will be related to more specific objectives for duration over shorter periods. This will make it simpler to quantify the value of deviating from the central value of the duration band.

In practice, the overall strategic duration band will be supplemented with a narrower target band, cf. Chapter 4. The more explicit consideration of duration management during the year supports the evaluation of the duration decisions. At the quarterly government debt meetings, it will be decided whether tactical adjustments to the band should be made. The evaluation will be an integral element of the annual reporting of activities in *Danish Government Borrowing and Debt*.

In addition, there are plans to perform a more systematic assessment of the process relating to the choice of strategic benchmark for duration.

CHAPTER 12

# Integration of the European Government Bond Markets

*The establishment of the Economic and Monetary Union (EMU) on 1 January 1999 paved the way for greater integration of European government bond markets. Prior to the introduction of the euro, yields on government bonds varied greatly among the future euro area member states, primarily as a result of exchange-rate risk. Parallel with the introduction of the euro, a market-driven integration process has taken place. For example, market conventions have been harmonised among European issuers, and international electronic trading platforms have become more widespread.*

*In addition, the market for euro-denominated interest-rate swaps has developed considerably, and today, fixed-income securities in the euro area are typically priced on the basis of this market. In this way, the national government bond markets are interconnected. The integration of the bond markets has contributed to reducing yield spreads across the euro area. The narrow yield spreads still existing today, are primarily attributable to differences in credit risk and liquidity among the euro area member states.*[1]

## NARROWING OF YIELD SPREADS 12.1

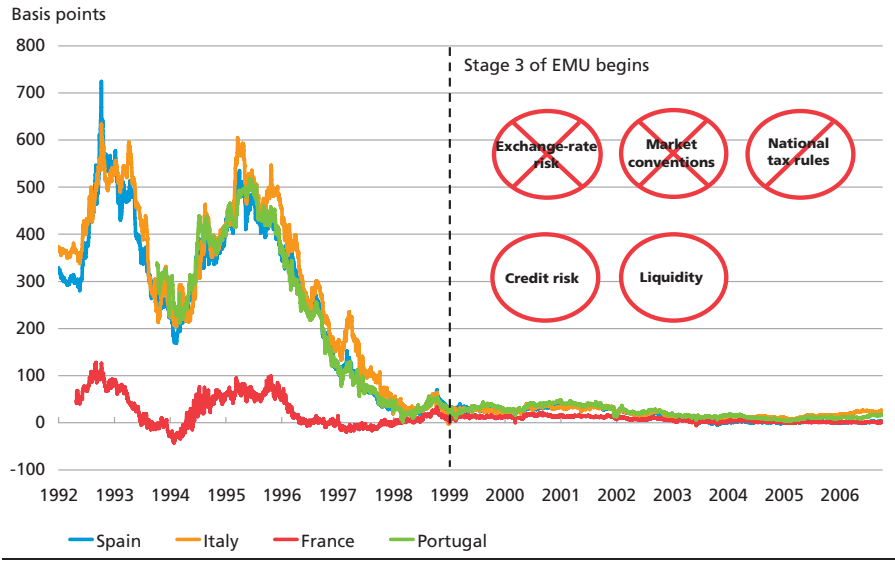
Prior to the introduction of the euro, the European government bond markets were characterised by relatively large differences in yields. For example, yield spreads vis-à-vis Germany ranged up to 700 basis points in the 1990s, cf. Chart 12.1.1.[2] A number of factors contributed to the considerable variation in yield spreads. One of the most important was uncertainty regarding future exchange-rate fluctuations. Moreover, there were also differences in market conventions, public regulation such as investment rules[3], varying taxation rules, credit risk and liquidity.

1 This Chapter is inspired by Governor Jens Thomsen's speech at the European Government Bond Summit, October 2006, *European bond markets before and after the euro,* which is available at Danmarks Nationalbank's website, www.nationalbanken.dk.

2 Germany is used as a reference since the long-term German government bond had the lowest yield at the beginning of Stage 3 of EMU. In addition, German bonds accounted for the largest share of the total outstanding volume of euro-denominated bonds.

3 For example, financial institutions were subject to requirements of maximum exposure limits against certain countries.

10-YEAR YIELD SPREADS VIS-À-VIS GERMANY Chart 12.1.1




Note: The yield spreads are adjusted for differences in maturity.
Source: Bloomberg.

With EMU, exchange-rate fluctuations within the euro area have been eliminated and progress has been made in harmonising national tax rules. In addition, the introduction of the euro, combined with technological advances, has stimulated a market-driven integration process. As a result, European yield spreads have narrowed considerably, and today are attributable primarily to differences in liquidity and credit risk.

## MARKET-DRIVEN INTEGRATION 12.2

### Intensified competition

The introduction of the euro gave investors easier access to financial markets within the euro area. This reduced the home bias[1] of investors, thereby increasing diversification within the euro area. Furthermore, technological advances have created new distribution channels and increased competition between issuers of financial products. Today issuers therefore to a greater extent compete for the same pool of investors. The competition has contributed to increased harmonisation of market conventions in the euro area due to incentives for issuers to adjust the market structure in order to attract more investors.

[1] Home bias covers the tendency of investors to limit their holdings to the domestic market.

**Market conventions**

A harmonisation of market conventions has taken place among euro area countries in the market for government bonds and T-bills. For example, settlement date and day-count conventions have now by and large been harmonised across the euro area, cf. Table 12.2.1. This has made the European bond market more transparent and thus more accessible for international investors.

It is important to emphasise that the harmonisation could have taken place without EMU, but in connection with the transition to the euro it was natural to harmonise the market conventions as well. The harmonisation of market conventions thus went hand in hand with the introduction of the euro.

MARKET CONVENTIONS IN EU-15 MEMBER STATES — Table 12.2.1

| | Bonds | | | | T-bills | | | |
|---|---|---|---|---|---|---|---|---|
| | Settlement date[1] | | Day-count basis[2] | | Settlement date | | Day-count basis | |
| | 1998 | 2006 | 1998 | 2006 | 1998 | 2006 | 1998 | 2006 |
| **Euro area member states** | | | | | | | | |
| Belgium | T+3 | T+3 | 30/360 | Act/Act | T+2 | T+2 | Act/365 | Act/360 |
| Greece | T+2 | T+3 | Act/365<br>30/360 | Act/Act | T+2 | T+3 | 30/360 | Act/360 |
| Finland | T+3 | T+3 | 30/360 | Act/Act | T+2 | T+2 | Act/365 | Act/360 |
| France | T+3 | T+3 | Act/Act | Act/Act | T+1 | T+1 | Act/360 | Act/360 |
| Netherlands | T+3 | T+3 | 30/360 | Act/Act | T+2 | T+2 | Act/360 | Act/360 |
| Ireland | T+1 | T+3 | Act/365<br>30/360<br>Act/Act | Act/Act | T+0<br>T+1 | T+2 | Act/365 | Act/360 |
| Italy | T+3 | T+3 | 30/360 | Act/Act | T+2 | T+2 | Act/365 | Act/360 |
| Portugal | T+3 | T+3 | Act/Act<br>30/360 | Act/Act | T+2 | T+2 | Act/365 | Act/360 |
| Spain | T+3 | T+3 | Act/365 | Act/Act | T+1 | T+2 | Act/360 | Act/360 |
| Germany | T+2 | T+3 | 30/360 | Act/Act | T+2 | T+2 | Act/360 | Act/360 |
| Austria | T+3 | T+3 | 30/360 | Act/Act | T+2 | T+2 | Act/360 | Act/360 |
| **Other member states** | | | | | | | | |
| Denmark | T+3 | T+3 | 30/360 | Act/Act | T+2 | T+2 | Act/360 | Act/360 |
| Sweden | T+3 | T+3 | 30/360 | 30/360 | T+2 | T+2 | 30/360 | Act/360 |
| UK | T+1 | T+1 | Act/365<br>Act/Act | Act/Act | T+1 | T+1 | Act/365 | Act/365 |

Source: Bloomberg, MTS and European Commission.

[1] A settlement date of T+3 indicates that there are 3 days between the acceptance date and the value date.

[2] The day-count basis indicates the method by which the number of days to be included in the calculation of yields is determined.

**Liquidity dispersed among many issuers**

Compared to the USA, there are many issuers of government bonds in the euro area. The large number of outstanding bond series, combined with varying credit ratings for issuers, makes the European market more fragmented than the US market. This sets limitations to liquidity, while also increasing the need for trading information.

As a result, coordinated issuance has been considered to bring together liquidity from several member states. In 2000, the European Commission published the Giovannini Group's report, "Co-ordinated Public Debt Issuance in the Euro Area".[1] The report pointed out that joint issues could be an advantage for the small member states in particular since higher liquidity premiums could reduce their costs. The report examined four initiatives that, to different degrees, would lead to increased coordination of government debt policies, cf. Box 12.1.

Today, a certain degree of coordination of technical aspects is seen among European issuers, cf. the EFC Sub-Committee on EU Government Bonds and Bills Markets (the Thomsen Group).[1] However none of the other initiatives have been implemented. The intensified market integration, since the publication of the report, has reduced the problem of split liquidity.

THE GIOVANNINI REPORT ON COORDINATED ISSUANCE — Box 12.1

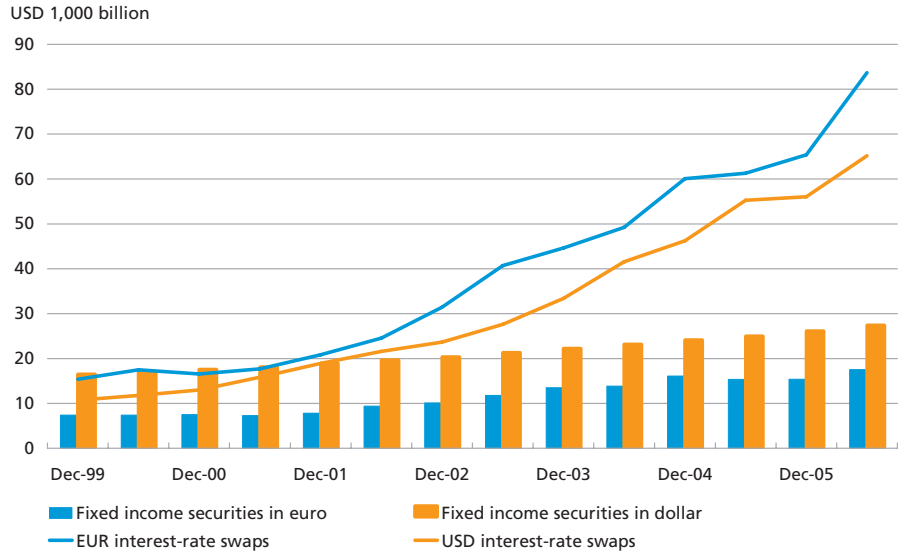
The Giovannini Report outlines four initiatives for coordination in public debt issuance:

- *Coordination on technical aspects*. This hypothesis, which entails the lowest degree of integration, concerns exchange of information on issuing calendars, a higher degree of consistency in terms of coupons and maturity dates, a common primary dealership system, and a common clearing and settlement system.
- *Joint debt instrument with several country-specific tranches*. Joint issuance by a number of member states. Each member state guarantees only its portion (or tranche) of the joint instrument. The participating member states would need to have identical credit ratings.
- *A single euro-area debt instrument backed by joint guarantees*. Each participant guarantees the entire issue ("joint and several guarantees"). The proposal is in conflict with Article 103 of the EU Treaty, which prohibits bail out.[1]
- *Supranational issuances*. A supranational government debt unit is established, which grants loans in its own name and re-lends to the member states.

[1] According to Article 103 of the EU Treaty (the no bail out clause), neither the Union nor the member states are responsible for other member states' obligations.

[1] The Giovannini Group advises the European Commission on issues concerning integration of capital markets in the Economic and Monetary Union. The reports of the Giovannini Group can be downloaded from: http://ec.europa.eu/economy_finance/giovannini_en.htm.

INTEREST-RATE SWAPS AND FIXED-INCOME SECURITIES, OUTSTANDING Chart 12.2.1




Note: Notional volume of interest-rate swaps and outstanding volume of fixed-income securities in euro are translated into dollars.
Source: Bank of International Settlements (BIS).

**The interest-rate swap market**

The European interest-rate swap market has increased more than fivefold since the introduction of the euro, measured by outstanding volumes. Relative to the outstanding volume of fixed-income securities, the euro-denominated interest-rate swap market is now twice as large as the dollar-denominated interest-rate swap market, cf. Chart 12.2.1.

The euro swap curve is used as the reference for the pricing of bonds since it is independent of coupon size and based on an average of the credit ratings of the most creditworthy banks. This means that the curve is not dependent on the credit rating of a single issuer.[2] In view of the ample liquidity in the market for euro-denominated interest-rate swaps, fixed-income securities in the euro area are now typically priced on the basis of the standardised euro swap curve.

The euro-denominated interest-rate swap market has thus achieved the same status as US government securities in the dollar-denominated market in terms of the pricing of fixed-income securities and interconnects the national European markets for government securities.

[1] See http://ec.europa.eu/economy_finance/efc_en.htm for an overview of coordination among European issuers.
[2] The relation between the swap curve and the credit ratings of private banks entails that bonds from government issuers are typically traded at a yield that is lower than the swap yield curve.

SELECTED PRIMARY DEALERS IN DENMARK AND EURO-ZONE COUNTRIES, 2006 Table 12.2.2

| | AUS | BEL | DEN | FIN | FRA | GER[1] | GRE | IRE | ITA | NLD | POR | SPA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ABN AMRO ..... | X | X | X | X | X | X | X | X | X | X | X | X |
| Barclays Bank ..... | X | X | X | X | X | X | | X | X | X | X | X |
| BNP Paribas ..... | X | | | X | X | X | X | | X | X | X | |
| Calyon ..... | X | X | | X | X | X | | X | X | X | X | X |
| Citigroup ..... … | X | X | | X | X | X | X | X | X | X | X | X |
| Credit Suisse Securities | X | X | | | X | X | X | | X | X | | X |
| Deutsche Bank AG..... | X | X | X | X | X | X | X | X | X | X | X | X |
| Dresdner Bank AG … | X | | X | X | X | X | | | X | X | | X |
| Goldman Sachs ..... | X | X | | | X | X | X | | X | | X | X |
| HSBC ..... | X | X | | X | X | X | X | X | X | X | X | X |
| JP Morgan ..... | X | X | X | X | X | X | X | | X | | | X |
| Morgan Stanley ..... | X | | X | X | X | X | X | | X | X | X | |
| Société Générale..... | | X | | | X | X | X | | X | X | X | X |

Note: An X indicates that the given financial institution is a primary dealer in the member state in question.
Source: MTS Handbook, June 2006.
[1] Market participants (Germany has no primary dealers).

**Electronic trading platforms**

Today, the electronic trading platforms constitute a network that links the European government bond issuers. For example, Danish bonds are traded at MTS[1], TradeWeb, Bloomberg, Bondvision, Reuters and ICAP/BrokerTec, which are electronic trading platforms also operating across the euro area. Most of the issuers in the euro area member states are connected to the same trading platforms. The increase in electronic trading has contributed to reducing the costs of trading government bonds, while also supporting liquidity.

**Primary dealers**

Most euro area member states have now established a network of primary dealers, i.e. financial institutions with the right to purchase government bonds on issue. Up to the launch of EMU there was a general tendency to internationalise the group of primary dealers in the various countries. Today the euro area member states use a combination of national and international financial institutions as primary dealers. This has accelerated the integration of the government bond markets because primary dealers operate across the euro area. The largest international banks are present in virtually all euro area member states, cf. Table 12.2.2.

[1] MTS has become the dominant trading platform in the wholesale market. See Celent (2004): Electronic Trading in European Fixed Income Markets.

METHOD FOR QUANTIFYING THE DEGREE OF FINANCIAL INTEGRATION Box 12.2

The degree of financial integration is measured by analysing the extent to which changes in the German 10 year par yield can explain changes in yields on the sovereign bond markets. This relationship is estimated using the following regression:

$$\Delta R_{i,t} = \alpha_i + \beta_i \Delta R_{Germany,t} + \varepsilon_{i,t}$$

where $\Delta R_{i,t}$ is the change in the 10-year par yield in member state *i* and $\Delta R_{Germany,t}$ is the change in the 10-year par yield in Germany. The regression is based on daily observations and estimated separately for each member state, and on a one-year retrospective moving basis. First the regression is estimated for the first year in the time series, i.e. on observations 1 to 260 (number of trading days in each year), then the regression is estimated on observations 2 to 261, etc. In this way, a time series of estimated $\alpha$- and $\beta$-values is achieved for each member state.

The introduction of electronic trading platforms, and the standardisation of market conventions, also enable dealers to operate in several national markets, which enhances familiarity with all markets. At the same time trading costs have been reduced. Furthermore, the presence of the primary dealers has helped to secure liquidity in the government securities.

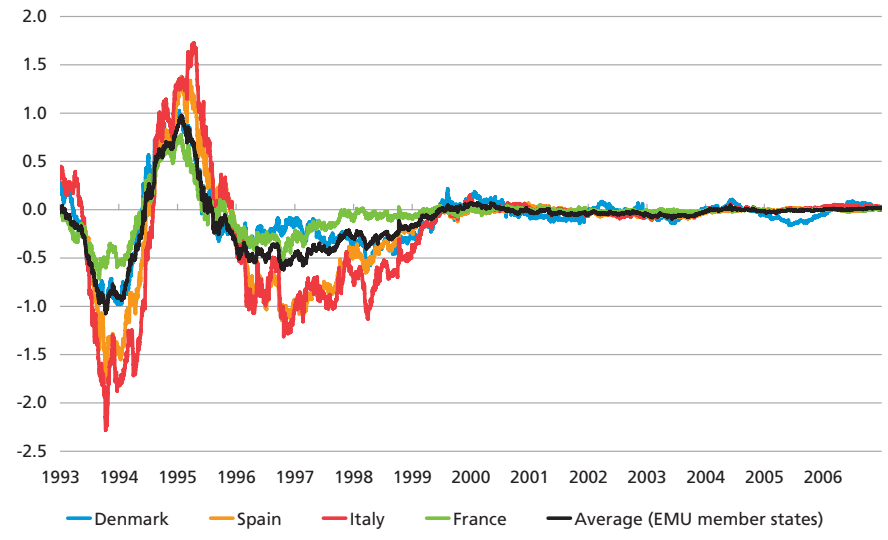
## ANALYSIS OF FINANCIAL INTEGRATION 12.3

In an integrated market without any barriers to international investment, bond yields will to a greater extent react to information that is relevant for the entire integrated market.

One measure of the degree of financial integration is the extent to which yield movements in the euro market is reflected in the yield on government bonds issued by a given country. The German government bond market is used as the euro area reference in the analysis. The analysis below therefore assesses the degree to which the change in the 10-year German bond yield can explain fluctuations in yields in the sovereign bond markets, cf. Box 12.2.

Increased financial integration entails that the estimated $\alpha$-values in the regression in Box 12.2 converge towards zero, since interest-rate fluctuations in one country should not be systematically larger or smaller than the changes in the reference. The development in the estimated $\alpha$-values is illustrated in Chart 12.3.1, which thus illustrates the integration process over time. It is seen that the estimated $\alpha$-values were volatile until 1999, after which they are approximately zero. After 1999 the Danish $\alpha$-values are more volatile than those of the euro area member states.

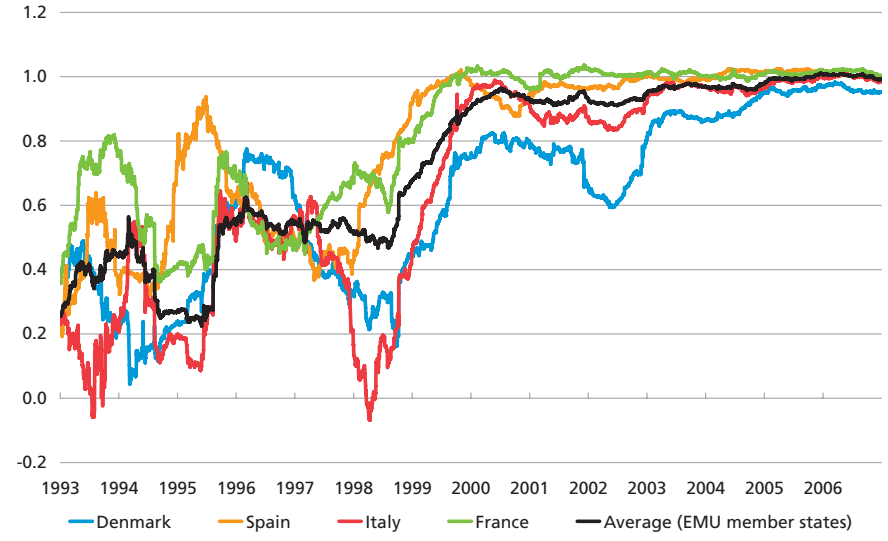
ESTIMATED α-VALUES — Chart 12.3.1




Source: Bloomberg and own calculations.

Increased financial integration also entails that the estimated β-values converge towards 1, since this implies that interest-rate changes across the integrated market are driven by the same factors. Chart 12.3.2 shows that the estimated β-values rose substantially in 1999 when the euro was introduced, and have subsequently converged towards 1.

ESTIMATED β-VALUES — Chart 12.3.2




Source: Bloomberg and own calculations.

## EXPLANATION OF CURRENT YIELD SPREADS IN THE EURO AREA 12.4

Yield spreads still exist between the euro area member states. On average, the euro area yield spreads have narrowed by 14 basis points since 1999, to a current average of 7 basis points. However, Greece, Italy and Portugal still have double-digit yield spreads, which in fact have widened in recent years. This reflects that since 2004 the budget deficit as a ratio of GDP has exceeded 3 per cent in all three countries.

In view of the single currency and the high degree of market harmonisation, the current yield spreads are primarily attributable to variations in liquidity and credit risk among issuers. This virtually also applies to Denmark due to Denmark's fixed exchange-rate policy vis-à-vis the euro.

### Credit risk

Credit risk is the risk of a financial loss as a consequence of the bond issuer's default on its payment obligations. The higher the credit risk, the greater the additional return required by investors for holding the bond in question.

The credit risk on a government bond depends primarily on the issuer's debt ratio and the tax base. For example, a higher debt ratio will make government finances more exposed to cyclical fluctuations and changes in interest rates, which increases the risk that the debt is downgraded.[1] Downgrading often coincides with a widening of the spread, and thus a capital loss.

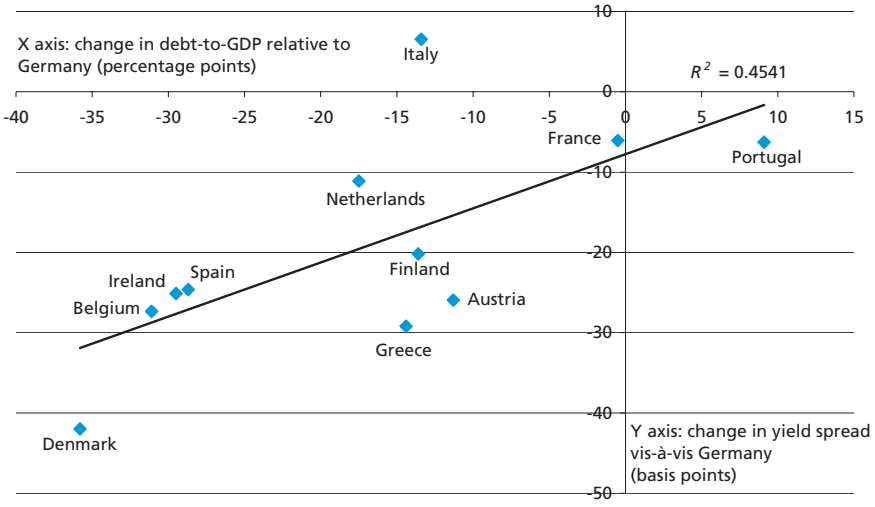
In general, recent years have seen very small variations in yield spreads compared with differences in fiscal-policy conditions. However, the relation between the development in yield spreads and in the debt-to-GDP ratio is positive, cf. Chart 12.4.1. For example, Denmark's gross government debt as a ratio of GDP declined 29 percentage points in the period 1999-2006, while Germany's debt rose by 7 percentage points. Denmark's debt thus declined by 36 percentage points of GDP relative to Germany. In the same period, the Danish yield spread vis-à-vis Germany narrowed by 42 basis points.

### Liquidity

Liquidity depends on the size and trading volume of the bond issue, among other factors. A high level of liquidity makes it possible for investors to sell assets without influencing price formation.

[1] It is rare for a central government to default on its obligations. Among the few examples are Russia in 1998 and Argentina in 2001.

DEVELOPMENT IN YIELD SPREADS AND DEVELOPMENT IN DEBT-TO-GDP RELATIVE TO GERMANY, 1999-2006 Chart 12.4.1




Note: Monthly averages are applied when calculating the changes in the par yield spreads from January 1999 to December 2006.
Source: Bloomberg and European Commission's autumn forecast 2006.

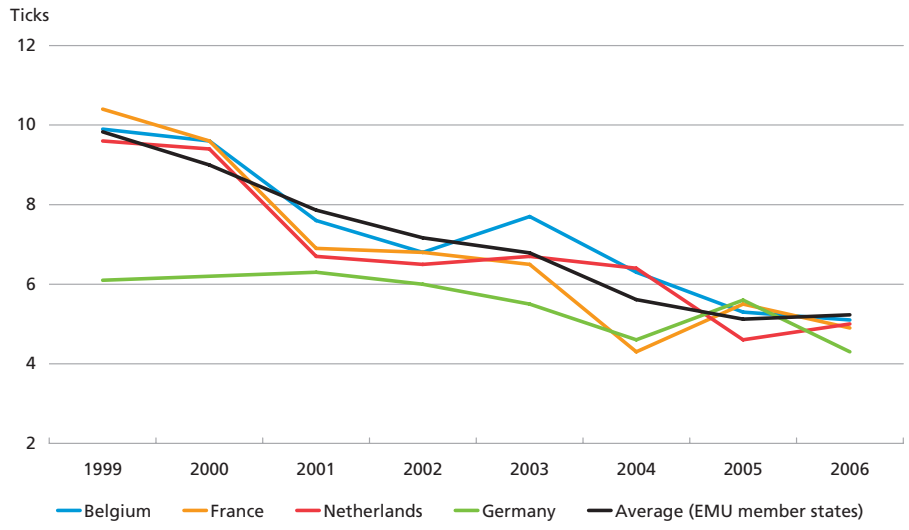
Increased competition among government issuers has increased the focus on achieving sound liquidity in the bond series issued. This should be viewed against the fact that even in the short term government debt offices can improve liquidity in government securities. On the other hand, the market's perception of credit risk is more difficult for the issuer to influence since the credit risk is primarily dependent on the general fiscal-policy development. The focus on liquidity has led to strategy adjustments in several EU member states. For example, there has been a tendency for the government bond market to concentrate issues on fewer, but larger series.[1] This creates the conditions for substantial liquidity and thereby lower financing costs.

The bid-ask spread for a bond, i.e. the cost of purchasing a security and then selling it immediately after, is an indicator of liquidity.[2] Chart 12.4.2 shows that since the introduction of the euro the average bid-ask spreads have narrowed.

1 Bonds with a volume of up to euro 20 billion constitute 80 per cent of the total bond market in the euro area, while bonds with a volume of up to euro 5 billion only constitute 4 per cent. Bonds with a volume of up to euro 500 million have almost vanished. Source: The Euro Bond Market Study, *ECB,* December 2004.

2 There are other key liquidity measures besides the bid-ask spread, e.g. order coverage, depth and turnover. For an analysis of various key liquidity measures see Michael J. Fleming, Measuring Treasury Market Liquidity, *FRBNY Economic Policy Review*, 2003.

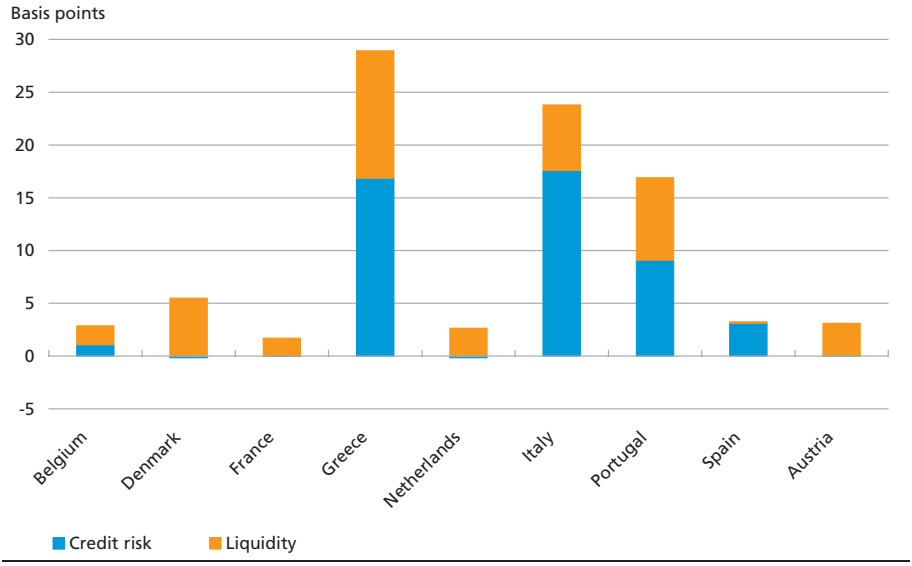
BID-ASK SPREADS FOR 10-YEAR BENCHMARK GOVERNMENT BONDS Chart 12.4.2




Note: The bid-ask spreads are calculated as yearly averages.
Source: Bloomberg, ECB and MTS.

The narrowing of the bid-ask spreads indicates that liquidity has generally improved in the period. However, liquidity still has an impact on European yield spreads. Empirical studies have shown that liquidity is

10-YEAR YIELD SPREADS VIS-À-VIS GERMANY BROKEN DOWN BY CREDIT RISK AND LIQUIDITY Chart 12.4.3




Note: The Chart is based on average 10-year par yield spreads and 10-year CDS prices for the period from September to December 2006.
Source: Bloomberg.

METHOD FOR BREAKDOWN OF YIELD SPREADS BY CREDIT RISK AND LIQUIDITY Box 12.3

The breakdown of yield spreads by credit risk and liquidity is conducted using prices for credit default swaps (CDS). A CDS is a swap that transfers the credit risk on a bond from one party to another. The buyer of the CDS pays a current premium in return for receiving an amount if a credit event for the underlying asset occurs during the term of the contract, and has thus hedged the credit risk. The price of a CDS depends on the probability that a credit event occurs, as well as the risk aversion of the market participants, and can thus be interpreted as the credit risk premium on the asset in question.

A given member state's credit spread vis-à-vis Germany is calculated as the difference in the price of a German CDS and an equivalent CDS for the member state in question. An issuer with lower creditworthiness than Germany thus has a positive credit spread. The liquidity spread is subsequently calculated as the residual.[1]

A source of error regarding this method is that both credit risk and liquidity affect the CDS market. The credit market is typically limited for smaller countries with low credit risk. Low liquidity in the CDS market may imply that the credit spread vis-à-vis Germany is overestimated. To the extent that this applies, the credit spread for small issuers with high credit ratings, such as Denmark, the Netherlands and Austria, will probably be smaller than shown in Chart 12.4.3.

[1] For each country, the CDS used in the calculation has the same maturity as the bond underlying the yield spread.

particularly important for countries with low credit risk, and in periods of high uncertainty in the markets.[1]

**Breakdown of yield spreads by credit risk and liquidity**

Chart 12.4.3 presents a breakdown of the average yield spread by respectively credit risk and liquidity in the period from September to December 2006. The credit risk premium is calculated on the basis of prices for credit default swaps (CDS), while the liquidity premium is calculated residually and will thus include contributions from other factors besides liquidity, cf. Box 12.3. Since Denmark has not adopted the euro, the liquidity premium for Denmark will also contain an element of e.g. exchange-rate risk.

Greece, Italy and Portugal are virtually the only member states paying a credit risk premium relative to Germany. Liquidity primarily affects the yield spreads among the small issuers.

[1] See Beber, Alessandro, Michael W. Brandt and Kenneth A. Kavajecz, Flight-to-Quality or Flight-to-Liquidity? Evidence From the Euro-Area Bond Market, *NBER Working Paper Series*, Working Paper 12376.

# Appendices

# Information on Government Borrowing and Debt

Government Debt Management currently publishes information on the government debt policy and government transactions. Further information is available at Danmarks Nationalbank's website, www.nationalbanken.dk under Government debt.

A wide range of information concerning government borrowing and debt is published via the Copenhagen Stock Exchange and DN News[1]. Several news agencies re-transmit the information from DN News, e.g. Bloomberg and Reuters. The information is also available at Danmarks Nationalbank's website. It is possible to be notified directly of new information and updates concerning government borrowing and debt by subscribing to Danmarks Nationalbank's electronic news service (see www.nationalbanken.dk under News service).

In addition, information on wholesale trading in Danish government securities is available at MTSDenmark's website, www.mtsdenmark.com.

Enquiries concerning government borrowing and debt should be directed to Danmarks Nationalbank, Government Debt Management at governmentdebt@nationalbanken.dk.

The following table presents the information on government borrowing and debt that is published on an ongoing basis.

[1] Danmarks Nationalbank's system for transmission of information to connected news agencies.

## INFORMATION ON GOVERNMENT BORROWING AND DEBT

| | Overall contents | Information at | Frequency |
|---|---|---|---|
| Danish Government Debt Management Strategy, June and December | • Borrowing strategy<br>• Key on-the-run issues<br>• Securities eligible for buy-back<br>• Duration band | • CSE<br>• www.nationalbanken.dk | Semi-annually |
| Opening of new securities | • Coupon<br>• Maturity date<br>• Opening date | • CSE<br>• DN News, screens 55-57<br>• Reuters DKNA-55-57<br>• www.nationalbanken.dk | Irregularly |
| T-bill auction | • Convening of auction<br>• Result of auction | • CSE<br>• DN News, screens 52 and 53<br>• Reuters, DKNA-52 and -53<br>• www.nationalbanken.dk | Monthly |
| Daily buy-backs and sales | • Daily sales by securities<br>• Daily buy-backs by securities | • DN News, screens 51 and 58<br>• Reuters, pages DKNA-51 and DKNA-58<br>• www.nationalbanken.dk | Daily |
| Monthly buy-backs and sales, 1st banking day | • Monthly sales by securities<br>• Monthly buy-backs by securities<br>• Monthly currency swaps | • www.nationalbanken.dk | Monthly |
| Government funds' holding of government securities, 1st banking day | • Government funds' holding of government securities as of end of previous month | • www.nationalbanken.dk | Monthly |
| Central-government borrowing requirement | • Borrowing requirement based on *Budget Outlook*<br>• Subsequent buy-backs<br>• Subsequent currency swaps (monthly) | • DN News, screen 54<br>• Reuters, page DKNA-54<br>• www.nationalbanken.dk | Daily |
| Day-to-day distribution of government payments, penultimate banking day | • Day-to-day distribution for liquidity impact of central-government payments in coming months | • www.nationalbanken.dk | Monthly |
| *Danish Government Borrowing and Debt*, normally in February | • Past year's development<br>• Detailed statement of debt and transactions<br>• Report on issues of relevance to debt management | • Publication from Danmarks Nationalbank<br>• www.nationalbanken.dk | Annually |
| *Budget Outlook*, normally in May, August and December | • Net financing and borrowing requirement, current and coming years | • Publication from the Ministry of Finance<br>• www.fm.dk (website of the Ministry of Finance) | Normally 3 times a year |
| Trading in Danish government securities on MTSDenmark | • Information about prices and turnover in Danish government securities traded on MTSDenmark | • www.mtsdenmark.com | Ongoing |

Note: *Budget Outlook* is published by the Ministry of Finance. CSE denotes the Copenhagen Stock Exchange. CSE's website is at http://www.omxgroup.com/nordicexchange.

# Principles for Management of Credit Risk on Government Swaps

*Counterparty credit standing (rating):* To limit the credit risk on swap counterparties, swaps are only transacted with counterparties with high credit standing. A counterparty must normally be rated minimum Aa3/AA- by at least two well-reputed rating agencies (Fitch, Moody's or Standard & Poor's). If a counterparty is rated by three rating agencies, the minimum requirement is based on the lowest rating. For interest-rate swaps in kroner and currency swaps between kroner and euro, however, counterparties with a rating of minimum A3/A- are permitted.

*Limits for credit exposure (lines):* To avoid high credit exposures, the credit exposure on a counterparty must be within an authorised line. The size of the lines granted depends on the counterparty's rating and net worth, cf. Table 1.

*Compilation of counterparty credit exposure*: Counterparties' credit exposure and utilisation of lines are monitored on an ongoing basis. The central government's credit exposure to a given counterparty is compiled as the current positive market value of the portfolio plus a premium, the potential credit exposure, that takes into account that the portfolio's market value can increase further as a consequence of market development. Pledged collateral is deducted.

LIMITS FOR CREDIT EXPOSURE — Table 1

| Counterparty rating | | Lines (max. total credit exposure) | | Threshold value (max. uncollateralised market value) |
|---|---|---|---|---|
| Moody's | Standard & Poor's, Fitch IBCA | DKK million | In per cent of counterparty's net worth | DKK million |
| Aaa | AAA | 2,000 | 8.0 | 500 |
| Aa1 | AA+ | 1,500 | 7.0 | 400 |
| Aa2 | AA | 1,000 | 6.0 | 300 |
| Aa3 | AA- | 700 | 5.0 | 200 |
| A1 | A+ | 600 | 5.0 | 150 |
| A2 | A | 400 | 4.5 | 100 |
| A3 | A- | 200 | 4.0 | 50 |

Note: In the event of different ratings, the lowest rating is the basis for the granting of a line and for the maximum uncollateralised market value in the favour of the central government.

*Handling of excess credit exposure*: New swaps may only be transacted with a counterparty for as long as the credit exposure is less than 75 per cent of the authorised line. The remaining 25 per cent of the line is a buffer to limit the extent of excess credit exposure. In the event of excess credit exposure, the counterparty relationship is monitored closely. If the excess exposure is considered to be unacceptably high, it is sought to reduce the credit exposure.

*Eligible swaps*: Only plain-vanilla interest-rate swaps and plain-vanilla currency swaps may be transacted. The maturity will normally be 10 years or lower. Dual-currency swaps and zero-coupon swaps are considered to be plain-vanilla swaps. Structured swaps are no longer transacted. The same applies to deals that include option elements, including swaptions, interest-rate caps, etc.

*Legal basis of agreement*: Swaps are only transacted with counterparties with whom an ISDA Master Agreement, which governs the business relationship between the central government and the counterparty, and a collateral agreement, cf. below, have been established.

*Netting*: ISDA Master Agreements contain netting provisions whereby gains and losses on transacted swaps are set off in the event of counterparty default.

Master Agreements are signed only with counterparties domiciled in countries whose legislation is expected to provide for netting.

*Early termination of swaps*: It must be possible to terminate all swaps with a counterparty should the counterparty's rating fall to an unsatisfactory level. All new ISDA Master Agreements therefore contain rating triggers. A rating trigger entails that swaps can be termninated should a counterparty's rating fall to a given threshold level. In most of the central government's ISDA Master Agreements, the rating trigger is Baa1/BBB+ or below.[1]

As a further safeguard against credit losses, cross-default clauses are also applied. These allow swaps to be terminated if the counterparty defaults on its payment obligations to a third party.

*Collateralisation*: To limit any losses in the event of counterparty default, new swaps may only be transacted with counterparties that have signed collateral agreements (ISDA Credit Support Annex) to the ISDA Master Agreements that regulate the relationship between the central government and the swap counterparties. The key elements of the agreements are:

[1] Some Master Agreements, dating from before the rating trigger requirement was formalised, have none or a lower trigger.

- The agreements are unilateral, so that only the central government's counterparties pledge collateral.
- Collateral is not pledged until the market value in the central government's favour exceeds an agreed amount (the threshold value). This threshold value depends on the counterparty's rating, cf. Table 1.
- The market value of swaps is compiled on a regular basis and as required. If the market value less the pledged collateral exceeds the agreed threshold, the counterparty is required to pledge collateral.
- Only collateral of DKK 10 million or more is transferred (reversed).
- Permitted collateral will normally be government bonds with a rating of minimum Aa3/AA-. Other bonds can also be accepted, subject to individual assessment, e.g. Danish mortgage-credit bonds. The collateral value of the bonds is calculated as the market value after a haircut. Haircuts will depend on the remaining maturity of the bonds and take into account that the value of the bonds can decrease.
- The administration of bonds pledged as collateral to the central government is transferred to the custodian bank with which the securities are deposited. On behalf of the central government, the custodian bank will request the counterparty to provide additional collateral, should the collateral value of the deposited bonds decrease and become insufficient to cover the market value of the transacted swaps after deduction of the threshold. In the event of surplus cover, the custodian bank is equivalently authorised to release bonds to the counterparty.

# Terms for the Securities Lending Facilities of the Central Government and the Social Pension Fund

Primary Dealers will have the right to use the securities lending facilities of the central government and the Social Pension Fund to which the participants are eligible. The purpose of the securities lending facilities is to supplement and strengthen market efficiency. Considering the functioning of the repo market, Primary Dealers shall make every effort to support a well-functioning market, and to prevent occurrences of intended market failures. Information on the terms for Central Government's and the Social Pension Fund's Securities Lending Facilities is given below.

**The central government's securities lending facility**

1. The lending facility applies to on-the-run government securities and government securities with benchmark status.
2. The specific terms for lending in the individual government securities are published in the central government's announcements concerning on-the-run issues.
3. For government bonds the lending facility is available for Primary Dealers in Danish government bonds.
4. For T-bills the lending facility is available for Primary Dealers in Danish T-bills.
5. In normal circumstances the maximum lending in bond series is DKK 4 billion and the maximum lending in all T-bills is DKK 10 billion. However, these limits may be raised in the event of abnormal price formation on the market for securities lending.
6. The fee is 0.2 per cent per year for securities lending of government bonds. The fee is 0.15 per cent per year for securities lending of T-bills.
7. The lending facility is available as buy-/sell-back transactions. Participants borrow in one buy-/sell-back transaction and lend (provide collateral) in another buy-/sell-back transaction.
8. The securities may be borrowed for a period from 1 to 5 trading days.

9. Transactions can be made during the day between 9.00 a.m. and 3.30 p.m., but should, as far as possible, be concluded before 2.00 p.m. (CET).
10. Lending in securities is granted in the order that requests to Danmarks Nationalbank are received from security dealers on the relevant day. The right to make discretionary allocations is reserved if deemed appropriate.
11. Danish government securities (bullet loans and T-bills) denominated in Danish kroner issued via the Danish Securities Services (VP) in series with an outstanding amount of at least DKK 3 billion are accepted as collateral.
12. A haircut of 2.5 per cent is applied to each buy-/sell-back transaction. Hence, the market price of the security lend by the central government is raised by 2.5 per cent and the market price of the security provided as collateral by the borrower is lowered by 2.5 per cent.
13. Settlement takes place on the following trading day. Transactions are settled as trading transactions in the VP system.
14. In case settlement only succeeds for one of the buy-/sell-back transaction, be that the lending transaction or the collateral transaction as it may, borrowers are obliged to ensure immediate settlement of the failed transaction.
15. For bond trading members of the Copenhagen Stock Exchange lending transactions are reported as two or more separate repurchase agreements to Copenhagen Stock Exchange.
16. Government Debt Management may from time to time amend the terms and conditions applicable to the Central Government's Securities Lending Facility to reflect market practice and ensure a well-functioning securities lending facility. Government Debt Management informs Primary Dealers at least one week prior to implementation of any change to the terms of the lending facility.
17. Any enquiries concerning securities lending transactions should be made to Danmarks Nationalbank, Market Operations, on tel. +45 3363 6747 or +45 3363 6736.

**The Social Pension Fund's securities lending facility**

1. Lending is in all government bonds with more than 1 month remaining maturity of the type bullet loans in the Social Pension Fund's portfolio.
2. The lending facility is available to Primary Dealers in government bonds.
3. The fee is 0.2 per cent per year.

4. The lending facility is available as buy-/sell-back transactions. Participants borrow in one buy-/sell-back transaction and lend (provide collateral) in another buy-/sell-back transaction.
5. The securities may be borrowed for a period from 1 to 5 trading days.
6. Transactions can be made during the day between 9.00 a.m. and 3.30 p.m., but as far as possible should be concluded before 2.00 p.m. (CET).
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11. In case settlement only succeeds for one of the buy-/sell-back transaction, be that the lending transaction or the collateral transaction as it may, borrowers are obliged to ensure immediate settlement of the failed transaction.
12. For bond trading members of the Copenhagen Stock Exchange transactions are reported as two or more separate repurchase agreements to Copenhagen Stock Exchange.
13. Government Debt Management may from time to time amend the terms and conditions applicable to the Social Pension Fund's Securities Lending Facility to reflect market practice and ensure a well-functioning securities lending facility. Government Debt Management informs Primary Dealers at least one week prior to the implementation of any change to the terms of the Social Pension Fund's Securities Lending Facility.
14. Any enquiries concerning securities lending transactions should be made to Danmarks Nationalbank, Market Operations, on tel. +45 3363 6747 or +45 3363 6736.

# Appendix of Tables

CENTRAL GOVERNMENT DEBT, YEAR-END 1996-2006 — Table 1

| DKK million | 1996 | 1997 | 1998 |
|---|---|---|---|
| A. Debt | | | |
| *Domestic debt denominated in DKK* | | | |
| - Fixed-rate bonds | 516,812 | 556,874 | 550,989 |
| - Floating-rate bonds | 16,760 | 9,848 | 4,346 |
| - Lottery bonds | 1,200 | 1,200 | 1,000 |
| - Treasury notes | 84,499 | 49,140 | 58,830 |
| - Treasury bills | 51,234 | 50,001 | 41,255 |
| - Currency swaps from DKK to EUR (net)[1] | - | - | - |
| - Currency swaps from DKK to USD | | | |
| - Government securities held by the central government | - | - | - |
| Domestic debt denominated in DKK | 670,505 | 667,063 | 656,420 |
| *Domestic debt denominated in EUR*[2] | | | |
| - Fixed-rate bonds | 9,597 | 6,634 | - |
| - Government securities held by the central government | -2,372 | - | - |
| Domestic debt, total | 677,730 | 673,697 | 656,420 |
| *Foreign debt* | | | |
| - in USD | 4,562 | 1,514 | 1,336 |
| - in CHF | 6,179 | 3,974 | 1,094 |
| - in JPY | 2,396 | 1,047 | 562 |
| - in EUR | 88,826 | 90,661 | 84,982 |
| - in other currencies and multi-currency | 6,519 | 6,418 | 365 |
| - Government securities held by the central goverment[3] | -6,986 | - | - |
| Foreign debt, total | 101,495 | 103,613 | 88,338 |
| Domestic and foreign debt, total | 779,225 | 777,310 | 744,758 |
| B. Government deposits with the central bank[4] | -31,645 | -29,080 | -30,412 |
| C. The Social Pension Fund, The Financing Fund, and The High-Technology Foundation | | | |
| - Government securities | -83,435 | -92,453 | -100,135 |
| - Other securities | -65,336 | -54,368 | -43,468 |
| The three funds, nominal value, total[5] | -148,772 | -146,821 | -143,603 |
| Central-government debt, total (A+B+C) | 598,808 | 601,409 | 570,743 |
| Central-government debt, per cent of GDP | 56.0 | 53.4 | 49.0 |

Note: Plus denotes liabilities, minus denotes assets. As of 2006, the Mortgage Bank of the Kingdom of Denmark is included in the central-government debt, which increases the debt by DKK 0.4 billion. The amount is not included the figures above.

[1] Currency swaps from DKK to EUR less currency swaps from EUR to DKK.

[2] In connection with the introduction of new accounting principles for the government debt, the 8.5 per cent EUR bullet loan 2002 has been reclassified as foreign debt instead of domestic debt as of 1998.

[3] Book value equal to original costs of purchase, cf. central-government accounts.

[4] For 2006, the central government's account is compiled in accordance with the monthly balance sheet of Danmarks Nationalbank.

[5] Index-linked bonds are compiled at indexed value.

CENTRAL GOVERNMENT DEBT, YEAR-END 1996-2006 Table 1

| 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 537,289 | 506,992 | 494,875 | 497,938 | 480,874 | 480,590 | 440,351 | 428,796 |
| - | - | - | - | - | - | - | - |
| 900 | 900 | 900 | 400 | 400 | 400 | 200 | 200 |
| 74,040 | 81,257 | 70,788 | 79,371 | 78,532 | 71,690 | 33,980 | - |
| 36,350 | 36,846 | 49,224 | 63,404 | 67,347 | 68,602 | 60,092 | 42,660 |
| - | - | -4,800 | -16,200 | -16,200 | -16,200 | -15,456 | -12,755 |
| | | | | | -524 | -2,688 | -4,862 |
| | | | | | | | |
| - | -2,000 | - | - | - | - | - | - |
| 648,579 | 623,995 | 610,987 | 624,913 | 610,953 | 604,558 | 516,479 | 454,039 |
| | | | | | | | |
| - | - | - | - | - | - | - | - |
| | | | | | | | |
| - | - | - | - | - | - | - | - |
| 648,579 | 623,995 | 610,987 | 624,913 | 610,953 | 604,558 | 516,479 | 454,039 |
| | | | | | | | |
| 1,187 | - | - | - | - | 518 | 2,810 | 4,583 |
| 3,616 | 3,822 | - | - | - | - | - | - |
| 2,453 | 1,672 | - | - | - | - | - | - |
| 82,386 | 79,287 | 83,753 | 83,689 | 83,861 | 83,370 | 87,833 | 75,162 |
| 383 | 428 | 42 | 42 | 42 | 40 | 38 | 21 |
| | | | | | | | |
| - | - | - | - | - | - | - | - |
| 90,025 | 85,209 | 83,795 | 83,730 | 83,903 | 83,929 | 90,681 | 79,766 |
| 738,604 | 709,204 | 694,782 | 708,644 | 694,856 | 688,487 | 607,160 | 533,805 |
| -35,237 | -32,637 | -39,627 | -45,975 | -40,621 | -57,559 | -53,297 | -71,449 |
| | | | | | | | |
| -105,432 | -106,312 | -109,474 | -113,132 | -118,138 | -120,799 | -124,635 | -125,111 |
| -36,207 | -33,244 | -31,621 | -28,230 | -20,576 | -16,065 | -11,284 | -9,535 |
| -141,640 | -139,556 | -141,095 | -141,362 | -138,714 | -136,864 | -135,919 | -134,646 |
| 561,727 | 537,011 | 514,060 | 521,308 | 515,521 | 494,064 | 417,944 | 327,709 |
| 46.3 | 41.5 | 38.5 | 38.0 | 36.8 | 33.9 | 26.9 | 20.1 |

SERVICE ON CENTRAL-GOVERNMENT DOMESTIC DEBT[1], END-2006 Table 2.1

| DKK billion | Interest | Redemptions | Total |
|---|---|---|---|
| 2007 | 20,7 | 29,4 | 50,1 |
| 2008 | 18,7 | 45,2 | 63,9 |
| 2009 | 16,9 | 60,1 | 77,0 |
| 2010 | 13,1 | 31,6 | 44,7 |
| 2011 | 12,2 | 60,1 | 72,3 |
| 2012 | 8,8 | -0,4 | 8,4 |
| 2013 | 8,8 | 77,6 | 86,4 |
| 2014 | 4,9 | -0,4 | 4,5 |
| 2015 | 5,0 | 59,6 | 64,6 |
| 2016 | 2,5 | -0,4 | 2,1 |
| 2017 | 2,7 | 24,3 | 27,1 |
| 2018 | 1,7 | -0,1 | 1,6 |
| 2019 | 1,7 | - | 1,7 |
| 2020 | 1,7 | - | 1,7 |
| 2021 | 1,7 | - | 1,7 |
| 2022 | 1,7 | - | 1,7 |
| 2023 | 1,7 | - | 1,7 |
| 2024 | 1,7 | 25,0 | 26,7 |
| Total | 126,6 | 411,4 | 538,0 |

[1] Excluding T-bills. Including net interest payments on domestic interest-rate swaps. Krone payments to and from the central government in currency swaps are included in the redemptions.

SERVICE ON CENTRAL-GOVERNMENT FOREIGN DEBT[1], END-2006 Table 2.2

| DKK billion | Interest | Redemptions | Total |
|---|---|---|---|
| 2007 | 2,3 | 19,1 | 21,4 |
| 2008 | 1,6 | 22,7 | 24,3 |
| 2009 | 0,7 | 21,2 | 21,9 |
| 2010 | 0,1 | 13,8 | 13,9 |
| 2011 | -0,4 | 0,4 | 0,1 |
| 2012 | -0,6 | 0,4 | -0,2 |
| 2013 | 0,0 | 0,4 | 0,4 |
| 2014 | 0,1 | 0,4 | 0,5 |
| 2015 | 0,0 | 0,4 | 0,4 |
| 2016 | 0,0 | 0,4 | 0,4 |
| 2017 | 0,0 | 0,3 | 0,4 |
| 2018 | 0,0 | 0,1 | 0,1 |
| Total | 3,8 | 79,7 | 83,5 |

[1] Including net interest payments on swaps. Payments in foreign currency to and from the central government in currency swaps are included in the redemptions.

THE CENTRAL GOVERNMENT'S CURRENT, INVESTMENT AND LENDING BALANCE, NET CASH BALANCE AND GROSS DEFICIT, 1996-2006 Table 3

| DKK billion | 1996 | 1997 | 1998 |
|---|---|---|---|
| Current, investment and lending budget | -21.5 | 7.6 | 31.4 |
| Net bond purchases[1] | -4.4 | 7.4 | - |
| Re-lending of government loans | -1.4 | -0.8 | 0.3 |
| Disturbed capital losses on issue and due interest[2] | 7.4 | 5.1 | 2.1 |
| Other capital items[3] | 0.4 | -6.6 | 0.1 |
| Net cash balance | -19.5 | 12.7 | 34.0 |
| Redemptions on domestic government debt | 76.7 | 81.4 | 79.0 |
| Redemptions on foreign government debt | 30.8 | 31.4 | 37.4 |
| Gross deficit | -126.9 | -100.1 | -82.5 |
| Gross domestic financing requirement | 94.7 | 73.8 | 64.4 |
| Sale of government securities, market value [4] | 96.0 | 73.0 | 68.0 |

Source: Central-government accounts. 2006 numbers are based on Danmarks Nationalbank's end-year specification. The numbers can deviate from the accounting figures.

[1] As from 1998, net bond purchases by the Social Pension Fund are no longer included in the net cash balance, but are instead included in the redemptions on the domestic government debt.

[2] Including capital losses on buy-back.

[3] Includes e.g. movements in the central government's holdings, cf. Budget Review from the Ministry of Finance.

[4] Includes net sales of T-bills.

THE CENTRAL GOVERNMENT'S CURRENT, INVESTMENT AND LENDING BALANCE, NET CASH BALANCE AND GROSS DEFICIT, 1996-2006 Table 3

| 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|
| 9.1 | 30.7 | 24.0 | 25.8 | 12.4 | 27.7 | 80.6 | • |
| - | - | - | - | - | - | - | • |
| -1.6 | -2.8 | -2.4 | -8.9 | -0.8 | -5.4 | -3.2 | • |
| 3.2 | 1.4 | 0.4 | -0.1 | -0.7 | 0.5 | -0.7 | • |
| 0.2 | -2.3 | 0.9 | -20.0 | -4.1 | 0.9 | -0.9 | • |
| 10.9 | 27.0 | 22.9 | -3.2 | 6.9 | 23.6 | 75.9 | 92.8 |
| 75.9 | 91.3 | 101.2 | 112.4 | 106.3 | 100.0 | 119.5 | 80.5 |
| 20.0 | 15.7 | 17.8 | 22.5 | 17.1 | 16.1 | 9.3 | 12.9 |
| -85.0 | -80.0 | -96.2 | -138.1 | -116.6 | -92.5 | -52.9 | -0.6 |
| 67.9 | 62.3 | 81.1 | 115.5 | 99.7 | 76.4 | 43.6 | -14.4 |
| 68.8 | 65.7 | 87.7 | 121.9 | 94.1 | 92.6 | 30.1 | 13.2 |

DOMESTIC CENTRAL-GOVERNMENT SECURITIES ISSUED IN 2006 Table 4.1

| Loan no. | Coupon, per cent | Name<br>Issue Period | Redemption date | Issued in 2006, DKK million |
|---|---|---|---|---|
| **Government bonds, fixed interest rate** | | | | |
| 490 | 4 | 4 per cent bullet loans 2010<br>20 Apr 2004- | 15 Nov 2010 | 3,850 |
| 487 | 4 | 4 per cent bullet loans 2015<br>12 Feb 2004-26 Apr 2006 | 15 Nov 2015 | 3,090 |
| 553 | 4 | 4 per cent bullet loans 2017<br>26 Jan 2006- | 15 Nov 2017 | 24,700 |
| **Treasury bills** | | | | |
| 547 | 0 | T-bill 2006 II<br>2 May 2005-1 Feb 2006 | 1 May 2006 | 400 |
| 548 | 0 | T-bill 2006 III<br>1 Aug 2005-1 May 2006 | 1 Aug 2006 | 3,100 |
| 549 | 0 | T-bill 2006 IV<br>1 Nov 2005-1 Aug 2006 | 1 Nov 2006 | 6,400 |
| 589 | 0 | T-bill 2006 V<br>3 Jul 2006-2 Okt 2006 | 1 Dec 2006 | 8,300 |
| 555 | 0 | T-bill 2007 I<br>1 Feb 2006-1 Nov 2006 | 1 Feb 2007 | 16,960 |
| 581 | 0 | T-bill 2007 II<br>1 May 2006- | 1 May 2007 | 10,160 |
| 592 | 0 | T-bill 2007 III<br>1 Aug 2006- | 1 Aug 2007 | 8,360 |
| 603 | 0 | T-bill 2007 IV<br>1 Nov 2006- | 3 Dec 2007 | 7,180 |

FOREIGN CENTRAL-GOVERNMENT SECURITIES ISSUED IN 2006 Table 4.2

| Loan no. | Coupon, per cent | Name<br>Issue Period | Redemption date | Issued in 2006, DKK million |
|---|---|---|---|---|
| **US Commercial Paper** | | | | |
| 244-56[1] | 0 | USCP 50 mil.USD<br>14 Jun 2006 | 21 Jun 2006 | 296.4 |
| **EURO Commercial Paper** | | | | |
| 298-46 | 0 | ECP 50 mil.EUR<br>16 Jun 2006 | 23 Jun 2006 | 372.5 |

[1] A Forward Contract in Foreign-Exchange with Danmarks Nationalbank is attached to the Issue. At maturity the Kingdom of Denmark receives USD 50,000,000 and pays EUR 39,782,184.58.

CENTRAL-GOVERNMENT INTEREST-RATE SWAP TRANSACTIONS, 2006 Table 5

| Loan no. | Start date | Termination date | Amount in DKK million |
|---|---|---|---|
| Domestic interest-rate swaps | | | |
| 550 | 11-01-06 | 11-01-11 | 500 |
| 551 | 19-01-06 | 19-01-11 | 500 |
| 552 | 25-01-06 | 25-01-11 | 500 |
| 554 | 27-01-06 | 27-01-11 | 500 |
| 556 | 03-02-06 | 03-02-16 | 200 |
| 557 | 08-02-06 | 08-02-16 | 200 |
| 558 | 17-02-06 | 17-02-16 | 200 |
| 559 | 22-02-06 | 22-02-16 | 200 |
| 560 | 28-02-06 | 28-02-16 | 200 |
| 561 | 01-03-06 | 01-03-16 | 200 |
| 562 | 02-03-06 | 02-03-16 | 200 |
| 563 | 07-03-06 | 07-03-16 | 200 |
| 564 | 08-03-06 | 08-03-16 | 200 |
| 565 | 09-03-06 | 09-03-16 | 400 |
| 566 | 10-03-06 | 10-03-16 | 200 |
| 567 | 16-03-06 | 16-03-16 | 200 |
| 568 | 20-03-06 | 20-03-16 | 200 |
| 569 | 21-03-06 | 21-03-16 | 200 |
| 570 | 22-03-06 | 22-03-11 | 400 |
| 571 | 28-03-06 | 28-03-16 | 300 |
| 572 | 29-03-06 | 29-03-16 | 300 |
| 573 | 31-03-06 | 31-03-16 | 300 |
| 574 | 05-04-06 | 05-04-16 | 300 |
| 575 | 07-04-06 | 07-04-16 | 300 |
| 576 | 10-04-06 | 10-04-16 | 300 |
| 577 | 19-04-06 | 19-04-16 | 300 |
| 578 | 21-04-06 | 21-04-16 | 300 |
| 579 | 24-04-16 | 24-04-16 | 300 |
| 580 | 25-04-06 | 25-04-16 | 300 |
| 582 | 09-05-06 | 09-05-16 | 300 |
| 583 | 11-05-06 | 11-05-11 | 400 |
| 584 | 17-05-06 | 17-05-16 | 300 |
| 585 | 23-05-06 | 23-05-16 | 300 |
| 586 | 02-06-06 | 02-06-16 | 200 |
| 587 | 21-06-06 | 21-06-16 | 300 |
| 588 | 28-06-06 | 28-06-16 | 200 |
| 590 | 05-07-06 | 05-07-16 | 300 |
| 591 | 26-07-06 | 26-07-16 | 300 |
| 593 | 04-08-06 | 04-08-16 | 300 |
| 594 | 11-08-06 | 11-08-16 | 300 |
| 595 | 15-08-06 | 15-08-16 | 300 |
| 596 | 29-08-06 | 29-08-16 | 300 |
| 597 | 31-08-06 | 31-08-16 | 200 |
| 598 | 15-09-06 | 15-09-16 | 200 |
| 599 | 21-09-06 | 21-09-16 | 300 |
| 600 | 27-09-06 | 27-09-16 | 200 |
| 601 | 28-09-06 | 28-09-16 | 300 |
| 602 | 13-10-06 | 13-10-16 | 200 |
| Total domestic interest-rate swaps | | | 13,600 |

CENTRAL-GOVERNMENT INTEREST-RATE SWAP TRANSACTIONS, 2006 Table 5

| Loan no. | Start date | Termination date | Amount in DKK million |
|---|---|---|---|
| Foreign interest-rate swaps | | | |
| 1061 | 26-10-06 | 26-10-16 | 559 |
| 1062 | 31-10-06 | 31-10-16 | 373 |
| 1063 | 07-11-06 | 07-11-16 | 745 |
| 1064 | 13-11-06 | 13-11-16 | 746 |
| 1065 | 21-11-06 | 21-11-16 | 746 |
| 1067 | 15-12-06 | 15-12-16 | 559 |
| 1068 | 19-12-06 | 19-12-16 | 559 |
| Total foreign interest-rate swaps | | | 4,287 |

Note: The Kingdom of Denmark receives fixed interest and pays 6-month Cibor on all domestic interest rate swaps entered into in 2006. The Kingdom of Denmark receives fixed interest and pays 6-month Euribor on all foreign interest-rate swaps entered into in 2006.

CENTRAL-GOVERNMENT CURRENCY SWAP TRANSACTIONS ,[1]2006 Table 6

| Loan no. | Start date | Receiving | | | Paying | | | Termination date | Fee in DKK million |
|---|---|---|---|---|---|---|---|---|---|
| | | Cur-rency | DKK Million | Interest | Cur-rency | USD Million | Interest | | |
| 20008 | 16-02-06 | DKK | 513.0 | 3.3996 | USD | 81.9 | 4.855 | 16-11-17 | -32.5 |
| 20009 | 12-04-06 | DKK | 499.0 | 3.7942 | USD | 81.9 | 5.06 | 12-04-18 | 6.4 |
| 20012 | 18-08-06 | DKK | 717.4 | 3.9378 | USD | 123.4 | 5.27 | 28-08-18 | -0.0 |
| 20013 | 10-11-06 | DKK | 720.2 | 3.6916 | USD | 123.4 | 4.755 | 10-11-18 | -0.0 |

[1] Currency swaps in connection with re-lending to Danish Ship Finance.

CENTRAL-GOVERNMENT DOMESTIC DEBT AS OF 31 DECEMBER 2006 Table 7.1

| Loan no. | Coupon, per cent | Name<br>Issue Period[1] | Redemption date | Outstanding amount, DKK million. |
|---|---|---|---|---|
| **Government bonds, fixed interest rate** | | | | |
| *Bullet loans* | | | | |
| 264 | 7 | Bullet loans 2024<br>6 Apr 1994-31 Dec 2000 | 10 Nov 2024 | 24,951.0 |
| 279 | 7 | Bullet loans 2007<br>10 Apr 1996-30 Dec 1997 | 15 Nov 2007 | 35,250.0 |
| 291 | 6 | Bullet loans 2009<br>14 Jan 1998-3 May 2000 | 15 Nov 2009 | 66,146.0 |
| 358 | 6 | Bullet loans 2011<br>4 May 2000-18 Feb 2002 | 15 Nov 2011 | 60,501.0 |
| 424 | 4 | Bullet loans 2008<br>22 Jan 2002-1 Aug 2005 | 15 Aug 2008 | 47,274.0 |
| 428 | 5 | Bullet loans 2013<br>19 Feb 2002-11 Feb 2004 | 15 Nov 2013 | 78,005.0 |
| 487 | 4 | Bullet loans 2015<br>12 Feb 2004-26 Apr 2006 | 15 Nov 2015 | 60,000.0 |
| 490 | 4 | Bullet loans 2010<br>20 Apr 2004- | 15 Nov 2010 | 31,890.0 |
| 553 | 4 | Bullet loans 2017<br>26 Jan 2006- | 15 Nov 2017 | 24,700.0 |
| *Amotized loans* | | | | |
| 14 | 5 | S 2007<br>20 Oct 1953-12 Sep 1958 | 15 Sep 2007[2] | 5.3 |
| 16 | 4 | S 2017<br>29 Nov 1955-12 Sep 1958 | 15 Jun 2017[2] | 55.0 |
| *Perpetuals* | | | | |
| 1 | 3,5 | Dansk Statslån<br>11 Dec 1886 | Perpetuals[2] | 18.2 |
| 80 | 5 | Dansk-Islandsk Fond 1918<br>20 May 1919 | Perpetuals | 1.0 |
| Government bonds, fixed interest rate, total..... | | | | 428,796.5 |

CENTRAL-GOVERNMENT DOMESTIC DEBT AS OF 31 DECEMBER 2006 Table 7.1

| Loan no. | Coupon, per cent | Name<br>Issue Period[1] | Redemption date | Outstanding amount, DKK million. |
|---|---|---|---|---|
| **T-bills** | | | | |
| *Zero-coupon loans* | | | | |
| 555 | 0 | T-bill 2007 I<br>1 Feb 2006-1 Nov 2006 | 1 Feb 2007 | 16,960.0 |
| 581 | 0 | T-bill 2007 II<br>2 May 2006- | 1 May 2007 | 10,160.0 |
| 592 | 0 | T-bill 2007 III<br>1 Aug 2006- | 1 Aug 2007 | 8,360.0 |
| 603 | 0 | T-bill 2007 IV<br>1 Nov 2006- | 3 Dec 2007 | 7,180.0 |
| T-bills, total ..... | | | | 42,660.0 |
| **Lottery bonds** | | | | |
| 20 | 7 | Lottery bonds of 1965/2010<br>22 Sep 1965 | 22 Sep 2010 | 100.0 |
| 21 | 7 | Lottery bonds of 1969/2009<br>1 Oct 1969 | 31 Dec 2009 | 100.0 |
| Lottery bonds, total ..... | | | | 200.0 |
| **Domestic government securities, total**..... | | | | 471,656.5 |
| Swap from DKK to EUR[3] ..... | | | | -12,755.6 |
| Swap from DKK to USD ..... | | | | -4,862.2 |
| **Central-government domestic debt, total**..... | | | | 454,038.6 |

[1] The issue period refers to the period the series has been open for issue. For Treasury bills the dates refer to settlement date. Series still open for issue are marked with "-" after the first day of issue. Certain securities are only sold on one single date. For these securities only this date is stated.

[2] May be redeemed by the central government at three months' notice.

[3] Currency swaps from DKK to EUR less currency swaps from EUR to DKK.

CENTRAL-GOVERNMENT FOREIGN DEBT AS OF 31 DECEMBER 2006 Table 7.2

| Loan no. | Coupon, per cent | Name | Redemption date | Outstanding amount, DKK million[1] |
|---|---|---|---|---|
| **DKK** | | | | |
| 1 | 3 | 1894[2] | Perpetuals | 10.6 |
| 2 | 3.5 | 1901[2] | Perpetuals | 4.0 |
| 3 | 3.5 | 1909[2] | Perpetuals | 6.0 |
| Total DKK ..... | | | | 20.6 |
| **EUR** | | | | |
| 794 | float. | 1997/07 JPY-loan | 29 Jan 2007 | 47.5 |
| - | float. | 1997/07 swap to DEM | | -47.5 |
| - | float. | 1997/07 swap from JPY | | 52.0 |
| 799 | float. | 1997/07 swap to DEM | 29 Jan 2007 | -52.0 |
| - | 5.73 | 1997/07 swap from DEM (swap attached to no. 794) | | 52.0 |
| 835 | 2.63 | 1997/07 JPY-loan | 27 Jun 2007 | 237.6 |
| - | 2.63 | 1997/07 swap to DEM | | -237.6 |
| - | float. | 1997/07 swap from JPY | | 264.7 |
| 842 | float. | 1997/07 swap to DEM | 27 Jun 2007 | -264.7 |
| - | 5.826 | 1997/07 swap from DEM (swap attached to no. 835) | | 264.7 |
| 838 | 3.46 | 1997/07 JPY-loan (AUD interest) | 20 Jun 2007 | 142.5 |
| - | 3.46 | 1997/07 swap to DEM | | -142.5 |
| - | float. | 1997/07 swap from JPY (AUD Interest) | | 169.0 |
| 844 | float. | 1997/07 swap to DEM | 20 Jun 2007 | -169.0 |
| - | 5.6925 | 1997/07 swap from DEM (swap attached to no. 838) | | 169.0 |
| 850 | float. | 1997/07 JPY-loan | 10 Sep 2007 | 95.0 |
| - | float. | 1997/07 swap to DEM | | -95.0 |
| - | float. | 1997/07 swap from JPY | | 118.2 |
| 853 | float. | 1997/07 JPY-loan | 09 Oct 2007 | 23.8 |
| - | float. | 1997/07 swap to DEM | | -23.8 |
| - | float. | 1997/07 swap from JPY | | 28.9 |
| 855 | 2.02 | 1997/07 EIB JPY-loan | 20 Oct 2007 | 161.5 |
| - | 2.02 | 1997/07 swap to DEM | | -161.5 |
| - | float. | 1997/07 swap from JPY | | 187.8 |
| 862 | 4 | 1997/07 USD-loan | 19 Nov 2007 | 169.8 |
| - | 4 | 1997/07 swap to DEM | | -169.8 |
| - | float. | 1997/07 swap from USD | | 165.9 |
| 879 | 4.625 | 1998/08 EUR-loan | 04 Sep 2008 | 3,541.6 |
| 881 | 6.25 | 1998/07 NOK-loan | 15 Jan 2007 | 298.7 |
| - | 6.25 | 1998/07 swap to DEM | | -298.7 |
| - | float. | 1998/07 swap from NOK | | 283.2 |
| 888 | 5 | 1998/07 SEK-loan | 08 Oct 2007 | 412.4 |
| - | 5 | 1998/07 swap to DEM | | -412.4 |
| - | float. | 1998/07 swap from SEK | | 388.8 |
| 890 | 5.12 | 1998/07 SEK-loan | 12 Oct 2007 | 412.4 |
| - | 5.12 | 1998/07 swap to DEM | | -412.4 |
| - | float. | 1998/07 swap from SEK | | 386.9 |
| 962 | 4.875 | 2002/07 EUR-loan | 18 Apr 2007 | 11,184.0 |

CENTRAL-GOVERNMENT FOREIGN DEBT AS OF 31 DECEMBER 2006 Table 7.2

| Loan no. | Coupon, per cent | Name | Redemption date | Outstanding amount, DKK million[1] |
|---|---|---|---|---|
| **EUR – continued** | | | | |
| 1000 | 3.25 | 2003/08 EUR-loan | 14 Nov 2008 | 17,148.8 |
| 1015 | 3.125 | 2004/09 EUR-loan | 15 Oct 2009 | 15,023.8 |
| 1018 | 3.125 | 2005/10 EUR-loan | 15 Oct 2010 | 13,420.8 |
| EUR-loans, total ..... | | | | 62,364.6 |
| Foreign loans, total ..... | | | | 62,385.1 |
| **Swaps – EUR** | | | | |
| 10004 | float. | 2001/08 swap from DKK | 08 Oct 2008 | 351.0 |
| 10005 | float. | 2001/08 swap from DKK | 15 Oct 2008 | 351.0 |
| 10007 | float. | 2001/07 swap from DKK | 05 Nov 2007 | 500.8 |
| 10008 | float. | 2001/08 swap from DKK | 12 Nov 2008 | 400.3 |
| 10009 | float. | 2001/08 swap from DKK | 19 Nov 2008 | 500.5 |
| 10011 | float. | 2002/09 swap from DKK | 08 Jan 2009 | 400.9 |
| 10012 | float. | 2002/09 swap from DKK | 15 Jan 2009 | 501.3 |
| 10013 | float. | 2002/09 swap from DKK | 28 Jan 2009 | 501.7 |
| 10014 | float. | 2002/07 swap from DKK | 28 Jan 2007 | 501.7 |
| 10015 | float. | 2002/09 swap from DKK | 07 Feb 2009 | 501.9 |
| 10016 | float. | 2002/09 swap from DKK | 19 Mar 2009 | 501.6 |
| 10017 | float. | 2002/09 swap from DKK | 19 Mar 2009 | 301.0 |
| 10018 | float. | 2002/09 swap from DKK | 18 Mar 2009 | 501.6 |
| 10019 | float. | 2002/09 swap from DKK | 18 Mar 2009 | 501.6 |
| 10020 | float. | 2002/09 swap from DKK | 20 Jun 2009 | 501.4 |
| 10021 | float. | 2002/09 swap from DKK | 24 Jun 2009 | 501.6 |
| 10022 | float. | 2002/09 swap from DKK | 02 Jul 2009 | 1,003.7 |
| 10023 | float. | 2002/07 swap from DKK | 19 Sep 2007 | 501.9 |
| 10024 | float. | 2002/07 swap from DKK | 25 Sep 2007 | 501.7 |
| 10025 | float. | 2002/07 swap from DKK | 30 Sep 2007 | 501.9 |
| 10026 | float. | 2002/07 swap from DKK | 04 Oct 2007 | 501.9 |
| 10027 | float. | 2002/07 swap from DKK | 16 Oct 2007 | 501.8 |
| 10028 | float. | 2002/07 swap from DKK | 29 Oct 2007 | 501.6 |
| 10029 | float. | 2002/07 swap from DKK | 31 Oct 2007 | 501.7 |
| 10030 | float. | 2002/07 swap from DKK | 08 Nov 2007 | 501.6 |
| 10031 | float. | 2002/07 swap from DKK | 20 Nov 2007 | 401.6 |
| 10032 | float. | 2002/07 swap from DKK | 26 Nov 2007 | 401.6 |
| 10033 | float. | 2002/07 swap from DKK | 03 Dec 2007 | 401.6 |
| 10034 | float. | 2005/07 swap to DKK | 18 Jun 2007 | -745.6 |
| EUR, total ..... | | | | 12,797.4 |

CENTRAL-GOVERNMENT FOREIGN DEBT AS OF 31 DECEMBER 2006 Table 7.2

| Loan no. | Coupon, per cent | Name | Redemption date | Outstanding amount, DKK million[1] |
|---|---|---|---|---|
| **Swaps – USD** | | | | |
| 20001 | 4.164 | 2004/16 swap from DKK | 30 Jun 2016 | 221.6 |
| 20002 | 4.164 | 2004/16 swap from DKK | 30 Jun 2016 | 221.8 |
| 20003 | 4.355 | 2005/17 swap from DKK | 28 Jan 2017 | 234.9 |
| 20004 | 4.4875 | 2005/17 swap from DKK | 10 Feb 2017 | 396.8 |
| 20005 | 4.497 | 2005/17 swap from DKK | 11 Aug 2017 | 398.7 |
| 20006 | 4.66 | 2005/17 swap from DKK | 20 Oct 2017 | 398.7 |
| 20007 | 4.7925 | 2005/17 swap from DKK | 15 Dec 2017 | 425.3 |
| 20008 | 4.855 | 2006/17 swap from DKK | 16 Nov 2017 | 443.8 |
| 20009 | 5.06 | 2006/18 swap from DKK | 12 Apr 2018 | 444.6 |
| 20012 | 5.27 | 2006/18 swap from DKK | 28 Aug 2018 | 698.5 |
| 20013 | 4.755 | 2006/18 swap from DKK | 10 Nov 2018 | 698.5 |
| USD, total ..... | | | | 4,583.1 |
| **Foreign debt, total** ..... | | | | 79,765.6 |

[1] The outstanding amount as of 31 December 2006 is calculated on the basis of the following exchange rates as of 29 December 2006 expressed as the exchange rate per 100 units: EUR = 745.60, JPY = 4.7512, NOK = 90.51, SEK = 82.47, USD = 566.14. The outstanding amount as of 31 December 2006 in the former national currencies in the euro zone is converted into DKK by use of the irrevocable fixed exchange rates vis-à-vis EUR: DEM = 1.95583.

[2] Multi-currency loan. The creditor can choose which currency to make payments in, however, at a fixed rate of exchange. Redeemable by the Kingdom of Denmark at 3 months' notice.

CENTRAL-GOVERNMENT INTEREST-RATE SWAPS AS OF 31 DECEMBER 2006 Table 8

| Termination year | Krone interest-rate swaps | Euro interest-rate swaps | |
|---|---|---|---|
| | Notional amount in DKK million | Notional amount in EUR million | Notional amount in DKK million[1] |
| 2007 | 9,700 | 700 | 5,219 |
| 2008 | 800 | 50 | 373 |
| 2009 | 12,550 | 0 | 0 |
| 2010 | 14,600 | 175 | 1,305 |
| 2011 | 11,950 | 150 | 1,118 |
| 2012 | 0 | 4,235 | 31,576 |
| 2013 | 4,400 | 810 | 6,039 |
| 2014 | 8,500 | 0 | 0 |
| 2015 | 1,800 | 1,500 | 11,184 |
| 2016 | 10,800 | 575 | 4,287 |
| Interest rate swaps, total | 75,100 | 8,195 | 61,102 |

Note: The Kingdom of Denmark receives fixed interest and pays 6-month Cibor on all domestic interest-rate swaps. The Kingdom of Denmark receives fixed interest and pays 6-month Euribor on all foreign interest-rate swaps.

[1] Converted to DKK on the basis of the following exchange rate of 29 December 2006: EUR = 745.60.

KINGDOM OF DENMARK'S RATING IN DOMESTIC CURRENCY — Table 9.1

| | Moody's | Standard & Poor's |
|---|---|---|
| 1986, Jul | Aaa | |
| 1992, Jul | | AAA |
| Current rating | Aaa | AAA |

Note: Moody's Investors Service and Standard & Poor's use the following ratings:
*Moody's:* Aaa, Aa, A, Baa, Ba, B, Caa, Ca and C.
For the categories Aa to Caa are used 1, 2 or 3 to indicate a status slightly better or worse within the category.
*Standard & Poor's:* AAA, AA, A, BBB, BB, B, CCC, CC, C and D.
For the categories AA to CCC are used + or - to indicate a status slightly better or worse within the category.

KINGDOM OF DENMARK'S RATING IN FOREIGN CURRENCY — Table 9.2

| | Moody's | Standard & Poor's |
|---|---|---|
| 1981, Mar | | AAA |
| 1983, Jan | | AA+ |
| 1985, Apr | Aa | |
| 1986, Aug | Aa1 | |
| 1987, Mar | | AA |
| 1991, Oct | | AA+ |
| 1999, Aug | Aaa | |
| 2001, Feb | | AAA |
| Current rating | Aaa | AAA |

Note: See the note in Table 9.1 for ranking of the rating categories.

RATING OF SELECTED COUNTRIES' CENTRAL-GOVERNMENT DEBT — Table 10

| | Moody's | | Standard & Poor's | |
|---|---|---|---|---|
| | Domestic | Foreign | Domestic | Foreign |
| Australia | Aaa | Aaa | AAA | AAA |
| Belgium | Aa1 | Aa1 | AA+ | AA+ |
| Canada | Aaa | Aaa | AAA | AAA |
| Denmark | Aaa | Aaa | AAA | AAA |
| Finland | Aaa | Aaa | AAA | AAA |
| France | Aaa | Aaa | AAA | AAA |
| Greece | A1 | A1 | A | A |
| Netherlands | Aaa | Aaa | AAA | AAA |
| Ireland | Aaa | Aaa | AAA | AAA |
| Italy | Aa2 | Aa2 | A+ | A+ |
| Japan | A2 | Aaa | AA- | AA- |
| New Zealand | Aaa | Aaa | AAA | AA+ |
| Norway | Aaa | Aaa | AAA | AAA |
| Portugal | Aa2 | Aa2 | AA- | AA- |
| Switzerland | Aaa | Aaa | AAA | AAA |
| Spain | Aaa | Aaa | AAA | AAA |
| UK | Aaa | Aaa | AAA | AAA |
| Sweden | Aaa | Aaa | AAA | AAA |
| South Africa | A2 | Baa1 | A+ | BBB+ |
| Czech Republic | A1 | A1 | A | A- |
| Germany | Aaa | Aaa | AAA | AAA |
| USA | Aaa | Aaa | AAA | AAA |
| Austria | Aaa | Aaa | AAA | AAA |

Note: See the note in Table 9.1 for ranking of the rating categories.
Source: Moody's Investors Service and Standard & Poor's, January 2007.

# Glossary

This glossary presents explanations of a number of key terms and concepts in the area of government debt. Terms in *italics* are included elsewhere in the glossary.

**Acceptance date**
The date on which a loan is agreed.

**Accrued interest**
Accrued interest is payment for the interest accruing on a paper since the last interest due date. In the Danish bond market trades are with coupon interest. The buyer of the paper pays a proportion of the coupon to the seller for the period from the last due date to the settlement date. In return, the buyer receives the whole of the following coupon. See also *clean price* and *dirty price*.

**Annuity loan**
Loan for which service payments (interest and redemptions) are constant throughout the lifetime of the loan.

**Asset Liability Management (ALM)**
Risk management principle for consolidation of all assets and liabilities as one *portfolio* in order to minimise the risk on the overall portfolio. This principle is applied by private financial institutions and makes it possible to minimise risk by matching the financial characteristics of respectively assets and liabilities, so that one side of the balance sheet hedges the other.

**Asset swap**
A swap of specific assets whereby the investor restructures the interest rate and/ or currency of the assets in question.

**Auction**
Issuance of government securities via auction is undertaken in large single issues at regular intervals. At an auction, a bond is offered at a given nominal interest rate, maturity and redemption profile. An eligible group of market participants may submit bids for a certain volume of bonds at a given price (or interest rate).

When government securities are sold via auction, a distinction is often drawn between two different methods of fixing the price paid by the bidders. In the "uniform pricing" method, a cut-off price is fixed on the basis of the bids received, and all bids at the cut-off price or above are met at the cut-off price. If the total volume of bids at the cut-off price and above exceeds the volume that the issuer intends to sell, allocation can take place on a pro-rata basis. This entails that for bidders who have submitted bids at the actual cut-off price, only a part of the bids are honoured. The Danish central government uses auctions with "uniform pricing" on sale of T-bills, where bids are made for an interest rate rather than a price.

By the "multiple pricing" method, a cut-off price is likewise fixed on the basis of the bids received, and all bids at the cut-off price or above are met at the prices offered by the individual bidders.

**Bail out**
Guarantee by an institution or a member state for the financial commitments of another institution or member state.

**Basis points**
1 basis point is 0.01 percentage point. Used as an expression of e.g. *yield spreads* between two bonds.

**Benchmark bond**
A key issue. Changes in the benchmark status of Danish government bonds are determined and published by Government Debt Management after discussion by the *primary dealer* committee.

**Bid-ask price**
The bid-ask price is the price from the perspective of the market maker. The difference between the ask and bid price is the bid-ask spread.

**Bid-ask spread**
See *bid-ask price*.

**Borrowing requirement**
The part of the *gross financing requirement* that is covered by issuance of government securities.

**Bullet loans**
Loans on which only interest is paid during the term of the loans. The loans are repaid in full on the maturity date. Danish government bonds are bullet loans.

**Buy-back issues**
The government securities which the central government can buy back before maturity. Buy-backs are used to manage interest-rate risk, to smooth the central government's redemption profile and to maintain liquid on-the-run issues.

**Callable bond**
Bond that can be redeemed before maturity by the borrower on terms agreed in advance. The debtor has a call option on the bond.

**Capital losses/gains on issuance**
Capital losses and gains on issuance arise when a loan is issued at prices below and above par respectively. Capital losses/gains on issuance are distributed on a linear basis in the government accounts across the maturity of the loan under *distributed capital losses on issuance.*

**Cash management**
The central government's cash management comprises liquidity management of the central government's account and its payment flows. Cash management is required due to time lags between the central government's receipts and disbursements. The framework for the cash management by the central government is given by the EU Treaty's prohibition of monetary financing, combined with the central-government *funding rules*.

**Cibor (Copenhagen InterBank Offered Rate)**
The interest rate at which a bank in the Copenhagen interbank market is willing to lend Danish kroner without collateral to another creditworthy bank. Cibor is calculated on the basis of rates offered by a number of individual banks (Cibor quoters). Cibor is fixed for eight different maturities: 1, 2, 3, 4, 5, 6, 9 and 12 months.

Cibor is the reference interest rate for a large number of financial contracts. See also *Euribor* and *Libor*.

**Clean price**
The price of a bond excluding accrued interest. See also *accrued interest* and *dirty price*.

**Clearing and settlement**
Clearing is the compilation of each participant's purchase and sale, resulting in the net position of each participant. Settlement is completion of a trade by final settlement of agreed commitments.

**Clearstream**
Securities clearing/settlement and custodian institution.

**Commercial Paper (CP)**
Short-term debt instruments (*zero-coupon paper*) with maturities of up to one year. CPs are mainly issued to cover a short-term financing requirement. The central government has a CP programme in the American and European markets.

**Cost-at-Risk (CaR) model**
Simulation model developed by Government Debt Management to quantify the risk on the exposure of the central-government debt portfolio to future interest-rate developments. The model simulates 2,500 scenarios for the central government's annual interest costs 10 years ahead.

Absolute CaR for a given year indicates the maximum interest costs for the debt with a probability of 95 per cent. Absolute CaR thus expresses the risk on the debt portfolio under a given strategy.

**Credit default swap**
Insurance against a counterparty's default on its financial obligations. The buyer of a credit default swap (the insured) pays a premium to the seller (the insurer), and the insurer undertakes to pay compensation to the insured in the event of default on the underlying asset. The credit risk on an asset is thus transferred from the insured to the insurer.

**Credit risk**
The risk of a financial loss as a consequence of a counterparty's default on its payment obligations. In connection with the government debt, the credit risk occurs in relation to *swaps* and *re-lending*.

**Credit standing**
Assessment of a debtor's willingness and ability to honour its obligations. See also *rating*.

**Cross default**
Clause in loan or swap agreement that permits cancellation of the agreement should one of the parties default on its payment obligations vis-à-vis the counterparty or a third party.

**Derivative**
An instrument of which the value is derived from the price of an underlying asset, e.g. securities, goods or currency. *Options* and *swaps* are examples of financial derivatives.

**Dirty price**
The price of a bond including accrued interest. See also *accrued interest* and *clean price*.

**Discount rate**
Danmarks Nationabank's discount rate is a signal rate indicating the overall level of the monetary-policy interest rates.

**Duration**
The average fixed-interest period for a financial *portfolio*. Long duration of the government debt implies a low interest-rate risk, since on average smaller proportions of the interest costs are adjusted to changes in the level of interest rates.

In other contexts, duration is used to express the price sensitivity of the portfolio. The higher the duration, the greater the price sensitivity.

**Electronic trading**
Placement of orders (bid or ask) via electronic facilities to a trading system in which orders are matched and executed automatically.

**EMU debt**
The consolidated gross debt of the central, regional and local governments compiled at nominal value. The claims of the government subsectors on each other can be set off in the compilation of the debt. The EMU debt is defined on the basis of the national accounts and based on the criteria set out in the EU Treaty and the Stability and Growth Pact for the monitoring of excessive general-government deficits and general-government debt.

**Euribor (Euro InterBank Offered Rate)**
The interest rate at which a bank in the euro-interbank market is willing to grant money-market loans in euro to another creditworthy bank. Used as a reference interest rate in a large number of financial contracts, e.g. *swaps*. See also *Cibor* and *Libor*.

**Euroclear**
Securities clearing/settlement and custodian institution.

**EuroMTS**
Electronic trading platform for the most liquid *benchmark bonds* denominated in euro. Fully owned by MTS S.p.A. See also *electronic trading*.

**Exchange-rate risk**
The risk of losses due to exchange-rate fluctuations. The exchange-rate risk on the central-government debt is the risk of an increase in the value of the debt due to exchange-rate changes.

**Exposure**
Exposure denotes a financial position that entails a risk of losses or gains if the market conditions change. For example, currency exposure entails a risk of loss or gain from fluctuations in exchange rates, and interest-rate exposure entails a risk of loss or gain from changes in interest rates.

**Final exposure**
Denotes the currency or interest-rate exposure on a loan compiled after *swaps*.

**Floating interest rate**
An interest rate that is agreed to float as, or in step with, another interest rate listed on the market at specific shorter intervals than the maturity of the loan, typically every third or sixth month.

**Foreign-exchange reserve**
The purpose of Danmarks Nationalbank's foreign-exchange reserve is first and foremost to support Denmark's fixed-exchange-rate policy vis-à-vis the euro area. The foreign-exchange reserve is primarily placed in foreign bonds and as foreign bank deposits.

**Forward contract**
Agreement on delivery and payment of goods, securities or currency on a future date at a price fixed at the time of the agreement (*forward price*).

**Forward price**
The price fixed at the time of agreement in a *forward contract* on future delivery of goods, securities or currency.

**Funding rules**
Framework for the distribution of the central government's domestic and foreign borrowing. Under the domestic funding rule, the domestic borrowing in Danish kroner for the year as a whole is equivalent to the central government's overall financing requirement (the gross financing requirement) less repayments on the foreign debt. In addition, it is possible to raise domestic loans in kroner if the foreign government debt is reduced equivalently. The foreign funding rule prescribes that the central government's repayments on the government debt in foreign currency (the foreign government debt), including early redemptions and buy-backs, shall normally be refinanced by foreign borrowing.

**Government debt**
Comprises liabilities in the form of domestic and foreign debt as well as assets in the Social Pension Fund, the High-Technology Foundation, the Financing Fund for increased distributions from the Danish National Research Foundation, the Prevention Fund (as from 2007) and the balance of the central government's account.

**Government-guaranteed company**
Government-owned company that can raise government-guaranteed loans.

**Gross financing requirement**
The gross financing requirement is compiled as the *net financing requirement* with the addition of redemptions on the domestic and foreign debt including buy-backs, the net bond purchases of four government funds, and the central government's currency swap payments (the liabilities leg of the central government's currency swaps). See also *borrowing requirement*.

**Haircut**
The deduction made from a paper's market value on determining its collateral value. This gives a prudent estimate of the value of the securities received as collateral for lending or another outstanding. A haircut takes account of the risk of the paper's depreciation from the date of compilation of the collateral value until the possible enforced realisation of the paper. The central government uses haircuts for collateral pledged by counterparties in connection with *swaps* and government securities lending.

**Home bias**
The tendency for investors to primarily invest in their respective domestic markets, e.g. due to greater familiarity with the domestic market, specific preference for domestic assets, or regulatory factors.

**ICMA (International Capital Market Association)**
International association of financial institutions that trade securities in the international market. ICMA e.g. works for standardisation of practice and documentation of settlement of trades.

ICMA was established on 1 July 2005 on the merger of the International Securities Market Association (ISMA) and the International Primary Market Association (IPMA).

**Interest-rate fixing**
The interest-rate fixing at a given time is the amount for which a new interest rate is to be fixed within one year.

**Interest-rate risk**
In connection with the government debt this is the risk of higher interest costs as a consequence of the development in interest rates. See also *refinancing risk* and *market risk*. In other contexts, interest-rate risk applies to the risk of capital losses as a consequence of interest-rate fluctuations.

**ISDA (International Swaps and Derivatives Association)**
International association of financial institutions. ISDA's objective is to work for standardisation of practice and documentation e.g. in relation to *swaps*.

**ISDA Master Agreement**
Framework agreement whereby all *swaps* with one and the same counterparty are documented.

**Issuance**
Danish government bonds are issued via *MTSDenmark*. See also *auction* and *tap sale*.

**Key on-the-run issues**
Government series that are being built up and which are issued to cover the current domestic borrowing requirement. Key on-the-run issues are open for current *issuance* (on-the-run).

**Libor (London InterBank Offered Rate)**
The interest rate at which a bank in the London interbank market is willing to undertake money-market lending in various currencies to another creditworthy bank. Used as a reference interest rate in a large number of financial contracts, e.g. *swaps*. See also *Cibor* and *Euribor*.

**Liquidity**
Liquidity expresses tradability. Liquid bonds are often characterised by a large outstanding amount, high turnover and a narrow spread between *bid and ask prices*. Investors will generally be willing to pay a higher price for a more liquid bond (liquidity premium).

**Market maker**
A securities dealer that quotes current tradable bid and ask prices in securities.

**Market risk**
The risk that fluctuations in market prices (e.g. interest rates, exchange rates, bond prices and equity prices) will result in losses.

**Monetary-policy counterparties**
Financial institutions with access to the monetary-policy instruments: deposits with Danmarks Nationalbank on a day-to-day basis, purchase of certificates of deposit and loans against securities as collateral. Danish banks and mortgage-credit institutes, as well as a number of branches of foreign credit institutions, comprise the monetary-policy counterparties.

**MTS Associated Markets (MTSAM)**
Belgian company with market segments for wholesale trading in Belgian, Danish and Finnish government securities.

**MTSDenmark (MTSDk)**
A market segment under *MTS Associated Markets (MTSAM)* for wholesale trading in Danish government bonds. The segment uses the electronic trading system *Telematico*. Further information on trading in Danish government securities is available at www.mtsdenmark.com. See also *Electronic trading*.

**Net financing requirement**
The net financing requirement is compiled as the deficit on the central government's current, investment and lending (CIL) account with addition of *re-lending* (net of redemptions) and portfolio movements and accruals.

**Operational risk**
The risk of economic loss as a consequence of faults in internal processes, human errors or system faults, or as a consequence of external events.

**Option**
A contract giving the owner (the buyer) the right, but not the obligation, to buy or sell an underlying asset (goods, a financial instrument or a currency) at an agreed price (strike price) at an agreed future time or for an agreed future period. The seller is obliged to recognise the owner's right.

**Option-adjusted duration**
The *duration* for *callable bonds* where adjustments have been made for the uncertainty of the maturity structure as a consequence of the borrower's right to early redemption of the bond. The option-adjusted duration is lower than if the borrower did not have the possibility of early redemption. In connection with government debt, option-adjusted duration is used to calculate the duration of the Social Pension Fund's portfolio of callable bonds.

**Over-the-counter (OTC)**
Trading in financial instruments outside a stock exchange, e.g. via a dealer network or by telephone.

**Par yield**
Par yields are adjusted for differences in the remaining maturities of the bonds and are used e.g. when comparing yields over time or across countries. Par yields are calculated on the basis of estimated zero-coupon yield curves. For example, the par yield for a 10-year Danish

government bond is the coupon rate which ensures that a synthetic *bullet loan* with a maturity of exactly 10 years has a theoretical value of 100 ("par"), calculated on the basis of the zero-coupon yield curve for Danish government securities.

**Percentile**
The numerical value representing the share of the observations below that value. For example, the 95th percentile for the maximum interest costs (absolute CaR) indicates a 95 per cent probability that the interest costs on the central-government debt in a given year are lower than this value.

**Perpetual**
Loans with infinite maturity, i.e. the only payments are the ongoing coupon payments. The Kingdom of Denmark has a few minor perpetuals from the end of the 19th century and beginning of the 20th century.

**Plain vanilla**
Term used for standardised and simple products, e.g. *bullet loans* and simple interest-rate *swaps.* See also *Structured loans.*

**Portfolio**
Term used for holdings of assets and/or liabilities.

**Primary dealer**
Primary dealers are financial institutions that by agreement with the issuer, against special rights, are obliged to provide *liquidity* in specific government securities. Primary dealers typically have the exclusive right to bid at government securities auctions, and are normally obliged to accept a certain minimum amount. Primary dealers are also typically obliged to e.g. contribute to liquidity in the bond market by quoting current bid and ask prices for bonds vis-à-vis other banks (market-making).

**Primary market**
Market for issuance of bonds. See also *Secondary market.*

**Rating**
Credit rating given by rating institutes such as Fitch, Moody's and Standard & Poor's, cf. Tables 9 and 10 of the Appendix of Tables. See also *credit standing*.

**Re-financing risk**
The risk that the borrower has to refinance redemptions on the debt at a time when the interest-rate level is high, or in a period where the borrower's specific borrowing terms are particularly unfavourable.

**Re-lending**
Re-lending constitutes central-government loans to government-owned companies and Danish Ship Finance. These loans precisely reflect an existing government paper. Coupon, interest due date and maturity date will thus be identical with an existing government paper. The price of the loans is set on the basis of the current market conditions. The loan proceeds are disbursed from the central government's account. The resulting financing requirement is met via the key on-the-run issues.

In addition, Danish Ship Finance has access to a re-lending facility whereby re-lending is offered as fixed-rate serial loans with a maturity of up to 12 years. Re-lending to Danish Ship Finance can take place in both Danish kroner and US dollars.

**Re-lending list**
The range of government securities in which *re-lending* can be granted. The re-lending list is determined by Government Debt Management and comprises all fixed-rate government bonds that are bullet loans in Danish kroner in the maturity segments between 2 and 10 years. Re-lending is financed via *key on-the-run issues*.

**Risk-free interest rate**
The risk-free interest rate is the interest rate that can be obtained in the market without assuming any risk. The risk-free interest rate is often the yield on short-term, liquid government bonds with a high credit rating, or the T-bill rate. See also *risk premium*.

**Risk premium**
Additional payment for holding assets that are subject to risk. See also *risk-free interest rate*.

**Secondary market**
Market for trading of bonds after they are issued in the *primary market.*

**Securities lending**
Securities lending is a transaction whereby the seller/borrower is paid to transfer securities to a buyer/lender. On conclusion of the agreement, the seller/borrower simultaneously commits to buy back the securities at

an agreed price on expiry of the agreement. For legal/technical reasons, securities lending is defined in the contracts as sale and buy-back of securities, but in reality these are collateralised loans. The counterparty in this transaction lends against securities as collateral.

The central government and the Social Pension Fund lend government bonds to *primary dealers* in Danish government bonds (securities lending facility).

**Serial loan**

A loan for which the debt is repaid in equal redemptions on each interest due date. As the outstanding debt decreases throughout the maturity of the loan, the interest payments, and thereby the overall payments, are lower for each due date.

**Strategic benchmarks**

Guiding points for liquidity and interest-rate exposure used in the implementation of the Danish government debt strategy. For example, strategic benchmarks are set for the outstanding amount in *key on-the-run* government securities and for the *duration* of the government debt.

**Structured loan**

A loan on special terms, e.g. special redemption terms or built-in *options,* is characterised as a structured loan, in contrast to a *plain vanilla* loan.

**Swap**

A swap is an agreement between two parties to exchange payments over a fixed period. A swap is a separate financial transaction.

Currency swaps are used to restructure debt among various payment currencies. Payments in one currency are thus swapped to payments in another currency. In a currency swap from kroner to euro, the central government e.g. receives interest in kroner at a floating rate and pays interest in euro at a floating rate. The counterparty pays interest and repays the krone principal, in return for payments on the euro principal. Normally, principals are exchanged both at the start and end of the deal.

Interest-rate swaps are typically used to restructure debt between fixed and floating interest rates. In an interest-rate swap from fixed to floating interest rates in the krone market, the central government e.g. receives interest on the swap at a fixed rate (e.g. 5- or 10-year) and pays interest in kroner at a floating rate. In contrast to a currency swap there is no exchange of principal between the parties in an interest-rate swap. The principal in an interest-rate swap is synthetic and is used only to determine the size of the interest payments at the individual due dates.

The principal in an interest-rate swap is often described as the notional value. The central government's interest-rate swaps are transacted as portfolio swaps, i.e. not connected to specific loans.

The overall value of a swap is usually zero when the swap is transacted, but the value of the swap can subsequently become positive or negative, depending on market developments in interest and exchange rates.

**Swap assignment**
Term used when a *swap* is assigned to another counterparty. The purpose of the transaction can be to reduce the potential *credit risk* on the original swap counterparty.

**Swap interest rate**
The swap interest rate is the fixed interest rate paid or received in an interest-rate swap.

**Swap spread**
The swap spread is the difference between the fixed interest rate received by the central government in an interest-rate swap, and the yield to maturity on a government bond with the same maturity.

**Swaption**
An option on a *swap*. The buyer of a swaption has the right, but not the obligation, to conclude a swap on agreed terms.

**Tap sale**
Ongoing *issuance* in the same series. In Denmark, the issuance of government bonds is normally via tap sale. See also *auction.*

**Telematico**
The dominant electronic trading system for wholesale trading of European *benchmark bonds*, see also MTSDenmark.

**Termination**
When a swap agreement is cancelled before actual expiry, it is said to be terminated. This can be by specific agreement between the parties or because an event has occurred which gives one party the right to terminate the swap. On termination, settlement is at the market value of the swap.

**Term structure**
See *yield curve*.

**Ticks**
One tick is 0.01 Danish kroner. Ticks are used to measure e.g. spreads in *bid-ask prices* for bonds (*bid-ask spread*).

**Value date**
Settlement date, i.e. the date on which e.g. a securities deal is closed by delivery of securities against payment.

**Volatility**
The movements in the price of an asset, e.g. the fluctuation in a bond price.

**VP Securities Services**
Securities clearing/settlement and custodian institution. VP also handles electronic issuance of securities and registration of ownership and rights pertaining to electronic securities.

**Yield curve**
Relationship between the interest rate and maturity of securities. A rising yield curve – i.e. where interest rates for short-term securities are lower than interest rates for long-term securities – is called normal. A falling yield curve is described as inverse.

**Yield spread**
The spread between the *yields to maturity* on two bonds. On calculating yield spreads, adjustment is often made for differences in the bonds' remaining terms to maturity, e.g. based on an estimated *yield* or *zero-coupon yield* curve (*par yield* spread).

**Yield to maturity**
The fixed discount rate that makes the present value of payments on the bond equivalent to the actual price of the bond. On calculating the yield to maturity all payments are included, irrespective of whether they are interest or redemption payments.

**Zero-coupon bond**
Loan that is not subject to current interest payments, and which is redeemed on maturity. The cost of borrowing is solely a result of a *capital loss on issuance*. Treasury bills and *Commercial Paper* are zero-coupon bonds.

**Zero-coupon rate**
The *yield to maturity* on a *zero-coupon bond.* The zero-coupon-yield structure indicates the relation between remaining maturity and the zero-coupon rate.