Danmarks Nationalbank

Danish Government Borrowing and Debt

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APPENDIX OF TABLES

Introduction and Summary

In connection with the management of the Danish central-government debt Danmarks Nationalbank issues the publication STATENS LÅNTAGNING OG GÆLD (Danish Government Borrowing and Debt). The publication describes the borrowing in the previous year, and other issues in this relation.

In addition to the publication in Danish the Nationalbank used to issue two publications in English, DANISH GOVERNMENT SECURITIES and DATA ON DANISH PUBLIC FOREIGN BORROWING. They are now replaced by this English translation of STATENS LÅNTAGNING OG GÆLD. Further information about the management of the central-government debt and the current sale of government securities etc. can be found on the Nationalbank's website www.nationalbanken.dk.

DANISH GOVERNMENT BORROWING AND DEBT 1998 is divided into two main sections: A report section describing the principles behind the borrowing and the development of borrowing and debt in the previous year; and a special-topic section dealing in depth with special topics.

The report section comprises Chapters 1-6. The key principles of the domestic and foreign central-government borrowing are described in Chapter 1. The domestic borrowing is described in Chapter 2 and the foreign borrowing in Chapter 3. The coordinated management of the exchange-rate risk of the government and the Nationalbank is dealt with in Chapter 4. Chapter 5 gives an overall description of the structure of the government debt. Chapter 6 describes the management of the assets of the Social Pension Fund.

The special-topic section comprises Chapters 7 to 9. In Chapter 7 the government debt policy is seen in an international perspective. Chapter 8 deals with the market for interest-rate swaps in Danish kroner and the activities of the central government in this market. The management of the credit risk on the central government's swap portfolio is dealt with in Chapter 9.

CHAPTER 1

Key Principles of Government Borrowing

SUMMARY 1.1

The central objective of the government debt policy is to achieve the lowest possible long-term borrowing costs, while taking into account the risks associated with the debt. The government debt is managed by Danmarks Nationalbank, which acts as fiscal agent to the Ministry of Finance in the area of central-government borrowing.

The central government issues bonds denominated in both Danish kroner and other currencies. The distribution between domestic borrowing and foreign borrowing is determined by the "central-government borrowing norm". According to the norm the central government's current borrowing requirement is covered by issuing domestic krone-denominated securities. Foreign borrowing takes place if there is a need to increase the foreign-exchange reserve and to refinance redemptions on the foreign government debt.

Domestic borrowing takes place via the trading systems of the Copenhagen Stock Exchange. Liquid government securities are built up in the long (approximately 10 years), medium (approximately 5 years) and short (2-3 years) segments of the market. Moreover, short-term Treasury bills are also issued. The issuing strategy is designed to minimise borrowing costs by utilising liquidity premiums. The foreign borrowing is based predominantly on raising small loans on advantageous terms. Borrowing costs are sought minimised by utilising particularly attractive borrowing terms prevailing from time to time in certain markets.

The central government's borrowing strategy entails interest-rate, exchange-rate and credit risks. Various risk measures are used to calculate and manage the interest-rate risk on the government debt. The duration of the debt, the redemption profile and the Cost-at-Risk (CaR) level supplement each other as measures of the interest-rate risk. The central government's exchange-rate risk and the exchange-rate risk on the Nationalbank's foreign-exchange reserve are managed within a coordinated framework whereby it is the net foreign-exchange position that is in focus. The credit risk is limited by trading only with counterparties rated above a certain level, and within specific lines. The credit risk will be further reduced in the future through the use of collateral.

MANAGEMENT OF THE GOVERNMENT DEBT 1.2

The central objective of the government debt policy is to achieve the lowest possible long-term borrowing costs, while taking into account the risks associated with the debt.

The legislative basis for government borrowing is set out in the Act on the authority to raise central-government loans. The Act empowers the Minister of Finance to raise loans on behalf of the central government up to a maximum of DKK 950 billion, which is the maximum limit for the total domestic and foreign government debt. At the close of 1998 outstanding loans totalled almost DKK 745 billion calculated at nominal value.

Since 1991, Danmarks Nationalbank – the Danish central bank – has acted as fiscal agent to the Ministry of Finance. The overall responsibility for the management of the government debt rests with the Ministry of Finance, while the Nationalbank is authorised to conduct the necessary debt transactions on behalf of the government.

The overall government borrowing strategy is determined at quarterly meetings of the Ministry of Finance, the Ministry of Economic Affairs and the Nationalbank. The strategy is drawn up on the basis of proposals from the Nationalbank. The latter handles the necessary borrowing transactions and the ongoing management of the debt in accordance with the adopted strategy as authorised by the Ministry of Finance.

The Nationalbank's management of the government debt involves cooperation between three departments of the bank: the Financial Markets Department, the Market Operations Department and the Accounting Department.

The Financial Markets Department sets out the overall framework for borrowing and prepares analyses and strategy proposals concerning the

OBJECTIVES OF THE GOVERNMENT DEBT POLICY Box 1.1

The objectives of the government debt policy are set out in the remarks to the bill for the Act on the authority to raise loans on behalf of the central government. The Act was adopted by the Folketing (Parliament) on 22 December 1993.

The overall objective of the government debt policy is to achieve the lowest possible long-term borrowing costs.

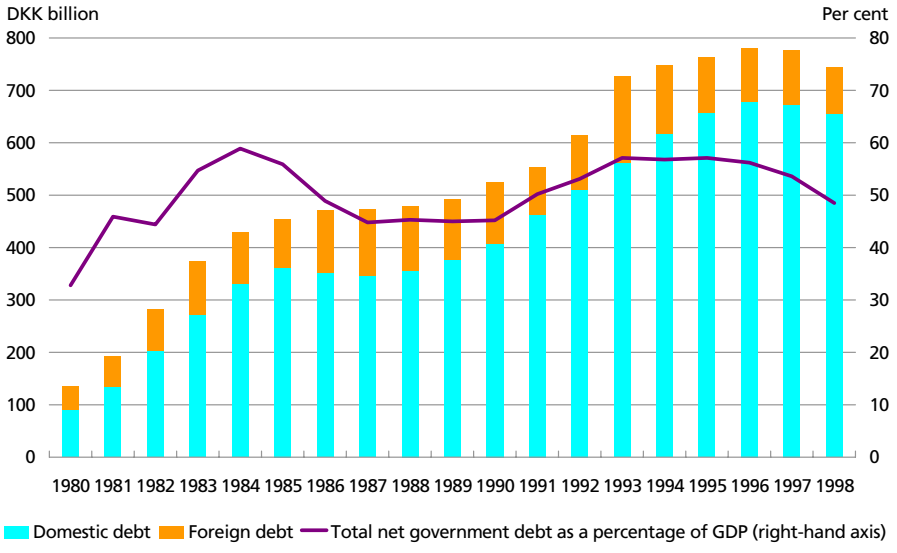
If possible without increasing the borrowing costs in the long term the government debt policy must be planned to take account of the overall requirement to build up a well-functioning, effective Danish capital market. In addition, borrowing must be designed to facilitate the central government's access to the capital markets in the long-term perspective.

domestic and foreign government debt. The Market Operations Department handles the practical aspects of debt management such as the sale of bonds, raising of loans and swap transactions. The Accounting Department ensures the settlement and bookkeeping of transactions related to the government debt. The Nationalbank's Audit Department assists the Auditor General in the auditing of the government debt management and the Social Pension Fund.

DOMESTIC AND FOREIGN GOVERNMENT BORROWING 1.3

In 1998 the central government sold bonds and Treasury notes on the Copenhagen Stock Exchange for DKK 78.7 billion and raised foreign loans for DKK 15.8 billion. At the close of 1998 Denmark's government debt totalled DKK 567 billion, taking into account the assets of the Social Pension Fund and the balance of the central government's account with the Nationalbank. The gross liabilities of the public sector (EMU debt) totalled DKK 657 billion at the close of 1998.[1] The central

GOVERNMENT DEBT 1980-98 Chart 1.3.1



Note: The total net government debt as a percentage of GDP is calculated with due account of the assets of the Social Pension Fund and the balance of the central government's account with the Nationalbank. The statistics thus do not correspond to the gross debt of the public sector (EMU debt).

[1] The EMU debt is calculated for the total public sector, i.e. the liabilities of both central and local government. The liabilities are calculated in gross terms. However, the public sector's claims on itself can be deducted, i.e. holdings of government securities by the Social Pension Fund and the social funds, cf. Section 5.3.

government's domestic and foreign borrowing in 1998 are described in Chapters 2 and 3, while the composition of the government debt is presented in Chapter 5.

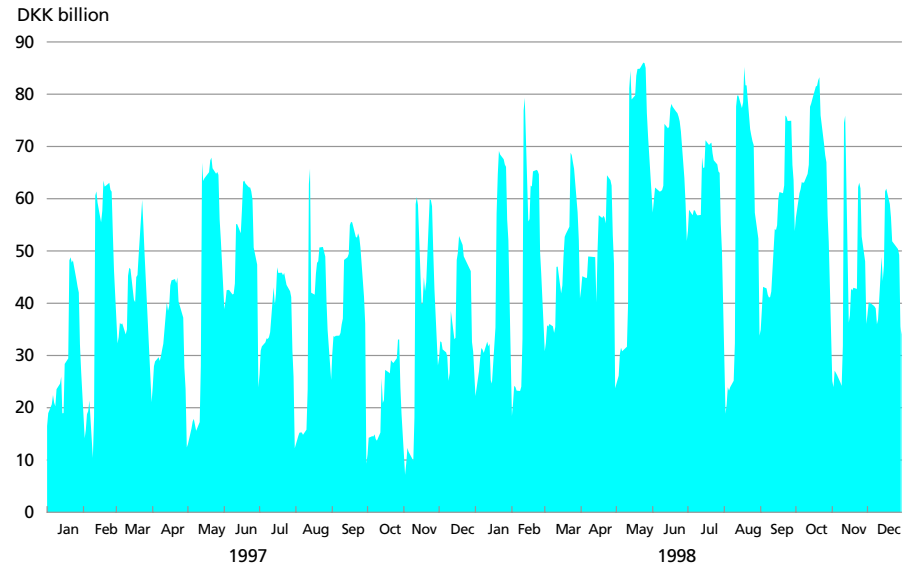
The distribution between domestic borrowing and foreign borrowing is determined by the "central-government borrowing norm" agreed between the government and the Nationalbank. The agreement is composed of two parts: a norm for domestic borrowing and a norm for foreign borrowing.

The norm for domestic and foreign borrowing

To ensure the separation of fiscal policy and monetary policy a norm is set for the extent of domestic and foreign borrowing, cf. Box 1.2. In Denmark there is a longstanding tradition for a dividing line of this nature between fiscal and monetary policy.

The norm for domestic borrowing states that the issuance of domestic securities denominated in kroner must cover the central government's borrowing requirement, including redemption of the domestic government debt. The norm for foreign borrowing states that redemptions on the foreign debt must be matched by new foreign borrowing. The size of the foreign debt is determined considering the size of the foreign-exchange reserve and the average balance of the central government's account with the Nationalbank. The norm for foreign borrowing may be exceeded if there is a need to strengthen the foreign-exchange reserve.

THE CENTRAL GOVERNMENT'S ACCOUNT WITH THE NATIONALBANK Chart 1.3.2



THE CENTRAL-GOVERNMENT BORROWING NORM Box 1.2

The central-government borrowing norm is set out in an agreement between the government and Danmarks Nationalbank. The most recent version was concluded in 1993, although a fixed norm for sale of domestic krone-denominated government securities has formed the basis for monetary policy for the last 15 years. The agreement is composed of two parts: a norm for domestic borrowing and a norm for foreign borrowing.

The norm for domestic borrowing states that the issuance of domestic krone-denominated government securities within a year shall match the gross central-government borrowing requirement (the gross deficit on a cash basis) less redemptions on the foreign debt. The norm for domestic borrowing ensures that the central government's domestic payments do not affect domestic liquidity (the banks' net position with the Nationalbank). The norm for domestic borrowing is thus an important element of the dividing line between fiscal policy and monetary policy.

As an integral part of the norm for domestic borrowing the Nationalbank will buy in the market the foreign currency needed to cover the central government's current expenses in foreign currency, including interest payments on the foreign debt. This is a precondition for ensuring that the liquidity effects of central-government payments are neutralised. Although the issue of domestic government securities exceeds the domestic deficit the liquidity effect is neutralised by the Nationalbank's purchases of foreign currency in the market to finance the central government's current interest payments on the foreign debt. The norm for domestic borrowing must be fulfilled within each year. The timing of domestic issuance during the year takes account of the market situation and the balance of the central government's account with the Nationalbank. As a consequence of Article 104 of the Maastricht Treaty which prohibits monetary financing the balance of the central government's account with the Nationalbank must be positive at all times.

The norm for foreign borrowing states that the central government’s redemptions on the foreign debt, including securities bought back from the market and early redemptions, are normally refinanced by foreign borrowing. Together the domestic and foreign norms ensure that the central government's total foreign payments do not affect the foreign-exchange reserve. The purpose of the central government's foreign borrowing is to maintain an adequate foreign-exchange reserve. Situations may arise where substantial amounts of foreign currency are required for intervention purposes or, conversely, where foreign-exchange receipts have swelled the foreign-exchange reserve. In these cases the norm for foreign borrowing may be waived. If the foreign-exchange reserve decreases more than required, the government will raise foreign loans. The foreign-exchange proceeds fall to the Nationalbank and the central government's account with the Nationalbank increases by the equivalent amount in kroner. If the foreign-exchange reserve increases by more than is required the norm for foreign borrowing can be reduced provided that the balance on the central government's account with the Nationalbank leaves scope for such a reduction.

The norm for domestic borrowing must be fulfilled within each year. Planning of sales of domestic government securities during the year takes into account the conditions in the financial markets and the balance of the central government's account with the Nationalbank. As Chart 1.3.2 shows, there is considerable day-to-day fluctuation in the balance of the central government's account. However, the restructuring of VAT payments as of 1 April 1999 will reduce fluctuations in relation to previous levels.

In practice there are minor deviations between the total domestic gross borrowing requirement for the year and actual sales of domestic government securities. These deviations are due primarily to the fact that the gross borrowing requirement is not known until the end of the year, i.e. after sale of government securities has closed. Box 1.3 presents the calculation of the gross borrowing requirement.

THE GROSS DOMESTIC BORROWING REQUIREMENT — Box 1.3

The gross domestic borrowing requirement is defined as:

– Payments to the central government
+ Disbursements by the central government
= *(+) Net borrowing requirement / (–) Net placement requirement*
+ Ordinary redemptions on the domestic government debt
+ Buy-backs of domestic government securities with maturity in coming years
+ Net bond purchases by the Social Pension Fund at market value
= *Gross domestic borrowing requirement*

Disbursements by the central government include the value in kroner of the central government's current foreign-exchange expenditure as interest and transfers, but not exchange-rate adjustments of the debt. Redemption and buy-back of Treasury bills are not included in the gross borrowing requirement. Sales of Treasury bills are calculated on a net basis, i.e. redemptions and buy-backs are deducted from gross sales. The sale requirement for the year of government bonds and Treasury notes is the gross domestic borrowing requirement with addition of net sales of Treasury bills. Sales of government securities during the year are matched to the estimated gross borrowing requirement published in the budgetary reviews of the Ministry of Finance. The estimated payments to and disbursements by the government may deviate from the actual borrowing requirement. Sales up to the turn of the year are therefore determined on the basis of the Nationalbank's calculation of the impact of central-government finances on the net position of the banks. This calculation is also the basis for compliance with the norm for domestic borrowing, cf. the description in Box 1.2. The Nationalbank's estimate of the monthly distribution of central-government payments can be found at www.nationalbanken.dk under "Markets".

Strategy for borrowing on the domestic and foreign markets

There are significant differences in the central government's method of borrowing in respectively Denmark and abroad. The central government plays a dominant role in the domestic market, while on foreign markets the Kingdom of Denmark is a minor borrower among many others who can act without affecting market conditions.

Domestic borrowing takes place via the trading systems of the Copenhagen Stock Exchange. Bond issues take place as current sales on tap in a number of the government bond series (current issues open for sale).

It is sought to keep borrowing costs at a minimum by quickly building up a small number of bond series (benchmark securities) to a relatively large amount in the internationally most important maturity segments. Benchmark securities are issued in the short (2-3 years), medium (approximately 5 years) and long (approximately 10 years) segments of the market. Moreover short-term Treasury bills are also issued. The current issues open for sale thus consist of a relatively small number of internationally conforming bond series.

This strategy is based on the view that the leading investor groups are willing to pay a premium for benchmark issues in line with international standards which can be traded without affecting prices significantly. The central government hereby gains a liquidity premium entailing a lower interest rate than for issues in less liquid series.

Since the current issues open for sale cover various maturity segments the risk on the debt is reduced by spreading the redemptions over a number of years. Moreover, the various maturity segments in the current issues open for sale make it possible to take the market conditions in the various segments into account. If interest rates in the short-term segment are especially high as a consequence of e.g. temporary unrest issues can be moved to market segments which are not affected by the special conditions.

Foreign borrowing takes place primarily by raising small loans on advantageous terms for the "Kingdom of Denmark", the name used by the Danish central government on the international capital markets. Since the foreign borrowing requirement is only moderate the central government can wait for advantageous borrowing terms to emerge in the market. The fact that the "Kingdom of Denmark" has a very high credit rating is crucial to the borrowing terms offered to the central government for both domestic and foreign borrowing.

After 1 January 1999 the central government's foreign borrowing will predominantly be denominated in euro. However, the currency of an

advantageous borrowing opportunity is not the deciding factor since the loan terms can be adjusted via a swap to euro as the final currency of the loan. It is often the attractive conditions in the swap market that make it advantageous to borrow in a particular market. Evaluation of the borrowing terms must take into consideration that swap transactions entail a credit risk for the central government.

In recent years most loans have been raised as bullet issues at fixed interest rates. The tendency is thus for more simple loan structures than before to be applied to foreign borrowing by the central government. The objective is to reduce the risk.

In cases where the foreign-exchange reserve or the balance of the central government's account with the Nationalbank entail an immediate need to borrow foreign currency the central government may issue short-term Commercial Papers (CP). If necessary the CP programmes can also be used as bridge financing of a redeemed loan until a new loan is raised. The CP programmes can be activated at short notice to raise loans with maturities typically ranging between one week and up to one month.

RISK MANAGEMENT OF THE GOVERNMENT DEBT 1.4

Like other borrowers the central government is exposed to various borrowing risks. These include market risks such as interest-rate and exchange-rate risks, and credit risk. Other risks are related to e.g. the risk of errors in the administration of the debt by oneself or the counterparty.

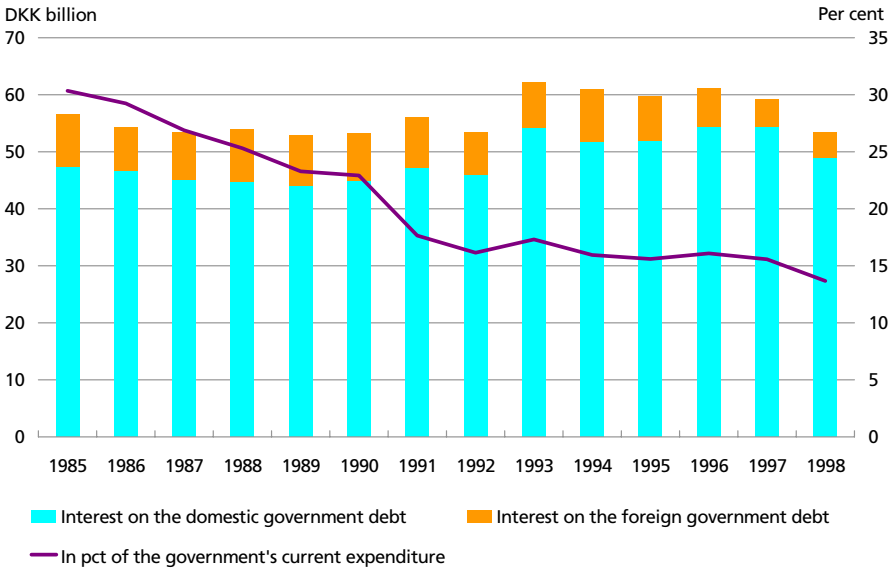
Interest-rate risk

The cost of borrowing is determined by the future development in interest rates. The interest-rate risk to the central government is the risk entailed by covering the borrowing requirement by borrowing on future dates at unknown market interest rates. A short-term debt will normally entail a higher interest-rate risk than a debt with a longer maturity.

As Chart 1.4.1 shows, interest on the government debt is a very large element of government expenditure. Fluctuating interest costs thus affect the fiscal-policy scope. In this respect both the long-term level of interest costs and the year-on-year fluctuations are of significance.

The interest-rate risk can be divided into a general and a specific risk. The specific risk is also called the refinancing risk. The general risk is related to uncertainty concerning the future market interest rates. The refinancing risk is the risk of the central government's borrowing costs increasing in relation to the ordinary market interest rates.

INTEREST ON THE GOVERNMENT DEBT 1985-98 Chart 1.4.1



Note: For 1998 interest as a percentage of the central government's current expenditure is based on estimates, cf. the Budgetary Review of the Ministry of Finance, 3 December 1998.

The interest-rate risk is calculated using 3 different measures: duration, the stability of the redemption profile and Cost-at-Risk (CaR), cf. Chapter 7 of STATENS LÅNTAGNING OG GÆLD 1997 (Danish government borrowing and debt). This chapter is available in an English version on the website www.nationalbanken.dk. Duration and the stability of the redemption profile are used as measures of the interest-rate risk for both the domestic and foreign debt, while for the time being CaR is applied solely to the domestic debt.

Duration, redemption profile and CaR each in their own way illustrate different aspects of the central government's exposure to interest-rate changes, cf. Box 1.4. The measures supplement each other when the framework for the central government's interest-rate risk is determined.

The interest-rate risk is managed by a *duration band* which sets the limits for duration. Duration bands have been fixed for both the domestic and foreign debt. The band for the domestic debt is 4 years $\pm$ 0.5 year. The band for the foreign debt is 2.5 years $\pm$ 0.5 year. At the end of 1998 the duration of the domestic and foreign debt was respectively 4.4 and 2.0 years. The total duration of the debt was 4.1 years, cf. Table 1.4.1.

Management of the interest-rate risk takes the duration of the total debt into account. It may thus be appropriate to accommodate a wish to adjust the duration of the total debt by changing the duration of either

MEASURES OF THE INTEREST-RATE RISK ON THE GOVERNMENT DEBT Box 1.4

The interest-rate risk on the government debt is calculated using three different risk measures: the duration of the debt, the stability of the redemption profile and the Cost-at-Risk.

The duration of the government debt is calculated as Macaulay duration (V_{Mac}). This is defined as:

$$V_{Mac}(s, i_s) = \sum_t (t - s) \frac{C_t (1 + i_s)^{-(t-s)}}{\sum_u C_u (1 + i_s)^{-(u-s)}}$$

where s is today, i_s is a discount rate, and t is the time of the future payment C_t.

Duration indicates the average fixed interest period of the debt. The longer the duration, the longer the time it will take for the debt to adjust to the current interest-rate level. Longer duration gives a lower risk on the debt, since on average smaller elements of the government debt are adjusted to the current level of interest rates. Long duration thus typically entails a low variation in the annual interest expenditure on the government debt.

Duration is an average measure of the interest-rate risk and does not indicate the spread of the payments on the debt. A duration of 4 years can be achieved with one single loan of 4 years' duration and by a combination of e.g. 75 per cent of the debt in loans with 2 years' duration and 25 per cent in securities with a duration of 10 years. Duration is thus in principle not a suitable measure of the refinancing risk on the debt.

A *stable redemption profile* reduces the risk of interest adjustment of the debt taking place in a period of especially high interest rates. The redemption profile is therefore of significance to the interest-rate risk. The refinancing risk is measured by the distribution of the future redemptions on the debt. The smoother the redemption profile, the lower the refinancing risk.

To supplement duration and the redemption profile a *Cost-at-Risk (CaR)* measure is used to calculate the interest-rate risk on the debt. For the domestic government debt absolute CaR is calculated as the maximum interest cost which can be expected with a 95 per cent probability. Relative CaR is calculated as the difference between absolute CaR and the average interest costs. Relative CaR is thus a measure of the maximum increase in interest costs that can be expected with a 95 per cent probability.

CaR is calculated in a model to which the input is the future development in the borrowing requirement, the maturity distribution of borrowing and market interest rates. CaR is thus not an objective risk measure. The results depend on the model specifications and the assumptions concerning e.g. the volatility of interest rates and time horizon used in the model.

CaR is a concept developed by the Nationalbank. A more detailed account is given in Chapter 7 of STATENS LÅNTAGNING OG GÆLD 1997 (Danish government borrowing and debt). An extract in English can be found at www.nationalbanken.dk.

DURATION OF THE GOVERNMENT DEBT — Table 1.4.1

Year	End-1998
Domestic debt	4.4
Foreign debt	2.0
Total duration	4.1

Note: Duration is cumulative so that the total duration of the debt is calculated as the weighted sum of the individual components.

the domestic or foreign debt. Work is being done to include central-government assets such as the central government's account with the Nationalbank, and the Social Pension Fund, in the management of duration. Inclusion of these assets will provide a more true and fair view of the exposure of the government debt to changes in interest rates.

The refinancing risk of both the domestic and foreign debt is managed by ensuring that the *redemption profile* is fixed so that a constant proportion of the debt is redeemed each year. This target is reached in different ways for the domestic and the foreign debt respectively, which reflects the diverging issuing strategies.

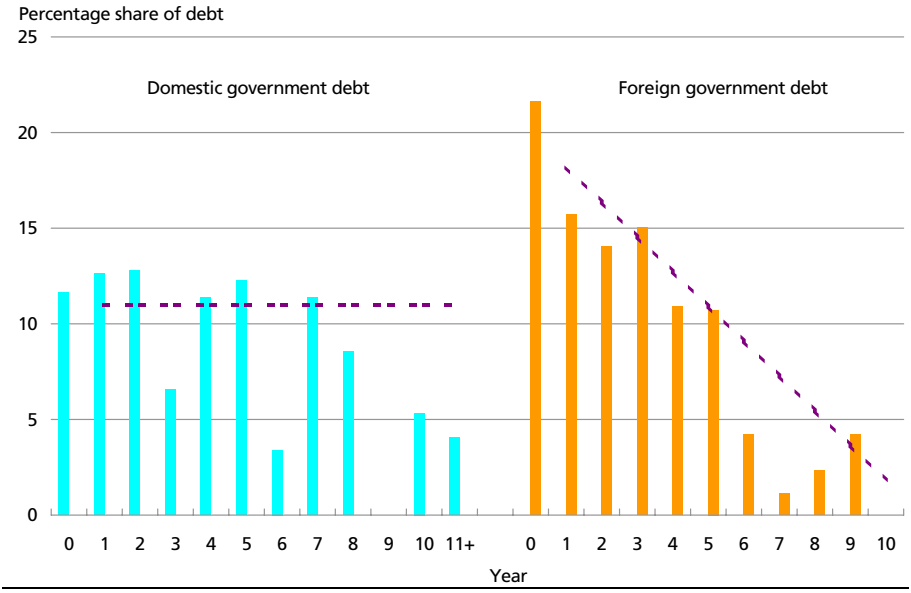
For the domestic debt a target maximum redemption amount in individual years is aimed at. Due to the wish to also build up liquid benchmark series in the longer maturity segments current borrowing is undertaken up to the target in the relevant segments of the curve, cf. Chart 1.4.2. The gaps are filled up over time with new issues.

It is also possible to limit the refinancing risk by other means than via issuing activity. Government securities are thus bought back before maturity in order to limit the refinancing risk within a year or between years.

The foreign government debt is managed by aiming at a target for the redemption profile of the debt, which declines with remaining maturity. The target aimed at for the redemption profile is fixed so that the loans which are redeemed in a given year (year "0" in Chart 1.4.2) are to be refinanced by issues in the maturity segments up to 10 years in which the framework was not filled out at the beginning of the year. The fixing of the target reflects that it is not possible to determine in advance in which maturity segments advantageous borrowing opportunities will arise.

The target which is aimed at is not determined rigorously and can be deviated from should the need arise. In cases where borrowing is particularly advantageous in certain maturity segments the principle ruling the distribution of borrowing can be waived.

REDEMPTION PROFILE AND TARGET FOR THE DOMESTIC AND FOREIGN GOVERNMENT DEBT, END-1998 Chart 1.4.2



Cost-at-Risk (CaR) is used as a supplementary measure in the management of the interest-rate risk on the debt. Both relative and absolute CaR measures are calculated for the domestic debt.

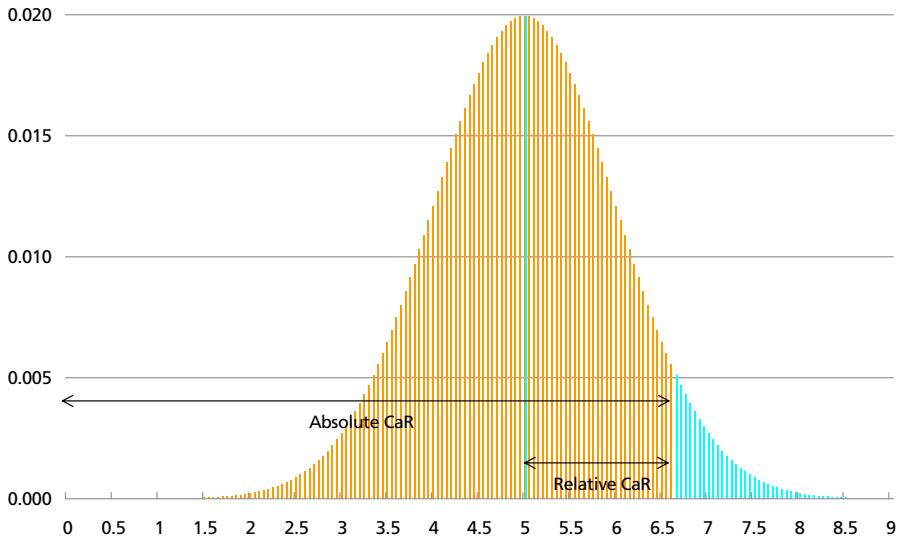
Chart 1.4.3 shows an example of a distribution of interest costs on a debt portfolio. In the example normal distribution of the interest costs around a mean value of DKK 5 billion with a standard deviation of DKK 1 billion is assumed.

The marked area of the right-hand "tail" in the distribution indicates the scale of the interest costs in the 5 per cent of cases where the interest costs are highest. With a probability of 95 per cent the interest costs will not exceed DKK 6.7 billion, which is the absolute CaR for the debt.

Relative CaR measures the difference between absolute CaR and the average interest costs. Relative CaR thereby indicates the amount above which the interest costs with 95 per cent probability will not increase. In the example relative CaR is DKK 1.7 billion.

CaR is a new risk measure which is still being developed by the Nationalbank. A level for CaR on the Danish government debt has therefore not yet been fixed. At present CaR is used more qualitatively in risk management to e.g. assess the consequences of various issuing strategies for the risk on the debt.

ABSOLUTE AND RELATIVE COST-AT-RISK, DKK BILLION Chart 1.4.3



Exchange-rate risk

The central government assumes an exchange-rate risk on its foreign borrowing. The exchange-rate risk is the risk that the debt will increase in value as a consequence of the development in exchange rates.

Since 1992 the exchange-rate risk on the debt has been subject to coordinated management with the Nationalbank's foreign assets in the foreign-exchange reserve. The background to the net management of the exchange-rate risk is that, as previously stated, the central government primarily raises foreign loans in order to ensure an adequate foreign-exchange reserve. There is thus a close relation between the central government's foreign liabilities and the Nationalbank's foreign assets.

At quarterly meetings of the Ministry of Finance, the Ministry of Economic Affairs and the Nationalbank a distribution of the currencies of the net liabilities is fixed. This distribution is the benchmark for the currency distribution of the net assets.

On determining the benchmark the expected revenues such as income from interest and exchange-rate gains/losses are weighed against the expected risk on the debt.

With net liabilities or net assets which deviate from zero it is unavoidable that the central government and the Nationalbank taken as one will have an exchange-rate risk. However, the exchange-rate risk is reduced by holding the net position in currencies against which the Danish krone is stable.

As from 1 January 1999 the Danish fixed-exchange-rate policy has been continued within the ERM II arrangement. The fixed-exchange-rate policy is based on maintaining a stable krone rate against the euro. A benchmark which solely comprises positions in EUR is considered to be the risk-minimising benchmark with the lowest possible exchange-rate risk. Before 1 January 1999 the risk-minimising benchmark comprised positions in DEM.

When the actual benchmark is determined at the government debt meetings one consideration is a weighing of the exchange-rate risk against interest costs.[1]

If the interest rate of a non-euro country is below the euro interest rate the central government and the Nationalbank will in overall terms be able to achieve an interest saving by holding some of the net liabilities in the relevant currency. On the other hand, the exchange-rate risk will increase. Risk and interest-rate levels (including long-term exchange-rate expectations) are weighed against each other on the basis of a portfolio model. The difference between the actual benchmark and the risk-minimising benchmark can be described as a strategic position taken at the government debt meeting.

The benchmark is fixed as an absolute distribution measured in krone terms. In its day-to-day administration the Nationalbank may take positions in relation to the benchmark within a fluctuation band of DKK $\pm$ 2.5 billion in each currency. In the event of foreign-exchange unrest and considerable intervention in the foreign-exchange market the management according to the benchmark may be temporarily suspended.

The composition and performance of the benchmark are described in more detail in Chapter 4.

Credit risk

In relation to the government debt the central government is exposed to credit risk in connection with interest-rate and currency swap transactions.

Since a swap is an agreement between two parties to exchange payments during a specific period there is a risk that the counterparty cannot or will not fulfil the commitments. Even though in such case the central government is not obliged to fulfil its commitments either, the central government will nonetheless suffer a loss. It is this credit risk which must be calculated and managed.

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[1] The exchange-rate risk on the benchmark is calculated by Value-at-Risk (VaR), which indicates the maximum exchange-rate loss on the benchmark with a given probability over a specific period. In practice as from 1 January 1999 VaR will be calculated as the maximum exchange-rate loss resulting from the development in the EUR rate against third-country currencies with a probability of 95 per cent.

The total credit exposure on swaps depends on both the actual market value, which is zero on the date of the swap transaction, and the future value of the swap (the potential market value). This potential market value is included in the management of the credit risk from the time that the swap is entered into.

The Nationalbank uses a swap limit system to manage the risk on the swap portfolio. The swap limit system is based on the allocation of lines to counterparties on the basis of credit agency ratings. The central government only concludes swap contracts with counterparties holding a rating of AA- or higher. For interest-rate swaps in Danish kroner the minimum requirement has been relaxed so that counterparties with a rating of A+, A or A- may also enter into this type of interest-rate swap transaction with the central government. The swap limit system is described in more detail in Chapter 9.

The aim is to further reduce the credit risk to the central government by concluding agreements whereby counterparties must provide collateral against the exposure under a swap agreement with the central government. If a central-government exposure to a counterparty exceeds a given limit the counterparty must deposit securities on a designated safekeeping account for a value equivalent to the excess exposure. In the event of breach of the original contract the securities may be realised by the central government to cover the counterparty's obligations.

Other risks

On raising loans the central government, like other major borrowers, assumes a number of other (non-quantifiable) risks. These include the risk of error in the management of the debt by oneself or others, but also the risk that the legal basis for e.g. swap contracts proves to be unsound. Furthermore, the central government may wish to avoid participating in certain types of loan scheme on ethical or political grounds.

Administrative errors can be prevented by segregation of the functions of the executive, control and registration elements of debt management. It is furthermore sought to use simple, well-known debt-management instruments.

The legal risk can be minimised by using contracts which are as standardised as possible. This principle is e.g. applied to swap contracts.

CHAPTER 2

Domestic Borrowing

SUMMARY 2.1

The conditions on the bond market and the terms for sale of government securities were generally favourable. From mid-August until mid-September conditions were influenced by the unrest affecting the financial markets in 1998.

Sales of government securities in 1998 totalled DKK 68.0 billion at market value, which is approximately DKK 5 billion less than in 1997. The duration of the domestic government debt was just over 4 years in 1998.

Sale of government securities in 1999 is based on the same overall guidelines as in recent years. The continuing objective is large, liquid series of government securities. The duration band used is still 4 years +/- ½ year. The gross domestic borrowing requirement is expected to be DKK 66 billion.

In 1998 interest-rate swaps in Danish kroner were introduced and interest-rate swap transactions in kroner will be continued in 1999.

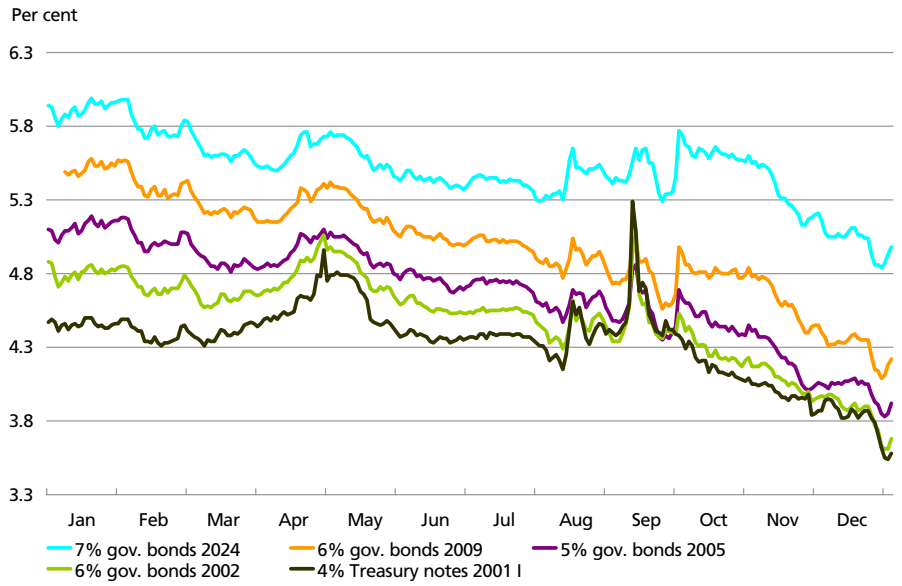
BOND MARKETS AND DEVELOPMENT IN INTEREST RATES IN 1998 2.2

The conditions on the bond market and the terms for sale of government securities were favourable in 1998. In both the USA and Germany long-term yields fell to historically low levels during 1998. At the close of 1998 the long-term German yield thus fell to below 4 per cent, while US long-term yields decreased to just over 4.5 per cent.

In connection with Russia's suspension of payments on its debt the international capital markets were affected by unrest in August and September. Towards the end of the year the development had returned to normal conditions.

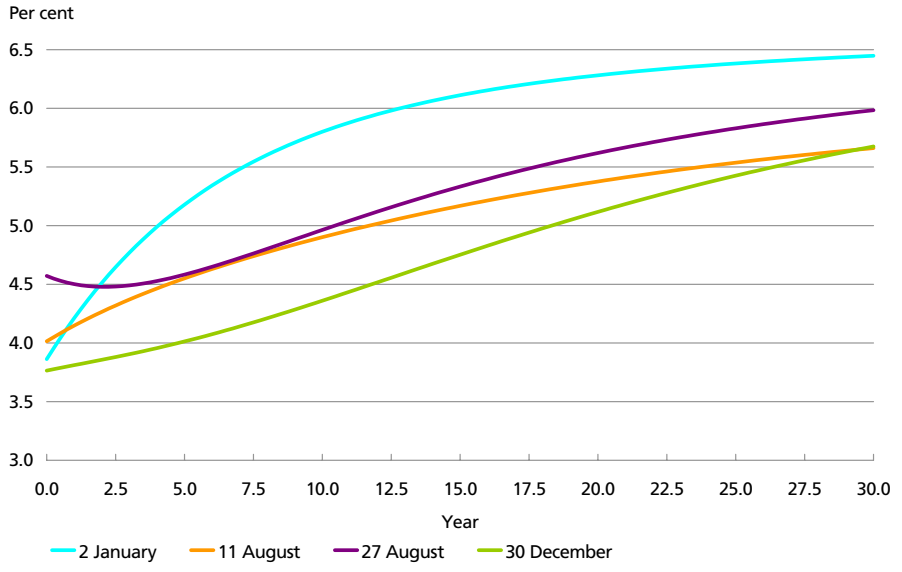
Yields on Danish bonds fluctuated in parallel with yields on the leading foreign bond markets. The yield on 10-year government bonds rose a little at the beginning of the year, but then declined, and as in Germany and the USA fell to historically low levels at end-1998.

YIELDS ON SELECTED DANISH GOVERNMENT SECURITIES IN 1998 Chart 2.2.1



In Denmark the unrest gave rise to greater volatility and a temporary increase in short-term yields. Chart 2.2.1 shows the development in the yields to maturity of selected government securities.

ESTIMATED ZERO-COUPON YIELD STRUCTURES, 1998 Chart 2.2.2



Note: The zero-coupon yield curve is an estimated curve of yields on zero-coupon bonds which shows the relation between yield and maturity at a given point in time.

THE 10-YEAR YIELD DIFFERENTIAL TO GERMANY, 1998 Chart 2.2.3

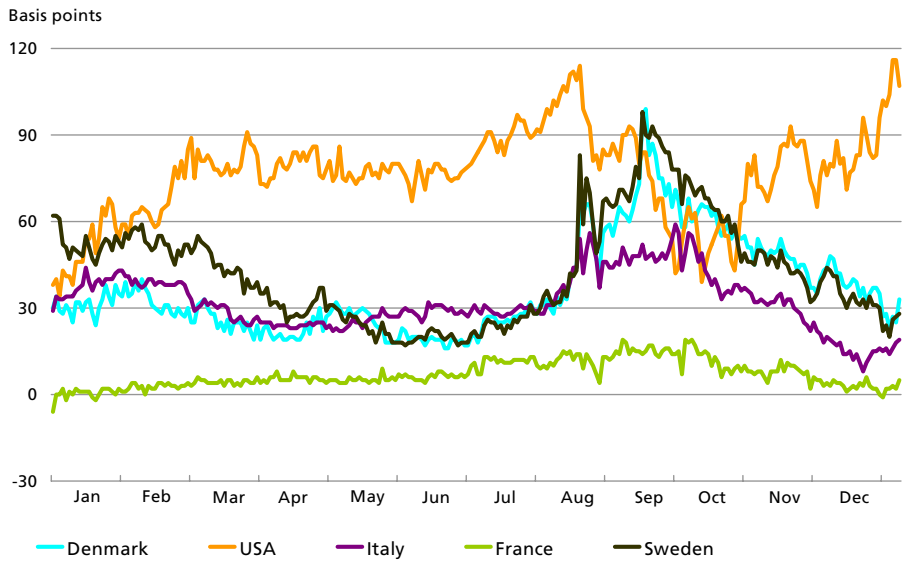


Chart 2.2.2 presents the development in the structure of zero-coupon yields. The yield curve flattened out during 1998 in step with the drop in long-term interest rates. During the unrest on the financial markets the yield curve was inverted for maturities of up to 5 years.

Chart 2.2.3 shows the development in the 10-year yield differential to Germany of selected countries. The development in the yield differentials of the Scandinavian countries was influenced by the unrest in August-September. In Denmark's case the yield differential to Germany briefly came close to 100 basis points, but then fell gradually during the following two months.

SALES OF GOVERNMENT SECURITIES IN 1998 2.3

In practice there are minor deviations between the gross domestic borrowing requirement and the sale of domestic government securities during the year. These deviations are related primarily to the fact that the actual gross borrowing requirement is not known until the end of the year, i.e. after sales of government securities have closed.

The central government's gross domestic borrowing requirement was DKK 64.4 billion, cf. Table 2.3.1. Sales of domestic government securities in 1998 were DKK 68.0 billion at market value, implying a surplus sale of DKK 3.6 billion, cf. Table 2.3.2.

The planning of sales during the year takes several factors into account, which must be weighed against each other. It is sought to

THE CENTRAL GOVERNMENT'S CIL, NET AND GROSS DEFICIT (CASH BASIS) Table 2.3.1

DKK billion	1995	1996	1997	1998
Current, investment and lending budget	- 31.3	- 21.5	7.6	22.9
Net bond purchases[1]	- 11.5	- 4.4	- 6.5	-
Re-lending of government loans	- 1.6	- 1.4	- 0.8	- 0.2
Distributed capital losses on issue	5.7	7.4	5.1	4.1
Other capital items	0.1	0.4	0,8	- 0.8
Net cash balance	- 38.5	- 19.5	12,7	26.0
Redemption of domestic government debt				
Government bonds	48.4	38.7	28.1	56.7
- of which bought back for cancellation	(2.9)	(0.1)	(14.2)	(21.1)
Treasury notes	56.1	38.0	53.3	21.2
- of which bought back for cancellation	(5.0)	(0.7)	(12.0)	(0.0)
Redemptions on foreign government debt	28.5	30.8	31.4	37.4
Gross deficit (cash basis)	- 171.5	- 126.9	- 100.1	- 89.3
Gross domestic borrowing requirement[2]	138.8	94.7	73.8	64.4

Source: 1995-97 are figures from the central-government accounts. Provisional figures are given for 1998 based on the Budgetary Review 3-98, the Nationalbank's press release and the central-government accounts.

[1] As from 1998 net bond purchases as part of the government debt management and by the Social Pension Fund are no longer included in the net deficit. As from 1998 net bond purchases by the Social Pension Fund are included in the redemptions of the domestic government debt.

[2] Calculated at year-end. The figures may therefore deviate from the accounting figures.

distribute sales of government securities relatively evenly throughout the year. The refinancing of a large government securities series is therefore not concentrated around the redemption date, but spread throughout the year.

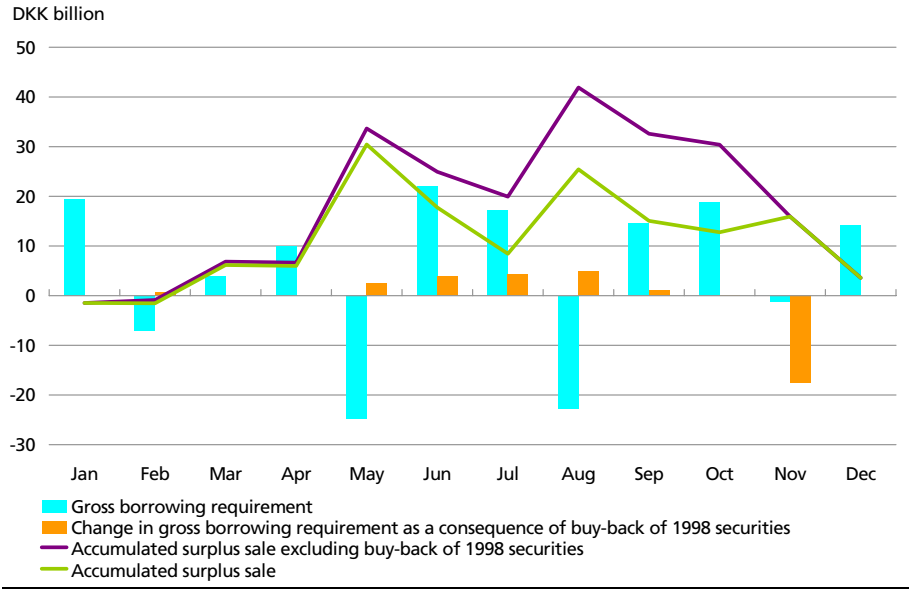
Another concern is that the accumulated surplus sale, i.e. sales of government securities less the domestic borrowing requirement accumulated from the beginning of the year, should not be disproportionately large (either positive or negative). Since the borrowing requirement varies quite considerably from one month to the next fluctuation in the accumulated surplus sale cannot be avoided.

The distribution of sales over the year also depends on the market conditions. It is taken into account that sales of government securities in unfavourable markets can have a certain self-reinforcing effect on market conditions.

SALE OF DOMESTIC GOVERNMENT SECURITIES Table 2.3.2

DKK billion	1995	1996	1997	1998
Sale of government securities, market value	137.2	96.0	73.0	68.0
Gross domestic borrowing requirement	138.8	94.7	73.8	64.4
Difference	- 1.6	1.2	- 0.8	3.6

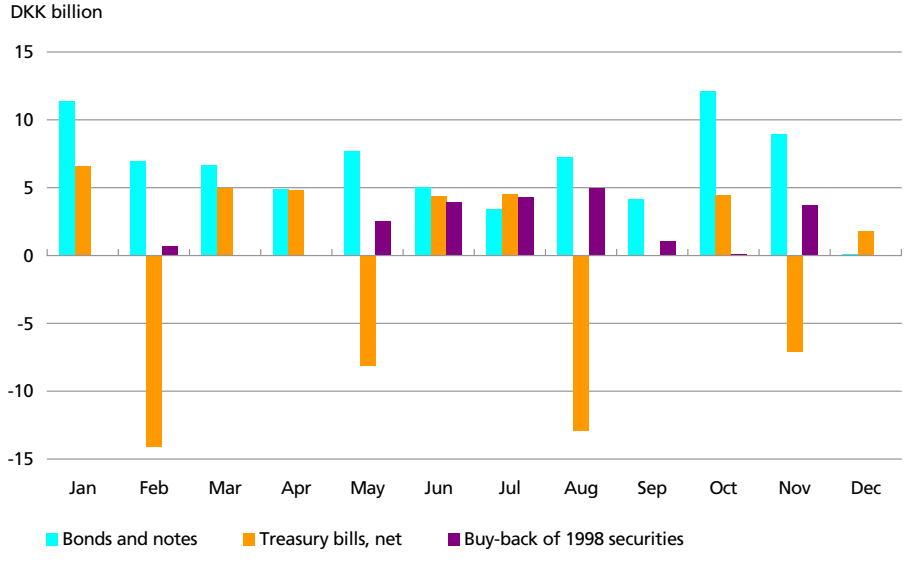
BUY-BACK OF SECURITIES MATURING IN 1998 AND EFFECT ON THE GROSS DOMESTIC FINANCING REQUIREMENT AND ACC. SURPLUS SALE, 1998 Chart 2.3.1



Note: Sales of Treasury bills are calculated on a net basis so that Treasury bills maturing in 1999 bought back in December do not affect the calculation of the gross borrowing requirement. See Box 1.3 for further details.

A further consideration is that the balance of the central government's account with the Nationalbank must always be positive. The requirement to take this balance into account meant that sales to some extent

SALE AND BUY-BACK OF GOVERNMENT SECURITIES BY MONTH, 1998 Chart 2.3.2



were brought forward during the year, and that planned buy-backs in September and October were deferred. Chart 2.3.1 shows the effect on the gross borrowing requirement and the accumulated surplus sale of the 1998 securities buy-backs. It is shown that buy-backs of 1998 securities both reduced the accumulated surplus sale and brought the gross borrowing requirement forward from November to the preceding months. Chart 2.3.2 presents the monthly distribution of government securities sales and buy-backs.

GOVERNMENT DEBT INSTRUMENTS IN 1998 2.4

Government borrowing takes place through the issue of bonds, Treasury notes and Treasury bills. In 1998 interest-rate swaps were introduced as an instrument for management of the domestic government debt. The use of interest-rate swaps is described in Chapter 8.

The securities in which issues take place are the current domestic issues open for sale. The issues of bonds and Treasury notes are divided into three segments. The long-term segment comprises series with maturities

DOMESTIC GOVERNMENT SECURITIES IN 1998 Table 2.4.1

DKK million	Issue			Nominal outstanding amount, end-1998
	Nominal value	Market value	Capital loss	
7% government bonds 2024	500	587	- 87	24,875
6% government bonds 2009	32,725	35,062	- 2,337	32,275
5% government bonds 2005	2,960	2,989	- 29	20,750
6% government bonds 2002	8,955	9,447	- 492	38,907
Fixed-interest-rate bonds, total	45,140	48,085	- 2,945	
4%Treasury notes 2001 I	30,890	30,581	309	30,890
Treasury notes, total	30,890	30,581	309	
Bonds and Treasury notes, total	76,030	78,666	- 2,636	
Treasury bills 1999 III	11,385	11,048	337	11,385
Treasury bills 1999 II	15,390	14,999	391	15,390
Treasury bills 1999 I	19,085	18,657	428	14,480
Treasury bills 1998 IV	21,571	21,090	481	
Treasury bills 1998 III	16,155	15,881	274	
Treasury bills 1998 II	4,615	4,561	54	
Redemptions[1)]	96,947	96,927		
Treasury bills, net	- 8,746	- 10,692	- 20	
Sales of government securities, total	67,284	67,974	- 690	

[1)] Including extraordinary redemptions in connection with buy-back.

of respectively 10 and 30 years, the medium-term segment is series with maturities of approximately 5 years, and the short-term segment is series with maturities of approximately 2 years. Bonds are issued in the long-term and medium-term segments, while Treasury notes are issued in the short-term segment. Furthermore Treasury bills are issued with a maturity of 9 months on opening. Table 2.4.1 shows the issues of the various securities.

The borrowing in each segment is described below, followed by an account of the use of buy-backs and interest-rate swaps in 1998.

The long-term segment

The series in the 10-year segment are built up over a period of 2 years to an outstanding amount of DKK 50-60 billion. The most important issue in this segment in 1998 was 6 per cent government bonds 2009, which opened on 14 January 1998. Issues in this series amounted to DKK 35.0 billion at market value in 1998. The relatively large issue in one single year was to ensure sufficient liquidity. The securities lending arrangement for 6 per cent government bonds 2009 lapsed on 21 April when the series reached a volume of DKK 15 billion. Box 2.1 sets out the general terms of the securities lending arrangement.

The second current issue open for sale in the long-term segment was 7 per cent government bonds 2024, which was introduced in 1994 and has since been open for issue. The long maturity of this series has contributed to greater flexibility in the management of the duration and to

SECURITIES LENDING ARRANGEMENT FOR NEW GOVERNMENT SECURITIES Box 2.1

In order to improve the liquidity of new government securities issues a securities lending arrangement for new government securities issues was established in January 1998. As the fiscal agent of the central government Danmarks Nationalbank handles the practical aspects of the operation of the arrangement.

Lending takes place in new issues of government bonds and Treasury notes. The detailed terms of lending of new securities are announced prior to the opening of the series. The maximum lending is fixed at DKK 15 billion. There is a limit to the number of lending arrangements for each series. The fee charged for use of the arrangement is an incentive to market participants to reserve the arrangement for special circumstances. If considered appropriate no lending arrangement is established for a new securities issue.

Securities brokers authorised to trade on the Copenhagen Stock Exchange may borrow the newly-issued government securities for up to one week. Other government securities must be furnished as collateral for the borrowed securities. The lending agreements are transacted as repurchase agreements.

adapting the market for Danish government securities to foreign markets. Issues in the 30-year bond series are at a significantly lower pace than in the 5- and 10-year series. In 1998 issues in this series amounted to DKK 587 million at market value. The low rate of issue is due to the wish to maintain the duration band of 4 years +/- ½ and to the goal of building up the outstanding volume of 6 per cent government bonds 2009. Although the outstanding volume of 7 per cent government bonds 2024 is just below DKK 25 billion it is a relatively liquid series due to its non-resident ownership.

The medium-term segment

In recent years the series in the 5-year segment have been built up to DKK 40-50 billion per series over a period of 1½-2 years. In 1998 6 per cent government bonds 2002 and 5 per cent government bonds 2005 were part of the medium-term segment of the current issues open for sale. In 1998 sales of 5 per cent government bonds 2005 were DKK 3 billion at market value, while sales of 6 per cent government bonds 2002 were DKK 9.5 billion. Sales of 6 per cent government bonds 2002 were discontinued as of 1 January 1999, while sales of 5 per cent government bonds 2005 continue in 1999.

Due to its low coupon rate 5 per cent government bonds 2005 was previously an attractive government security. In 1999 it is the only government series in the medium-term segment.

The short-term segment

In the short-term segment Treasury notes with maturities of up to 3 years are sold. In recent years the outstanding volume of Treasury notes

FIXING OF COUPON RATES — Box 2.2

The coupon rates of government bonds and Treasury notes are fixed so that the securities comply with the minimum coupon requirements of the Capital Gains Act. Capital gains on the bonds are thus tax-exempt for private investors subject to ordinary Danish taxation.

When a series opens it is sought to hold the price at or just below 100 (par). As far as possible the securities must be resilient to any increase in the minimum coupon rate, since premature closure of a series as a consequence of a higher minimum coupon rate would prevent the bond series from being built up to the outstanding volume anticipated when the series opened. Moreover the required liquidity premium on the loan would not be achieved either.

Treasury bills are zero-coupon securities where interest payments are included in the calculation of the price at issue.

HOW GOVERNMENT BONDS AND TREASURY NOTES ARE SOLD Box 2.3

Government securities are sold via the Copenhagen Stock Exchange. All members of the Copenhagen Stock Exchange may purchase government securities directly from the Nationalbank via the Stock Exchange trading systems.

Government bonds and Treasury notes are issued by tap sale in the market. This method entails that government securities are sold on tap when there is a borrowing requirement and the markets are favourable. The Nationalbank conducts tap sales so as to avoid creating or amplifying market trends. Normally the Nationalbank does not underbid itself within the same day or within a period of a few days. The objective is to avoid creating or stimulating negative trends in the market. In the same way it is sought to achieve transparency of tap sales. On a daily basis details are published of sales of government securities on the previous day, cf. Box 2.5.

The procedure for opening new series of government bonds and Treasury notes is that 1-2 weeks before the issue opens details of the new loan stating the coupon rate, maturity and opening date are published via the Copenhagen Stock Exchange. Before the opening day an announcement is published with details of the initial opening volume and the maximum amount for sale on the opening day. The opening price is fixed on the basis of the structure of zero-coupon rates, experience from previous openings of government-securities issues and the current market conditions. Fixing a maximum amount for sale on the opening day ensures that if demand is very high sale can be interrupted without it being necessary to raise the price to a level which could impede sale on the following days. The announced maximum sale amount also gives market participants greater certainty concerning the course of sale on the opening day. The stated maximum does not reflect a required target for sale on the opening day, but indicates the upper limit for sale.

In addition to sale to the professional market participants government securities are also sold directly to private individuals as post order sales which are handled by the Danish Financial Administration Agency. The purpose of post order sale is to give private investors the opportunity to purchase bonds at the lowest possible cost, but so that the scheme pays for itself. Bonds are bought by sending in an order form and at the same time paying in the amount to the giro account of the Financial Administration Agency. The form and payment card are presented in a brochure issued through post offices and libraries. In 1998 post order sales of government bonds amounted to DKK 185 million, compared to DKK 425 million in 1997. The Agency also handles administration of lottery bonds. Up to 1 January 1999 the Financial Administration Agency was called the Mortgage Bank of the Kingdom of Denmark.

has ranged between DKK 13 and 35 billion in each series. It is sought to make regular new issues in the short-term segment.

On 7 January 1998 the 4 per cent Treasury notes 2001 I was opened for issue. The opening maturity was just over 3 years. Issues in this series

were almost DKK 31 billion at market value in 1998. The purpose of the relatively large issue was both to ensure sufficient liquidity and to compensate for the low sale of Treasury bills at the auctions in September and October, cf. below. The securities lending arrangement in 4 per cent Treasury notes 2001 I lapsed on 26 May 1998 when the series reached DKK 10 billion.

Treasury bills

Treasury bills are the most short-term domestic government securities. They are sold by auction and issued with an opening maturity of 9 months. Four times a year a new Treasury bill series is opened. It is kept open for issue until 3 months before maturity.

Treasury bills are zero-coupon securities which means that the interest payments are not based on the coupon rate but are included in the price at issue.

The Treasury bill series are normally built up to an outstanding volume of around DKK 20 billion per series. With due consideration of market conditions, it is sought to achieve a relatively stable volume of Treasury bills.

In 1998 the gross sale of Treasury bills in nominal terms was DKK 88.2 billion, while net sales at market value including buy-backs were DKK -10.7 billion , cf. Table 2.4.1. The outstanding nominal amount has thus

TREASURY BILL AUCTIONS — Box 2.4

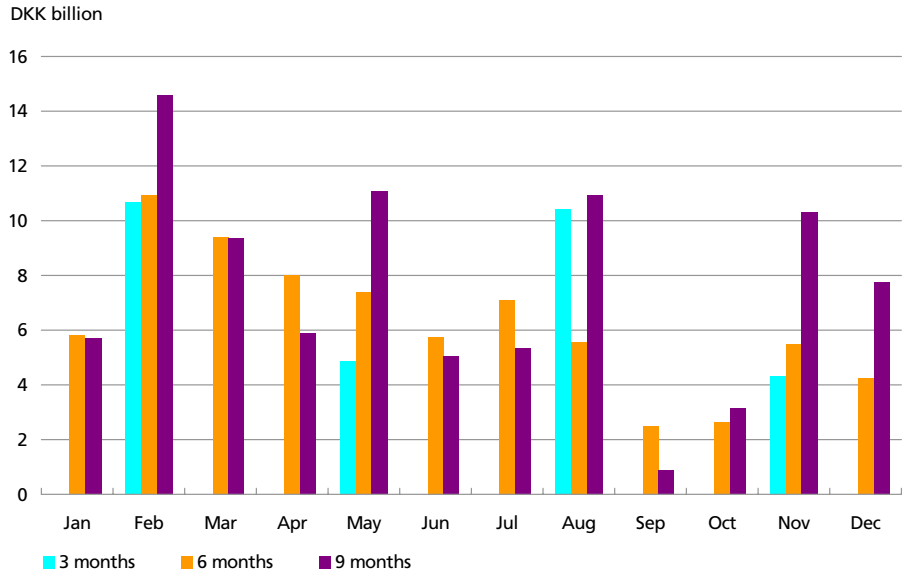
Treasury bills are sold at monthly auctions. The short maturity of the Treasury bills means that series are built up over a short period so that auction is found to be the most appropriate method of sale.

At the auctions bids are made for interest rates. All bids at or below the fixed cut-off interest rate are met at the cut-off interest rate. Proportional allocation to bids at the cut-off interest rate may be made.

On the fixing of the cut-off interest rate, price and volume are weighed against each other in relation to the sales requirement. Account is also taken of the current interest rates on the money market and the market for Treasury bills.

Since December 1997 submission of bids, enquiries concerning auction allocations, etc. have been made via the new electronic auction system. The background to the introduction of the auction system was the need to reduce the time between submission of bids and publication of the auction result, and the requirement of simplified administration of the auctions. With effect from the end of February 1998 the time between submission of bids and publication of the auction result was reduced to 1 hour, in contrast to the previous 2½ hours. The auction method, including the fixing of cut-off interest rates, is unchanged after the introduction of the electronic auction system.

BID AMOUNTS AT TREASURY BILL AUCTIONS IN 1998 Chart 2.4.1



decreased from around DKK 50 billion at the beginning of 1998 to just over DKK 40 billion at the close of the year.

The amounts bid fluctuated considerably, cf. Chart 2.4.1. Note that the market unrest resulted in very low bids at the September and October auctions.

ACCEPTANCE RATES AT TREASURY BILL AUCTIONS IN 1998 Chart 2.4.2

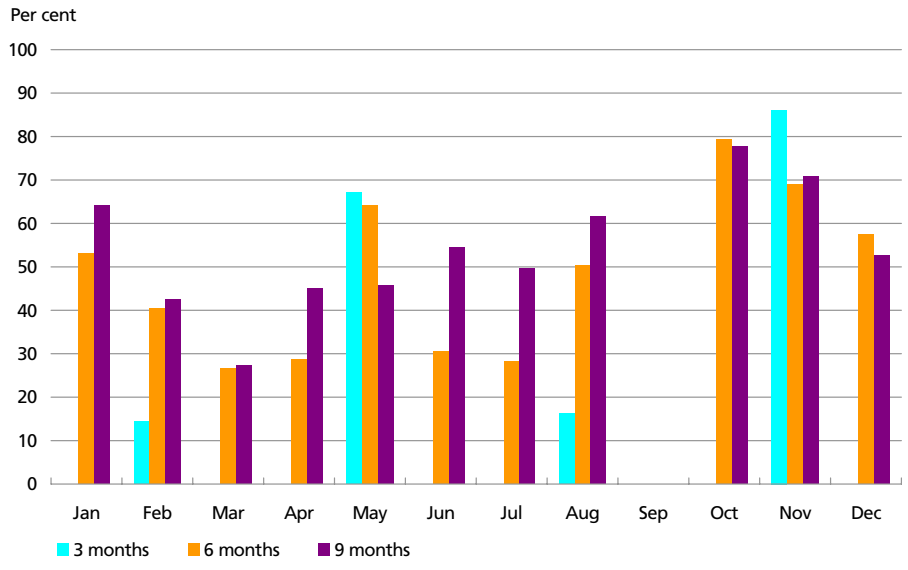


Chart 2.4.2 shows the acceptance rates at the auctions, i.e. accepted bids in relation to total bids. Apart from the auction in September the interest rates bid were in accordance with the market interest rates at the time of auction. At the September auction the interest rates bid were 25-45 basis points above the market interest rates on the auction date. For this reason there were no sales at the auction.

Securities other than current issues open for sale

Besides current issues open for sale there are various older bond series in which issues have closed, although bonds are still in circulation.

These are primarily previous current issues with a large total outstanding volume. Furthermore there are a number of serial loans, floating-rate government bonds, perpetual bonds and lottery bonds. Table 4 of the Appendix of Tables presents an overview of domestic government loans.

Loan categories no longer included in current issues open for sale maturing in 1998 are the floating-rate government bonds 1998 (DKK 5.5 billion), the lottery bond series 1948-98 (DKK 100 million) and the lottery bond series 1959-98 (DKK 100 million).

On 12 January 1998 the Mortgage Bank announced that it would not extend lottery bond loans on maturity. The lottery bonds were issued in the period 1948-80 and fall due in the period 1998-2010.

Buy-back

In recent years the main objective of buying back domestic government securities has been to equalise the central government's domestic borrowing requirement within one year or between two years.

The central government buys back securities when bonds are priced below the level on new borrowing. As a general rule the bonds which are bought back are cancelled immediately thereafter.

If securities due for ordinary redemption in the same year are bought back the borrowing requirement during that year is moved forward. The purpose of these buy-backs is to equalise the refinancing of loans maturing during the year and also to reduce the accumulated surplus sale. In order to meet these requirements 9 per cent government bonds 1998 were bought back from the market, cf. Table 2.4.2.

BUY-BACK OF DOMESTIC GOVERNMENT SECURITIES IN 1998 Table 2.4.2

Unit	Repurchase		Outstanding amount at end-1998
	Nominal value	Market value	
9% government bonds 1998	21,050	21,326	0
Treasury bills 1999 I	4,605	4,585	14,480

If securities due for ordinary redemption in a following year are bought back the borrowing requirement is moved forward to the buy-back year. The main consideration is to smooth out the redemption burden from year to year and thereby to reduce the interest-rate and refinancing risk. Buy-backs at the end of the year can be used to adjust sales of government securities to the borrowing requirement. The buy-backs of Treasury bills 1999 I towards the end of 1998 fulfilled this requirement.

Domestic interest-rate swaps

In 1998 interest-rate swaps in Danish kroner were introduced as an instrument for management of the domestic government debt. The objective is to improve the basis for separation of issues in liquid bond series from the management of the interest-rate and refinancing risk on the government debt. Using interest-rate swaps improves opportunities to manage the duration of the debt while also utilising the central government's relative advantage of long-term borrowing. Domestic interest-rate swaps are described in more detail in Chapter 8.

In 1998 there were interest-rate swap transactions for a notional value of DKK 500 million. These are swaps whereby the central government assumes the obligation to pay a short-term interest rate, while the counterparty enters the obligation to pay a long-term interest rate. Interest-rate swaps in Danish kroner will continue to be transacted in 1999. As of January 1999 interest-rate swaps for DKK 500 million had been transacted.

The central government's location-swap facility

The central government's location-swap facility was discontinued as of 1 April 1998. The purpose of the facility was to make it possible to transfer government bonds between the Danish Securities Centre (VP) and Euroclear without loss of value days. After the commissioning of a new Securities Centre system and improvements in the connection to Euroclear the location-swap facility is no longer required.

INTEREST-RATE AND REFINANCING RISK 2.5

The overall management of the interest-rate and refinancing risk on the domestic government debt is based on objectives concerning the duration and redemption profile of the debt and the size of Cost-at-Risk, cf. Chapter 1.

Duration

At the close of 1998 the duration was 4.4 years, cf. Table 2.5.1. Duration is calculated as Macaulay duration.

DURATION AND AVERAGE REMAINING MATURITY, YEAR-END — Table 2.5.1

Year	Duration	Average remaining maturity
1990	2.4	4.4
1991	2.3	3.6
1992	2.8	4.2
1993	3.3	4.2
1994	3.3	4.4
1995	3.9	5.0
1996	4.2	5.3
1997	4.2	5.3
1998[1)]	4.4	5.4

[1)] Duration is calculated including interest-rate swaps.

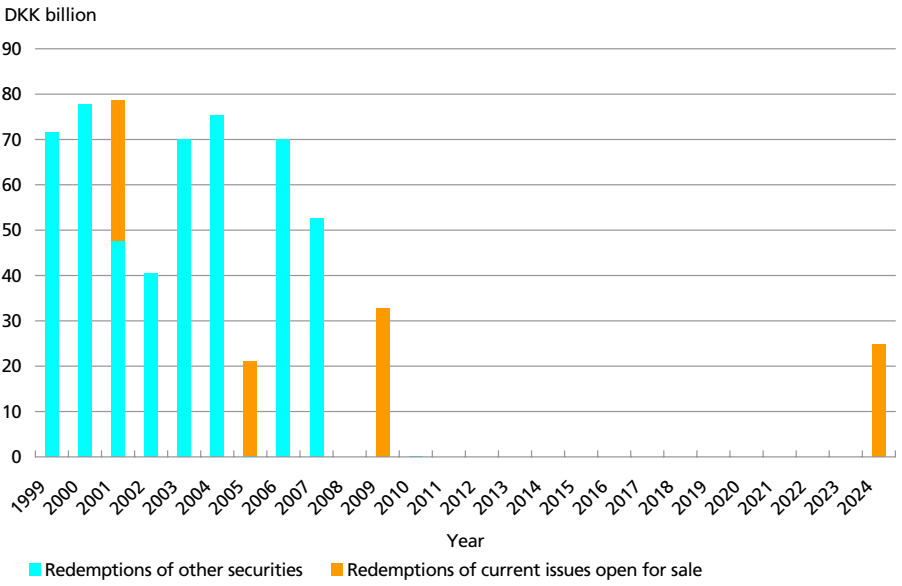
The development in duration in 1998 is shown in Chart 2.5.1. It is seen that duration has been in the upper half of the duration band. In order to illustrate the effect of the falling level of interest rates duration is calculated at the interest-rate levels at respectively the end of the month and the end of 1997. At the close of the year the duration at the prevailing level of interest rates was 4.4 years, but 4.2 years at the interest-rate level at end-1997.

Redemption profile

Duration is an average measure of the interest-rate and refinancing risk and does not express the distribution of the redemptions of the government debt over time. In order to reduce the interest-rate and refinanc-

DEVELOPMENT IN DURATION, 1998 — Chart 2.5.1

REDEMPTION PROFILE OF THE DOMESTIC GOVERNMENT DEBT, END-1998 Chart 2.5.2



ing risk it is important that redemptions are spread relatively evenly between different years. Chart 2.5.2 presents the redemption profile of the government debt at end-1998. Redemption of the securities included in current issues open for sale in the first half of 1999 is highlighted. A Treasury note maturing in 2002 is planned to be opened in the first half of 1999. It is shown that issues are predominantly in securities maturing in the years where redemptions are low, thereby evening out the redemption profile.

Cost-at-Risk

As described in Chapter 1 Cost-at-Risk (CaR) is used as a risk measure in connection with the management of domestic borrowing. CaR was developed by the Nationalbank in order to improve the basis for weighing the cost of borrowing against the risk assumed by the central government.

In 1998 work has been done to introduce a CaR measure in the management of the domestic government debt policy as a supplement to the duration target and the target for the shape of the redemption profile. A distinction is made between absolute CaR and relative CaR. Absolute CaR indicates the maximum interest cost that can be expected with a probability of 95 per cent. Relative CaR is given as the difference between absolute CaR and the average interest costs. Relative CaR indicates the maximum increase in interest costs that can be expected with a probability of 95 per cent. As yet there is no fixed criterion for an acceptable level of CaR.

Calculations show that with the present composition of the debt relative CaR is DKK 1.5 billion. This implies that there is a less than 5 per cent risk of interest costs increasing by more than DKK 1.5 billion in 1999. A change of DKK 1.5 billion is equivalent to just over 3 per cent of the expected interest costs in 1999.

Three main conclusions can be drawn from work on CaR so far. The first is that debt with a large spread of maturities entails a relatively low risk measured by CaR. On the other hand, the CaR of debt which is concentrated on only a few maturities is higher. The second main conclusion is that CaR is sensitive to fluctuations in the short-term interest rate. Finally, it appears that CaR is less sensitive to fluctuation in the budget balance. The reason is that the debt is distributed evenly across maturities.

Future work is expected to focus on three areas.

The first is to improve the model assumptions concerning the development in interest rates and time horizon. The second is to illuminate the sensitivity of interest costs to extreme developments in interest rates. This is known as the stress test. The last area is to set out a CaR measure for the total government debt.

OWNERSHIP STRUCTURE OF GOVERNMENT SECURITIES 2.6

On a quarterly basis Statistics Denmark publishes the investor distribution of Danish bonds on the basis of data from the Danish Securities

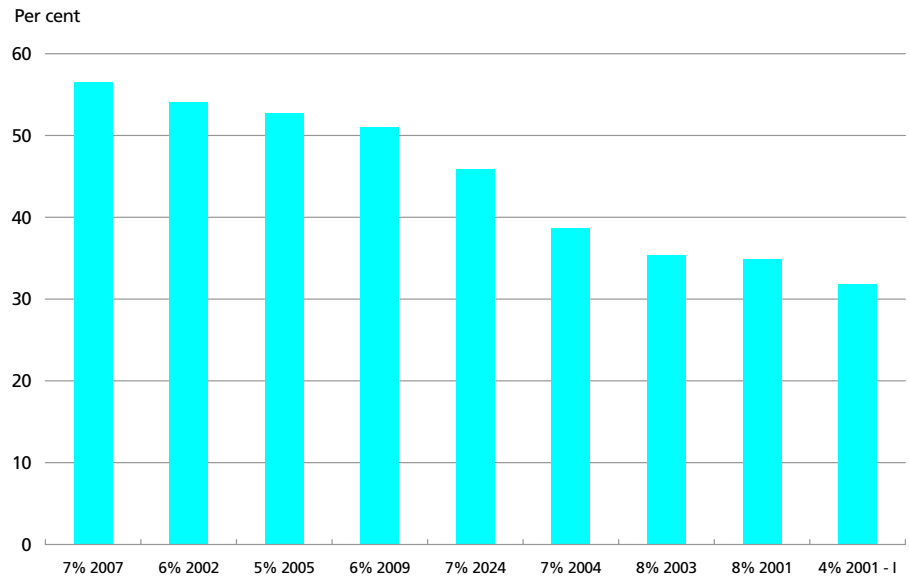
DISTRIBUTION BY SECTOR OF CIRCULATING KRONE-DENOMINATED SECURITIES[1] Table 2.6.1

Per cent	End lst qtr. 1998	End 2nd qtr. 1998	End 3rd qtr. 1998	End 4th qtr. 1998
Non-financial companies	5.7	5.4	4.8	5.2
Financial institutions incl. the Nationalbank	14.3	16.7	17.4	17.9
Insurance companies and pension funds	9.2	9.4	8.6	9.3
Public sector	20.9	21.3	21.4	19.2
Private, non-dividend paying institutions	5.2	4.8	4.4	3.8
Households	1.1	1.2	1.2	1.4
Non-residents	42.8	40.3	40.7	41.8
Not stated	0.9	1.0	1.4	1.3
Total	100.0	100.0	100.0	100.0
Total market value, DKK billion	725.0	734.7	732.6	71.1

Note: Rounded figures based on market values.

[1] In the calculations adjustment is made for repo-transactions between Danish banks and non-residents and for bonds covered by the central government's location-swap facility. Moreover estimated adjustment is made for non-residents' holdings of bonds in Euroclear and CEDEL which are recorded as owned by non-residents in the statistics of the Danish Securities Centre (VP).

PROPORTION OF SELECTED GOVERNMENT SECURITIES
OWNED BY NON-RESIDENTS, END-1998 Chart 2.6.1



Centre (VP). The Nationalbank makes certain estimated adjustments to these statistics. The distribution by sector is shown in Table 2.6.1.

In recent years the proportion of krone-denominated government securities held by non-residents has increased. Non-residents' holdings accounted for 30 per cent at the close of 1994 and have since risen to 40 per cent.

Chart 2.6.1 shows which government securities with an outstanding volume of at least DKK 20 billion by market value account for the largest proportion of non-resident ownership. It is shown that the three series with the longest remaining maturity all have an ownership share of over 40 per cent. It also appears that non-residents do not invest solely in long-term securities.

GOVERNMENT DEBT POLICY IN 1999 2.7

The estimated central-government borrowing requirement for 1999 is DKK 66.0 billion. In 1999 – as in previous years – the borrowing requirement is covered by issuing government securities on the domestic market.

As in recent years it is sought to build up sufficient volume and liquidity in the individual government securities series to create a basis for efficient trading on the bond market. Sales of government securities are planned to focus on issue in short- (2-3 years), medium- (approximately 5 years) and long-term (approximately 10 years) segments.

CURRENT ISSUES OPEN FOR SALE, JANUARY 1999 — Table 2.7.1

Issue	Redemption date
Fixed-rate bonds	
7% government bonds 2024	10 November 2024
6% government bonds 2009	15 November 2009
5% government bonds 2005	15 August 2005
Treasury notes	
4% Treasury notes 2001 I	15 February 2001
Treasury bills	
1999 III	2 August 1999
1999 II	3 May 1999

Sales in the long-term segment are concentrated on 6 per cent government bonds 2009, while only moderate sales of 7 per cent government bonds 2024 I is expected. Sales in the medium-term segment will solely comprise 5 per cent government bonds 2005. Sale of 6 per cent government bonds 2002 has been discontinued.

Sale of 4 per cent Treasury notes 2001 I continues. It is the intention for 4 per cent Treasury notes 2001 I to be replaced by a new Treasury note in mid-1999. The Treasury note will have a redemption date in the first half of 2002.

The Treasury bill programme continues with monthly auctions. In 1999 new Treasury bill series will be opened at the auctions with settlement dates of 1 February, 3 May, 2 August and 1 November.

Current issues open for sale in January 1999 are shown in Table 2.7.1.

In 1999 the central government will use the buy-back option more actively as an instrument to manage the domestic government debt policy. The buy-backs are intended to be used to safeguard the volume and liquidity of current issues open for sale. The aim is to create a basis for continued low long-term borrowing costs.

In order to even out redemptions within the year government securities which are due for redemption in 1999 will be bought back. Another objective is to buy back 8 per cent government bonds 2001 in order to quickly build up an outstanding volume in the Treasury note series which opens in mid-1999.

As stated in the notification in July 1998 concerning the central government's current issues open for sale domestic interest-rate swaps are a new instrument of government debt policy. Interest-rate swap transactions in Danish kroner will continue in 1999.

INFORMATION ON SALES OF GOVERNMENT SECURITIES Box 2.5

The volume of domestic government securities sales is determined by the central government's gross borrowing requirement. Central-government deficit forecasts are presented in the budgetary reviews of the Ministry of Finance normally issued in May, August, October and December. After each budgetary review the Nationalbank issues a monthly breakdown of the central government's estimated net and gross borrowing requirements. In connection with the opening of new series of government securities a notification is sent to Copenhagen Stock Exchange A/S describing the terms of sale on the opening day and normally stating the maximum sale of the relevant securities on the opening day and the initial volume offered.

On the first banking day of each month a notification is sent to Copenhagen Stock Exchange A/S and other interested parties stating the total sales of the preceding month at market value as well as the nominal sale per bond series. Moreover, on the second banking day of each month the central government's actual borrowing requirement in the preceding month is announced. This announcement is also issued via DN News and Reuters (page DKMG-H).

At the monthly Treasury-bill auctions notification of the results of the auction, including cut-off interest rates and sales in the individual Treasury bill series, is sent to Copenhagen Stock Exchange A/S and published via DN News and Reuters (page DKMC-F). On a daily basis notification is published via DN News and Reuters (page DKMA-B) of nominal sales in open government securities series on the previous trading day. In addition to sales statistics details are published each month of the actual central-government payments as well as the gross and net borrowing requirements.

The notifications described above are issued in Danish and English and can also be seen under "Government debt" at www.nationalbanken.dk.

CHAPTER 3

Foreign Borrowing

SUMMARY 3.1

In 1998 the central government's net redemptions of the foreign debt totalled DKK 21.6 billion. Redemptions of the foreign debt amounted to DKK 37.4 billion, while the medium- and long-term borrowing for the year was DKK 15.8 billion.

In connection with Danmarks Nationalbank's intervention in the foreign-exchange market in September the central government issued short-term loans for DKK 18.4 billion under the Commercial Paper programme. In step with the Nationalbank's repurchase of foreign exchange, outstanding short-term loans were reduced to 0 at the close of the year.

The currency distribution of the central government's foreign debt is concentrated primarily on the national currencies of the EMU countries, and on ECU. After the commencement of the third stage of EMU this element of the debt is considered as liabilities in EUR, even though the debt has not been redenominated.

In 1999 redemptions of the foreign government debt are expected to be DKK 19 billion. In principle the redemptions are financed in full by medium- and long-term borrowing. Further reduction of the foreign government debt is determined by the development in the balance of the central government's account with the Nationalbank and the development in the foreign-exchange reserve.

BORROWING IN 1998 3.2

In 1998 redemptions of the central government's foreign debt amounted to DKK 37.4 billion. Borrowing totalled DKK 15.8 billion. The central government's net redemption of the foreign debt was thus DKK 21.6 billion, cf. Table 3.2.1.

At the beginning of 1998 the central government sold its shares in Tele Danmark for DKK 31.2 billion in total. Tele Danmark bought back shares from the central government for DKK 10 billion. Shares for the remaining amount were sold to Ameritech of the USA. It was decided

FOREIGN BORROWING BY THE CENTRAL GOVERNMENT, NOMINAL VALUE

Table 3.2.1

DKK billion	Commercial Paper, net	Medium- and long-term borrowing	Redemption[1]	Net borrowing	Exchange-rate adjustment	Liabilities, end of period[2]
1995	- 0.5	13.7	32.3	- 19.1	- 5.1	105.6
1996	11.7	16.7	32.1	- 3.7	- 0.4	101.5
1997	- 10.8	36.0	24.4	0.8	1.3	103.6
1998 1st qtr.	0.0	2.4	8.3	- 6.0	0.3	104.6
1998 2nd qtr.	0.0	4.1	8.9	- 4.7	- 0.4	99.5
1998 3rd qtr.	18.4	6.3	17.6	7.1	- 0.5	106.1
1998 4th qtr.	- 18.4	3.0	2.6	- 18.0	0.3	88.3
1998	0.0	15.8	37.4	- 21.6	- 0.3	88.3

[1] Buy-back of own bonds is included as redemptions.

[2] Net liabilities, i.e. adjusted for the value of the central government's portfolio of own bonds. As of 1 January 1998 Kingdom of Denmark 8.5 per cent government bonds XEU 2002 was reclassified as foreign debt. This entails that as of January 1998 the foreign debt was written up by DKK 6.6 billion.

that the revenue from the sale of shares to Ameritech would be used to reduce the foreign government debt. Moreover, the income from interest earned before the proceeds went to finance redemptions would also be used to redeem the foreign government debt. The revenue from the central government's sale of shares to Ameritech totalled DKK 21.4 billion, including income from interest.

MEDIUM- AND LONG-TERM BORROWING 3.3

For a number of years the strategy for medium- and long-term borrowing has been based on advantageous borrowing, cf. Chapter 1. This strategy entails that foreign borrowing by the central government often takes place by issuing small loans on the international capital markets. The central government normally transacts interest-rate and currency swaps in conjunction with the actual issue of bonds. This makes it possible to adjust the individual loan in terms of floating or fixed interest rates and currency exposure. Advantageous borrowing is often related to special conditions on the markets for interest-rate and currency swaps, cf. the example in Box 3.1.

Guidelines for acceptable loan categories are set out for the central government's medium- and long-term borrowing. The guidelines stipulate requirements of the overall loan structure, i.e. both the underlying loan and the related interest-rate and currency swaps. The purpose of these guidelines is to minimise the political, legal and operational risks assumed by the central government.

ADVANTAGEOUS BORROWING Box 3.1

Whether the government's issues of foreign bonds are advantageous is as a general rule based on an evaluation in relation to the 6-month LIBOR for a loan on the relevant currency and maturity terms. Using Libor as a reference interest rate is the standard for international bond issues.

Often an advantageous level of interest rates can be achieved because the central government is able to utilise special conditions in the international borrowing and swap markets. This is illustrated by the example below of government bond issue no. 891 in Swedish kronor (SEK) on 6 October with value 12 October 1998.

The loan was issued as a fixed-yield bond at a nominal value of SEK 400 million. A swap was used to convert it to a floating-rate loan in DEM, since the central government did not wish to pay a fixed interest rate on the new loan, nor to hold an exchange-rate risk in SEK. The related swap comprises an interest-rate swap from a fixed to a floating interest rate in SEK (6-month Stibor (Stockholm Inter Bank Offered Rate)) and a currency swap from floating-rate SEK to floating-rate DEM (6-month DEM Libor). After this swap was transacted the central government held an 8-year floating-rate loan at DEM Libor less 30 basis points (bp), cf. Table 1.

INTEREST RATES ON 12 OCTOBER 1998 Table 1

Instrument	Circulating volume, SEK million	Expiry date	Yield to maturity, per cent
Swedish government bond	33,289	25-10-06	4.53
Bond issued by the Kingdom of Denmark (KoD)	400	12-10-06	5.07
Swedish swap curve (mid-price)		12-10-06	5.48
Spread - Swedish government bond/KoD			0.54
Spread - KoD/Swedish swap curve			- 0.41
Spread - KoD/6-month Stibor (bid price)			- 0.38
Spread - KoD/6-month DEM Libor			- 0.30

Note: The Danish central government operates on international bond markets as the Kingdom of Denmark (KoD).

When evaluating the terms of the loan it should be noted that on 12 October the central government could have issued an 8-year bond denominated in DEM with a yield to maturity 22 bp above the yield on German government bonds. Since on that day the spread between the swap interest rate and German government bonds was 30 bp, in theory the central government could have achieved a floating-rate loan at DEM Libor less 8 bp. The central government's loan no. 891 thus cost 22 bp less than borrowing directly in the German market. As appears from the Table the yield to maturity on the Danish government's bond in SEK was higher than the yield on equivalent bonds in the Swedish market. The advantageous interest-rate level of the loan was achieved solely due to a large spread between the swap interest rate and the bond yield in SEK on 12 October 1998.

The following general conditions must be fulfilled:

- The loan structure must be known in the market and used by recognised borrowers.
- The loan structure must be composed of simple elements which make the structure transparent.
- The loan structure must not entail uncertainty concerning the central government's redemption payments or lead to the central government assuming a disproportionally high credit risk in connection with related interest-rate and currency swaps.

Borrowing transactions in 1998

In 1998 medium- and long-term borrowing amounted to DKK 15.8 billion. A total of 18 loans were raised with average proceeds of almost DKK 1 billion, cf. Table 3 of the Appendix of Tables. Apart from two minor dual-currency loans all loans were fixed-yield bullet issues. All were swapped to floating interest-rate terms. Of the year's total proceeds DKK 7.0 billion was issued in ECU (XEU). As of 1 January 1999 these loans were converted from XEU to EUR in the ratio 1:1. The remainder of the borrowing was either issued directly in or swapped to DEM.

Borrowing in EUR should be viewed in the light of the currency distribution of the foreign government debt after 1 January 1999. Within the framework of the benchmark for the central-government debt and the Nationalbank's foreign-exchange reserve it is the objective that the central government's foreign debt be denominated primarily in EUR.

At EUR 500 million one of the four EUR issues was larger than the others. With a maturity of 10 years, on its issue this loan was compared to benchmark issues by other central-government borrowers. Thus at its price fixing the loan was compared with the eurobond issue by the French state, OAT 5.25 per cent 04/2008. The issue of the central government's EUR 500 million loan is related solely to the fact that it was possible to issue large bond series on advantageous terms in this segment and does not reflect a change from the central government's previous borrowing strategy towards greater focus on benchmark issues.

Particularly investors from Asia, including Japan, showed interest in the central-government EUR 500 million loan. More than half of the issue was taken up by Asian investors, while the remainder went to European investors. All four EUR issues were to a great extent sold to investors in Japan and the rest of Asia. This should be viewed in connection with the fact that during 1998 Japanese investors have shown great interest in investing in EUR-denominated securities.

SHORT-TERM BORROWING 3.4

The total redemptions of the foreign government debt within a given year is normally financed by medium- and long-term borrowing. Short-term borrowing by the central government can be used to quickly replenish the foreign-exchange reserve in connection with the National-bank's intervention in the foreign-exchange market. Moreover, the central government uses short-term borrowing in periods where the balance of the central government's account with the Nationalbank is expected to be low. Short-term borrowing takes place by drawing on the central government's Commercial Paper (CP) programmes, in which individual issues typically have maturities from one week to one month.

In connection with the Nationalbank's intervention in the foreign-exchange market the central government issued short-term bonds for DKK 18.4 billion in the 3rd quarter of 1998. As the foreign-exchange market stabilised the Nationalbank could repurchase foreign exchange and the outstanding amount was reduced in the 4th quarter. At the close of the year the outstanding amount under the CP programmes was 0. The development in the balance of the central government's account did not make it necessary to issue CPs in 1998.

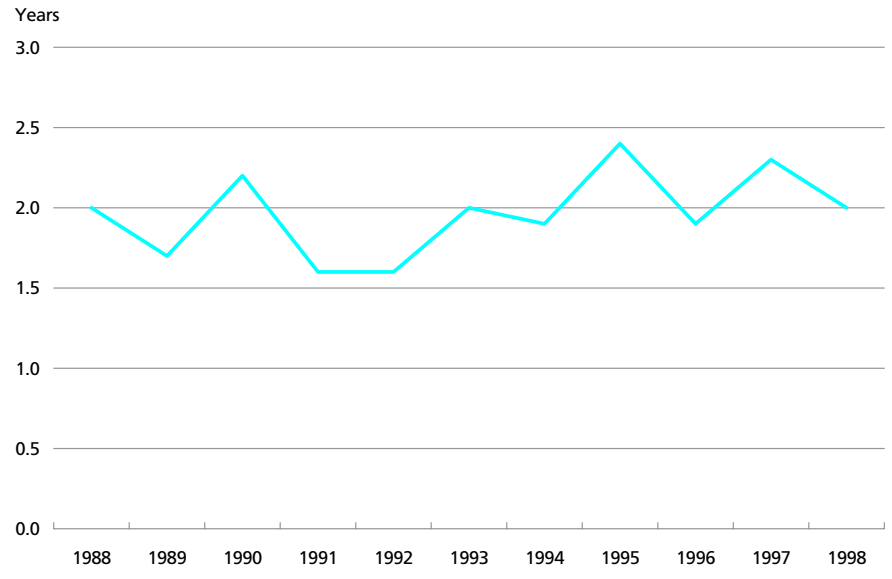
RATING OF THE CENTRAL GOVERNMENT 3.5

Rating is of great significance to the cost of both medium- and long-term, and short-term borrowing. The Kingdom of Denmark is rated by the leading rating agencies. For loans denominated in foreign exchange Denmark is currently rated AA+, Aa1, and AA+ by respectively Standard & Poor’s, Moody's and Fitch IBCA. For all three agencies this is equivalent to the next-best category, cf. Table 9 of the Appendix of Tables. In May Standard & Poor’s added the comment "positive outlook" to Denmark's rating.

INTEREST-RATE AND REFINANCING RISK 3.6

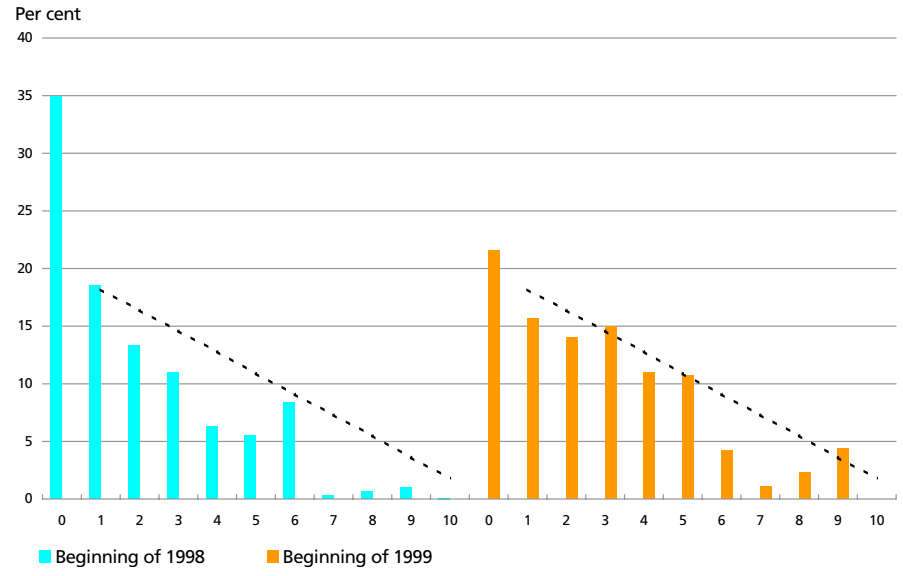
The general interest-rate risk on the foreign government debt is managed by applying a duration target. In 1998 the target for the duration of the foreign debt was 2.5 years +/- 0.5 years. During 1998 the duration of the currency-denominated foreign debt fell from 2.3 years to 2.0 years, cf. Chart 3.6.1. The development in the duration of the foreign debt should be set against the development in the duration of the domestic debt, cf. Chapter 1. The objective for the 1st quarter of 1999 is to maintain the duration at around the present level.

DURATION OF THE FOREIGN GOVERNMENT DEBT, YEAR-END Chart 3.6.1



The refinancing risk can be expressed as the size of the annual refinancing burden. To facilitate the management of the refinancing risk a target for the redemption profile of the debt has been set up. The

REDEMPTION PROFILE AND TARGET FOR REDEMPTION PROFILE FOR THE FOREIGN GOVERNMENT DEBT Chart 3.6.2



Note: The dashed line indicates the target at which the redemption profile is aimed at year-end.

redemption-profile target is based on the assumption that borrowing in a given year in principle will be distributed equally on the relevant maturity segments.

Chart 3.6.2 shows that during 1998 the redemption profile flattened out. However, redemptions in the 6-8 year maturity segments are still lower than the redemption profile which is aimed at. This is because it has not been possible to achieve sufficiently advantageous borrowing in these maturity segments. Adjustment to the target for redemptions in these maturity years will be ensured for the coming years' borrowing.

Management of the interest rate and refinancing risk on the central government's foreign debt is to a great extent handled by using currency swaps.

These can either be related to the issue of an actual loan or transacted as portfolio swaps without any direct connection to an underlying loan. The use of interest-rate swaps ensures greater flexibility in adjusting the duration of the foreign government debt and also in connection with new borrowing.

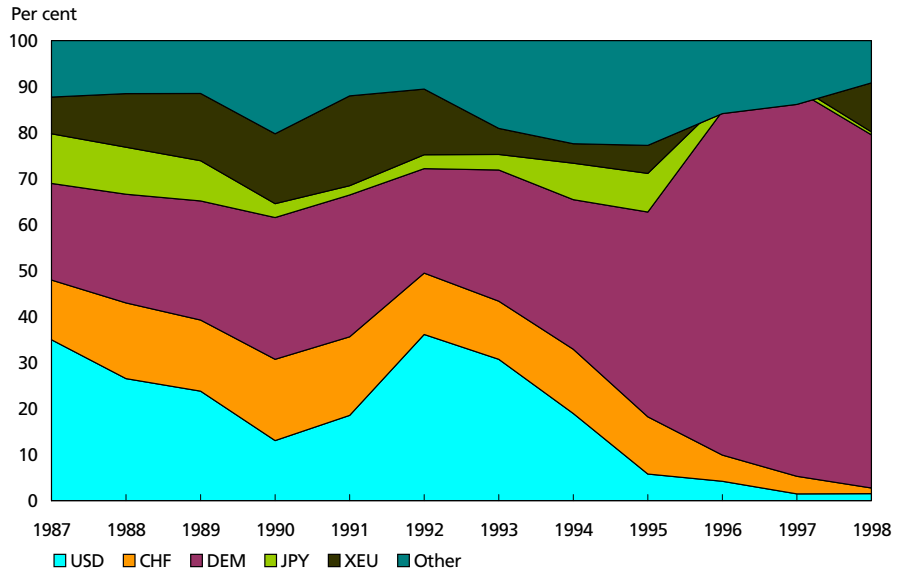
THE CURRENCY DISTRIBUTION OF THE FOREIGN GOVERNMENT DEBT 3.7

The exchange-rate risk on the foreign government debt is managed in coordination with the Nationalbank's foreign-exchange reserve, cf. Chapter 4. This entails that a target for the currency distribution of the debt and the foreign-exchange reserve calculated on a net basis, called the benchmark, is set up. Throughout the 1990s DEM was considered to entail the least possible risk on determining this benchmark. This is explained by the objective of maintaining a stable krone rate against the core European currencies, as well as the position of DEM as the anchor currency. After the transition to the third stage of EMU on 1 January 1999 EUR has replaced DEM as the risk-minimising currency in the benchmark.

In recent years the currency distribution of the foreign government debt has moved towards a larger DEM share, cf. Chart 3.7.1. This is due to the greater focus on the exchange-rate risk on the gross positions in the benchmark for the central government's foreign debt and the foreign-exchange reserve. This strategy continues after the transition to the third stage of EMU, where liabilities denominated in the former currencies of the euro countries or in XEU are now considered to be liabilities in EUR, even though the debt has not been redenominated. At the beginning of 1999 the exchange-rate risk on the foreign government debt was thus placed mainly in EUR, cf. Chart 3.7.2.

To a great extent the currency distribution of the foreign government debt is managed by using currency swaps. These enable the central gov-

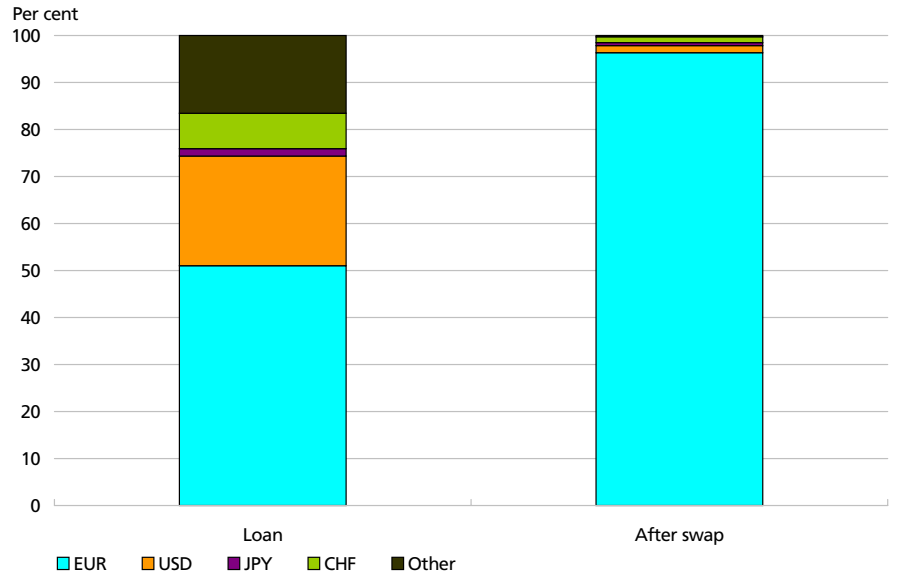
CURRENCY DISTRIBUTION OF THE FOREIGN GOVERNMENT DEBT, YEAR-END Chart 3.7.1



Note: Buy-back of own bonds has not been deducted on calculation of the foreign government debt. "Other" mainly comprises GBP and EMS currencies besides DEM.

ernment to issue loans in currencies outside the euro area without thereby assuming a higher exchange-rate risk than on EUR issues. The greater flexibility in choice of issuing currency makes it easier for the

CURRENCY DISTRIBUTION OF THE FOREIGN GOVERNMENT DEBT BEFORE AND AFTER CURRENCY SWAPS, END-1998 Chart 3.7.2



Note: EUR denotes the currencies DEM, EUR, FRF, BEF, LUC and NLG.

central government to utilise special conditions on the international capital markets, so as to reduce borrowing costs. Chart 3.7.2 illustrates the use of swaps to adjust the currency distribution of the foreign government debt.

The transaction of interest-rate and currency swaps entails that the central government assumes a credit risk on the counterparty in each swap. A description of how the credit risk on the central government's swap portfolio is handled is presented in Chapter 9.

PREPARATIONS FOR EMU 3.8

In connection with the commencement of the third stage of EMU the Nationalbank has made a number of adjustments to the administration of the foreign government debt.

There was no redenomination of the foreign government debt in connection with the transition to the third stage of EMU. However, the Nationalbank will let payments on loans and swap contracts denominated in the national currencies of the EMU countries take place in euro. In accordance with the European Commission's recommendation of 23 April 1998 concerning banking charges for conversion to euro the banks are not entitled to charge commission on payment of euro-denominated amounts in national currencies. Investors who wish interest and redemption payments to be made in the original currency of the loan will therefore not be affected by this decision.

The ECU ceased to exist as a currency as of 1 January 1999. The Council Order on continuity of contracts issued pursuant to Article 235 of the Maastricht Treaty stipulates that loans raised in XEU are converted to EUR in the ratio 1:1 unless otherwise agreed by the parties. The central government's XEU-denominated loans were thus converted to EUR on 1 January 1999, including 8.5 per cent government bonds XEU/EUR 2002, which is listed on the Copenhagen Stock Exchange.

The market conventions for the central government's foreign loans were not amended in connection with the transition to the third stage of EMU.

With regard to the central government's loan and swap contracts the Nationalbank has investigated whether the transition to the third stage of EMU would present problems. In particular it was necessary to clarify which reference interest rates would be applied to the floating-rate leg of swap contracts after the national reference interest rates ceased to exist. In order to minimise the need for bilateral negotiations with the central government's swap counterparties, in the summer of 1998 the Nationalbank signed an EMU protocol prepared by the International

CHANGE IN THE RATING OF CENTRAL-GOVERNMENT BORROWERS AS A CONSEQUENCE OF EMU

Table 3.8.1

	Moody's		Standard & Poor's	
	Domestic debt	Foreign debt	Domestic debt	Foreign debt
Belgium	Aa1	Aa1	**AA +** ↓	AA +
Finland	Aaa	**Aaa** ↑	**AA** ↓	AA
Ireland	Aaa	**Aaa** ↑	**AA +** ↓	AA +
Italy	Aa3	Aa3	**AA** ↓	AA
Portugal	Aa2	**Aa2** ↑	**AA -** ↓	AA -
Spain	Aa2	Aa2	**AA** ↓	AA
Denmark	Aaa	Aa1	AAA	AA +

Note: Rating in **bold** indicates change. ↑ ↓ indicates direction of change.
Source: Moody's Investors Service and Standard & Poor's.

Swaps and Derivatives Association (ISDA). The purpose of this protocol was multilaterally to clarify any issues of interpretation concerning the transition to the third stage of EMU. The protocol must be considered primarily as a confirmation of regulations already adopted and of current market conventions.

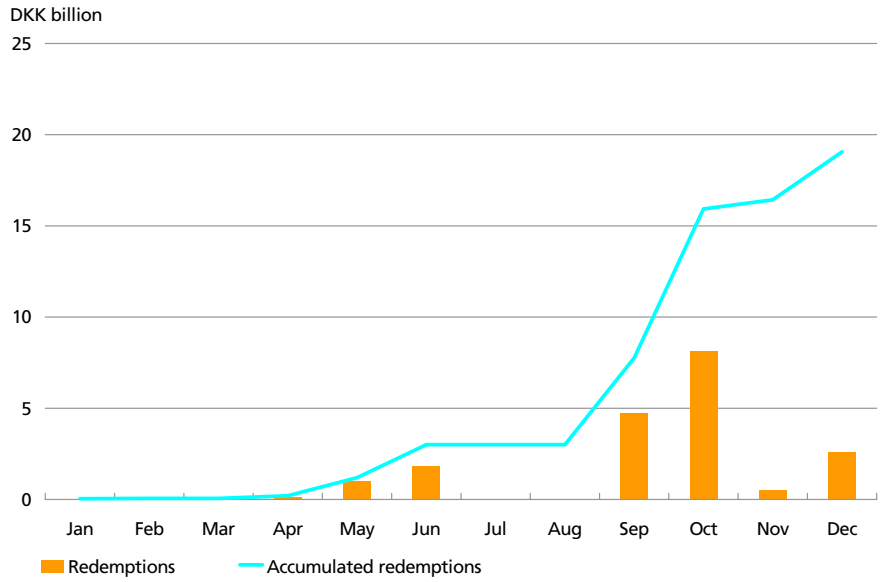
The nomination of the countries participating in EMU has entailed a number of adjustments to the rating of the participating countries' government debt by the leading rating agencies, Moody's Investors Service and Standard & Poor's, cf. Table 3.8.1.

With reference to the status of the euro area as a net creditor both agencies have given all countries a rating ceiling of Aaa/AAA. However, the opinions of the two rating agencies diverge with regard to the consequences of EMU for the rating of the government debt of the participating countries. Referring to the common rating ceiling Moody's has upgraded the rating of the foreign government debt to the level of the domestic government debt. On the other hand, Standard & Poor's has downgraded the rating of the domestic government debt in a number of the participating countries to the rating for the foreign government debt, on the grounds that the countries no longer have access to monetary financing. The adjustments to the EMU countries' ratings has not influenced the rating of the Danish government debt.

BORROWING IN 1999 3.9

Redemption of medium- and long-term debt amounts to DKK 19 billion in 1999. The redemptions take place primarily in the second half of the year, cf. Chart 3.9.1. In principle, all redemptions of the foreign government debt are expected to be financed by new borrowing. The

REDEMPTIONS OF THE FOREIGN GOVERNMENT DEBT IN 1999 CHART 3.9.1



opportunities to reduce the foreign government debt in 1999 depend on the size of the foreign-exchange reserve and the expected balance of the central government's account with the Nationalbank. In all circumstances, any reduction of the debt cannot take place until the second half of the year, when most of the redemptions fall due.

It is not expected that CPs need to be issued to adjust the balance of the central government's account in 1999. This is among other things because fluctuations in the central government's account with the Nationalbank will be reduced as a consequence of the restructuring of the central government's VAT receipts with effect from 1 April 1999.

BORROWING BY STATE-GUARANTEED ENTITIES 3.10

As the fiscal agent of the Ministry of Finance the Nationalbank issues guarantees for the borrowing, etc. of a number of state-guaranteed entities. They are the following:

- The Financial Administration Agency; (up to 1 January 1999 called the Mortgage Bank of the Kingdom of Denmark) a unit under the Ministry of Finance which e.g. manages the administration of the debt of the Mortgage Bank.
- Great Belt A/S; responsible for the construction and operation of the fixed link between Zealand and Funen.

STATE-GUARANTEED DEBT OF STATE-GUARANTEED ENTITIES, END-1998 Table 3.10.1

	DKK million
Øresundskonsortiet	16,309
A/S Øresundsforbindelsen	7,157
Great Belt A/S	39,526
Danish Financial Administration Agency	10,922

Source: The entities.
Note: The debt of Øresundskonsortiet is guaranteed jointly by the Danish and Swedish states.

- A/S Øresundsforbindelsen; responsible for the construction of the Danish facilities on land for the fixed link between Denmark and Sweden.
- Øresundskonsortiet; responsible for the construction and operation of the fixed link between Denmark and Sweden.

Previously borrowing by the state-guaranteed entities was authorised by the Nationalbank pursuant to the agreement from 1991 between the Ministry of Finance and Danmarks Nationalbank. Under this agreement the Nationalbank approved the commercial terms for the individual financial transactions and legally granted the individual transactions, and moreover issued state guarantees.

During the 1990s state control of the national enterprise sector underwent a change from influence on current operational decisions to stipulation of the overall framework for each company. In the light of these changes and since the entities had gradually built up financial expertise, on 25 November 1998 the Ministry of Finance and the Nationalbank concluded a new agreement on guidelines for borrowing by state-guaranteed entities.

The new guidelines set out the overall framework for the entities' borrowing and risk management. It is also stated that the board of directors and management of each company are responsible for borrowing and risk management. The Nationalbank continues to issue guarantees for the borrowing by the entities. In the future regular meetings will be held at which the state-guaranteed entities will inform the Ministry of Finance and the Nationalbank of borrowing and risk management in relation to the loan portfolio.

CHAPTER 4

Coordinated Management of Exchange-Rate Risk

SUMMARY 4.1

The central government's foreign debt is subject to coordinated management with Danmarks Nationalbank's foreign-exchange reserve. This ensures that taken as one the exchange-rate risk of the central government and the Nationalbank does not reflect fluctuation in the debt and reserves, but is managed so as to minimise the risk. At the close of 1998 the net foreign assets of the central government and the Nationalbank were approximately DKK 20 billion.

THE BACKGROUND TO THE COORDINATED MANAGEMENT 4.2

The primary purpose of the central government's borrowing in foreign currencies is to maintain an adequate foreign-exchange reserve. When the Kingdom of Denmark borrows in foreign currencies the proceeds are added to the foreign-exchange reserve; and the balance of the central government's account with the Nationalbank increases. If the central government borrows in one currency, e.g. USD, and the Nationalbank converts the proceeds to another currency, e.g. EUR, the exchange-rate-risk exposure of the central government and the Nationalbank taken as one will present a high risk and will not reflect the most appropriate placement. The coordinated management of the net foreign-exchange exposure of the central government and the Nationalbank began in 1992.

At quarterly meetings of the Ministry of Finance, the Ministry of Economic Affairs and the Nationalbank the benchmark for the currency distribution of the net foreign assets is determined. In its day-to-day administration the Nationalbank may deviate from the benchmark and in periods of intervention the benchmark may be suspended.

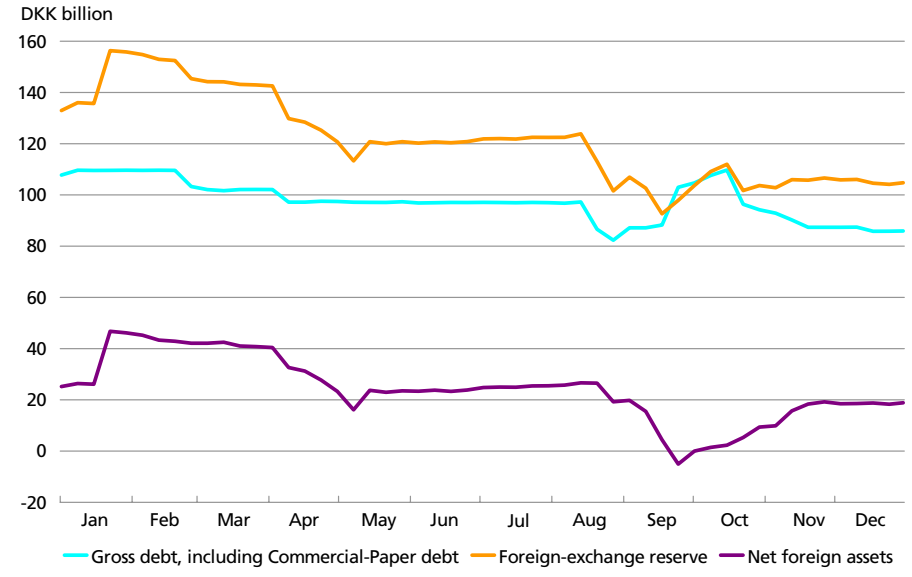
In the period 1992-95 the benchmark was set as a fixed relative currency distribution of the net liabilities. This meant that the absolute exposure in all currencies fluctuated with changes in the net liabilities.

On an increase in the net liabilities, the exchange-rate risk of the central government and the Nationalbank taken as one increased, whereas the exchange-rate risk diminished if the net liabilities decreased. This automatic linking of the level of net liabilities and the exchange-rate risk was less appropriate. As from the beginning of 1996 the benchmark was therefore changed to a fixed absolute distribution for all currencies except the EMS currencies (DEM, FRF, NLG, BEF and XEU). The net position in EMS currencies was determined residually and thereby absorbed the adjustment to changes in the net liabilities. This model implied that changes in the net liabilities only increased the exposure to the currencies which fluctuated least against the Danish krone, i.e. those which entailed the lowest risk.

COORDINATED MANAGEMENT IN 1998 4.3

Normally the development in the net foreign assets reflects the Nationalbank's intervention in the foreign-exchange market. When the Nationalbank sells foreign exchange against kroner the net foreign assets decrease, together with the foreign-exchange reserve. On the other hand, when the Nationalbank buys foreign exchange, the reserve and the net foreign assets increase. The central government's foreign borrowing does not affect the net foreign assets since the foreign-exchange proceeds from this borrowing increase the foreign-exchange reserve.

DISTRIBUTION OF THE NET FOREIGN ASSETS IN 1998 Chart 4.3.1



For the first good five years after coordinated management was introduced in 1992 the central government and the Nationalbank taken as one had net foreign debt, but since mid-1997 – apart from a single brief interval – they have held net foreign assets. In other words, the Nationalbank's net foreign assets now exceed the central government's foreign debt. The fact that the central government and the Nationalbank hold net foreign assets instead of net foreign liabilities does not affect the basic principles of the coordinated management.

At the beginning of 1998 net foreign assets were just over DKK 25 billion. In mid-January the foreign-exchange reserve and the net foreign assets increased by approximately DKK 21 billion. This increase reflected the central government's receipt of the foreign-exchange proceeds from the sale of Tele Danmark shares. The proceeds were credited directly to the foreign-exchange reserve, but were drawn on during the year in order to reduce the central government's foreign liabilities.

As a consequence of the Nationalbank's intervention during the foreign-exchange unrest in September the net foreign assets became negative. In the following months the Nationalbank bought back foreign exchange and at the close of the year the net foreign assets were almost DKK 20 billion.

Composition of the benchmark

The exchange-rate risk comprises two elements: one element reflects the risk of depreciation of the Danish krone – a krone-rate risk – and the other reflects the risk of relative fluctuation between other currencies than the Danish krone.

In view of Denmark's exchange-rate policy the risk related to the DKK/EUR rate is perceived as the krone-rate risk. This risk is unavoidable for as long as there are net assets/liabilities. Placement of all net foreign assets in EUR would entail the lowest possible exchange-rate risk. Prior to the introduction of EUR, DEM, as the anchor EMS currency, was considered to entail the lowest risk.

COMPOSITION OF THE BENCHMARK — Table 4.3.1

DKK billion	USD	JPY	GBP	CHF	EMS/EUR[1)]
1st qtr. 1998	2.0	- 2.5	- 1.0	- 2.0	Rest
2nd qtr. 1998	1.0	- 2.5	0.5	- 2.5	Rest
3rd qtr. 1998	2.0	- 1.5	- 2.0	- 3.0	Rest
4th qtr. 1998	- 0.5	- 1.5	- 0.5	- 2.5	Rest
1st qtr. 1999	0.0	- 1.0	- 0.5	- 3.5	Rest

Note: Negative figures indicate liabilities.

[1)] EMS indicates DEM, FRF, NLG, BEF and XEU.

The purpose of the benchmark's foreign-exchange positions is that by running a certain (small) exchange-rate risk in the long term the central government and the Nationalbank can achieve interest- and exchange-rate gains in relation to the risk-minimising currency distribution. In order to achieve these interest- and exchange-rate gains the benchmark is adjusted as appropriate. However, it must be emphasised that the exchange-rate risk is kept at a very low level. The composition of the benchmark during 1998 and at the beginning of 1999 is shown in Table 4.3.1.

THE PERFORMANCE OF THE BENCHMARK 4.4

As previously stated, since 1992 the net position of the central government and the Nationalbank has been managed on the basis of a benchmark. It is relevant to consider the performance of the benchmark, i.e. the revenue consequences of foreign-exchange positions compared to a distribution which solely comprises DEM.

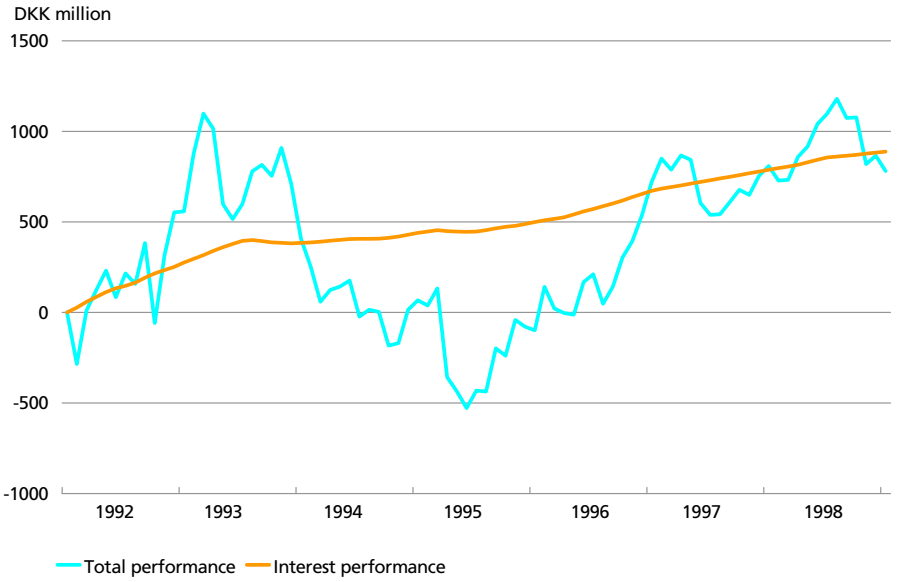
No unambiguous method can be used to assess the performance of the benchmark. Up to and including 1995 management involved the use of a relative distribution, and thereafter of an absolute distribution. This implies that in the period 1992-95 the absolute exchange-rate risk of the benchmark varied concurrently with the size of the net foreign debt. Moreover, management according to the benchmark was suspended in periods of major intervention. The benchmark was thus suspended for a large part of 1993.

BENCHMARK FOR THE NET DEBT Table 4.4.1

	USD	JPY	GBP	CHF	EMS	Total
			Per cent			
1 Jan.-15 Sep. 1992	6	2	- 9	36	65	100
16 Sep.-8 Oct. 1992	- 2	0	- 2	35	69	100
9 Oct.-30 Dec. 1992	- 2	0	0	34	68	100
31 Dec.-14 June 1993	- 5	0	4	30	71	100
15 June-31 Dec. 1993	- 8	0	3	20	85	100
1 Jan. 1994-31 Dec. 1995	- 10	7	- 3	14	92	100
			DKK billion			
1 Jan.-31 Dec. 1996	- 4.0	2.5	0.0	4.5	Rest	
1 Jan.-31 Dec. 1997	- 2.0	2.5	1.0	2.0	Rest	
1st qtr. 1998	- 2.0	2.5	1.0	2.0	Rest	
2nd qtr. 1998	- 1.0	2.5	0.5	- 2.5	Rest	
3rd qtr. 1998	- 2.0	1.5	2.0	3.0	Rest	
4th qtr. 1998	0.5	1.5	0.5	2.5	Rest	

Note: Negative figures indicate assets.

THE ACCUMULATED PERFORMANCE OF THE BENCHMARK Chart 4.4.1



Note: Accumulated performance, end of month.

A performance assessment has therefore been carried out in order to evaluate whether the active decisions concerning the benchmark's currency distribution were advantageous. The calculation is based on the premise that management has been absolute since 1992. The basis for comparison is a currency distribution exclusively comprising DEM.

The calculation of the benchmark's accumulated performance since 1992 shows a gain of almost DKK 800 million, cf. Chart 4.4.1. The interest costs of the benchmark were approximately DKK 900 million less than the interest costs of a DEM placement. The positive, steadily improving interest performance reflects that the benchmark borrowing is normally in low-yield currencies and the placement in high-yield currencies. On the other hand, the benchmark had an accumulated exchange-rate loss of almost DKK 100 million compared to placement in DEM.

The active decisions concerning the composition of the benchmark have thus overall resulted in a substantial gain.

THE PERFORMANCE OF THE NATIONALBANK 4.5

The Nationalbank manages the currency distribution of the net foreign assets on a day-to-day basis. The Nationalbank may allow the currency distribution of the net foreign assets to deviate from the benchmark by

up to DKK 2½ billion in each currency. The Nationalbank will allow the actual currency distribution to deviate from the benchmark in order to achieve a higher yield.

The performance of the Nationalbank is calculated as the difference between the calculated revenue from the benchmark and the calculated revenue from the actual currency distribution. In 1998 the Nationalbank's performance was negative at just over DKK 50 million. The negative performance is related particularly to positions in USD and JPY.

CHAPTER 5

The Government Debt

SUMMARY 5.1

In 1998 Denmark's central-government debt diminished by DKK 34.4 billion as a consequence of the surplus on central-government finances. The decrease is related to the central government's sale of its Tele Danmark shareholding, which gave revenue amounting to DKK 31.4 billion. At the close of 1998 the government debt was DKK 567.1 billion, equivalent to 48.5 per cent of GDP. In 1998 interest payments on the government debt were DKK 38.8 billion.

The gross debt of the public sector calculated in accordance with the Maastricht Treaty – the EMU debt – amounted to DKK 657 billion, or 59 per cent of GDP, at the end of 1998.

At the beginning of 1998 new accounting policies were introduced for inter alia the calculation of interest payments and distributed capital losses on issue. Expenditure is now recorded on the basis of time of earning, in contrast to time of payment as before. This ensures a more true and fair picture of the costs related to the government debt.

THE GOVERNMENT DEBT AND INTEREST EXPENDITURE 5.2

As a consequence of the surplus on central-government finances the government debt diminished by DKK 34.4 billion in 1998, cf. Table 5.2.1. The large decrease should be viewed in the light of the central government's sale of its Tele Danmark shareholding, which yielded revenue of DKK 31.4 billion. At the end of 1998 the government debt had been reduced to DKK 567.1 billion and amounted to 48.5 per cent of GDP. The ratio of the government debt to GDP has thus been falling since 1995. In 1999 a small decline in the government debt is expected in view of the budgeted central-government surplus.

The central government's Tele Danmark shareholding was sold to Ameritech of the USA and to Tele Danmark itself, cf. Chapter 3. Revenue from the sale to Ameritech was DKK 21.4 billion, while Tele Danmark bought back own shares for DKK 10.0 billion.

The revenue from the sale to Ameritech was used to reduce the foreign government debt. It decreased by DKK 15.3 billion in 1998, since

NET BORROWING AND CHANGES IN THE GOVERNMENT DEBT, 1995-99 Table 5.2.1

DKK billion	1995	1996	1997	1998	1999
Net borrowing					
Net domestic borrowing	32.6	19.3	- 5.9	- 10.3	- 5.4
Net foreign borrowing[1]	- 19.9	- 5.0	- 0.2	- 21.7	- 0.1
Drawing on Danmarks Nationalbank	21.6	2.6	2.0	- 5.0	0.0
Net borrowing at market value	34.3	16.9	- 4.1	- 37.0	- 5.5
Value adjustment					
Domestic capital loss on issue	7.8	1.6	1.8	- 0.7	- 0.7
Foreign capital loss on issue	0.5	0.0	0.2	0.1	0.1
Exchange-rate adjustment (- = gain)[2]	- 5.5	0.0	1.4	- 0.3	0.0
Value adjustment, total	2.8	1.7	3.3	- 0.9	- 0.6
Net borrowing at nominal value	37.1	18.6	- 0.8	- 37.9	- 6.1
Balance-sheet items					
Year-end, nominal value					
Domestic debt	657.7	677.7	673.7	656.4	650.3
Foreign debt	105.6	101.5	103.6	88.3	88.3
The central government's account with the Nationalbank	33.7	31.1	29.0	34.0	34.0
The Social Pension Fund[3]	151.4	148.8	146.8	143.6	142.0
Government debt	578.3	599.4	601.5	567.1	562.6
Government debt as a percentage of GDP	57.1	56.2	53.6	48.5	46.2

Source: Central-government accounts 1995, 1996 and 1997, Budgetary Review 3-98 and provisional figures from the central-government accounts.

Note: Figures for 1999 are estimates based on the Budgetary Review 3-98. No value adjustment takes place in connection with buy-backs of own securities. Borrowing in individual years can therefore deviate from changes in the debt. As from 1998 net bond purchases by the Social Pension Fund are not included in domestic and total net borrowing at market value. On the transition to the new accounting policy as of 1 January 1998 the outstanding volume of nominal DKK 6.6 billion on 8.5 per cent government bonds XEU 2002 was reclassified as foreign debt instead of domestic debt. The movement in domestic and foreign government debt in 1998 therefore does not correspond to net domestic and foreign borrowing.

[1] In 1995-97 including buy-back of the former domestic ECU-denominated loan.

[2] In 1995-97 including exchange-rate adjustment of the former domestic ECU-denominated loan. The figures may therefore deviate from Table 3.1.1.

[3] Index-linked bonds are made up at indexation value. The bond portfolio of the Social Pension Fund is made up at acquisition value in the central-government accounts.

the outstanding volume of nominal DKK 6.6 billion on 8.5 per cent government bonds XEU 2002 was reclassified as foreign debt instead of domestic debt. These factors explain by and large all of the change in the foreign government debt.

Domestic government debt decreased by DKK 17.3 billion. This decline can be related to the proceeds from Tele Danmark's repurchase of shares for DKK 10.0 billion and to the reclassification of the outstanding volume of nominal DKK 6.6 billion on 8.5 per cent government bonds XEU 2002.

In contrast to previous years domestic borrowing in 1998 did not entail an overall capital loss on issue. As a consequence of the low level of interest rates the central government issued bonds and notes at prices above par. However, issues of Treasury bills, which are zero-coupon securities, did realise a capital loss on issue.

A new accounting policy has been introduced as of 1 January 1998. It provides for a more true and fair picture of the costs related to the government debt. The principles for accrual of interest costs and capital losses on issue have been amended, and realised exchange-rate losses on the redemption payments on the foreign debt are carried as expenditure.

Accrual of interest costs and distributed capital losses on issue is now based on time of earning, in contrast to time of payment as before. Interest costs are calculated according to the interest debited for the year, equivalent to the number of days which the loan exists in that year. Capital losses on issue are calculated as the difference between nominal and market value on issue and are carried to the government accounts as distributed capital losses on issue. According to the new accounting policy the capital loss on issue is distributed on a straight-line basis over the maturity of the loan. Previously capital losses on issue were distributed according to the redemption payments on the individual loans.

The new accounting policy entails that part of the future distributed capital losses on issue are not carried as expenditure to the current, investment and lending account of the central government, but are included as an adjustment at the beginning of the year to the central government's balance sheet for 1998.

Table 5.2.2 is a statement of the interest expenditure on the government debt, which in 1998 totalled DKK 38.8 billion. In 1997 interest expenditure calculated according to the previous accounting policy were DKK 43.5 billion. Approximately DKK 1 billion of the difference of DKK 4.7 billion between 1997 and 1998 can be attributed to the fact that the interest expenditure on the domestic debt in 1997 is lower when calculated according to the new accounting policies. In 1999 total interest expenditure is expected to decrease to DKK 38.1 billion. The decline in total interest payments mainly reflects falling interest expenditure on the domestic government debt.

At DKK 48.8 billion the interest expenditure on the domestic government debt carried as expenditure in 1998 was DKK 5.3 billion lower than in 1997. Approximately DKK 1 billion is explained by the amended accounting policies, cf. above. At just over DKK 3 billion the impact on interest expenditure of the drop in interest rates in recent years and of

INTEREST EXPENDITURE ON THE GOVERNMENT DEBT, 1995-99 Table 5.2.2

DKK billion	1995	1996	1997	1998	1999
Domestic debt					
Interest	46.2	47.8	49.7	45.3	43.7
Distributed capital losses on issue	5.6	6.4	4.4	3.5	3.2
Interest expenditure	51.8	54.2	54.1	48.8	46.9
Foreign debt					
Interest	7.6	5.6	3.9	5.0	4.7
Realised exchange-rate loss on redemptions	-	-	-	- 1.2	- 0.1
Distributed capital losses on issue	0.1	1.0	0.7	0.1	0.2
Interest expenditure	7.7	6.6	4.6	3.9	4.8
Interest concerning (- = revenue)					
The central government's account with the Nationalbank	- 1.6	- 1.5	- 1.2	- 1.7	- 1.9
The Social Pension Fund	- 15.4	- 15.3	- 14.0	- 12.2	- 11.7
Total	42.4	44.0	43.5	38.8	38.1

Source: As for Table 5.2.1. Figures for 1998 and 1999 are estimates.

Note: A new accounting policy as from 1 January 1998 changed the calculation of interest payments and distributed capital losses on issue. At the same time the outstanding principal of nominal DKK 6.6 billion on 8.5 per cent government bonds XEU 2002 was reclassified as foreign debt instead of domestic debt. The years 1998 and 1999 are therefore not directly comparable with the period 1995-97.

the decreasing debt account for most of the remaining difference. The drop in interest rates contributes further via the decrease in capital losses on issue by almost DKK ½ billion. Finally, capital losses in connection with buy-backs were almost DKK ½ billion less in 1998 than in 1997.

In 1998 interest expenditure on the foreign government debt was DKK 0.7 billion lower than in 1997.

In 1998 income from interest on the Social Pension Fund's bond portfolio was DKK 1.8 billion lower than in 1997. Almost half of the decrease can be attributed to lower income from interest, while the remainder is related to a drop in capital gains.

THE GROSS DEBT OF THE PUBLIC SECTOR – EMU DEBT 5.3

Pursuant to the Maastricht Treaty Denmark must avoid excessive deficits on the public sector budget. The threshold for the public sector budget deficit is 3 per cent while the threshold for the gross debt of the public sector is 60 per cent of GDP.

Details of the public deficit and the gross debt are reported to the European Commission twice a year. The Commission then prepares a report on the countries which do not comply with the aforementioned

PUBLIC-SECTOR DEBT, END 1995-98 Table 5.3.1

	1995	1996	1997	1998
Gross debt in DKK billion	700	691	683	657
Per cent of GDP	73	68	64	59

Source: Ministry of Economic Affairs, December 1998.
Note: EU definitions are applied to the calculation of GDP statistics.

threshold values. The assessment must take into account whether the debt is decreasing or "…all other relevant conditions ", cf. Article 104C, section 3 of the Maastricht Treaty. On the basis of a European Commission recommendation and remarks from the member state the Council of the European Union will then determine whether an excessive budget deficit exists.

The calculation of the public debt pursuant to the Maastricht Treaty deviates from the calculation of the government debt in Section 5.2. Firstly, in addition to the government debt the public debt also includes local-government debt. However, in Denmark the government debt constitutes most of the public debt. Secondly, the debt is calculated as the gross debt, but with some consolidation of the public sector's claims on itself. The holdings of government securities of the Social Pension Fund and of the social funds (including ATP, the Danish Labour Market Supplementary Pension Fund) are thus deducted in the public-debt statistics. On the other hand, the balance of the central government's account with the Nationalbank and the holdings of non-government bonds of the Social Pension Fund and the social funds are not deducted.

At the close of 1998 the public debt calculated in accordance with the Maastricht Treaty was DKK 657 billion, equivalent to 59 per cent of GDP, cf. Table 5.3.1. The ratio of the public debt to GDP has diminished by 5 percentage points. The public debt thus fell to below the threshold value of 60 per cent.

Since June 1996 Denmark has not been included in the list of member states with excessive budget deficits, even though for most of the period the debt has exceeded the threshold value of 60 per cent of GDP. This should be viewed against the background of a public budget deficit below the threshold value of 3 per cent of GDP, and a falling debt ratio since 1993.

CHAPTER 6

The Social Pension Fund

SUMMARY 6.1

At the end of 1998 the nominal value of the bond portfolio of the Social Pension Fund was DKK 143.6 billion, making it an important asset for the central government. Government bonds account for approximately 70 per cent of the portfolio. The remainder is invested mainly in mortgage-credit bonds. The duration of the portfolio at the end of 1998 was 4.2 years. Interest on the portfolio was DKK 11.2 billion. DKK 7.2 billion was transferred to the Ministry of Social Affairs to cover pension improvement measures and DKK 3.7 billion was paid as pension-fund tax.

BACKGROUND 6.2

The Social Pension Fund was established by the Social Pension Fund Act in 1970. A special state retirement pension contribution was introduced. The proceeds were allocated to the Social Pension Fund and were to be invested in bonds.

With effect from 1982 the Act was amended and the payments to the Fund ceased. The Fund was continued an asset of the central government on the basis of the Fund's accumulated capital. It was also determined that the interest on the Social Pension Fund's bond portfolio would be used to finance pension improvement measures or would be allocated to the Fund.

The proportion of interest used to finance pension improvements is set out in the Finance Act. The amount corresponds to the actual expenditure on pension improvement measures taken pursuant to the Social Pension Fund Act. The amount is transferred on an ongoing basis to the Ministry of Social Affairs.

MANAGEMENT OF THE FUND AND PLACEMENT POLICY 6.3

The Fund is managed by the Minister of Social Affairs and the Minister of Finance. The ongoing administration of the bond portfolio of the Social Pension Fund is handled by a committee with representatives from the Ministry of Finance and the Ministry of Social Affairs, as well as

from Danmarks Nationalbank. The day-to-day management of the assets of the Social Pension Fund is handled by the Nationalbank.

The Fund's capital is placed in stock-exchange listed bonds, primarily government securities. Since October 1995 the Fund's portfolio has been restructured to comprise government bonds rather than non-government bonds. This restructuring mainly took place in conjunction with drawings and redemptions, but also on sale of fixed-yield nominal mortgage-credit bonds and index-linked bonds. Reinvestment takes place exclusively in government bonds. On reinvestment or restructuring it is sought to purchase government bonds without significantly affecting the formation of interest rates in the bond market, including the yield spread between mortgage-credit and government bonds.

THE CURRENT PAYMENTS AND PORTFOLIO OF THE FUND 6.4

In 1998 income from interest was DKK 11.2 billion calculated according to the accounting policies of the Fund[1]. Of this amount DKK 7.2 billion was transferred to the Ministry of Social Affairs to finance pension improvement measures. Pension-fund tax of DKK 3.7 billion was paid.

Together with the proceeds of DKK 17.0 billion from drawings and redemptions of bonds the remaining amount was invested in government securities.

In connection with the restructuring of the portfolio from other bonds to government securities bonds for a total market value of DKK 2.3 billion were restructured. This amount was also invested in government bonds.

In connection with drawings and sale of bonds capital gains of DKK 1.0 billion were realised, made up in accordance with the accounting policies for the Fund.

At the close of the year the bond portfolio of the Social Pension Fund was DKK 143.6 billion at nominal value, cf. Table 6.4.1. The portfolio

BOND PORTFOLIO OF THE SOCIAL PENSION FUND, YEAR-END Table 6.4.1

DKK billion	1993	1994	1995	1996	1997	1998
Nominal value	138.4	146.9	151.5	148.8	146.8	143.6
Market value	146.7	138.3	153.5	156.6	157.4	159.8

Note: Index-linked bonds are included at indexed value in the calculation at nominal value.

[1] As of 1 January 1998 the accounting policies for the government debt, including the bond portfolio of the Social Pension Fund, were amended.

BOND PORTFOLIO OF THE SOCIAL PENSION FUND
DISTRIBUTED BY TYPES OF BOND, YEAR-END

Table 6.4.2

Nominal value	1997		1998	
	DKK billion	Per cent	DKK billion	Per cent
Government bonds	92.5	63.0	100.1	69.7
Mortgage-credit bonds[1]	44.3	30.2	34.4	23.9
Index-linked bonds[2]	9.4	6.4	8.6	6.0
Municipal credit bonds[1]	0.0	0.0	0.0	0.0
Ship Credit Fund bonds[1]	0.5	0.3	0.4	0.3
Other bonds	0.1	0.1	0.1	0.0
Total	146.8	100.0	143.6	100.0

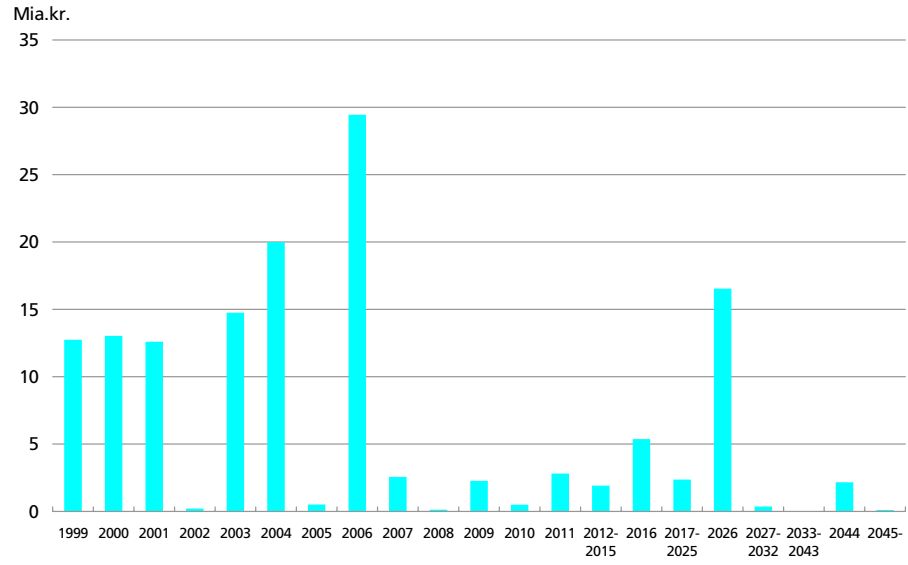
[1] Excluding index-linked bonds.
[2] Indexed value.

thus accounts for a good 7 per cent of the total outstanding volume of bonds listed on the Copenhagen Stock Exchange. During 1998 the nominal value of the portfolio decreased by DKK 3,2 billion. The decline is predominantly related to the reinvestment of drawn bonds in government securities at prices above par. Despite the decrease in the nominal value of the portfolio the falling level of interest rates entailed an increase in the market value by DKK 2.4 billion during 1998.

The bond portfolio mainly comprises government bonds, cf. Table 6.4.2. The reinvestment in government securities has increased the pro-

BOND PORTFOLIO OF THE SOCIAL PENSION FUND DISTRIBUTED
BY YEAR OF MATURITY, END-1998, NOMINAL VALUE

Chart 6.4.1



DURATION OF THE SOCIAL PENSION FUND'S BOND PORTFOLIO Table 6.4.3

Year	End-1997	End-1998
Government bonds	3.6	3.9
Other bonds	5.5	4.9
Total portfolio	4.3	4.2

Note: For callable mortgage-credit bonds an option-adjusted duration which takes the conversion element into account is used.

portion of government bonds to almost 70 per cent. The remainder of the portfolio is invested mainly in mortgage-credit bonds.

The distribution of the Fund's portfolio by year of maturity is shown in Chart 6.4.1. All government securities in the portfolio mature before 2008. Government securities thus account for by far the largest proportion of the total portfolio of bonds maturing before 2008, of which the nominal value is DKK 105.4 billion. The majority of the mortgage-credit, index-linked and Ship Credit Fund bonds in the portfolio mature after 2007.

At the end of 1998 the duration of the total bond portfolio was 4.3 years, cf. Table 6.4.3. The Fund's portfolio thus has a duration similar to the duration of the domestic government debt. The duration of the portfolio of government bonds was increased to 3.9 years on the purchase of relatively long-term government securities. These purchases must be viewed against the background that the duration of the remainder of the bond portfolio fell to 4.9 years. This decrease is due to a shorter remaining maturity and the falling level of interest rates, which reduces the duration of callable mortgage-credit bonds.

CHAPTER 7

Government Debt Policy in an International Perspective

SUMMARY 7.1

Common features of government debt policy are described, with the main focus on European countries. Since it is not possible to cover all aspects of government debt policy in an international comparison of this nature, the chapter concentrates on a few important elements.

The objective of most countries' government debt policy is to achieve low costs in the long term, with due consideration of the risk. Establishing and supporting well-functioning domestic capital markets is generally given high priority. In step with greater specialisation the management of government debt is increasingly organised as separate independent units.

Primarily simple standardised instruments are used in the government debt policy. The most important issues are fixed-rate bullet bonds with 10 years' maturity. There is a tendency for issues to be concentrated in a few series. The purpose is to achieve a liquidity premium by creating the conditions for high-turnover series.

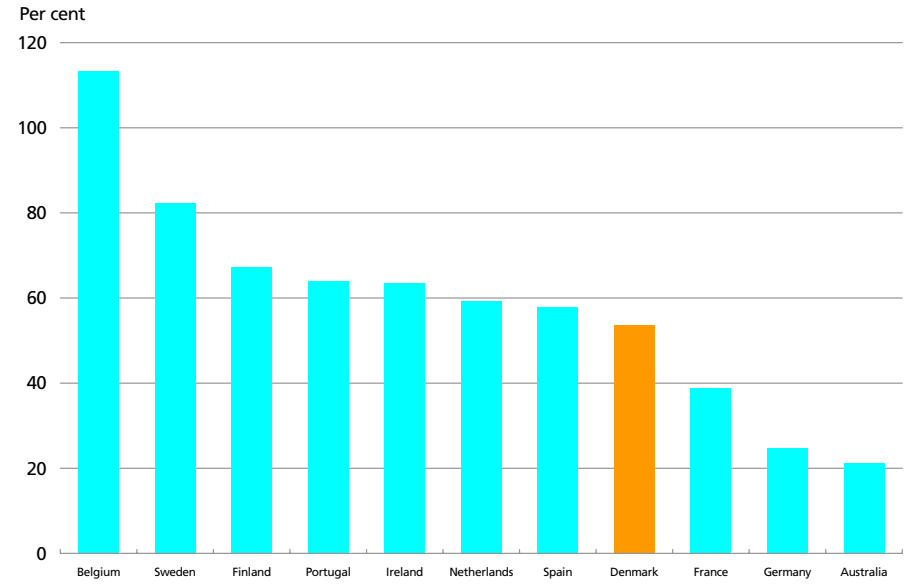
The tendency to standardise the array of government debt instruments has been amplified by the gradual integration of the international capital markets and by the preparations for the third stage of EMU. In most countries non-resident investors have acquired a growing proportion of domestic government bonds. This development has also implied that the countries to an increasing degree are competitors for the most inexpensive funding.

More attention has been focused on the risk management aspect of government debt policy. This applies to the identification and handling of risks, and to the use of more sophisticated risk measures.

BACKGROUND 7.2

From the end of the 1970s the budget deficits of most industrialised countries rose. One consequence of this growth was an expansion of government debt. The European countries' debt as a ratio of GDP

GOVERNMENT DEBT OF SELECTED COUNTRIES
AS A PERCENTAGE OF GDP, END-1997 Chart 7.2.1



Note: Different countries' definitions of government debt vary considerably. For some countries statistics are exclusively calculated in gross terms, while for others they are netted to a degree. In Denmark's case the balance of the central government's account with the Nationalbank and the nominal value of the bond portfolio of the Social Pension Fund are deducted from the nominal value of the domestic and foreign government debt.

peaked in the mid-1990s. As Chart 7.2.1 shows, the government debt of the European countries as a percentage of GDP is considerable. Government debt in the range of 50 per cent of GDP imposes a considerable burden on government budgets.

This growing debt entailed greater focus on the need to develop well-functioning domestic bond markets, since many countries wished to finance domestic deficits by issuing government securities. The purpose was to neutralise the expansion of domestic liquidity as a consequence of the government budget deficit. In virtually every country the central government is the dominating issuer on the domestic bond markets.

An important factor in the development of the government debt policy was the gradual removal of capital restrictions, a trend which accelerated in the 1980s. This liberalisation has led to a very considerable integration of the international capital markets. As a consequence, individual issuers of government securities have access to a wide-ranging group of investors. For a number of countries, including Denmark, non-resident investors are the largest group of investors in domestic government bonds.

The increasingly more integrated capital markets have furthermore meant that in the area of government debt countries to an increasing

degree are competitors. This tendency is amplified by the very strong similarities in the countries' issuing policies. For countries participating in the third stage of EMU this tendency is particularly pronounced, since as from 1 January 1999 the countries issue government securities in a common currency.

The western countries share in common that domestic borrowing is based on the issuer being able to achieve a liquidity premium on major issues of fixed-rate bonds (benchmark issues). The liquidity premium arises because investors are willing to pay a premium for a bond subject to high turnover, since this is the investor's guarantee that even in difficult markets the bond can be sold without affecting the market price. The philosophy behind benchmark issues is that at one and the same time the central government can fulfil the need for the cheapest possible funding in the long term, and the consideration of well-functioning domestic bond markets.

Usually other objectives and considerations are applied to the foreign-borrowing element of the government debt than to the domestic debt. Loans are typically raised in foreign currencies for the purpose of strengthening the country's foreign-exchange reserve. Some countries have furthermore used foreign borrowing as a substitute for domestic borrowing when this has been evaluated to be less expensive, or where no domestic capital markets have existed. With regard to foreign borrowing each country will be a minor issuer in a very large market. This implies access to a wider range of instruments. The foreign debt policy is therefore usually more explicitly directed towards achieving the lowest possible borrowing costs, without consideration of the capital-market conditions, and is therefore more short-term oriented than the domestic government debt policy.

OBJECTIVES OF THE GOVERNMENT DEBT POLICY 7.3

The main purposes of government borrowing are to finance budget deficits and to maintain/strengthen the foreign-exchange reserve. The framework for the government debt policy is usually drafted by the minister of finance and adopted by parliament.

The objective of the country's government debt policy is normally to a ensure low costs, with due consideration of the risks entailed by the government debt, cf. Box 7.1.

The first part of the objective is related to achieving low costs over a given time horizon. For some countries this element of the objective is formulated as a minimisation of costs, while for others the formulation is less rigid, such as to ensure the lowest possible costs in the long term.

OBJECTIVE OF GOVERNMENT DEBT POLICY Box 7.1

The objective of government debt policy can be formulated more or less explicitly. In general, the objective focuses on achieving low long-term costs with due consideration of risk. The following are examples of elements included in government debt policy objectives:

- Ensure low costs (in the medium/long term)
- Maintain an acceptable level of risk
- Ensure low volatility in annual interest payments
- Contribute to supporting and maintaining effective and transparent domestic capital markets in order to ensure future access to these markets
- Outperform a given benchmark

The risk elements included in the government debt policy objectives are primarily:

- Market risk (interest-rate and exchange-rate risk)
- Refinancing risk
- Credit risk

In Denmark's case the government debt policy objective is stated in the remarks to the Act on the authority to raise loans (Act No. 1079 of 22 December 1993) which states that "an overall objective of the government debt policy is to achieve the lowest possible costs in the long term". This objective must be fulfilled subject to a number of considerations, cf. Chapter 1.

The second part of the objective is usually a condition subsidiary to the objective of low costs and concerns management and minimisation of risk. Wordings with regard to risk are often relatively vague, such as a "suitable level of risk" or "low risk".

The objectives are tending to become more explicit, for example a benchmark reflecting the overall objectives. This applies particularly to the countries participating in the third stage of EMU since factors which are difficult to quantify, e.g. consideration of domestic capital markets, diminish in importance as a major euro-denominated capital market is created. It will thus be possible to formulate the objective of the government debt policy more explicitly. This implies that to a greater degree the results of government debt management can be measured, e.g. in relation to a benchmark. Ireland is one example of a country where debt management performance is measured in relation to a benchmark.

ORGANISATIONAL STRUCTURE 7.4

Government debt management may be the responsibility of a country's ministry of finance or its central bank. Alternatively, there may be

separate administrative units with a greater or lesser degree of independence.

Previously, management of government debt was usually organised as part of the ministry of finance, since the government debt policy was considered to be an integral part of fiscal policy. In recent years the trend has been to separate debt management as independent units (agencies).

To an increasing degree government debt portfolios are managed using the tools available to portfolio managers in e.g. banks and pension funds. It has been found that the annual costs of the government debt can be reduced by establishing specialised government debt agencies with explicit objectives concerning costs and risk, and with the opportunity to conduct an active government debt policy. Finally, the establishment of separate agencies has been based on the fact that it is easier to attract specialists to independent units with their own budget.

The countries which have gone furthest in creating autonomous agencies for the management of government debt include Ireland, Portugal, Austria and New Zealand, while e.g. the UK and the Netherlands have established separate government debt agencies which are organised as part of the ministry of finance. Denmark stands out among the European countries since its government debt management is conducted by the central bank.

Irrespective of the specific set-up, the typical model is for the strategy of the government debt policy to be determined at regular meetings of the relevant parties. A number of countries, e.g. Ireland and Portugal, furthermore have a panel of experts to advise on the management of the government debt. There is also a tendency for the countries increasingly to involve investment banks as sparring partners. This can e.g. be the case in connection with the establishment of benchmarks or for analysis of the risks entailed by a debt portfolio.

COMPOSITION OF THE DEBT 7.5

As previously stated, different considerations will typically apply to respectively domestic and foreign borrowing. However, for the EMU countries in particular there is a tendency for the management of domestic and foreign government debt to be more closely integrated. This applies especially to risk management.

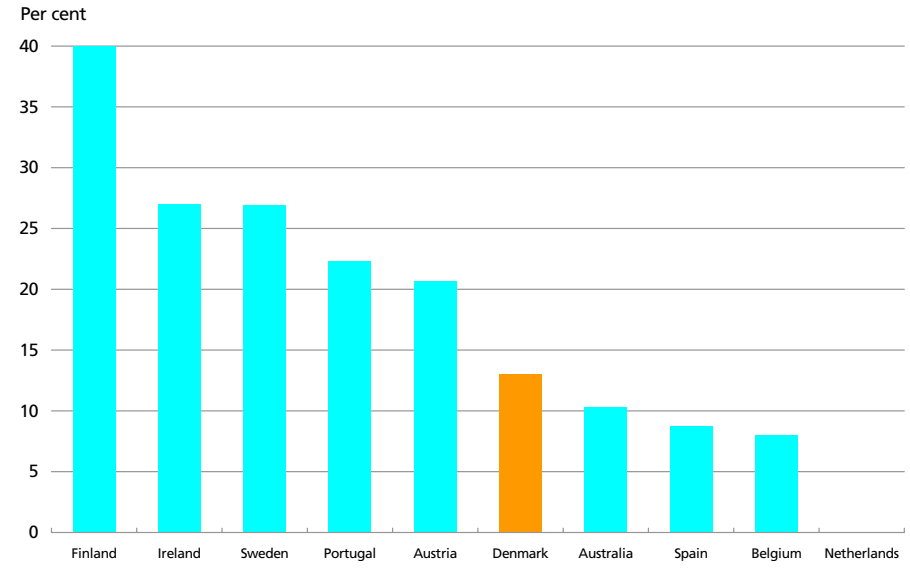
The attitude of the large countries with well-functioning domestic capital markets has been that financing domestic budget deficits by raising loans in foreign currency does not constitute "sound financing". Smaller countries, on the other hand, have for some periods financed domestic budget deficits by foreign borrowing, since this was found to

be the cheapest way of financing the deficit, and also because it was not possible to raise domestic loans on a sufficiently large scale.

Countries such as Switzerland, the USA, Germany and the Netherlands have no foreign government debt, while e.g. Eastern European countries are obliged to cover a large proportion of their borrowing requirement with loans raised in foreign currencies, in view of their less developed domestic capital markets. Between these two extremes are the majority of the western countries whose foreign government debt constitutes 10-20 per cent of the central-government debt. Despite their well-developed domestic markets, many countries wish to hold a certain proportion of the government debt in foreign currency, since they hereby keep up their contact and familiarity with the international capital markets. This ensures easier access to foreign borrowing, if required.

With regard to the countries participating in the third stage of EMU the proportion of their foreign government debt which was denominated in the currencies of other participating countries was redefined as domestic government debt as of 1 January 1999. Therefore, the foreign debt ratio in these countries has changed considerably in relation to the statistics shown in Chart 7.5.1. Moreover, the EMU countries' need for a foreign-exchange reserve, and thereby the need for a contingency arrangement in the form of a continued presence in the foreign borrowing markets, has been reduced.

FOREIGN DEBT AS A PERCENTAGE OF TOTAL GOVERNMENT DEBT, END-1997 — Chart 7.5.1



The boundary between domestic and foreign government debt policy has gradually been erased in recent years. This development is e.g. reflected in the leading rating agencies' adjustment of their ratings to be identical for the EMU countries' domestic and foreign government debt. The reason for eliminating the rating differential between domestic and foreign government debt is that it is no longer possible to achieve monetary financing of domestic government debt.

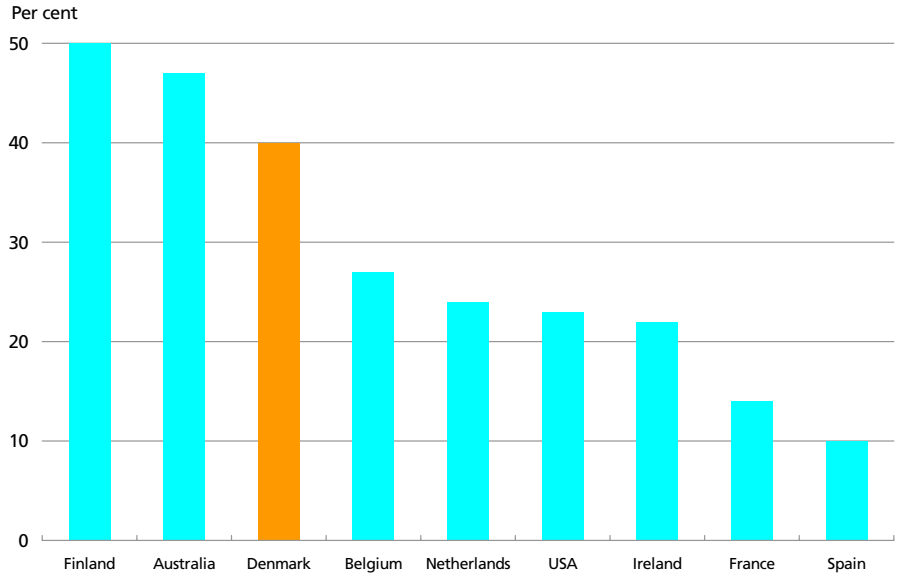
NON-RESIDENT OWNERSHIP OF DOMESTIC GOVERNMENT DEBT 7.6

With the gradual development of domestic government-bond markets and the lifting of restrictions on capital movements a growing proportion of domestic debt is held by non-resident investors, cf. Chart 7.6.1.

Smaller countries in particular have adopted a deliberate policy of arranging issues of government securities to make them attractive to non-resident investors, i.e. fixed-rate bullet issues which are built up to a considerable outstanding volume. This gives access to a very wide range of investors who are willing to pay a premium for a highly liquid bond.

The tendency for a greater proportion of non-resident ownership is expected to continue in the coming years. This is not least a consequence of the commencement of EMU, which means that e.g. pension funds which previously to varying degrees were obliged to invest in

NON-RESIDENT OWNERSHIP OF DOMESTIC GOVERNMENT DEBT, END-1997 Chart 7.6.1



securities in domestic currency now have greater opportunity to spread their investments across several countries.

INSTRUMENTS OF GOVERNMENT DEBT POLICY 7.7

In general, simple standardised instruments are used to conduct the domestic government debt policy, whereas there are examples of the use of more exotic instruments in the foreign debt policy.

Instruments used in domestic government debt policy

The domestic government debt policy of most countries is based on building up large liquid bond series. Concentrating the issues in a few series creates the conditions for a high turnover of the government securities. Primarily fixed-rate bullet issues are used, but in step with the development of the capital markets and the greater focus on risk management the trend is to include other financial instruments, e.g. swaps, in the array of instruments.

An important consideration for domestic government debt policy is to spread the issues across various maturities, thereby taking into account the refinancing risk and also easing future access to the borrowing markets, since different investor segments can be accommodated.

INSTRUMENTS OF GOVERNMENT DEBT POLICY Box 7.2

Simple, standardised instruments are predominantly used in the management of government debt:

The instruments used most to raise government loans are:

- Fixed-rate bullet issues
- Zero-coupon bonds
- Index-linked bonds
- Floating-rate bullet issues
- Structured loans

Moreover, a number of countries issue bonds targeted at private investors, e.g. lottery bonds or savings certificates.

In step with the growing focus on risk, new instruments are used in government debt management. These include:

- Buy-backs of outstanding loans before maturity
- Switching between existing and new loans
- Interest-rate and currency swaps
- STRIPS
- Options

Mainly fixed-rate claims with a maturity of between 2 and 30 years are used. The most important maturities are the 2-, 5-, 10- and 30-year segments. The fixed-rate issues are usually supplemented with a short-term Treasury bill programme with a maturity of up to 12 months.

A number of countries supplement the fixed-rate issues with floating-rate loans, as well as index-linked bonds. The traditional issuers of index-linked bonds include Australia, Canada, the UK and Sweden, but in recent years some countries, among them the USA and France, have also begun to issue index-linked bonds. Finally, to varying degrees products designed for private investors are used. They include lottery bonds and savings certificates. Instruments designed for private investors are normally only a minor share of the total government debt, however, and outstanding volumes under these schemes are declining.

Supplementary instruments of domestic debt policy

Buy-backs have developed into a natural element of the array of instruments used by government debt units. The reason is the wish to keep up issues in large series despite diminishing borrowing requirements, and also the effects of the commencement of EMU. For example, Ireland is planning to switch high-coupon loans for securities at more market-conforming coupon rates, while France has bought back outstanding ECU-denominated loans. In both cases the purpose has been to provide a basis for major euro-denominated issues. The assumption is that an active buy-back policy can reduce the costs of the government debt.

STRIPS, i.e. the opportunity to split up existing bonds into individual components and to trade the individual interest and redemption payments separately as zero-coupon securities, are a supplementary instrument used by many countries. STRIPS can be of interest to e.g. pension funds, since investment in zero-coupon securities does not entail any reinvestment risk before maturity. From the issuer's point of view the purpose of STRIPS is to make the domestic market more interesting to more investors, since investors can customise the government debt products to their own needs. It is assumed that STRIPS entail a premium for the issuer, since investors will be willing to pay for access to split up (and merge) the payment flows of a bond. STRIPS are mainly a means to create additional liquidity.

Domestic interest-rate swaps are increasingly used as an instrument in risk management of the government debt. This tendency will be augmented in coming years, since the EMU countries will have access to a large and liquid euro-denominated swap market.

In addition to the instruments used directly by government debt units derivatives based on government securities can also increase the liquidity

of the government securities market. These instruments include futures and options on government bonds. With regard to futures, the turnover of a government bond may increase if it can be delivered under the contract. In connection with the introduction of futures based on euro-denominated government bonds by the leading European stock exchanges, issuer countries have shown great interest in having their government securities issues deliverable in these futures.

Instruments of foreign debt policy

The instruments used in the management of the foreign debt are often more sophisticated than the instruments used in managing domestic government debt. This is mainly because borrowing takes place in large, well-functioning capital markets. Furthermore, the borrower is not required to take domestic capital-market conditions into account.

Management of foreign government debt focuses more directly on achieving the cheapest possible funding, and less on supporting bond markets and building up large series. Loans denominated in foreign currencies can e.g. entail structures or options which make them attractive to specific investors, while borrowing often involves swaps in order to achieve the required interest-rate and exchange-rate exposure. Up to the commencement of EMU some countries, e.g. France and Finland, have used ECU issues as a means of getting ahead in establishing leading benchmarks on the market for euro-denominated government bonds.

As an example of ongoing innovation in the management of government debt, in recent years Ireland has raised loans in foreign currency and then swapped to her domestic currency. This means that in real terms borrowing is in the domestic currency, but in a market where there is access to far more investors and instruments and which presents arbitrage opportunities which can make borrowing extraordinarily inexpensive. On the other hand, Sweden has raised domestic loans and swapped to foreign liabilities. Innovation of this type also illustrates the tendency not to separate domestic and foreign borrowing to the same extent as before.

METHODS OF ISSUE 7.8

The basic methods of issue used for domestic issues are auctions and sales on tap. Most issues of government securities take place via auction. The primary arguments in favour of the auction method are that it entails a high degree of transparency with regard to sale, and provides equal access for all. Some countries (including Denmark) issue government securities via current sales on tap. The arguments in favour of

selling on tap are based on the continuous presence in the market and favourable market conditions can be utilised as they arise.

Countries which issue government securities by auction usually make use of a more or less formalised primary dealer system. Primary dealers are financial institutions which are obliged to create liquidity and turnover in specific government securities, in return for payment, or access to special privileges or information. Primary dealers hold the sole right to make bids at auctions of government securities and normally also commit themselves to buying a certain minimum volume. Countries such as the USA, France, Belgium, Ireland and Finland use primary dealers. These countries assume that primary dealers help to increase turnover and to sharpen price offering in the bond market, and thereby reduce the central government's borrowing costs.

Recent years' increasing interest in attracting non-resident investors has led many countries to widen the geographical scope of their primary dealer network.

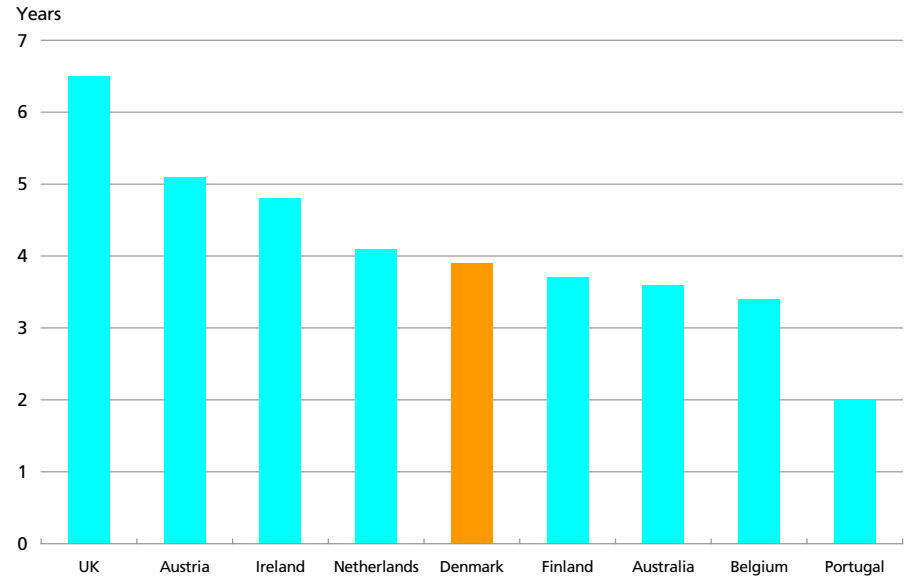
RISK MANAGEMENT 7.9

Government debt policy concerns the weighing of expected future costs against expected risk. Risk is defined primarily in relation to fluctuations in interest and exchange rates, but also e.g. includes settlement risk, and in respect of swaps credit risk. Risk management is the area of government debt policy which has developed most in recent years. Especially after the establishment of separate government debt agencies requirements for accurate reporting and handling of all of the relevant risks have become more stringent. This has led to the development and use of risk measures to quantify the risks related to the management of government debt. Generally, government debt units are characterised as being more averse to risk than traditional portfolio management.

The primary risks in relation to government debt portfolios are the interest-rate and the refinancing risk. The interest-rate risk is normally managed via a target for average remaining maturity or duration. In view of the different considerations and objectives often separate duration targets are applied to domestic and foreign debt. As previously stated, however, there is a tendency for less pronounced segregation of domestic and foreign government debt policy. Instead, a duration target is applied to the total government debt.

The trend in recent years has been to extend the duration of the government debt. This is related to the greater focus on issues in long, liquid series. Another reason is the low interest-rate levels in recent years.

DURATION OF THE TOTAL CENTRAL-GOVERNMENT DEBT, END-1997 Chart 7.9.1



The refinancing risk is managed either via an objective to spread issues across maturities, more explicitly via a target for the shape of the redemption profile or a maximum limit for redemptions in a given year.

In the wake of the development and gradual introduction of Value-at-Risk (VaR) measures there has also been active development of more sophisticated risk measures in the area of government debt. In contrast to asset portfolios, market value is less relevant to government debt than to nominal value. The reason is the long horizon applied to government debt, as well as the limited opportunities to restructure the portfolio since the central government is usually the dominant issuer in the domestic market. This means that the relevant risk measure for the central government focuses on fluctuations in interest costs more than on the development in market value of the debt. Some countries, including Ireland, do, however, apply VaR statistics to the management of their government debt, as a supplement to other risk measures. Especially for a minor issuer operating in a large capital market where there is access to a wide array of instruments, VaR is applicable as a risk measure for government debt, since it becomes more relevant to consider the market value of the debt.

On the basis of the methodology behind VaR a number of countries have introduced risk measures to quantify the risk of fluctuations in the annual interest payments on the government debt. The countries include Austria, Italy, Portugal and Denmark. These risk measures are

e.g. called Budget-at-Risk, Cash flow-at-Risk or Cost-at-Risk (CaR). The measures express the risk of an increase in the annual interest payments, with a given probability.

Where VaR focuses on the risk of a decrease in the market value of a portfolio, the focus with CaR is on a given increase in the nominal interest payments over a given period. In Danish government debt policy CaR is used as a supplement to the targets for duration and the shape of the redemption profile, cf. Chapters 1 and 2.

Use of derivatives, especially interest-rate and currency swaps, has led to a need to build up systems to handle the credit risk, which was not previously a risk element in relation to domestic government debt. Credit risk is usually handled on the basis of ratings by reputed rating agencies.

CONCLUSION 7.10

Government debt policy is subject to continuous international development. This development is driven by the ongoing integration of the capital markets and the access to a wider array of instruments. To an increasing degree countries compete to achieve the cheapest possible funding, in that government securities are sold as widely as possible, with great emphasis on non-resident investors.

The task of government debt units is to reduce the costs of the government debt as much as possible, with due consideration of the risk. The integration of capital markets, the introduction of more sophisticated financial instruments, and the fact that most countries have a large government debt, mean that to a growing extent government debt units operate as professional portfolio managers.

CHAPTER 8

Domestic Interest-Rate Swaps

SUMMARY 8.1

In summer 1998 the Danish central government introduced interest-rate swaps in Danish kroner as a new instrument of domestic government debt policy. Domestic interest-rate swaps have been introduced to increase the flexibility of government debt management and in order to be able to separate issues in liquid bond series from the management of the interest-rate and refinancing risk on the government debt.

The high credit rating of the central government implies that the central government has a comparative advantage from issuing bonds with long maturities. The central government can thus achieve advantageous borrowing terms by issuing long-term bonds and transacting interest-rate swaps whereby interest at a long fixed rate is received and interest at a short floating rate is paid. By entering into this type of interest-rate swap it is also possible to reduce the duration of the government debt.

When the central government transacts an interest-rate swap 2-4 potential counterparties are contacted. Prior to that a price level is determined. The central government must achieve this price for the contract to be transacted. The counterparty with the best bid wins the deal. If the central government's price level is not reached, the transaction does not take place.

The central government does not wish to influence the swap market and therefore only transacts interest-rate swaps for small amounts at a time. In periods where the central government's interest-rate-swap activity can have consequences for the swap market the central government will suspend such activity. This was the case during the market unrest in September.

Domestic interest-rate swaps are in an introduction period, enabling the central government to gain experience of the influence on the Danish swap market. Experience of interest-rate swaps in Danish kroner so far is positive. In future, the central government expects to be able to use domestic interest-rate swaps as one of several instruments to manage the government debt.

FLEXIBILITY IN GOVERNMENT DEBT POLICY 8.2

The central objective of the government debt policy is to achieve the lowest possible long-term costs while taking into account the risks associated with the debt. The costs of the domestic government debt are minimised by building up liquid bond series. Since international investors mainly require bonds in the long segments of the market, the central government covers a large proportion of the borrowing requirement by issuing bonds with long maturities. A declining borrowing requirement makes it more difficult to build up liquid bond series and at the same time achieve sufficiently flexible management of the duration band.

Domestic interest-rate swaps are one of several instruments which can give government debt policy greater flexibility. By transacting interest-rate swaps the central government can still issue liquid bond series and at the same time separately manage the duration of the government debt. The alternative to interest-rate-swap transactions is issue of bonds with short remaining maturities. These transactions will entail a reduction of liquidity in the long-term bonds.

For a number of years the central government has used swap contracts in its management of the foreign debt. Since 1983 the central government has transacted both interest-rate swaps and currency swaps in other currencies.

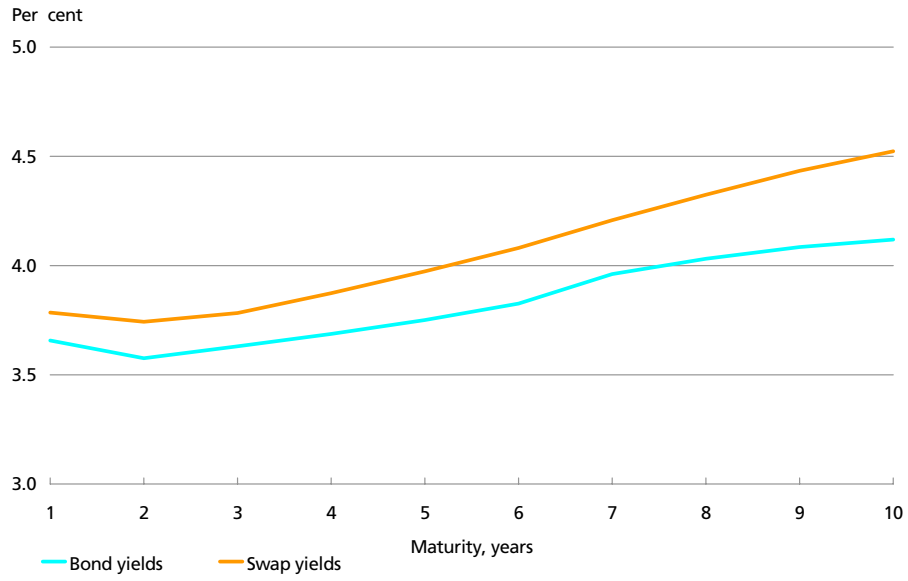
In international terms domestic interest-rate swaps are a relatively new instrument in government debt management. Several countries, including Australia, Ireland and Germany, have experience of using this instrument. A number of the euro countries plan in the very near future to introduce domestic interest-rate swaps to manage the duration of the government debt. The background is that the introduction of the common currency has created a large liquid swap market in euro.

INTEREST-RATE SWAPS 8.3

An interest-rate swap is an agreement between two parties to exchange interest payments on a given principal over a fixed period. Normally, fixed-interest-rate payments are exchanged with floating-interest-rate payments.

In contrast to a currency swap the principal is not exchanged between the parties in an interest-rate swap. The principal of an interest-rate swap is "synthetic" and is used only to determine the size of the payments on the due dates. To emphasise that the principal is synthetic the value of the principal in an interest-rate swap is often called the "notional value" instead of the "nominal value".

SWAP YIELDS AND YIELDS ON GOVERNMENT BONDS Chart 8.3.1



Note: The yield curves are based on yields to maturity from 22 January 1999.

By entering into an interest-rate swap a credit risk on the counterparty is undertaken. The yields in an interest-rate swap therefore include a premium in relation to yields on government bonds. The premium covers the credit spread and differences in liquidity. Chart 8.3.1 presents a yield curve of the fixed interest rate in an interest-rate swap (the swap yield) and a yield curve for government bonds. The difference between the fixed swap yield and the government-bond yield is called the "spread-over". Normally, spreadover increases with the maturity of the swap contract.

There are various types of interest-rate swap. The most common are asset swaps[1] and portfolio swaps. In an asset swap the interest-rate swap is linked to an actual bond loan. One leg of the swap therefore has the same due dates as the underlying bond loan, whereas a portfolio swap is an interest-rate swap with no direct relation to a specific underlying loan. Portfolio swaps make it possible to spread interest payments and interest-fixing dates. For both asset swaps and portfolio swaps the floating interest rate is normally a short money-market interest rate.

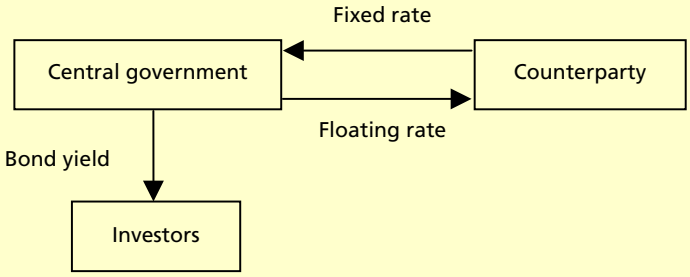
In principle, it is possible to enter into an interest-rate swap where all types of payment flow are exchanged, for as long as a counterparty is willing to enter into the contract. In order to facilitate day-to-day turn-

[1] No distinction is made in the following between asset swaps and liability swaps. The difference is merely whether the swap is related to an asset or a liability.

THE CENTRAL GOVERNMENT'S USE OF INTEREST-RATE SWAPS Box 8.1

A central-government issuer with a high credit rating has a comparative advantage when issuing bonds with long maturities. Although swap contracts make it possible to both pay as well as receive interest at a floating rate, interest-rate swaps whereby fixed interest is received and floating interest is paid are the type of interest-rate swap most used by the central government.

The central government pays a fixed interest rate on most of the existing domestic government debt. Should the central government wish to change some of its fixed-rate payments to floating-rate payments it can enter into interest-rate swaps.



The chart illustrates that the central government receives fixed-rate interest from the counterparty in an interest-rate swap against payment of floating-rate interest. The fixed-rate payments in the interest-rate swap equalise part of the interest payments on the government debt.

over a number of standard interest-rate swaps have been developed. A standard interest-rate swap is often described as a "plain vanilla" interest-rate swap. Many market players currently set indicative prices for plain vanilla interest-rate swaps via electronic media such as Reuters, or in response to telephone inquiries from customers. In the Danish krone market plain vanilla interest-rate swaps are primarily interest-rate swaps with exchange of fixed-rate payments against floating-rate payments, where the maturity (and thereby the fixed interest rate) is 1-10 years and the floating interest rate is the 6-month Copenhagen Inter Bank Offered Rate (Cibor).

Alternative costs

The basis for transacting a plain vanilla interest-rate swap is the wish to switch interest-rate payments from fixed to floating rates, or vice versa. This can be related to comparative advantages in various market segments, the fact that the duration of a portfolio is to be increased or reduced, or the wish to have the same type of interest payments on assets and liabilities.

"SAVING" FROM TRANSACTING AN INTEREST-RATE SWAP
FROM FIXED TO FLOATING INTEREST — Table 8.3.1

		Per cent
The central government pays	+ interest on bond (A)	4.75
	+ floating interest in swap (B)	4.55
The central government receives	- fixed interest in swap (C)	5.20
Net borrowing costs	(= A+B-C)	4.10
Borrowing costs of alternative	Interest on Treasury bill (D)	4.20
"Saving" from the swap	(= D-A-B+C)	0.10

Note: The figures in the Table are fictive.
In the calculation it is important to take the different interest-rate conventions for payments into account.

Normally, there is an alternative to an interest-rate swap, i.e. a different strategy giving the same cash flow. To evaluate whether an interest-rate swap is advantageous it can be compared with this alternative.

In the example in Table 8.3.1 the central government wishes to borrow at a floating interest rate. Loans at floating interest rates can be obtained either by issuing a fixed-interest-rate bond and then swapping the payments to floating interest, or alternatively by issuing Treasury bills.

By issuing a bond and transacting an interest-rate swap the central government has to pay interest on the bond and floating interest in the swap, but in return the central government receives a fixed swap yield. If the central government issues Treasury bills it needs only to pay the interest on these bills. The "saving" to the central government of transacting the interest-rate swap is the difference in the costs of the two strategies. The "saving" among other things reflects the credit risk on the counterparty assumed by the central government.

The "saving" gives only an indication of the advantageousness of the interest-rate swap on the day it is transacted. It is therefore not a fixed saving throughout the maturity of the swap. Each time the floating interest rate in the swap is fixed, the "saving" from the interest-rate swap changes. Whether the swap is advantageous depends on the spread between the floating interest rate and the Treasury-bill interest rate. The smaller the spread, the greater the saving on the interest-rate swap.

Pricing of an interest-rate swap

An interest-rate swap has two "legs": a fixed-rate leg and a floating-rate leg. Normally, the price of an interest-rate swap is set so that the present value of the fixed leg and the floating leg are identical on the date of transaction. The net present value of an interest-rate swap is thus normally by definition zero on the date of transaction. In practice the

interest rate on the fixed leg (the swap interest rate) is adjusted to give the interest-rate swap the value of zero. In Appendix 8.A.1 the price fixing of an interest-rate swap is explained in more detail.

The swap interest rate which makes the present value of the two legs identical is called the "mid point" or "breakeven". The final swap interest rate to be paid or received depends on the bid/offer spreads, the swap structure, the competitive situation and the positions and credit rating of the counterparty.

The value of an interest-rate swap at any time can be determined as the difference between the present value of the two legs in the interest-rate swap. For the party receiving fixed interest the value is given by the present value of the fixed-rate payments (the asset leg), minus the

INTEREST-RATE SWAPS' EFFECT ON THE DURATION OF A DEBT PORTFOLIO Box 8.2

When an interest-rate swap is transacted in which fixed-rate interest is received and floating-rate interest is paid the duration of a debt is reduced. This example shows the extent of the effect of an interest-rate swap on the duration of a debt.

Assume that an interest-rate swap is transacted for a notional amount of DKK 1 billion and that the present value and the duration of the debt and the legs of the interest-rate swap are as shown below.

EFFECT ON DURATION Table 1

	Present value, DKK billion	Duration, year
Debt	100	4.10
Swap		
Asset leg	- 1	7.88
Liability leg	1	0.50
Duration contribution from swap		- 0.07
Duration of debt incl. swap		4.03

The total duration of the debt can be calculated as:

$$4.03 = 4.10\frac{100}{100} - 7.88\frac{1}{100} + 0.5\frac{1}{100}$$

The interest-rate swap thus affects the duration by -0.07 year. Note that the asset leg of the interest-rate swap has a negative present value since for liabilities the sign is considered to be positive.

present value of the floating-rate payments (the liability leg). Appendix 8.A.2 presents a description of the calculation of the market value.

It is necessary to know the market value of an interest-rate swap at any time in order to manage the credit risk, cf. Chapter 9, and should it be necessary to close the swap before expiry.

Duration of an interest-rate swap

A duration target is one of the measures used to manage the interest-rate and refinancing risk on the government debt. When the central government transacts interest-rate swaps in Danish kroner the duration of the domestic government debt is affected.

In Appendix 8.A.3 it is explained how an interest-rate swap affects the duration of a portfolio. The duration of the fixed-rate leg is the same as the duration of a fixed-yield bond with the same maturity as the swap. The duration of the floating-rate leg is merely the remaining maturity until the next interest-rate fixing. The total duration is the weighted sum of the durations of the two legs, weighted with the present values.

When the central government transacts interest-rate swaps whereby fixed-rate interest is received and floating-rate interest is paid the duration of the government debt is reduced. By using this type of interest-rate swap the central government can thus influence duration without changing the issuing policy.

Box 8.2 presents an example of how the duration of a debt of DKK 100 billion is affected by an interest-rate swap for a notional value of DKK 1 billion where fixed-rate interest is received and floating-rate interest is paid.

THE CENTRAL GOVERNMENT'S STRATEGY FOR TRANSACTION OF INTEREST-RATE SWAPS 8.4

In the management of the central-government debt experience of using interest-rate and currency swaps in other currencies besides Danish kroner is positive. By using swaps in other currencies the central government, as a small player, can normally transact swaps without influencing the market. The same does not necessarily apply to interest-rate swaps in own currency, so the use of interest-rate swaps in domestic debt management has given rise to a number of considerations concerning types of instrument, market access, etc.

Types of interest-rate swap

It is possible to transact numerous different types of interest-rate swap in Danish kroner. When the central government transacts these swaps, it

has been decided until further to use "plain vanilla" portfolio swaps with a floating interest rate based on 6-month Cibor and a maturity of up to 10 years.
Use of other types of swap product has been considered. In particular, "constant maturity swaps", whereby the floating interest rate is fixed on the basis of a different interest-rate index to 6-month Cibor, e.g. the 2-year interest rate. The purpose of using this product is to avoid some of the interest-rate fluctuations related to the development in the short-term interest rates.

There are several problems associated with using non-standardised swap products. The market for special swap products is less liquid, which limits the number of potential counterparties. On-line prices are not normally set for this type of product, which makes it difficult to control the terms offered. Moreover, the more specialised the swap is, the more difficult any future hedging of the product will be. In step with development of the swap market in Danish kroner this type of product may become more interesting to use in the future.

The major participants in the market for interest-rate swaps in Danish kroner set indicative swap prices for a wide range of maturities. Prices are normally set for swaps with maturities of up to 10 years, but increasingly prices for contracts with maturities as long as 30 years are seen.

The maturity of interest-rate swaps in Danish kroner transacted in connection with management of the central-government debt may not exceed 10 years. A number of considerations have determined this limit.

Even though the market participants increasingly set prices for contracts with maturities of between 10 and 30 years, so far the liquidity in these maturities is evaluated to be less favourable. Moreover, the credit risk on longer swap contracts can be excessive since the credit risk on interest-rate swaps increases with maturity, cf. Chapter 9. Finally, the composition of current issues open for sale affects the delineation. It has thus not been found appropriate to transact swap contracts with longer maturities than the present debt. In this connection the 30-year bond in the current issues open for sale (7 per cent government bonds 2024) has been disregarded.

Moreover, it has been decided that the central government will use *portfolio swaps* rather than asset swaps. There are two reasons:

Firstly, the central government does not wish to be exposed to the Cibor fixing on individual days. In an asset swap the payments on the underlying bond are matched. The payment dates in the asset swap are

therefore adjusted to the payment dates for the bond. With an annual due date on the underlying bond, e.g. 15 November, the floating interest rate in the asset swap is fixed at 15 May and 15 November each year. If asset swaps for a relatively large amount have been transacted, the central government becomes exposed to the fixing of the floating interest rate on individual days. This is less appropriate.

Secondly, the central government prefers payments not to be exchanged on the date of transaction, due to the credit risk. If the payments on an asset swap are to be matched completely with the payments on an underlying government bond the interest rate on the swap contract must be adjusted to the bond's coupon rate. Since coupon rates for government bonds are not equivalent to market interest rates, the swap contract's value will differ from zero on the date of transaction. This augments the credit risk.

Liquidity in the market for interest-rate swaps in Danish kroner normally fluctuates somewhat, depending on the market situation. However, it will not normally entail difficulties or subsequent market impacts to transact swaps with a *contract size* of up to DKK 500 million.

Market influence

In certain cases use of interest-rate swaps may influence the bond market. This is because a swap on which e.g. 6-month Cibor is paid and 10-year fixed interest is received can be perceived overall as purchase of a 10-year fixed-rate bond combined with sale of a floating-rate bond subject to Cibor interest-rate fixing. Ordinary arbitrage will thus result in the swap prices being closely related to the prices in the bond market.

If the central government transacts an interest-rate swap from the 10-year swap interest rate to 6-month Cibor, all else being equal this will affect the bond market as if the central government buys a 10-year bond in the market and simultaneously sells a 6-month Treasury bill to finance the purchase. At some point the transaction of the interest-rate swap may thus result in a deterioration of the liquidity at the long end of the bond market, which is not the intention.

It is expected that an impact of this nature can be avoided in the Danish market since in addition to government bonds there are a number of other instruments which can be used to hedge swap transactions and which do not negatively affect the liquidity of the bond market.

Normally, the banks seek to hedge swaps with other setoff swap transactions. Hedging a swap using government bonds is costly, due to the interest-rate differential between the two instruments. In cases where a bank does not have a setoff swap contract the position will normally be hedged until a counterparty interest appears. In these cases

a swap contract will be hedged in the short term with futures or in the market for short-term interest-rate instruments, e.g. the FRA market. As a consequence of the close links between the Danish and German interest-rate markets the very liquid German bund future will be used for short-term hedging.

In view of these other opportunities to hedge the swap positions it can be assumed that use of swaps will not reduce the liquidity of the bond market. It should thus be possible to combine use of interest-rate swaps with continued focus on the liquidity premium in benchmark series.

Transaction of contracts

Trading in the swap market is not as frequent as in the liquid government-bond market. Details of the ongoing price fixing of interest-rate swaps are therefore more difficult to obtain, since prices are not updated so frequently.

It is possible to transact a swap contract by contacting a potential counterparty with the request to handle the transaction of the swap and to set a price. This trading method can entail some advantages, particularly for large or very special contracts where the counterparty has time to work out an offer without being disturbed. In view of the limited notional amount and the standardised type of swap which the central government wishes to use it has been decided for competition and control-related reasons to contact more than one counterparty before a swap transaction takes place.

The central government uses a tender procedure for contact with counterparties, cf. Box 8.3. If a swap is to be transacted, 2-4 potential counterparties are contacted and asked to set a fixed price for an interest-rate swap with a specific maturity and for a particular notional amount. The price must be given immediately. Prior to that an interest-rate level to be fulfilled by the transaction is fixed. The participants do not know this level. If the level is achieved, the counterparty with the best bid will win the deal. The other participants are not informed of who won the transaction or at what level the deal was transacted. If the level is not reached, all are rejected.

The purpose of carrying out swap transactions in this way is to achieve sharp prices at a competitive level without simultaneously affecting the conditions in the market by broadcasting information on transactions. As the number of market participants and the liquidity of the Danish swap market improve, it will be considered whether to introduce an auction-based procedure.

In cases where the central government is directly offered a swap transaction by a counterparty the swap is not transacted until two other

METHODS FOR TRANSACTION OF INTEREST-RATE SWAPS Box 8.3

The central government can use several different types of trading method to find the best price in the swap market. In principle, the central government does not wish to contact only one potential counterparty to obtain a price. This is because opportunities to control the terms offered in the swap market are less favourable. There are ways of transacting swaps which provide a higher level of competition and better opportunities to control the bid prices. The liquidity and the number of participants in the market determine which method gives the best result.

In a "*tender procedure*" a number of counterparties are contacted and asked to set a price for the deal. The counterparties do not know each other and are given a short time to set a price. All prices are given simultaneously via telephone. This type of telephone auction functions best in a market where the number of participants is relatively small and the market liquidity is thin. The number of bidders from time to time is kept down, so as to reduce the risk of influencing the market prices. At the same time "contestable markets" are maintained by continuously changing the counterparties asked to participate. However, this entails the risk of excluding the potential counterparty who for special reasons would have been willing to offer an advantageous price.

In *consortium tenders* the required swap transactions are offered to a small, fixed consortium of swap counterparties. Use of a consortium to distribute swap transactions can be equivocated to using primary dealers in the bond market. The advantage of a consortium is that the counterparties know the central government's interests. When the market's interest matches the central government's interest, the counterparties can thus contact the central government. A consortium can be an advantage in building up a market. Another benefit is that the central government knows in advance that a particular minimum group is interested in a particular swap transaction. The greatest problem related to consortium tenders is that potential competition from institutions outside the consortium is waived, with the risk of formation of a cartel.

In *open auctions* the market is informed in advance of a given transaction, stating the swap volume. All potential counterparties can set a price for the required volume. Open auctions are most advantageous in a liquid market with many potential counterparties. In a market of this type the best price is obtained if the market is as deep as possible. There can be problems in using open auctions in less liquid markets, since the market prices may adjust to the news of the auction, so that very sharp prices around a distorted level are set.

potential counterparties have had an opportunity to bid for the same swap. This procedure is used for competitive reasons and in order to maintain market control of the price which is set.

Selection of counterparties

On selecting the potential counterparties it is taken into account that interest-rate swaps imply a credit risk for the central government. The group of potential counterparties is therefore limited to financial institutions with expertise in the swap market whose credit rating is satisfactory.

The group of potential counterparties on transaction of interest-rate swaps in Danish kroner is larger than the group of counterparties the central government may use on transaction of currency swaps, cf. Chapter 9. Normally, a minimum rating of AA- from reputed rating agencies is required, but for interest-rate swaps in Danish kroner a minimum rating of A- is accepted. The enlarged group of counterparties should be viewed in the light of the limited number of active participants in the interest-rate swap market in Danish kroner.

As previously stated, the transaction of interest-rate swaps does not involve exchange of principals between the parties. This significantly limits the absolute scale of the credit risk on an interest-rate swap compared to e.g. a currency swap, where principals are exchanged both on transaction and expiry of the swap. Since interest-rate swaps thus entail less exposure than currency swaps, lines for counterparties with a rating of A+, A and A- can be held at a relatively low level.

The extent of interest-rate swaps in Danish kroner

At the end of 1997 Germany's government debt unit gained access to use interest-rate swaps in D-marks to manage the duration of the debt. When this decision was published it appeared to affect the German yield curve as a drop in the long-term swap interest rates. Even though it subsequently emerged that the market overreacted in its expectations of the swap requirement, the market reaction showed that a central-government issuer must take care in a market of this nature.

It is important for the central government not to influence the Danish swap market. On using the interest-rate-swap market in Danish kroner the intention is therefore that in the first instance interest-rate swaps for a limited amount are transacted. The central government has introduced interest-rate swaps over an extended running-in period in order to gather experience of the effects on the Danish swap market.

THE DANISH INTEREST-RATE-SWAP MARKET 8.5

The volume in the market for Danish interest-rate swaps has more than trebled in the period 1995-98. A large part of the increase is related to the creation of the 4 per cent bond market in the autumn of 1996. After

NET TURNOVER AND OUTSTANDING AMOUNTS IN INTEREST-RATE SWAPS, DANISH KRONER — Table 8.5.1

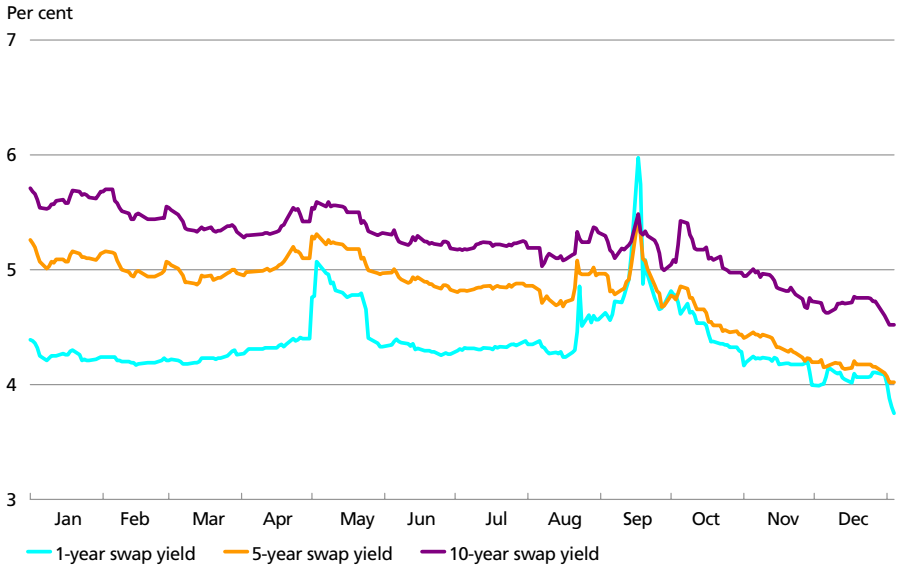
USD billion	April 1995	April 1998
Net turnover per banking day	0.2	0.7
Outstanding amounts	85	325

Source: BIS survey.
The Danish part of the BIS survey is described in an article by Henning Dalgaard entitled "Survey of the Foreign-Exchange Market and the Markets for Financial Derivatives in 1998", Danmarks Nationalbank, Monetary Review – 4th Quarter 1998.

the extraordinary lowering of the minimum coupon rate on 22 October 1996 many large institutions began to issue 4 per cent bonds and to swap fixed-rate payments to floating-rate payments.

The Danish swap market is dominated by the large Danish banks and by some large investment banks, most of which are located in London. Swap transactions among the active market participants take place in blocks of minimum DKK 100 million. Liquidity is good for interest-rate swaps with maturities of up to 10 years, but it is less favourable for maturities exceeding 10 years. Amounts in the range of DKK 500 million can be traded without significantly affecting the swap market. The amount depends on the current market conditions. Trading of larger

DEVELOPMENT IN SWAP YIELDS, 1998 — Chart 8.5.1



Note: The swap yields are indicative.

amounts can trigger an immediate market reaction due to the counter-party's hedging of the transaction.

The swap market in 1998

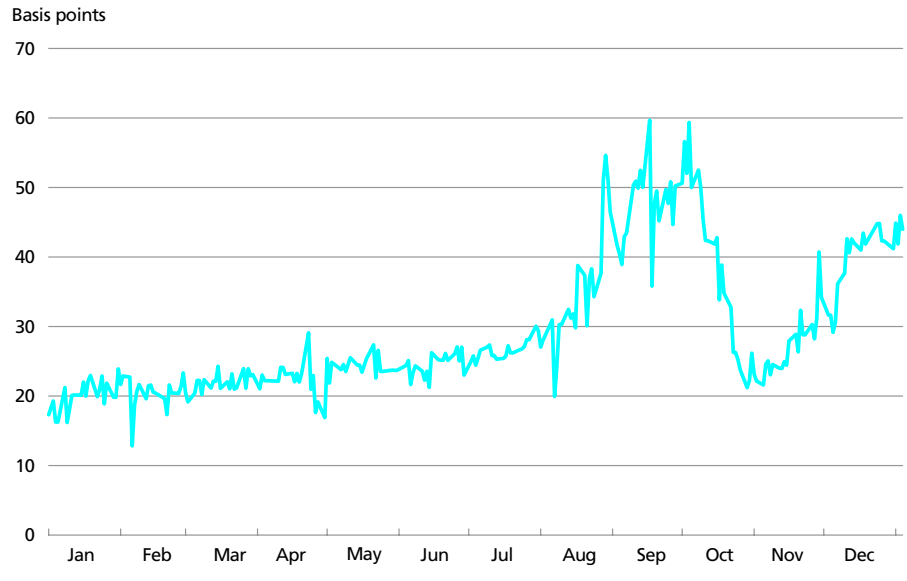
In 1998 swap yields were more volatile than bond yields, but otherwise the development was in parallel. There was a moderate falling trend for the 5- and 10-year swap yields. Mainly short-term swap yields were affected at the time of the Danish referendum on the Amsterdam Treaty during the spring of 1998, and the market unrest in the autumn.

Since interest-rate swaps present a credit risk, changes in the swap yields can be due to shifts in government-bond yields, in credit spreads and in the liquidity of the swap market.

In periods of market unrest the credit spread increases. Interest-rate swaps are therefore more severely affected than government bonds. After a period of market unrest there is a tendency for the spread between swap yields and government-bond yields to take longer to stabilise. Chart 8.5.2 presents the difference between the swap yield and the bond yield (the spreadover) in the 10-year segment.

Up to the market unrest the 10-year spreadover was at a level of around 20-30 basis points. During the market unrest the spreadover expanded strongly. After falling to the level prior to the market unrest the spreadover widened to a level of 40 basis points during December.

DEVELOPMENT IN SPREADOVER, 1998 Chart 8.5.2



Note: Spreadover is the difference between the 10-year indicative swap yield and the 10-year bond yield.

INTEREST-RATE SWAPS TRANSACTED IN DANISH KRONER Table 8.5.2

Month of transaction	Month of expiry	Notional amount	Central government receives	Central government pays
Sep. 1998	Sep. 2008	DKK 200 million	10-year rate	6-month Cibor
Sep. 1998	Sep. 2008	DKK 300 million	10-year rate	6-month Cibor
Jan. 1999	Jan. 2009	DKK 300 million	10-year rate	6-month Cibor
Jan. 1999	Jan. 2009	DKK 200 million	10-year rate	6-month Cibor

After the market unrest many market participants wished to receive interest at a fixed rate and to pay interest at a floating rate, since international investors wanted to divest their positions in mortgage-credit bonds. As a consequence of the lack of investors with counterbalancing interests liquidity in the swap market was limited. It was not restored until mid-December.

The central government's activity in the swap market

Prior to the market unrest in September the central government transacted two interest-rate swaps for a notional value totalling DKK 500 million, entailing receipt of a 10-year swap yield and payment of 6-month Cibor.

Immediately after the introduction the central government discontinued activity in the swap market as a consequence of the market unrest. After this market unrest had subsided, the central government sought to transact interest-rate swaps. It was not possible to achieve acceptable interest-rate-swap prices before January 1999, when the central government transacted interest-rate swaps for DKK 500 million.

Since the central government has only transacted a small number of interest-rate swaps the introduction period has continued. The experience gained so far has been positive. It is therefore expected that in the future interest-rate swaps can be used actively as one of several instruments to manage the risk on the government debt.

APPENDIX 8.A

Pricing of an interest-rate swap 8.A.1

The fixed interest rate on an interest-rate swap is normally fixed so that the present values of the floating and fixed legs are identical. The series of payments for the two legs of the interest-rate swap are presented in Box 8.A.1. A yield structure is used to determine the present value of the two legs. In theory, each of the two legs in the interest-rate swap must be discounted with a yield structure equivalent to the credit rating of the paying party. If party A pays interest at a floating rate, and party B at a fixed rate, the floating-rate leg is discounted by the yield curve equivalent to the credit rating of party A, while the fixed leg is discounted by the yield curve equivalent to the credit rating of party B.

In practice the interest rate on the floating leg is determined on the basis of an uncollateralised money-market rate, while the interest rate on the fixed leg (the swap yield) is determined on the basis of the actual government-yield curve with the addition of a spread for the credit risk on the counterparty and for competition factors.

If the payment series on the floating leg is discounted by the yield curve used to determine the floating interest rate, the floating leg will have a value of 1 on the interest-fixing dates. Since the floating interest rate is fixed on the date of transaction, the present value of the floating-rate leg is 1.

The present value of the fixed-rate leg can be determined as the discounted value of future payments

$$c\sum_{i=1}^{f} d(0,t(i,F)) + d(0,T)$$

where they are discounted by the actual yield curve with addition of a spread for credit risk and competition factors.

In order to determine the swap yield giving the swap contract the value of zero, the present values of the two legs are set to be equal. Solving this equation for c, the swap yield is

$$c = \frac{1 - d(0,T)}{\sum_{i=1}^{f} d(0,t(i,F))}$$

The swap yield is thus determined solely on the basis of the discounting factors on the fixed-rate leg of the interest-rate swap.

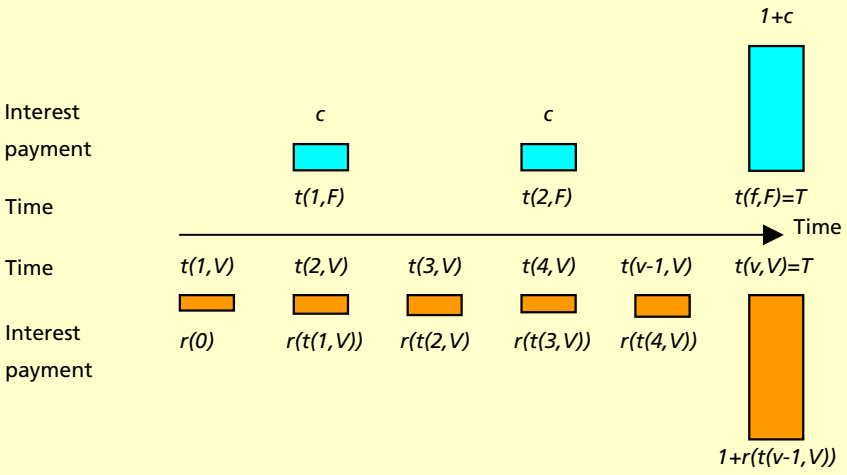
NOTATION AND PAYMENT SERIES Box 8.A.1

An interest-rate swap comprises a floating-rate leg and a fixed-rate leg. In order to set out the payment series for the two legs the following notation is used:

c	Swap yield – i.e. the interest rate on the fixed-rate leg.
$r(t)$	The floating interest rate fixed at time t, typically 6-month Cibor. $r(t_1)$ is the interest rate paid on the notional principal to time t_2.
$d(t_1,t_2)$	Discount factor between t_1 and t_2, $t_1 < t_2$.
T	Expiry date of the swap.
f	Number of payments on the fixed-rate leg. Usually paid once a year.
v	Number of payments on the floating-rate leg. Typically, interest is paid several times a year on the floating-rate leg. If 6-month Cibor is paid, there will be two annual payments.
$t(1,F),\ldots,t(f,F)=T$	Times of payments on the fixed-rate leg.
$t(1,V),\ldots,t(v,V)=T$	Times of payments on the floating-rate leg.

In an interest-rate swap normally principals are not exchanged. In order to make the calculations easier it can be assumed that amounts are exchanged equivalent to the notional principal on the expiry date of the swap, since this assumption leads to the same net payments. To make things easier the notional principal is set at 1 and it is assumed that the swap it transacted at the time zero.

If fixed-rate interest is received and floating-rate interest paid, the payments on the two legs can be illustrated as



The payment series for the floating leg is equivalent to the payment series on a bullet issue at a floating interest rate. The fixed-rate leg is identical to a bullet issue with a fixed coupon rate.

Market value of an interest-rate swap at any point in time **8.A.2**

The market value of an interest-rate swap at any point in time *t* can be determined as the difference between the present value of the two legs of the interest-rate swap. Let *t(k*,V)* and *t(k*,F)* be the first time after *t* where respectively floating interest (V) and fixed interest (F) are to be paid and assume as previously that payments of amounts equivalent to the notional principal on the expiry date are exchanged.

The present value of the floating leg to time *t* can be determined as the value at time *t(k*,V)* discounted back to time *t*. The floating interest rate for the following period is fixed at time *t(k*,V)* and interest is paid for the preceding period. The total value of the floating leg at time *t(k*,V)* discounted back to time *t* is therefore

$$(1+r(t(k^*-1,V)))d(t,t(k^*,V))$$

The present value of the fixed-rate leg is the discounted value of future payments

$$c\sum_{j=0}^{f-k^*} d(t,t(k^*+j,F))+d(t,T)$$

The value of the interest-rate swap to time *t(k)* can be determined as the difference between the two present values.

The value of an interest-rate swap will thus vary over time with the historical development in interest rates. On a drop in interest rates an interest-rate swap will be of positive value for the party receiving fixed-rate interest, whereas the interest-rate swap will have a negative value for the party receiving floating-rate interest.

Duration of an interest-rate swap **8.A.3**

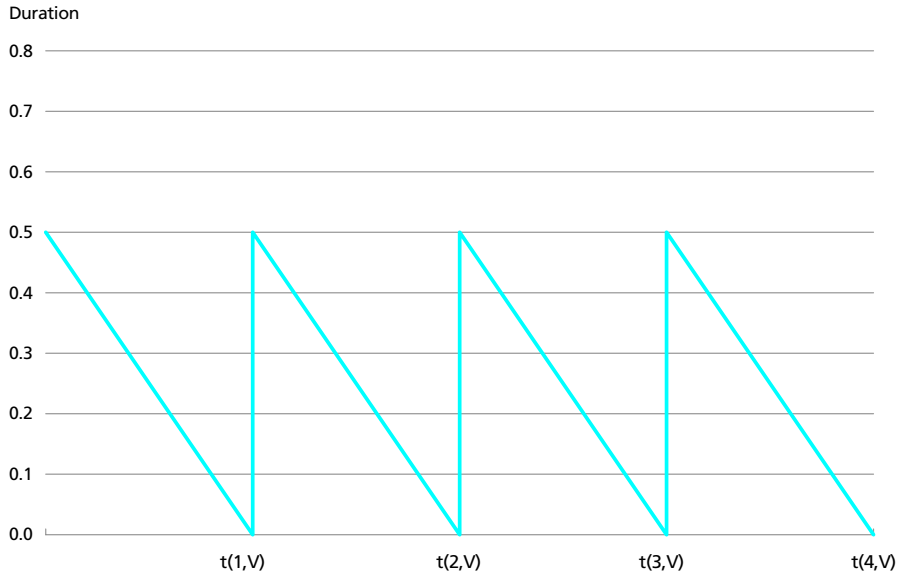
An interest-rate swap consists of an asset leg and a liability leg. The duration of an interest-rate swap can be determined as the weighted sum of the durations of the two legs, weighted with present values.

In order to make the calculations easier it can be assumed, as in Section 8.A.1, that amounts equivalent to the notional principal on the expiry date of the swap are exchanged.

The duration of the fixed-rate leg is merely the same as the duration of a bullet issue with a coupon equivalent to the swap interest rate.

In the definition of duration it is assumed that the payment series are known. Since the payments on the floating leg are not known the duration cannot be determined directly. However, it is likewise assumed in the definition of the Macaulay duration that the yield structure is flat. If the floating rate is replaced with the interest rate on which the

DEVELOPMENT IN THE DURATION OF THE FLOATING-RATE LEG Chart 8.A.3.1



calculation of the duration is based, it is possible to determine the duration of the floating leg.

Let the floating interest rate therefore be equivalent to the interest rate used to calculate the duration. Immediately after an interest payment the floating leg (including the principal) will have the value 1. The present value of the floating leg to a time t before a payment is $(1+r_{next})/(1+r)^t$, where r_{next} is the interest rate paid at the next due date. Note that at the time where r_{next} is fixed, $r = r_{next}$, but r_{next} will not change if r changes. The duration of the floating leg can be determined as t, which is the time to the next interest payment[1].

The duration of the government debt is found by discounting by an average interest rate for government bonds. To correct the duration for interest-rate swaps in practice, the floating rate in the swaps is set equivalent to the average interest rate. If the central government receives interest at a fixed rate, the payments on the fixed leg of the swaps are deducted from the total payment series for fixed-yield bonds. The duration is calculated as the weighted sum of the duration of the total payment series for fixed-yield bonds and the duration of the floating-rate debt, where weighting is with present values calculated on the basis of the average interest rate.

[1] Duration is defined as minus the derivative of the present value with regard to r multiplied by the weight *(1+r)/present value*. Minus the derivative of the present value can be determined as $t(1+r_{next})/(1+r)^{t+1}$. Multiplied by the weight $(1+r)(1+r)^t/(1+r_{next})$, the duration is t.

CHAPTER 9

The Credit Risk on the Central Government's Swap Portfolio

SUMMARY 9.1

The central government is exposed to a risk of losses on its swap portfolio if contracts are defaulted by swap counterparties. This risk of loss is called the central government's credit risk on the swap portfolio.

The swap portfolio was reduced during 1998. The reduction is related to the decrease in the foreign debt.

The market value of the swap portfolio and thereby the credit eksposuer on the portfolio also declined. This is primarily related to the appreciation of DEM against USD and GBP. The swap portfolio's sensitivity to fluctuation in especially exchange rates, but also interest rates, has led to considerable shifts in market value over the years.

The creditworthiness of swap counterparties weakened marginally in 1998. However, the decline in the credit exposure overshadows this effect, so that the total credit risk on the swap portfolio was reduced.

The credit risk on swaps cannot be eliminated entirely, but to limit the credit risk some key principles have been laid down concerning which counterparties contracts may be transacted with, the size of the credit exposure, etc. The credit exposure is calculated under the central government's swap limit system. Guidelines for the current monitoring, including handling of excess credit exposure, are laid down in a written procedure.

After many years of strong growth swaps are now widely used internationally. This has led to growing interest among market participants in reducing the risk on the now considerable credit exposures contained in swap portfolios. The central government aims to reduce the credit risk on its swap portfolio substantially in 1999. This will be achieved by establishing agreements with counterparties on pledging of collateral. The intention is that within a few years swap market values in the central government's favour will be covered by collateral.

THE BACKGROUND TO THE SWAP PORTFOLIO Box 9.1

Since 1983 the central government has used swaps in conjunction with foreign borrowing. The purpose has been to reduce borrowing costs and to manage the currency distribution and interest-rate risk (duration) of the debt.

The central government's swaps can be divided into three groups: liability swaps, asset swaps and portfolio swaps.

In the case of a liability swap the central government receives payments which are identical with the payments on a specific loan. The central government's payments on the liability swap are thus the actual interest and redemption terms of the loan. The central government may e.g. wish to convert a loan in USD to DEM. It can do this by transacting a swap whereby the central government services a (synthetic) DEM loan in return for receiving the payments on a (synthetic) USD loan. The USD payments in the swap are used to service the USD loan. The net result of the USD loan and the USD/DEM currency swap is a loan in DEM.

The central government also raises structured loans on special interest and redemption terms if the borrowing costs are found attractive. To avoid the "structural risk" the central government's payments on these loans are consistently swapped to ordinary interest and redemption terms using liability swaps.

On buy-back of bonds in a loan to which a liability swap is linked an asset swap is transacted. The notional value of the asset swap will match the size of the buy-backs. The payments under the asset swap will set off payments on the original liability swap.

Portfolio swaps are transacted without linking to a specific loan if there is a need to adjust the currency distribution and interest-rate risk of the existing debt.

On adjusting the currency distribution and duration of foreign loans often two liability swaps, both a currency and an interest-rate swap, are transacted. The total notional value of the central government's swap portfolio (excluding krone-denominated swaps) at end-1998 therefore exceeded the total foreign debt by DKK 25.3 billion.

CREDIT EXPOSURE AT THE END OF 1998 9.2

The central government's swap portfolio was reduced during 1998. This is related to a declining foreign borrowing requirement, cf. Chapter 3.
In 1998 the central government transacted 23 new swaps, while 35 swaps expired. The total notional value of the swap portfolio thus decreased by DKK 21.3 billion. At end-1998 the total notional value of the swap portfolio was DKK 114.1 billion, comprising 162 swaps, cf. Table 9.2.1.

The credit exposure on swap counterparties declined significantly during 1998. This is related particularly to a decrease of DKK 5.5 billion in the market value of the swap portfolio. At end-1998 the market value

THE CREDIT RISK ON SWAPS — Box 9.2

The size of the central government's credit risk on a swap counterparty depends on:

- The central government's credit exposure on the counterparty
- The probability of default by the counterparty
- The expected loss ratio should the counterparty default.

When swaps are transacted they normally have a market value of zero. Once a swap is transacted interest and exchange-rate fluctuations will cause the market value of the swap to change from zero. For example, an interest-rate swap on which fixed-rate interest is paid in return for floating-rate interest will gain a positive market value in favour of the central government if the market interest rate exceeds the swap's fixed interest rate. The market value is the difference between the net present values of the two (synthetic) loans which make up the swap.

When a swap's market value is positive for the central government the latter will have a claim (credit exposure) on the counterparty. The claim under the swap can be considered a loan. If a counterparty defaults the central government can suffer a loss. This risk of loss is the central government's credit risk on the swap portfolio.

The size of the credit exposure is thus determined by the market conditions on the calculation date. In addition to market value the credit exposure must also take the potential future credit exposure into account, cf. Section 9.4.

The probability of counterparty default depends on the counterparty's credit-worthiness for the duration of the swap. A higher creditworthiness reduces the probability of default.

The loss ratio in the event of default depends on the ratio between the value of the counterparty's assets and the counterparty's total liabilities. Creditors will be able to reduce the loss ratio, however, if some of the counterparty's assets are pledged as collateral for the creditors' claims. In such case the value of these assets will first and foremost be used to cover the claims of the relevant creditors.

THE SWAP PORTFOLIO OF THE CENTRAL GOVERNMENT — Table 9.2.1

	1997	1998
	Swaps	
Number of counterparties	35	33
Number of swaps	174	162
	DKK billion	
Notional value	135.4	114.1
Market value	5.4	- 0.1
Credit exposure	13.8	8.0

COMPOSITION OF THE SWAP PORTFOLIO — Table 9.2.2

	End-1997			End-1998		
	Number	Notional value	Market value	Number	Notional value	Market value
	Swaps	DKK billion		Swaps	DKK billion	
Interest-rate swaps	87	67.4	0.1	81	62.0	- 1.1
Currency swaps	74	64.1	5.0	70	48.2	1.0
Structured swaps	13	3.8	0.3	11	3.9	0.0

of the swaps represented a net liability of DKK 127 million. The decline is related especially to the depreciation of USD, AUD and GBP against DEM, and the expiry of swaps with a very large market value in the central government's favour.

The decline in the portfolio's market value meant that most counterparties' utilisation of authorised credit lines was relatively moderate at end-1998.

Table 9.2.2 shows the breakdown of the swap portfolio by category. Currency swaps are seen to account for the largest share of the reduction in the total notional value of the swap portfolio. Currency swaps also account for the largest change in the market value of the portfolio.

SENSITIVITY TO MARKET FLUCTUATIONS 9.3

The central government's swap portfolio is sensitive to fluctuations in exchange rates and interest rates. This means that the portfolio's market value and thereby the central government's credit exposure have fluc-

EXCHANGE-RATE RISK ON THE SWAP PORTFOLIO, DKK MILLION — Table 9.3.1

Currency	Change in market value of the asset leg	Change in market value of the liability leg	Net
AUD	57	- 22	35
CAD	19		19
CHF	48		48
CZK	3		3
EUR	716	- 1,082	- 366
GBP	46	- 3	43
GRD	3		3
JPY	11	- 2	10
NOK	3		3
SEK	12		12
USD	211	- 23	188
ZAR	2		2

Note: The Table shows the change in the market value of the swap portfolio on a currency's appreciation by 1 per cent against DKK.
The given measures of exchange-rate risk are excluding structured swaps.

tuated quite considerably. The background to the fluctuations is that the majority of the central government's payments under the swap contracts were in DEM (after 1 January 1999 in EUR), while received payments were predominantly in other currencies.

Table 9.3.1 shows that an appreciation of the USD rate by 1 per cent increases the market value of the portfolio at end-1998 by DKK 188 million. Appreciation of the EUR rate by 1 per cent would reduce the portfolio's market value by approximately DKK 366 million. In the light of the historical fluctuations on currency markets the Table emphasises that major shifts in the portfolio's market value are inevitable.

The swap portfolio is also sensitive to fluctuations in interest rates. On a general drop in interest rates by 1 percentage point the market value of the swap portfolio would increase by DKK 648 million, cf. Table 9.3.2. In general terms, the swap portfolio's market value increases when interest rates in Euroland rise, or when interest rates fall in other countries, especially the USA. Moreover shifts in the yield curve, whereby short-term rates rise and long-term rates fall, will also increase the market value of the portfolio.

The development over the years shows that exchange-rate fluctuations have had a considerably greater impact than interest-rate changes on the market value of the swap portfolio. This was also the case in 1998.

The central government's credit risk on the swap portfolio can be illustrated by dividing up the portfolio on the basis of the counterparties' credit rating, cf. Table 9.3.3. The Table shows that the swap

INTEREST-RATE RISK ON THE SWAP PORTFOLIO, DKK MILLION — Table 9.3.2

Currency	Remaining maturity				Total
	0-1 year	1-3 years	3-5 years	5-10 years	
AUD	10	12	17		39
CAD	8		32		40
CHF	35				35
CZK			7		7
DKK	-1			39	38
EUR	- 83	- 442	- 100	232	- 393
GBP		58			58
GRD		3	4		8
JPY				50	50
NOK				18	18
SEK				81	81
USD	12	98	193	363	665
ZAR		2			2
Total	- 19	- 269	153	783	648

Note: The Table shows the change in the market value of the swap portfolio on a drop in interest rates by 1 percentage point.
The given measures of the interest-rate risk are excluding structured swaps.

CREDIT QUALITY OF THE SWAP PORTFOLIO, DKK BILLION Table 9.3.3

Rating	End-1997				End-1998			
	Counter-parties	Notional value	Market value	Credit exposure	Counter-parties	Notional value	Market value	Credit exposure
AAA ...	2	1.5	- 0.1	0.0	3	8.0	- 0.5	0.0
AA+	12	82.0	3.8	8.8	9	42.5	- 0.2	3.0
AA	8	36.4	1.5	3.8	6	27.5	0.6	2.4
AA-	7	12.5	0.0	0.6	13	35.1	- 0.3	2.3
A+	3	1.3	0.2	0.2	2	1.1	0.2	0.2
A	2	0.6	0.0	0.0	0			
A-	1	1.2	0.1	0.3	0			
Total ..	35	135.4	5.4	13.8	33	114.1	- 0.1	8.0

counterparties' rating weakened marginally in 1998. The background was a combination of several factors:

- Changes in counterparty rating.
- Expiry of swaps with high market value was greatest among higher-rated counterparties.
- More new counterparties with AA- rating were added during the year.

On the other hand, the number of counterparties with a rating below AA- fell from 6 to 2. However, the credit exposure on these counterparties was so modest that this is insignificant.

In summary, the decrease in the total credit exposure overshadows the effect of the lower creditworthiness, so that the central government's total credit risk on the swap portfolio was reduced significantly during 1998.

CREDIT RISK MANAGEMENT OF THE SWAP PORTFOLIO 9.4

The central government's swap portfolio entails a risk of loss if swap counterparties default on their contracts. This risk of loss is the central government's credit risk on the swap portfolio, cf. Box 9.2.

Since the central government began to use swaps in debt management in 1983 it has not suffered any loss due to counterparty default. Certain counterparties used by the central government have faced very serious economic problems, however. A few have ceased to exist or could only continue with the support of public funds or after being acquired by a competitor.

The central government's credit risk on swaps cannot be eliminated completely. In order to limit the credit risk certain general principles for

managing the swap portfolio have been set out. The most important aspects are:

- Selection of counterparties for transaction of swaps
- Lines for maximum credit exposure on counterparties
- System and procedure for ongoing monitoring of the portfolio
- Guidelines for handling excess credit exposure on counterparties
- Measuring the credit exposure on swap counterparties
- Admissible swap contracts.

Selection of counterparties

The bearing principle of government credit policy is that the risk of default by swap counterparties must be as small as at all possible. The central government therefore only transacts swaps with counterparties enjoying a high credit rating. The rating requirement is met if the counterparty holds a rating of AA- or higher from reputed rating agencies.

When the central government in 1998 began to transact interest-rate swaps in Danish kroner the rating requirement was relaxed in order to increase the number of potential swap counterparties. This is considered to be necessary for the central government to be able to achieve satisfactory prices for interest-rate swaps in Danish kroner. The central government is thus willing to transact interest-rate swaps in Danish kroner with counterparties holding a rating of A+, A or A-. This relaxation applies *solely* to interest-rate swaps in Danish kroner.

It is unavoidable that the central government has a credit risk on claims against swap counterparties. This is illustrated in Table 9.4.1 which shows the risk of bond issuers' default at selected times after issuers held a given rating. It is seen that issuers with a high rating (Aaa, Aa or A) very rarely default on their debt. However, over a period of 15

FREQUENCY OF DEFAULT BY ISSUERS 1970-97 Tabel 9.4.1

	Percentage defaulting after:					
Initial rating	1 year	3 years	5 years	7 years	10 years	15 years
Aaa	0.00	0.00	0.14	0.37	0.82	1.71
Aa	0.03	0.10	0.39	0.70	1.07	1.79
A	0.01	0.21	0.54	0.92	1.65	3.06
Baa	0.12	0.75	1.70	2.74	4.53	7.98
Ba	1.34	6.21	11.44	15.53	20.88	30.42
B	6.78	19.13	28.59	35.91	43.85	49.41
Caa-C	20.51	34.10	41.44	51.52	63.13	65.96

Source: Moody's Investors Service, "Historical Default Rates of Corporate Bond Issuers, 1970-97", February 1998.
Note: Since 1983 Moody's has differentiated ratings by adding a figure (e.g. A1, A2 or A3). This differentiation is omitted in the Table.

years 1½-3 per cent of these issuers will nonetheless face a situation where they are obliged to default. In such cases they will usually for an extended period have shown clear signs of a reduced creditworthiness, resulting in a strong decrease in their rating.

If the central government were to suffer a loss on a swap counterparty due to default the loss would therefore probably only take place several years after transaction of the contracts. For this reason contracts are not normally transacted with a maturity exceeding 10 years.

Lines for maximum credit exposure on counterparties

In order to keep the central government's credit risk on swap counterparties at an acceptable level counterparties are granted a credit line which the credit exposure on transacted swaps may not exceed. However, excess credit exposure cannot be avoided completely, cf. below.

The size of authorised lines depends on the counterparty's credit rating. The higher the rating and equity, the greater the line that can be granted.

Lines may not exceed an absolute ceiling, irrespective of the equity standing of the counterparty. The ceiling on swap lines is the maximum risk of loss that is accepted for each counterparty. This ceiling also helps to spread the total credit exposure on more than one counterparty.

Table 9.4.2 presents the key principles for the credit risk which the central government will accept, depending on the swap counterparty's rating.

All lines are authorised on the basis of a concrete assessment involving other factors besides rating. A counterparty's fulfilment of the rating requirements set out in Table 9.4.2 thus does not entail automatic authorisation of a line. The rating agencies' ratings will be disregarded if

THE CENTRAL GOVERNMENT'S SWAP LINES — Table 9.4.2

Counterparty rating			Maximum line	
Moody's	Standard & Poor's	Fitch IBCA	DKK million	Percentage of counterparty's equity
Aaa	AAA	AAA	2,000	8
Aa1	AA+	AA+	1,500	7
Aa2	AA	AA	1,000	6
Aa3	AA-	AA-	700	5
A1	A+	A+	600	5
A2	A	A	400	4.5
A3	A-	A-	200	4

Note: The rating requirement is increased by 1, or respectively 2 notches if the counterparty is rated by only respectively 2 or 1 rating agencies. If a counterparty holds only one rating, e.g. Aa1 by Moody's, a line exceeding DKK 700 million or 5 per cent of the equity capital cannot be authorised.
If the counterparty is given a rating of A1/A+ or less the authorised line can only be used for interest-rate swaps in Danish kroner with a maximum maturity of 10 years.

information concerning a counterparty indicates a lower creditworthiness than the allocated rating would indicate.

Furthermore, the central government only transacts swaps with reputed financial institutions which are active in the swap market.

System and procedure for ongoing monitoring

In order to monitor the credit risk, in 1994 a system to calculate the government credit exposure on swap counterparties was established. In the system the calculated credit exposure is held against the counterparties' lines. Any excess credit exposure is marked so that it can be handled according to the guidelines set out.

Since 1996 monitoring of counterparty lines has been organised as a separate unit from the department which trades swaps on behalf of the central government. The purpose of separating trading and control into different departments is to ensure independent and thus more effective control of counterparties' utilisation of credit lines. This adheres to international recommendations on risk management of financial instruments. There are examples in some banks that the placement of line monitoring in trading departments diminished the quality of the actual control of counterparties' utilisation of lines, since it gave dealers easier access to exceed authorised credit lines.

Guidelines for handling excess credit exposures

The credit exposure on a swap portfolio cannot with certainty be kept within the authorised credit lines. Strong market fluctuations can lead within a short time to strong increases in market value and thereby credit exposure, so that excess credit exposure will occur. This was the case in e.g. 1997 when the appreciation of USD, JPY and GBP against DEM significantly increased the central government's credit exposure to many swap counterparties. The consequence was several major cases of excess credit exposure.

When the rating agencies downgrade a counterparty the counterparty's line is written down in accordance with the principles in Table 9.4.2. This can also lead to excess credit exposure.

As of 31 December 1998 three counterparties showed excess credit exposure. One case is due to a downgrading of the counterparty. The two others concern swaps transacted in 1990 before the aforementioned rating requirements were introduced.

In order to reduce both the number and scale of excess credit exposure the swap limit system ranks all counterparties in three zones depending on the size of the credit exposure in relation to authorised lines, cf. Table 9.4.3.

STATUS OF SWAP COUNTERPARTIES Table 9.4.3

Zone	Utilisation of credit line	Status of counterparty
"Green light"	Credit exposure < 75% of line	New swaps may be transacted with the counterparty
"Yellow light"	Credit exposure 75-100% of line	Transaction of new swaps is closed
"Red light"	Credit exposure > 100% of line	The excess credit exposure requires a decision on whether steps must be taken to reduce the credit exposure on the counterparty

The "yellow light" zone is a buffer against too many cases of excess credit exposure since new contracts may not be transacted with "yellow light" counterparties. Credit exposures exceeding 75 per cent of a line are therefore solely due to shifts in the market value of transacted swaps or reductions of lines. At the close of 1998 two of the central government's counterparties were in the "yellow light" zone".

In the event of excess credit exposure ("red light") it must be decided whether it is necessary to reduce the relevant counterparty's exposure. Factors relevant to the handling of excess credit exposure include:

- Size of excess credit exposure
- Expected duration
- Rating of counterparty (risk of default)
- Opportunities to reduce the exposure and the related costs.

The central government has in only a few cases actively attempted to reduce the credit exposure on counterparties whose lines were exceeded. After concrete assessment most cases of excess credit exposure are not found to present an unacceptable credit risk.

Measuring the credit exposure on swap counterparties

The market value is usually zero on the transaction of the swap, but due to fluctuating exchange rates and interest rates it can swing considerably during the lifetime of the swap. If the market value of the swap is positive for the central government it constitutes a claim on the counterparty, cf. Box 9.2. This claim is called the central government's *current credit exposure* on the counterparty.

Even if a swap has a negative market value for the central government it can later gain a positive market value. Similarly, a swap which already has a positive market value can gain an even more positive market value

for the central government. Measuring a swap's credit exposure must therefore besides market value also include a premium for the development in the market value in the favour of the central government during the remaining maturity of the swap. This premium is called the swap's *potential credit exposure*.

The *total credit exposure* on a swap thus comprises the current credit exposure plus the potential credit exposure.

It is necessary to include the potential credit exposure since a swap cannot normally be terminated without the consent of the counterparty. By entering into a swap agreement both parties have given the other an "irrevocable loan undertaking" which is to cover any future gains on the swap.

The size of a swap's potential credit exposure will depend on:

- *The interest and exchange-rate risk* on the swap. An increasing risk entails strong fluctuations in market value, thereby augmenting the irrevocable loan undertaking.
- *Remaining maturity*. The longer the remaining maturity, the greater the loan undertakings will be.

The potential credit exposure on a swap cannot be definitively measured since the quantification of the interest and exchange-rate risk is subject to statistical uncertainty. Usually the statistical expression "standard deviation" is used to describe the interest and exchange-rate risk. Often the standard deviation (or volatility) is calculated on the basis of the historical fluctuation in interest rates and currencies. In practice the calculation of swaps' potential exposure can be based on many different assumptions concerning the volatility of interest rates and currencies. For this reason the calculation of the central government's credit exposure in Section 9.2 must to some extent be considered a *statistical estimate*.

The actual credit exposure on a counterparty with whom several swaps have been transacted will often be less than the sum of the credit exposure on the individual swaps.

This is firstly due to the fact that changes in interest and exchange rates are to a varying extent *correlated*. If the exchange rate for USD and CAD is assumed to be positively correlated the gain on a swap whereby the central government pays USD will to some extent be set off by the loss on a swap whereby the central government receives CAD. In this light the potential credit exposure on the two swaps could be reduced in proportion to the size of the correlation. At present no account is taken of correlations between interest rates and currencies in the swap limit system's calculation of the credit exposure on swap counterparties.

Secondly, the credit exposure on a counterparty depends on whether gains on certain swaps can be set off against losses on other swaps in the event of counterparty default. All of the central government's ISDA agreements contain *netting* provisions by which gains can be set off against losses in the event of default by one of the parties, cf. Box 9.3. It is evaluated that, if necessary, netting can be used vis-à-vis all counterparties. However, in certain cases there may be minor reservations concerning the validity of the netting provisions under national legislation. On grounds of caution the credit exposure on some counterparties is measured in gross terms in the swap limit system, so that losses are not set off against gains, cf. Box 9.4.

ISDA AGREEMENTS Box 9.3

The central government has entered into a general standard agreement ("ISDA Master Agreement") with all swap counterparties. The agreement sets out the general framework for swap transactions between the central government and the counterparty, e.g. the country of jurisdiction for settlement of disputes and rules for set-off of counterbalancing payments in the same currency and with the same due date, etc.

The ISDA agreements also include provisions on *netting* by which gains and losses on transacted swaps can be set off in the event of default by one of the parties. The extent to which the netting provisions can be applied depends on the legislation in the counterparty's country of origin. Whether this is the case must be determined on the basis of a careful legal examination. With minor reservations netting is assumed to be applicable to all counterparties.

Most of the central government's ISDA agreements also contain a "credit trigger". This means that all swaps can be terminated or assigned to a third party if the rating of the central government or the counterparty falls to a certain level.

The provisions of the ISDA agreement cover all swaps transacted with the counterparty. On transaction of a new contract only a brief confirmation of the specific characteristics of the contract such as the size of the notional value, currencies, interest-rate terms, payment dates, expiry date, etc., is required.

It is acceptable for the first contract with a new counterparty to be transacted before the ISDA agreement is in place.

It is the intention, cf. Section 9.5, that the ISDA agreements will be extended by a "Credit Support Annex" containing provisions on the counterparties' pledging of collateral for the market values in the central government's favour on transacted swaps.

CALCULATION OF CREDIT EXPOSURE IN THE SWAP LIMIT SYSTEM Box 9.4

In the swap limit system the potential credit exposure on swaps is quantified by multiplying the notional value by risk weights. The latter are divided into 13 maturity bands, so that they increase with remaining maturity. Since the interest and exchange-rate risk concerns both the liability and asset legs in the swap agreements the potential exposure is calculated for both legs. In summary, the central government's credit exposure on each swap is calculated as:

*Market value + [Interest weight+Currency weight]*Liability leg + [Interest weight+Currency weight]*Asset leg*

For structured swaps, the market risk includes an option or gearing element, and for this a significant premium is added on calculation of the credit exposure.

On floating-rate legs the interest weight is fixed in relation to the next interest adjustment. If this is e.g. in 2½ months' time the interest weight for the 1-3 month maturity band is used.

In the swap limit system the total credit exposure on a counterparty, depending on whether netting is possible, is calculated according to the following principles:

With netting: Σ(credit exposure on all swaps); if $\Sigma < 0$ credit exposure is set at 0

Without netting: Σ(credit exposure on those swaps where the credit exposure is > 0)

With netting, "negative exposures" on a swap can be set off against the credit exposure on other swaps. If the result is negative, the credit exposure on the counterparty is set at zero. Without netting, the losses on a swap can only be set off against the potential credit exposure on the same swap. The following example illustrates the calculation of the credit exposure on a counterparty:

Unit	Market value	Interest weight	Currency weight	Potential exposure
Swap A, remaining maturity 9½ years				
Asset leg = USD 100, fixed interest	620 DKK	3.75%	7.50%	69.75 DKK
Liability leg = DEM 160, 6-month LIBOR	- 600 DKK	0.70%	7.50%	49.20 DKK
Swap A total	20 DKK			118.95 DKK
Swap B, remaining maturity 4½ years				
Asset leg = GBP 100, fixed interest.....	750 DKK	2.75%	5.50%	61.88 DKK
Liability leg = DEM 250, 3-month LIBOR	- 920 DKK	0.40%	5.50%	54.28 DKK
Swap B total	- 170 DKK			116.16 DKK

If netting is assumed to be possible the counterparty credit exposure will total DKK 85.11 (= 20 + 118.95 – 170 + 116.16). Without netting, the credit exposure solely comprises swap A's contribution of DKK 118.95, since the credit exposure on swap B is "negative".

Admissible swap contracts

The central government does not normally transact swaps with a maturity exceeding 10 years. Among other factors this is related to the greater credit risk on long-term compared to short-term outstandings. Moreover the market for swaps with long maturities (more than 10 years) is considerably less liquid than for shorter maturities. So swap contracts with a long remaining maturity can be more difficult to divest, should this be necessary.

By far the majority of the central government's swaps are "plain vanilla swaps". They are characterised by the fact that the market value can normally easily be derived, either via own calculations or by asking market participants.

In some cases the central government transacts structured swaps which are not plain vanilla. These are transacted only as liability swaps in conjunction with loans on special interest and redemption terms, so that the net result is a loan on ordinary interest and redemption terms, cf. Box 9.1. Examples are dual currency swaps and swaps where the interest and redemption terms on the asset leg include an option element.

Previously the central government transacted highly structured swaps, but today only moderately structured swaps are transacted on which the credit exposure is not evaluated to be disproportionally large.

Chapter 3 presents the current guidelines for the types of loan which can be used for foreign borrowing.

METHODS TO REDUCE CREDIT EXPOSURE 9.5

In the event of excess credit exposure or a lower credit rating it is vital to be able to quickly reduce the credit exposure on a counterparty.

Several methods can be used. Some are intended to reduce the exposure on swap counterparties with whom an agreement on reduction in certain specific circumstances has not been concluded in advance. This group includes assignment or termination of existing swaps. Another option is to cover the exposure via credit insurance. In a few cases the central government has used these instruments to reduce the credit exposure.

Since 1994 the central government has required a "credit trigger" to be inserted in all new ISDA agreements. This means that the central government can require all swaps to be assigned or terminated should the counterparty's rating fall to a certain level. The introduction of credit triggers in ISDA agreements has led to a reduction of the credit risk on the swap portfolio. One disadvantage of credit triggers is that they usually do not take effect until the counterparty's rating has fallen to a relatively low level.

In recent years there has therefore been a growing international interest in limiting the credit risk so that already at the time of transaction of swaps the parties agree on guidelines for limitation of the credit exposure. This group includes agreements on current setoff of the the market value of swaps, either by cash settlement or by pledging collateral.

In 1999 the central government will aim to reduce the credit risk on the swap portfolio by establishing agreements with counterparties on the pledging of collateral. The intention is that within a few years swap market values in the favour of the central government will be covered by collateral.

Reduction by assignment, termination or insurance

In recent years there have been cases where the credit risk on a swap counterparty has been evaluated to be disproportionally high. The reason has normally been a significant decrease in the counterparty's creditworthiness. In a few cases the counterparty has been contacted with the proposal that the central government's credit exposure should be reduced by either assignment or termination of swaps on which there was a considerable market value in the central government's favour.

When a swap is assigned the former counterparty withdraws and a new counterparty steps in and takes over all rights and obligations vis-à-vis the central government. On termination the swap contract is cancelled. In both cases a one-off amount equivalent to the market value of the swap is exchanged. For the central government assignment will usually be preferable, since the duration of the government debt including the swap portfolio hereby remains unchanged.

There are no fixed rules for the calculation of the market value of swaps which are to be assigned or terminated. Unlike bonds swaps are not negotiable so that the party requested to accept assignment or termination may require payment in return. The lack of negotiability means that for some periods even plain vanilla swaps are subject to relatively large variations in the bid/offer spreads set by the market makers in the swap market. In some periods trading in the swap market may even be low or non-existent, with the consequential risk of assignment or termination on very unsatisfactory terms.

In order to obtain an assignment or termination of a swap often the central government will have to accept a cash amount from the counterparty that is less than the actual market value of the swap on the calculation date.

Two additional factors apply to assigning and terminating structured swaps. Firstly, structured swaps are often customised, making it more difficult to find a new counterparty to enter into the contract. Secondly,

the structure of the swap may be so complicated that fixing the market value is subject to considerable uncertainty. Therefore structured swaps can be difficult to divest without accepting a considerable discount on the swap's market value.

An alternative to termination and assignment is to reduce the credit exposure (risk) on a swap counterparty by taking out credit insurance. Under a credit insurance policy the risk of loss in the event of counterparty default is assigned to the insurance company. The insurance company's premium for assuming the risk is equivalent to the deduction from the market value which is paid on assignment or termination.

A significant aspect of the aforementioned methods is that they must be used in time. If it is realised too late that the credit risk on a counterparty has become unacceptably large it can be very expensive, at worse impossible, to divest the risk.

Current equalisation of market values by cash settlement

In view of the weaknesses of the aforementioned methods it is obvious to consider methods where already on transaction of a swap detailed guidelines are agreed to keep the credit exposure at an acceptable level. One method is current equalisation of market values. Current equalisation takes place by cash settlement at fixed intervals of current swap market values.

Current equalisation of market values is known from other financial instruments, including futures contracts.

An agreement on cash settlement of market values requires agreement to be reached on objective criteria for the ongoing valuation. Furthermore, the parties must agree on the independent sources for the valuation input. This is rarely problematic.

On cash settlement of market value the interest terms of the swap must also be adjusted so that the market value of respectively payments received and payments made during the remaining maturity of the swap are identical ("recouponing"). If the central government has transacted a swap whereby fixed-rate interest is received against payment of floating-rate interest, an increase in interest rates will lead to the swap having a negative market value which must be equalised. Concurrently with payment of the market value to the counterparty the fixed-rate interest which the central government will receive in future must be increased. The purpose is to increase the (net present) value of interest received for the rest of the duration of the swap, so that the market value of the swap is once again zero.

When market values will arise (and must be paid) cannot normally be foreseen. The sensitivity of the swap portfolio to exchange-rate fluctua-

tions entails that current equalisation of market values on the swap portfolio will often lead to unforeseen fluctuation by several billion kroner in the central government's net payments within a year. Current equalisation of market values is therefore not a particularly suitable instrument to generally reduce the central government's credit risk on swap counterparties.

Current setoff of market values by pledging collateral

Another means to achieve ongoing limitation of the credit risk on swap counterparties is agreements on pledging of securities as collateral for the market values of transacted swaps. In such case the central government can only suffer a loss if the value of the securities received is not sufficient.

In contrast to cash settlement of market values pledging of collateral allows the central government to avoid inappropriate influence on central-government receipts and disbursements.

The value of an agreement with the counterparty to pledge collateral will depend on the quality of the securities pledged as collateral for market values in the central government's favour. In view of the counterparties' already favourable credit rating it is natural that the quality of the securities (the issuers' credit rating) is also high. It is also

BONDS AS COLLATERAL — Box 9.5

The quality of bonds as collateral depends on several conditions:

Quality of the bonds. Bonds' value as collateral depends on the credit rating of the issuer. In order to limit the risk of default, bonds will often be subject to a minimum rating requirement for them to be accepted as collateral.

The interest-rate risk on the bonds entails a risk of capital losses and thereby that the value of the collateral falls below the market value of the swaps to be covered. The value of the bonds as collateral is therefore normally fixed at the market value less a "haircut" fixed in relation to the interest-rate risk on the bonds, as well as how quickly one can realise the bonds if necessary.

The liquidity of the bonds, i.e. the risk that the price becomes subject to pressure on realisation. Illiquid bonds must either be excluded from the collateral basis or an especially large haircut must be deducted on calculating the collateral value.

Legal framework for realising collateral in the event of the swap counterparty's default on payment commitments. There have been many examples of the courts' reversing mortgagees' realisation of collateral on the grounds that the deed of security was not complete. (By deed of security is meant the procedures to be observed for it to be possible to invoke a pledge vis-à-vis the counterparty's creditors.)

important that the securities pledged as collateral are subject to prudent valuation, to avoid over-estimation of their actual value as collateral. Factors relevant to the value of bonds as collateral are reviewed in Box 9.5.

In 1999 it will be sought to reduce the credit risk on the swap portfolio significantly by establishing agreements on pledging of collateral with a suitable number of counterparties. In practice the agreements will be established by adding a "Credit Support Annex" to the ISDA agreements cf. Box 9.3. The Annex will set out guidelines for which bonds are allowable as collateral, the principles for calculation of the bonds' collateral value, etc.

In the light of the above considerations negotiations have begun with counterparties on conclusion of collateral agreements on the terms stated in Box. 9.6.

The introduction of collateral requirements will have derived effects on the rest of the central government's credit policy and credit risk management of this area. First and foremost, the potential credit exposure on swaps will be reduced. This is because it will longer be necessary to take into account the development to expiry, but only until the next time the market value of the swap is calculated and the pledged collateral is adjusted. This entails that all else being equal it will be possible to reduce the risk weights used in the swap limit system, cf. Box 9.4.

THE CENTRAL GOVERNMENT'S REQUIREMENTS FOR COLLATERAL Box 9.6

The following bonds are permitted as collateral for market values of swaps in the central government's favour:

- Government bonds with a rating of AA-/Aa3 or higher
- Other securities on the basis of a concrete evaluation

On calculation of the bonds' collateral value the following haircuts are proposed:

Remaining maturity of bonds	*Haircut*
< 3 years	5 per cent
3-7 years	6 per cent
> 7 years	8 per cent
Premium on haircut on illiquid bonds:	+10 per cent
Deduction from haircut if no exchange-rate risk	-3 per cent

Depending on the counterparty's rating the following uncollateralised outstandings can be accepted:

Counterparty rating	*Maximum amount*
AAA	DKK 500 million
AA+	DKK 400 million
AA	DKK 300 million
AA-	DKK 200 million
A+	DKK 150 million
A	DKK 100 million
A-	DKK 50 million
BBB+ or lower	DKK 0 million

In principle the aim is for collateral agreements not to be mutual, but to apply unilaterally to the counterparty.

Moreover the central government will require that:

- As a minimum once a month the counterparty submits a statement on the market value of the swap portfolio.
- On strong market fluctuations the swap portfolio can be revalued in order to adjust collateral (minimum DKK 10 million).
- The value of the collateral is calculated daily and compared with the portfolio's market value for the purpose of adjustment if necessary (minimum DKK 10 million).

As a general rule a collateral agreement will apply to both existing and new contracts. However, the central government has transacted a few swaps which can be difficult to fit into a collateral agreement. These are e.g. swaps whereby the central government receives a (zero-coupon) payment on maturity in return for current payments to the counterparty for the entire duration of the swap. Close to maturity the market value of these swaps may be substantial amounts for which the counterparties will have to pledge collateral, if an agreement is concluded. Problems of this nature will be considered bilaterally with the relevant counterparties.

Appendix of Tables

CENTRAL-GOVERNMENT DEBT 1988-98 — Table 1

DKK million	1988	1989	1990
A. Debt			
Domestic debt denominated in DKK[1]			
- Fixed-rate bonds	215,492	221,592	229,221
- Floating-rate bonds	82,785	88,410	85,010
- Lottery bonds	1,200	1,200	1,200
- Compulsory savings	1,425	1,375	864
- Treasury notes	54,085	64,550	68,850
- Treasury bills	-	-	21,350
- Government securities held by the Danish State	- 18	- 11	- 5
Domestic debt denominated in DKK, total	354,969	377,116	406,490
Domestic debt denominated in XEU[2]			
- Fixed-rate bonds	-	-	-
- Government securities held by the Danish State	-	-	-
Domestic debt, total	354,969	377,116	406,490
Foreign debt			
- in USD	32,983	27,624	15,556
- in CHF	20,452	17,919	21,033
- in DEM	29,374	30,034	36,700
- in XEU	14,480	16,970	18,103
- in JPY	12,718	10,156	3,597
- In other currencies	14,326	13,328	24,112
- Government bonds held by the Danish State[3]	- 1,569	- 1,574	- 1,126
Foreign debt, total	122,764	114,457	117,975
Domestic and foreign debt, total	477,733	491,573	524,465
Domestic and foreign debt, per cent of GDP	65.3	64.1	65.6
B. Government deposits with the central bank	- 39,855	- 35,254	- 45,206
C. The Social Pension Fund			
- Government securities	- 27,009	- 30,212	- 36,193
- Other securities	- 79,215	- 81,164	- 82,254
The Social Pension Fund, total[4]	- 106,224	- 111,376	- 118,447
Net government debt (A-B-C)	331,654	344,943	360,812
Net government debt, per cent of GDP	45.3	45.0	45.2

Note: + denotes liabilities, - denotes assets.

[1] Does not include the holdings of the Ministry of Finance under the location-swap facility. The facility was established in July 1993 and ended in April 1998.

[2] In connection with the introduction of new accounting principles for the government debt, the 8.5 per cent ECU bullet loan 2002 has been reclassified as foreign debt instead of domestic debt as of 1 January 1998.

[3] Acquired value. From end of 1993 adjusted to exchange-rate value.

[4] Indexed bonds are made up at indexed value.

CENTRAL-GOVERNMENT DEBT 1988-98 Table 1

1991	1992	1993	1994	1995	1996	1997	1998
252,481	316,690	357,346	409,565	466,608	516,812	556,874	550,989
85,010	57,147	41,241	30,345	20,722	16,760	9,848	4,346
1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,000
392	-	-	-	-	-	-	-
74,050	71,150	94,200	111,705	102,697	84,499	49,140	58,830
49,250	55,485	58,339	56,238	58,385	51,234	50,001	41,255
- 1	0	-	-	-	-	-	-
462,382	501,672	552,326	609,053	649,612	670,505	667,063	656,420
-	9,827	9,824	9,697	9,244	9,597	6,634	-
-	-	-	- 970	- 1,138	- 2,372	-	-
462,382	511,499	562,150	617,781	657,719	677,730	673,697	656,420
17,103	37,802	50,889	24,912	6,425	4,562	1,514	1,336
15,785	13,952	20,914	18,393	13,836	6,178	3,974	1,094
28,464	23,758	47,223	42,772	49,476	81,070	86,921	67,815
18,025	14,942	9,364	5,576	6,778	- 2,934	- 4,212	9,413
1,866	3,159	5,612	10,419	9,329	2,396	1,047	562
11,096	11,019	31,610	29,494	25,319	17,209	14,369	8,120
- 1,374	- 1,151	- 1,338	- 1,784	- 5,516	- 6,986	-	-
90,965	103,482	164,274	129,782	105,647	101,495	103,613	88,338
553,347	614,981	726,424	747,563	763,366	779,225	777,310	744,758
66.8	72.2	83.0	77.8	75.3	73.0	69.2	63.7
- 11,649	- 30,927	- 88,781	- 55,266	- 33,677	- 31,052	- 29,024	- 34,027
- 38,872	- 43,611	- 45,270	- 50,143	- 68,889	- 83,435	- 92,453	- 100,135
- 86,836	- 88,583	- 93,105	- 96,689	- 82,517	- 65,336	- 54,368	- 43,468
- 125,708	- 132,194	- 138,375	- 146,832	- 151,406	- 148,772	- 146,821	- 143,603
415,990	451,860	499,268	545,465	578,283	599,401	601,465	567,128
50.2	53.1	57.1	56.8	57.1	56.2	53.6	48.5

DOMESTIC GOVERNMENT SECURITIES ISSUED IN 1998	Table 2
No. 264, 7 per cent government bonds 2024 (7 pct. stående lån 2024)	
Issued in 1997, DKK million	500
Interest payable	10 Nov.
Stock exchange code	0991813
Issue commenced	6 Apr. 1994
Redemption date	10 Nov. 2024
No. 299, 6 per cent government bonds 2009 (6 pct. stående lån 2009)	
Issued in 1998, DKK million	32,725
Interest payable	15 Nov.
Stock exchange code	0991953
Issue commenced	14 Jan. 1998
Redemption date	15 Nov. 2009
No. 286, 5 per cent government bonds 2005 (5 pct. stående lån 2005)	
Issued in 1998, DKK million	2,960
Interest payable	15 Aug.
Stock exchange code	0991945
Issue commenced	14 Jan. 1997
Redemption date	15 Aug. 2005
No. 280, 6 per cent government bonds 2002 (6 pct. stående lån 2002)	
Issued in 1998, DKK million	8,955
Interest payable	15 Nov.
Stock exchange code	0991910
Issue commenced	18 Jun. 1996
Redemption date	15 Nov. 2002
No. 301, 4 per cent Treasury notes 2001 (4 pct. statsgældsbevis 2001 I)	
Issued in 1998, DKK million	30,890
Interest payable	15 Feb.
Stock exchange code	0991961
Issue commenced	7 Jan. 1998
Redemption date	15 Feb. 2001
No. 288, Treasury bills 1998 II (Skatkammerbevis 1998 II)	
Issued in 1998, DKK million	4,615
Interest payable	-
Stock exchange code	0980668
Issue commenced	1 Jul. 1997
Redemption date	1 May 1998
No. 289 Treasury bills 1998 III (Skatkammerbevis 1998 III)	
Issued in 1998, DKK million	16,155
Interest payable	-
Stock exchange code	0980676
Issue commence	1 Oct. 1997
Redemption date	3 Aug. 1998

DOMESTIC GOVERNMENT SECURITIES ISSUED IN 1998	Table 2
No. 292 Treasury bills 1998 IV (Skatkammerbevis 1998 IV)	
Issued in 1998, DKK million	21,571
Interest payable	-
Stock exchange code	0980684
Issue commenced	1 Feb. 1998
Redemption date	2 Nov. 1998
No. 293 Treasury bills 1999 I (Skatkammerbevis 1999 I)	
Issued in 1998, DKK million	14,480
Interest payable	-
Stock exchange code	0980692
Issue commenced	1 May 1998
Redemption date	1 Feb. 1999
No. 294 Treasury bills 1999 II (Skatkammerbevis 1999 II)	
Issued in 1998, DKK million	15,390
Interest payable	-
Stock exchange code	0980706
Issue commenced	1 Aug. 1998
Redemption date	3 May 1999
No. 295 Treasury bills 1999 III (Skatkammerbevis 1999 III)	
Issued in 1998, DKK million	11,385
Interest payable	-
Stock exchange code	0980714
Issue commenced	1 Dec. 1998
Redemption date	2 Aug. 1999

FOREIGN BORROWING TRANSACTIONS OF THE CENTRAL GOVERNMENT IN 1998[1] Table 3

Loan no.	Accept-ance date	Issue date	Coupon per cent	Type of loan[2]	Maturity date	Nominal amount in DKK million	Lead manager/Lender
864	01-12-97	07-01-98	5	EMTN	07-01-03	500 DEM	ABN-AMRO Bank AG
869	23-02-98	20-03-98	5.625	EMTN	30-12-03	100 AUD	Toronto-Dominion Sec.
870	16-03-98	08-04-98	5.75	EMTN	08-04-05	500 USD	Tokyo-Mitsubishi Intl.
871	03-04-98	24-04-98	13.75	EMTN	24-04-02	1,000 CZK	Citibank/RBC
872	07-04-98	28-04-98	6.69	EIB project loan	20-04-01	20 GBP	EIB
873	14-05-98	03-06-98	7.5	EMTN	03-06-03	10,000 GRD	RBC Europe Limited
875	13-07-98	27-07-98	8.5	EMTN	27-07-01	10,000 GRD	Bear Stearns Intl.
876	14-07-98	18-08-98	5.25	EMTN	18-08-03	100 CAD	CIBC Wood Gundy plc
877	31-07-98	19-08-98	4.05	EMTN	16-09-03	130 XEU	Daiwa Europe Limited
878	06-08-98	03-09-98	3.7	EMTN	03-09-01	98 XEU	Nikko Europe Plc
-[3]	02-09-98	01-10-98	3.7	EMTN	03-09-01	113 XEU	Nikko Europe Plc
379	13-08-98	04-09-98	4.625	Stand alone documentation	04-09-08	500 XEU	Morgan Stanley
880	24-08-98	03-09-98	11.85	EMTN – Dual Currency	04-09-00	2,000 JPY	RBC Europe Limited
881	26-08-98	05-10-98	6.25	EMTN	15-01-07	230 NOK	Merrill Lynch Intl.
-[4]	01-10-98	08-10-98	6.25	EMTN	15-01-07	100 NOK	Chase Manhattan
882	07-09-98	21-09-98	11.85	EMTN – Dual Currency	21-09-00	2,000 JPY	RBC Europe Limited
888	02-10-98	08-10-98	5	EMTN	08-10-07	500 SEK	SEB Debt Capital Markets
889	07-10-98	22-10-98	3.4	EMTN	23-03-04	100 XEU	Daiwa Europe Ltd.
890	06-10-98	12-10-98	5.12	EMTN	12-10-07	500 SEK	SEB Debt Capital Markets
891	06-10-98	12-10-98	5.065	EMTN	12-10-06	400 SEK	SEB Debt Capital Markets

[1] Including swaps, if any, in connection with new issues.
[2] EMTN (European Medium Term Note): Issues documented under the Kingdom of Denmark's EMTN-programme.
[3] Increase of loan no. 878. The Kingdom of Denmark received accrued interest of XEU 325,440 on the issue date.
[4] Increase of loan no. 881. The Kingdom of Denmark received accrued interest of NOK 52,080 on the issue date.

FOREIGN BORROWING TRANSACTIONS OF THE CENTRAL GOVERNMENT IN 1998[1)] Table 3

Issue price	Total expenses per cent	Start date	Counterparty	Notional amount in million	All-in cost, per cent p.a.	Amount in DKK
101.387	2.025				5.148%	1,891,902,161
101.21	2.04	20-03-98	General Re	120.00 DEM	6 month DEM-Libor -0.23%	457,512,000
101.195	1.875	08-04-98	General Re	363.44 DEM	6 month DEM-Libor -0,21%	1,385,724,032
		08-04-98	NationsBank	545.16 DEM	6 month DEM-Libor -0.21%	2,078,586,048
101.125	1.655	24-04-98	Citibank N.A.	53.17 DEM	6 month DEM-Libor -0.28%	202,770,507
100	0	28-04-98	SBCMDP	61.27 DEM	4.29%	233,738,923
101.675	2.08	03-06-98	FNBC	57.67 DEM	6 month DEM-Libor -0.44%	219,642,446
101.075	1.375	27-07-98	CSFP	60.24 DEM	6 month DEM-Libor -0.35%	229,571,397
101.375	1.92	18-08-98	CIBC	121.45 DEM	6 month DEM-Libor -0.25%	462,457,310
100	1.325	19-08-98	Chase	128.28 XEU	6 month XEU-Libor -0.25%	963,056,159
100	1.064	03-09-98	MSDP	98.00 XEU	6 month XEU-Libor -0.25%	735,715,400
100.98	1.055	01-10-98	MSDP	113.00 XEU	6 month XEU-Libor -0.27%	845,816,300
99.522	0.325	04-09-98	MSDP	500.00 XEU	6 month XEU-Libor -0.19%	3,753,350,000
100	3.5	03-09-98	Chase	25.00 DEM	6 month DEM-Libor -0.36%	95,187,500
100	0	05-10-98	Chase	51.92 DEM	6 month DEM-Libor -0.35%	197,472,912
100	0	08-10-98	Chase	22.37 DEM	6 month DEM-Libor -0.31%	85,067,115
99	3.5	21-09-98	RBC	26.00 DEM	6 month DEM-Libor -0.40%	99,122,400
100	0	08-10-98	General Re	102.00 DEM	6 month DEM-Libor -0.27%	387,855,000
100	1.1	22-10-98	CSFP	98.90 XEU	6 month XEU-Libor -0.25%	741,126,930
100	0	12-10-98	Banque AIG	101.50 DEM	6 month DEM-Libor -0.27%	386,065,400
100	0	12-10-98	SBCMDP	81.90 DEM	6 month DEM-Libor -0.30%	311,514,840

CENTRAL GOVERNMENT DOMESTIC SWAPS 1998 Table 4a

Loan no.	Accepted in	Amount in DKK	Receiving	Paying	Terminates in
295	September 1998	200,000,000	10 year fixed	6 month Cibor	September 2008
296	September 1998	300,000,000	10 year fixed	6 month Cibor	September 2008

CENTRAL GOVERNMENT FOREIGN SWAPS
UNCONNECTED TO NEW ISSUES 1998 Table 4b

Loan no.	Accept-ance date	Start date	Receiving			Paying			Termina-tion date	Amount in DKK
			Cur-rency	Mil-lion	Interest	Cur-rency	Mil-lion	Inter-est		
					6 month					
874[1)]	06-07-98	13-07-98	DEM	2.15	Libor -0.02	JPY	165.5	5.40	13-03-00	8,221,047

[1)] Asset swap connected to buy-back of bonds. The notional amount is repayable by the Kingdom of Denmark by GBP 821,340.09.

CENTRAL GOVERNMENT FOREIGN-EXCHANGE FORWARD
TRANSACTIONS WITH DANMARKS NATIONALBANK 1998[1)] Table 4c

Loan no.	Acceptance date	Start date	Receiving on the termination date USD	Paying on the termination date DEM	Termination date
883	21-09-98	23-09-98	700,000,000	1,174,740,000	26-10-98
884	21-09-98	23-09-98	67,500,000	113,298,750	22-10-98
885	21-09-98	23-09-98	900,000,000	1,510,650,000	23-10-98
886	22-09-98	24-09-98	100,000,000	169,190,000	26-10-98
892	20-10-98	22-10-98	40,000,000	65,264,000	23-11-98

[1)] Foreign-exchange forward transactions connected to Commercial-Paper issues.

DOMESTIC CENTRAL-GOVERNMENT DEBT AS OF 31 DECEMBER 1998 Table 5

Serial no.	Coupon per cent	Name Issue Period[1)]	Redemption date	Outstanding amount (DKK million)
Government bonds, fixed interest rate				
Bullet loans				
226	9	Stående lån 2000 2 Jan. 1990-30 Dec. 1992	15 Nov. 2000	59,150.0
246	8	Stående lån 2003 2 Jan. 1992-30 Dec. 1993	15 May 2003	69,000.0
257	7	Stående lån 2004 25 May 1993-5 Dec. 1994	15 Dec. 2004	74,450.0
264	7	Stående lån 2024 6 Apr. 1994-	10 Nov. 2024	24,875.0
265	6	Stående lån 1999 14 Apr. 1994-30 Dec. 1994 and 2 Jan. 1996-2 Jul. 1996	10 Dec. 1999	49,300.0
269	8	Stående lån 2006 5 Dec .1994-10 Apr. 1996	15 Mar. 2006	70,000.0
272	8	Stående lån 2001 9 Jan. 1995-18 Jun. 1996	15 Nov. 2001	44,135.0
279	7	Stående lån 2007 10 Apr. 1996-30 Dec. 1997	15 Nov. 2007	52,605.0
280	6	Stående lån 2002 18 Jun. 1996-30 Dec. 1998	15 Nov. 2002	38,907.0
286	5	Stående lån 2005 14 Jan. 1997-	15 Aug. 2005	20,750.0
291	6	Stående lån 2009 14 Jan. 1998-	15 Nov. 2009	32,725.0
Serial loans				
14	5	S 2007 20 Oct. 1953-12 Sep. 1958	15 Sep. 2007[2)]	49.6
16	4	S 2017 29 Nov. 1955-12 Sep. 1958	15 Jun. 2017[2)]	100.0
38	12	S 2001 6 Oct. 1980-9 May 1983	15 Feb. 2001	8,032.5
56	10	S 1999 10 May 1983-12 Jul. 1985	15 Jul. 1999	1,173.3
57	10	S 2004 10 May 1983-30 Aug. 1985	15 Oct. 2004	5,688.0
85	10	S 2001 15 Jul. 1985-30 Aug. 1985	15 Jul. 2001	1.5
Perpetuals				
1	3.5	Dansk Statslån 11 Dec. 1886	perpetuals[2)]	46.2
80	5	Dansk Islandsk Fond 1918 20 May 1919	perpetuals	1.0
Government bonds, fixed rate, total				550,989.1

DOMESTIC CENTRAL-GOVERNMENT DEBT AS OF 31 DECEMBER — Table 5

Serial no.	Coupon per cent	Name Issue Period[1]	Redemption date	Outstanding amount (DKK million)
Treasury notes				
282	6.00	Statsgældsbevis 1999 I 2 Jul. 1996-30 Dec. 1997	15 Feb. 1999	12,975.0
285	4.00	Statsgældsbevis 2000 I 7 Jan. 1997-30 Dec. 1997	15 Feb. 2000	14,965.0
290	4.00	Statsgældsbevis 2001 I 7 Jan. 1998-	15 Feb. 2001	30,890.0
Treasury notes, total				58,830.0
Treasury bills				
293	0	Skatkammerbevis 1999 I 1 May 1998-2 Nov. 1998	1 Feb. 1999	14,480.0
294	0	Skatkammerbevis 1999 II 3 Aug. 1998-	3 May 1999	15,390.0
295	0	Skatkammerbevis 1999 III 2 Nov. 1998-	2 Aug. 1999	11,385.0
Treasury bills, total				41,255.0
Government bonds, floating interest rate				
220	floating	Stående lån 1999 2 Jan. 1989-30 Dec. 1990	20 Nov. 1999	4,346.0
Government bonds, floating rate, total				4,346.0
Lottery bonds				
15	4	Præmieobligationslån af 1954/99 7 Oct. 1954	1 Oct. 1999	100.0
20	7	Præmieobligationslån af 1965/2010 22 Sep. 1965	22 Sep. 2010	100.0
21	7	Præmieobligationslån af 1969/2009 1 Oct. 1969	31 Dec. 2009	100.0
24	8	Præmieobligationslån af 1977/2002		
		I 14 Apr. 1977	15 Feb. 2002	100.0
		II 3 Jun. 1977	15 May 2002	100.0
		III 24 Jun. 1977	15 Jun. 2002	100.0
		IV 28 Jul. 1977	15 Jul. 2002	100.0
		V 30 Aug. 1977	15 Aug. 2002	100.0
39	10	Præmieobligationslån af 1980/2005 28 Oct. 1980	1 Jul. 2005	200.0
Lottery bonds, total				1,000.0
Domestic central-government debt denominated in DKK				656,420.1

[1] The issue period refers to the period the series has been open for issue. For Treasury bills "the dates refer to date of value". Series still open for issue at the end of 1998 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 Danish State at three months' notice.

CENTRAL-GOVERNMENT LOANS IN FOREIGN CURRENCY
AS OF 31 DECEMBER 1998[1)] Table 6

Loan no.	Rate of interest per cent p.a.	Title	Outstanding amount (million of currency)	Outstanding amount (DKK million) (1)	Note
AUD-loans					
683	0	1996/99 AUD(redemption)/JPY(interest)	25.7	100.9	
-	0	1996/99 swap to DEM with floating rate	- 385.8	- 1,513.6	
712	7.75	1996/99	34.7	136.0	
-	7.75	1996/99 swap to DEM with floating rate	- 60.0	- 235.4	
715	0	1996/99 swap from DEM with floating rate Swap concerning buy-back (JPY 28,000 mn) of loan no. 683	360.0	1,412.7	
719	0	1996/99 AUD(redemption)/JPY(interest)	330.8	1,298.0	
-	0	1996/99 swap to DEM with floating rate	- 348.4	- 1,367.0	
749	0	1996/00 AUD(redemption)/JPY(interest)	230.4	904.1	
-	0	1996/00 swap to DEM with floating rate	- 230.4	- 904.1	
757	7.75	1996/99 swap from DEM with floating rate Swap concerning buy-back (AUD 18 mn) of loan no. 712	18.0	70.6	
758	0	1996/00 AUD(redemption)/JPY(interest)	128.0	502.3	
-	0	1996/00 swap to DEM with floating rate	- 128.0	- 502.3	
761	0	1996/99 swap from DEM with floating rate Swap concerning buy-back (JPY 1,500 mn) of loan no. 719	17.4	68.3	
764	0	1996/00 AUD(redemption)/JPY(interest)	79.2	310.7	
-	0	1996/00 swap to DEM with floating rate	- 237.6	- 932.1	
767	0	1996/99 AUD(redemption)/JPY(interest)	111.5	437.6	
-	0	1996/99 swap to DEM with floating rate	- 111.5	- 437.6	
801	7.75	1997/99 swap from DEM with floating rate Swap concerning buy-back of loan no. 712	7.3	28.8	
806	0	1997/00 swap from DEM with floating rate Swap concerning buy-back (JPY 14,000 mn) of loan no. 764	158.4	621.4	
838	3.46	1997/07 AUD(interest on 33.86 mn)/JPY (redemption)	0.0	0.0	
-	3.46	1997/07 swap to DEM with floating rate	- 0.0	- 0.0	
869	5.625	1998/03	100.0	392.4	
-	5.625	1998/03 swap to DEM with floating rate	- 100.0	- 392.4	
Total AUD			- 0.2	- 0.7	
BEF-loans					
619	0	1995/03 swap to floating rate	- 5,000.0	- 923.3	(2)
-	float.	1995/03 swap from fixed rate	2,705.3	499.5	(2)
Total BEF			- 2,294.8	- 423.7	

[1)] All loans are repaid at maturity unless otherwise stated.
The outstanding amount of some loans has been reduced during the term of the loan through buy-backs to which asset swaps have been connected.
The redemptions are in some cases structured, i.e. they are calculated according to a certain formula and can be bigger or smaller than the outstanding amounts registered in the Table.

CENTRAL-GOVERNMENT LOANS IN FOREIGN CURRENCY
AS OF 31 DECEMBER 1998[1)] Table 6

Loan no.	Rate of interest per cent p.a.	Title	Outstanding amount (million of currency)	Outstanding amount (DKK million) (1)	Note
CAD-loans					
574	6.5	1993/99	250.0	1,032.0	
-	6.5	1993/99 swap to USD with floating rate	- 250.0	- 1,032.0	
802	6	1997/02	100.0	412.8	
-	6	1997/02 swap to DEM with floating rate	- 100.0	- 412.8	
876	5.25	1998/03	100.0	- 412.8	
-	5.25	1998/03 swap to DEM with floating rate	- 100.0	- 412.8	
Total CAD			0.0	0.0	
CHF-loans					
198	6.85	1984/99 EIB-loan IV	0.7	3.5	(3)
313	0	1987/02	85.2	394.8	
547	4.75	1993/99	150,0	695.4	
559	4.25	1993/99	1,000.0	4,636.3	
695	4.25	1996/99 swap to DEM with fixed rate	- 50.0	- 231.8	
696	4.25	1996/99 swap to DEM with fixed rate	- 100.0	- 463.6	
697	4.25	1996/99 swap to DEM with fixed rate	- 100.0	- 463.6	
698	4.25	1996/99 swap to DEM with fixed rate	- 100.0	- 463.6	
699	4.25	1996/99 swap to DEM with fixed rate	- 100.0	- 463.6	
700	4.25	1996/99 swap to DEM with fixed rate	- 150.0	- 695.4	
701	4.25	1996/99 swap to DEM with fixed rate	- 100.0	- 463.6	
702	4.25	1996/99 swap to DEM with fixed rate	- 100.0	- 463.6	
703	4.25	1996/99 swap to DEM with fixed rate	- 100.0	- 463.6	
704	4.25	1996/99 swap to DEM with fixed rate	- 100.0	- 463.6	
796	2.25	1997/04	200.0	927.3	
-	2.26688	1997/04 swap to DEM with floating rate	- 200.0	- 927.3	
Total CHF			235.9	1,093.7	
CZK-loans					
871	13.75	1998/02	1,000.0	211.9	
-	13.75	1998/02 swap to DEM with floating rate	- 1,000.0	- 211.9	
Total CZK			0.0	0.0	
DEM-loans					
509	8.345	1992/02 swap from floating rate	100.0	380.9	
-	float.	1992/02 swap to fixed rate	- 100.0	- 380.9	
512	8.3	1992/02 swap from floating rate	100.0	380.9	
-	float.	1992/02 swap to fixed rate	- 100.0	- 380.9	
515	8.285	1992/02 swap from floating rate	50.0	190.4	
-	float.	1992/02 swap to fixed rate	- 50.0	- 190.4	
516	8.31	1992/02 swap from floating rate	50.0	190.4	
-	float.	1992/02 swap to fixed rate	- 50.0	- 190.4	
524	8.03	1992/02 swap from floating rate	100.0	380.9	
-	float.	1992/02 swap to fixed rate	- 100.0	- 380.9	
528	7.94	1992/01 swap from floating rate	100.0	380.9	
-	float.	1992/01 swap to fixed rate	- 100.0	- 380.9	
572	6.07	1993/00	9.7	37.0	
579	5.69	1993/99 swap from USD with floating rate	300.0	1,142.6	

CENTRAL-GOVERNMENT LOANS IN FOREIGN CURRENCY
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Loan no.	Rate of interest per cent p.a.	Title	Outstanding amount (million of currency)	Outstanding amount (DKK million) (1)	Note
DEM-loans – continued					
621	6.125	1995/00	495.0	1,885.2	
624	6.445	1995/00 swap from floating rate	100.0	380.9	
-	float.	1995/00 swap to fixed rate	- 100.0	- 380.9	
626	6.23	1995/00 swap from floating rate	100.0	380.9	
-	float.	1995/00 swap to fixed rate	- 100.0	- 380.9	
638	6.31	1995/00 swap from floating rate	100.0	380.9	
-	float.	1995/00 swap to fixed rate	- 100.0	- 380.9	
639	6.305	1995/00 swap from floating rate	200.0	761.7	
-	float.	1995/00 swap to fixed rate	- 200.0	- 761.7	
641	6.16	1995/00 swap from floating rate	100.0	380.9	
-	float.	1995/00 swap to fixed rate	- 100.0	- 380.9	
642	6.1675	1995/00 swap from floating rate	200.0	761.7	
-	float.	1995/00 swap to fixed rate	- 200.0	- 761.7	
643	6.33	1995/01 swap from floating rate	100.0	380.9	
-	float.	1995/01 swap to fixed rate	- 100.0	- 380.9	
644	6.31	1995/01 swap from floating rate	100.0	380.9	
-	float.	1995/01 swap to fixed rate	- 100.0	- 380.9	
645	0	1995/00	51.6	196.5	
646	6.46	1995/02 swap from floating rate	100.0	380.9	
-	float.	1995/02 swap to fixed rate	- 100.0	- 380.9	
647	6.44	1995/02 swap from floating rate	100.0	380.9	
-	float.	1995/02 swap to fixed rate	- 100.0	- 380.9	
648	6.4	1995/02 swap from floating rate	100.0	380.9	
-	float.	1995/02 swap to fixed rate	- 100.0	- 380.9	
649	6.39	1995/02 swap from floating rate	100.0	380.9	
-	float.	1995/02 swap to fixed rate	- 100.0	- 380.9	
650	5.73	1995/00 swap from floating rate	100.0	380.9	
-	float.	1995/00 swap to fixed rate	- 100.0	- 380.9	
652	5.63	1995/00 swap from floating rate	200.0	761.7	
-	float.	1995/00 swap to fixed rate	- 200.0	- 761.7	
653	5.645	1995/00 swap from floating rate	100.0	380.9	
-	float.	1995/00 swap to fixed rate	- 100.0	- 380.9	
659	5.57	1995/00 swap from floating rate	100.0	380.9	
-	float.	1995/00 swap to fixed rate	- 100.0	- 380.9	
679	5.02	1995/99 swap from floating rate	100.0	380.9	
-	float.	1995/99 swap to fixed rate	- 100.0	- 380.9	
680	5.045	1995/99 swap from floating rate	100.0	380.9	
-	float.	1995/99 swap to fixed rate	- 100.0	- 380.9	
681	5.015	1995/99 swap from floating rate	100.0	380.9	
-	float.	1995/99 swap to fixed rate	- 100.0	380.9	
682	5.02	1995/99 swap from floating rate	100.0	380.9	
-	float.	1995/99 swap to fixed rate	- 100.0	- 380.9	
683	float.	1996/99 swap from JPY(interest)/AUD (redemption) with fixed rate	405.4	1,544.0	
686	4.39	1996/99 swap from floating rate	100.0	380.9	
-	float.	1996/99 swap to fixed rate	- 100.0	- 380.9	
688	4.4	1996/99 swap from floating rate	100.0	380.9	
-	float.	1996/99 swap to fixed rate	- 100.0	- 380.9	
691	4.335	1996/99 swap from floating rate	100.0	380.9	
-	float.	1996/99 swap to fixed rate	- 100.0	- 380.9	

CENTRAL-GOVERNMENT LOANS IN FOREIGN CURRENCY
AS OF 31 DECEMBER 1998[1)] Table 6

Loan no.	Rate of interest per cent p.a.	Title	Outstanding amount (million of currency)	Outstanding amount (DKK million) (1)	Note
DEM-loans – continued					
693	4.32	1996/99 swap from floating rate	100.0	380.9	
-	float.	1996/99 swap to fixed rate	- 100.0	- 380.9	
695	5.895	1996/99 swap from CHF with fixed rate	62.1	236.4	
696	5.88	1996/99 swap from CHF with fixed rate	124.0	472.3	
697	5.95	1996/99 swap from CHF with fixed rate	123.8	471.5	
698	5.925	1996/99 swap from CHF with fixed rate	124.0	472.3	
699	5.9	1996/99 swap from CHF with fixed rate	124.0	472.3	
700	5.9	1996/99 swap from CHF with fixed rate	185.8	707.6	
701	5.847	1996/99 swap from CHF with fixed rate	123.8	471.5	
702	5.836	1996/99 swap from CHF with fixed rate	124.2	473.1	
703	5.838	1996/99 swap from CHF with fixed rate	124.2	473.0	
704	5.838	1996/99 swap from CHF with fixed rate	124.3	473.6	
706	5	1996/99	300.0	1,142.6	
710	float.	1996/01 swap from LUF with fixed rate	48.6	185.1	
711	5.74	1996/01 swap from floating rate	48.6	185.1	
-	float.	1996/01 swap to fixed rate	- 48.6	- 185.1	
712	float.	1996/99 swap from AUD with fixed rate	69.0	262.8	
713	float.	1996/06 swap from FRF with floating rate	146.6	558.4	
714	float.	1996/02 swap from XEU with floating rate	94.0	357.9	
715	float.	1997/99 swap to JPY(interest)/AUD (redemption) Swap concerning buy-back (JPY 28,000 mn/ AUD 360 mn) of loan no. 683	- 395.4	- 1,506.0	
716	float.	1996/02 swap from XEU with floating rate	93.7	356.8	
717	float.	1996/02 swap from XEU with floating rate	188.0	716.2	
719	float.	1996/99 swap from JPY(interest)/AUD (redemption) with fixed rate	413.0	1,573.1	
721	float.	1996/02 swap from XEU with floating rate	189.0	719.8	
723	8.05	1996/02 swap from XEU with fixed rate	283.2	1,078.7	
725	float.	1996/02 swap from XEU with floating rate	284.4	1,083.0	
727	4.62	1996/99 swap from floating rate	200.0	761.7	
-	float.	1996/99 swap to fixed rate	- 200.0	- 761.7	
729	4.6525	1996/99 swap from floating rate	213.0	811.4	
-	float.	1996/99 swap to fixed rate	- 213.0	- 811.4	
732	4.4925	1996/99 swap from floating rate	69.0	262.8	
-	float.	1996/99 swap to fixed rate	- 69.0	- 262.8	
734	0	1996/01 swapped to floating rate	12.0	45.7	
735	6.3875	1996/06 swap from floating rate	146.6	558.4	
-	float.	1996/06 swap to fixed rate	- 145.6	- 558.4	
749	float.	1996/00 swap from JPY(interest)/AUD (redemption) with fixed rate	275.6	1,049.6	
750	float.	1996/99 swap from USD with fixed rate	297.0	1,131.1	
756	float.	1996/00 swap from XEU with fixed rate	189.3	720.8	
757	float.	1996/99 swap to AUD with fixed rate Swap concerning buy-back (AUD 18 mn) of loan no. 712	- 21.7	- 82.6	
758	float.	1996/00 swap from JPY(interest)/AUD (redemption) with fixed rate	137.8	524.8	
760	5	1996/01	500.0	1,904.3	

CENTRAL-GOVERNMENT LOANS IN FOREIGN CURRENCY
AS OF 31 DECEMBER 1998[1)] Table 6

Loan no.	Rate of interest per cent p.a.	Title	Outstanding amount (million of currency)	Outstanding amount (DKK million) (1)	Note
DEM-loans – continued					
761	float.	1996/99 swap to JPY(interest)/AUD (redemption) Swap concerning buy-back (JPY 1,500 mn/ AUD 17.4 mn) of loan no. 719	- 20.6	- 78.4	
762	4.61	1996/00 swap from XEU with fixed rate	47.8	181.9	
763	4.62	1996/00 swap from XEU with fixed rate	80.6	307.0	
764	float.	1996/00 swap from JPY(interest)/AUD (redemption) with fixed rate	283.5	1,079.7	
766	4.505	1996/00 swap from floating rate	189.3	720.8	
-	float.	1996/00 swap to fixed rate	- 189.3	- 720.8	
767	float.	1996/99 swap from JPY(interest)/AUD (redemption) with fixed rate	131.8	501.9	
768	3.94	1996/00 swap from floating rate	275.6	1,049.6	
-	float.	1996/00 swap to fixed rate	- 275.6	- 1,049.6	
769	4.1125	1996/99 swap from floating rate	297.0	1,131.1	
-	float.	1996/99 swap to fixed rate	- 297.0	- 1,131.1	
770	4.102	1996/00 swap from floating rate	283.5	1,079.7	
-	float.	1996/00 swap to fixed rate	- 283.5	- 1,079.7	
771	float.	1996/99 swap from USD with fixed rate	75.6	287.8	
772	float.	1996/06 swap from USD with fixed rate	29.9	114.0	
777	4.56	1996/00 swap from GBP with fixed rate	254.0	967.4	
-	4.495	1996/00 swap from GBP with fixed rate	64.3	244.9	
780	4.75	1997/02	485.5	1,849.0	
788	3.88	1996/00 swap from floating rate	137.8	524.8	
-	float.	1996/00 swap to fixed rate	- 137.8	524.8	
789	3.765	1996/99 swap from floating rate	131.8	501.9	
-	float.	1996/99 swap to fixed rate	- 131.8	- 501.9	
790	5.925	1996/06 swap from floating rate	29.9	114.0	
-	float.	1996/06 swap to fixed rate	- 29.9	- 114.0	
791	3.74	1996/99 swap from floating rate	75.6	287.8	
-	float.	1996/99 swap to fixed rate	- 75.6	- 287.8	
793	float.	1997/02 swap from USD with fixed rate	326.6	1,243.7	
794	float.	1997/07 swap from JPY with structured interest rate	13.6	51.9	
795	4.75	1997/02	700.0	2,666.0	
796	float.	1997/04 swap from CHF with fixed rate	228.7	870.9	
797	float.	1997/00 swap from USD with fixed rate	333.3	1,269.3	
798	4.885	1997/02 swap from floating rate	326.6	1,243.7	
-	float.	1997/02 swap to fixed rate	- 326.6	- 1,243.7	
799	5.73	1997/07 swap from floating rate	13.6	51.9	
-	float.	1997/07 swap to fixed rate	- 13.6	- 51.9	
800	5.275	1997/04 swap from floating rate	228.7	870.9	
-	float.	1997/04 swap to fixed rate	- 228.7	- 870.9	
801	float.	1997/99 swap to AUD with fixed rate Swap concerning buy-back of loan no. 712	- 9.3	- 35.3	
802	float.	1997/02 swap from CAD with fixed rate	121.5	462.7	
806	float.	1997/00 swap to JPY(interest)/AUD (redemption) Swap concerning buy-back (JPY 14,000 mn/ AUD 158.4 mn) of loan no. 764	- 191.4	- 729.1	

CENTRAL-GOVERNMENT LOANS IN FOREIGN CURRENCY
AS OF 31 DECEMBER 1998[1)] Table 6

Loan no.	Rate of interest per cent p.a.	Title	Outstanding amount (million of currency)	Outstanding amount (DKK million) (1)	Note
DEM-loans – continued					
807	3.895	1997/00 swap from floating rate	333.3	1,269.3	
-	float.	1997/00 swap to fixed rate	- 333.3	- 1,269.3	
810	float.	1997/00 swap from JPY(interest)/GBP (redemption) with fixed rate	95.7	364.5	
811	float.	1997/00 swap from USD with fixed rate	97.8	372.3	
812	4.748	1997/02 swap from floating rate	121.5	462.7	
-	float.	1997/02 swap to fixed rate	- 121.5	- 462.7	
817	3.875	1997/00 swap from floating rate	95.7	364.5	
-	float.	1997/00 swap to fixed rate	- 95.7	- 364.5	
824	float.	1997/00 swap from USD with fixed rate	676.0	2,574.5	
828	3.775	1997/00 swap from floating rate	97.8	372.3	
-	float.	1997/00 swap to fixed rate	- 97.8	- 372.3	
830	3.897	1997/00 swap from floating rate	676.0	2,574.5	
-	float.	1997/00 swap to fixed rate	- 676.0	- 2,574.5	
833	float.	1997/00 swap from GBP with fixed rate	277.0	1,055.0	
835	float.	1997/07 swap from JPY with fixed rate	69.4	264.4	
836	3.775	1997/00 swap from floating rate	277.0	1,055.0	
-	float.	1997/00 swap to fixed rate	- 277.0	- 1,055.0	
837	float.	1997/01 swap from USD with structured interest rate	166.1	632.4	
838	float.	1997/07 swap from AUD(interest)/JPY (redemption) with fixed rate	44.3	168.9	
841	float.	1997/03 swap from USD with fixed rate	862.5	3,284.8	
842	5.826	1997/07 swap from floating rate	69.4	264.4	
-	float.	1997/07 swap to fixed rate	- 69.4	- 264.4	
843	5.0625	1997/03 swap from floating rate	862.5	3,284.8	
-	float.	1997/03 swap to fixed rate	- 862.5	- 3,284.8	
844	5.6925	1997/07 swap from floating rate	44.3	168.9	
-	float.	1997/07 swap to fixed rate	- 44.3	- 168.9	
845	5	1997/03	500.0	1,904.3	
846	float.	1997/01 swap from USD with fixed rate	517.7	1,971.6	
847	3.992	1997/01 swap from floating rate	166.1	632.4	
-	float.	1997/01 swap to fixed rate	- 166.1	- 632.4	
848	4.224	1997/01 swap from floating rate	517.7	1,971.6	
-	float.	1997/01 swap to fixed rate	- 517.7	- 1,971.6	
849	float.	1997/04 swap from USD with fixed rate	926.0	3,526.7	
850	float.	1997/07 swap from JPY with structured interest rate	31.0	118.1	
851	float.	1997/01 swapped to fixed rate, 4.7425%	1,465.0	5,579.5	
852	5.4675	1997/04 swap from floating rate	926.0	3,526.7	
-	float.	1997/04 swap to fixed rate	- 926.0	- 3,526.7	
853	float.	1997/07 swap from JPY with structured interest rate	7.6	28.9	
854	5.25	1997/04	1,000.0	3,808.5	
855	float.	1997/07 swap from JPY with fixed rate	49.3	187.7	
862	float.	1997/07 swap from USD with fixed rate	43.5	165.8	
863	float.	1997/04 swapped to floating rate	125.0	476.1	
864	5	1998/03	500.0	1,904.3	
865	float.	1997/04 swap from fixed rate	1,000.0	3,808.5	
-	5.25	1997/04 swap to floating rate	- 1,000.0	- 3,808.5	

CENTRAL-GOVERNMENT LOANS IN FOREIGN CURRENCY
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Loan no.	Rate of interest per cent p.a.	Title	Outstanding amount (million of currency)	Outstanding amount (DKK million) (1)	Note
DEM-loans – continued					
869	float.	1998/03 swap from AUD with fixed rate	120.0	457.0	
870	float.	1998/05 swap from USD with fixed rate	908.6	3,460.4	
871	float.	1998/02 swap from CZK with fixed rate	53.2	202.5	
872	4.29	1998/01 swap from GBP with fixed rate	61.3	233.3	
873	float.	1998/03 swap from GRD with fixed rate	57.7	219.6	
874	float.	1998/00 swap to JPY(interest)/GBP (redemption) Swap concerning buy-back (JPY 165.5 mn) of loan no. 810	- 2.2	- 8.2	
875	float.	1998/01 swap from GRD with fixed rate	60.2	229.4	
876	float.	1998/03 swap from CAD with fixed rate	121.5	462.5	
880	float.	1998/00 swap from JPY(interest)/ZAR (redemption) with fixed rate	25.0	95.2	
881	float.	1998/07 swap from NOK with fixed rate	74.3	282.9	
882	float.	1998/00 swap from JPY(interest)/ZAR (redemption) with fixed rate	26.0	99.0	
888	float.	1998/07 swap from SEK with fixed rate	102.0	388.5	
890	float.	1998/07 swap from SEK with fixed rate	101.5	386.6	
891	float.	1998/06 swap from SEK with fixed rate	81.9	311.9	
Total DEM			17,806.1	67,814.5	
DKK-loans					
1	3	1894 perpetual	55.6	55.6	(4)
2	3.5	1901 perpetual	29.2	29.2	(4)
3	3.5	1909 perpetual	38.4	38.4	(4)
Total DKK			123.3	123.3	
FRF-loans					
224	12.9	1985/99 EIB-loan, DSB Electrification I	10.4	11.9	(3)
514	float.	1992/02 swap from fixed rate	250.0	283.9	
-	9.43	1992/02 swap to floating rate	- 250.0	- 283.9	
575	5.5	1993/99	6,185.0	7,023.7	
713	float.	1996/06	500.0	567.8	
-	float.	1996/06 swap to DEM with floating rate	- 500.0	- 567.8	
Total FRF			6,195.4	7,035.6	
GBP-loans					
120	13	1980/05	25.5	269.8	
247	11.55	1985/00 EIB-loan, DSB Electrification I	2.4	25.3	(3)
407	11.625	1990/00	95.0	1,005.5	
-	11.625	1990/00 swap to USD with floating rate	- 75.0	- 793.8	
-	11.625	1990/00 swap to USD with floating rate	- 25.0	- 264.6	
777	7.25	1996/00	125.0	1,323.0	
-	7.25	1996/00 swap to DEM with fixed rate	- 100.0	- 1,058.4	
-	7.25	1996/00 swap to DEM with fixed rate	- 25.0	- 264.6	
810	0	1997/00 GBP(redemption)/JPY(interest)	33.9	359.0	
-	0	1997/00 swap to DEM with floating rate	- 34.7	- 367.7	

CENTRAL-GOVERNMENT LOANS IN FOREIGN CURRENCY
AS OF 31 DECEMBER 1998[1)] Table 6

Loan no.	Rate of interest per cent p.a.	Title	Outstanding amount (million of currency)	Outstanding amount (DKK million) (1)	Note
GBP-loans – continued					
833	6.25	1997/00	100.0	1,058.4	
-	6.25	1997/00 swap to DEM with floating rate	- 100.0	- 1,058.4	
872	6.69	1998/01 EIB-loan. Danish Motorways III	20.0	211.7	
-	6.69	1998/01 swap to DEM with fixed rate	- 20.0	- 211.7	
874	0	1998/00 swap from DEM with floating rate Swap concerning buy-back (JPY 165.5 mn) of loan no. 810	0.8	8.7	
Total GBP			22.9	242.1	
GRD-loans					
873	7.5	1998/03	10,000.0	226.2	
-	7.5	1998/03 swap to DEM with floating rate	- 10,000.0	- 226.2	
875	8.5	1998/01	10,000.0	226.2	
-	8.5	1998/01 swap to DEM with floating rate	- 10,000.0	- 226.2	
Total GRD			0.0	0.0	
JPY-loans					
560	float.	1993/00 (fixed-rate option sold in swap)	10,000.0	561.7	
683	5.85	1996/99 JPY(interest on 2,000 mn)/ AUD(redemption)	0.0	0.0	
-	5.85	1996/99 swap (of 30,000 mn) to DEM with floating rate	- 0.0	- 0.0	
715	5.85	1996/99 swap from DEM with floating rate Swap concerning buy-back (JPY 28,000 mn) of loan no. 683	0.0	0.0	
719	6.7	1996/99 JPY(interest on 28,500 mn)/AUD (redemption)	0.0	0.0	
-	6.7134	1996/99 swap (of 30,000 mn) to DEM with floating rate	- 0.0	- 0.0	
749	5.8	1996/00 JPY(interest on 20,000 mn)/AUD (redemption)	0.0	0.0	
	5.8	1996/00 swap to DEM with floating rate	- 0.0	- 0.0	
758	4.1	1996/00 JPY(interest on 10,000 mn)/AUD (redemption)	0.0	0.0	
-	4.1	1996/00 swap to DEM with floating rate	- 0.0	- 0.0	
761	6.7	1996/99 swap from DEM with floating rate Swap concerning buy-back (JPY 1,500 mn) of loan no. 719	0.0	0.0	
764	5.6	1996/00 JPY(interest on 7,000 mn)/AUD (redemption)	0.0	0.0	
-	5.6	1996/00 swap (of 21,000 mn) to DEM with floating rate	- 0.0	- 0.0	
767	5.35	1996/99 JPY(interest on 10,000 mn)/AUD (redemption)	0.0	0.0	
-	5.35	1996/99 swap to DEM with floating rate	- 0.0	- 0.0	
794	float.	1997/07	1,000.0	56.2	
-	float.	1997/07 swap to DEM with floating rate	- 1,000.0	- 56.2	

CENTRAL-GOVERNMENT LOANS IN FOREIGN CURRENCY
AS OF 31 DECEMBER 1998[1)] Table 6

Loan no.	Rate of interest per cent p.a.	Title	Outstanding amount (million of currency)	Outstanding amount (DKK million) (1)	Note
JPY-loans – continued					
806	5.6	1997/00 swap from DEM with floating rate	0.0	0.0	
		Swap concerning buying (JPY 14,000 mn) of loan no. 764	0.0	0.0	
810	5.4	1997/00 JPY(interest on 6,834.5 mn)/GBP (redemption)	0.0	0.0	
-	5.4	1997/00 swap (of 7,000 mn) to DEM with floating rate	- 0.0	- 0.0	
835	2.63	1997/07	5,000.0	280.8	
-	2.63	1997/07 swap to DEM with floating rate	- 5,000.0	- 280.8	
838	0	1997/07 JPY(redemption)/AUD(interest)	3,000.0	168.5	
-	0	1997/07 swap to DEM with floating rate	- 3,000.0	- 168.5	
850	float.	1997/07	2,000.0	112.3	
-	float.	1997/07 swap to DEM with floating rate	- 2.000.0	- 112.3	
853	float.	1997/07	500.0	28.1	
-	float.	1997/07 swap to DEM with floating rate	- 500.0	- 28.1	
855	2.02	1997/07 EIB-loan, Danish Road By-passes B	3,400.0	191.0	
-	2.02	1997/07 swap to DEM with floating rate	- 3,400.0	- 191.0	
874	5.4	1998/00 swap from DEM with floating rate	0.0	0.0	
		Swap concerning buy-back (JPY 165.5 mn) of loan no. 810			
880	11.85	1998/00 JPY(interest on 2,000 mn)/ZAR (redemption)	0.0	0.0	
-	11.85	1998/00 swap to DEM with floating rate	- 0.0	- 0.0	
882	11.85	1998/00 JPY(interest on 2,000 mn)/ZAR (redemption)	0.0	0.0	
-	11.85	1998/00 swap to DEM with floating rate	- 0.0	- 0.0	
Total JPY			10,000.0	561.7	
LUF-loans					
619	0	1995/03	5,000.0	923.3	
710	5.45	1996/01	1,000.0	184.7	
-	5.45	1996/01 swap to DEM with floating rate	- 1,000.0	- 184.7	
Total LUF			5,000.0	923.3	
NLG-loans					
211	9.5	1984/04	37.5	126.8	(5)
224	8.15	1985/99 EIB-loan, DSB Electrification I	15.4	52.1	(3)
227	8.375	1985/00	12.2	41.2	(5)
Total NLG			65.1	220.1	
NOK-loans					
881	6.25	1998/07	330.0	276.9	
-	6.25	1998/07 swap to DEM with floating rate	- 330.0	- 276.9	
Total NOK			0.0	0.0	
SEK-loans					
888	5	1998/07	500.0	393.1	
-	5	1998/07 swap to DEM with floating rate	- 500.0	- 393.1	

CENTRAL-GOVERNMENT LOANS IN FOREIGN CURRENCY
AS OF 31 DECEMBER 1998[1)] Table 6

Loan no.	Rate of interest per cent p.a.	Title	Outstanding amount (million of currency)	Outstanding amount (DKK million) (1)	Note
SEK-loans – continued					
890	5.12	1998/07	500.0	393.1	
-	5.12	1998/07 swap to DEM with floating rate	- 500.0	- 393.1	
891	5.065	1998/06	400.0	314.5	
-	5.065	1998/06 swap to DEM with floating rate	- 400.0	- 314.5	
Total SEK.			0.0	0.0	
USD-loans					
407	float.	1990/00 swap from GBP with fixed rate	123.3	787.2	
-	float.	1990/00 swap from GBP with fixed rate	41.1	262.4	
574	float.	1993/99 swap from CAD with fixed rate	187.5	1,197.5	
579	float.	1993/99 swap to DEM with fixed rate	- 187.5	- 1,197.5	
598	6.8	1994/99 swapped to floating rate	48.8	311.3	
750	6.25	1996/99	200.0	1,277.3	
-	6.25	1996/99 swap to DEM with floating rate	- 200.0	- 1,277.3	
771	0	1996/99	48.6	310.4	
-	0	1996/99 swap to DEM with floating rate	- 48.6	- 310.4	
772	6.065	1996/06	20.0	127.7	
-	6.065	1996/06 swap to DEM with floating rate	- 20.0	- 127.7	
793	0	1997/02	300.0	1,916.0	
-	0	1997/02 swap to DEM with floating rate	- 300.0	- 1,916.0	
797	5.72	1997/00	206.1	1,315.9	
-	5.72	1997/00 swap to DEM with floating rate	- 210.0	- 1,341.2	
811	0	1997/00	57.0	364.0	
-	0	1997/00 swap to DEM with floating rate	- 57.0	- 364.0	
824	5.9	1997/00	400.0	2,554.6	
-	5.9	1997/00 swap to DEM with floating rate	- 400.0	- 2,554.6	
837	float.	1997/01	97.6	623.1	
-	float.	1997/01 swap to DEM with floating rate	- 97.6	- 623.1	
841	6.625	1997/03	500.0	3,193.3	
-	6.625	1997/03 swap to DEM with floating rate	- 500.0	- 3,193.3	
846	6.375	1997/01	300.0	1,916.0	
-	6.375	1997/01 swap to DEM with floating rate	- 300.0	- 1,916.0	
849	6.25	1997/04	500.0	3,193.3	
-	6.25	1997/04 swap to DEM with floating rate	- 500.0	- 3,193.3	
862	4	1997/07	30.0	191.6	
-	4	1997/07 swap to DEM with floating rate	- 30.0	- 191.6	
870	5.75	1998/05	500.0	3,193.3	
-	5.75	1998/05 swap to DEM with floating rate	- 500.0	- 3,193.3	
Total USD			209.2	1,335.8	
XEU-loans					
493	8.5	1992/02	880.8	6,570.6	
510	float.	1992/02 swap from fixed rate	50.0	373.0	
-	9.73	1992/02 swap to floating rate	- 50.0	- 373.0	
511	float.	1992/02 swap from fixed rate	50.0	373.0	
-	9.69	1992/02 swap to floating rate	- 50.0	- 373.0	
518	float.	1992/02 swap from fixed rate	50.0	373.0	
-	9.63	1992/02 swap to floating rate	- 50.0	- 373.0	

CENTRAL-GOVERNMENT LOANS IN FOREIGN CURRENCY
AS OF 31 DECEMBER 1998[1)] Table 6

Loan no.	Rate of interest per cent p.a.	Title	Outstanding amount (million of currency)	Outstanding amount (DKK million) (1)	Note
XEU-loans – continued					
519	float.	1992/02 swap from fixed rate	50.0	373.0	
-	9.63	1992/02 swap to floating rate	- 50.0	- 373.0	
520	float.	1992/02 swap from fixed rate	50.0	373.0	
-	9.61	1992/02 swap to floating rate	- 50.0	- 373.0	
521	float.	1992/99 swap from fixed rate	50.0	373.0	
-	9.72	1992/99 swap to floating rate	- 50.0	- 373.0	
522	float.	1992/02 swap from fixed rate	100.0	745.9	
-	9.29	1992/02 swap to floating rate	- 100.0	- 745.9	
523	float.	1992/02 swap from fixed rate	50.0	373.0	
-	9.33	1992/02 swap to floating rate	- 50.0	- 373.0	
529	float.	1992/02 swap from fixed rate	25.0	186.5	
-	9.38	1992/02 swap to floating rate	- 25.0	- 186.5	
530	float.	1992/02 swap from fixed rate	25.0	186.5	
-	9.4	1992/02 swap to floating rate	- 25.0	- 186.5	
597	6.65	1994/99 EIB-loan, Danish Motorways 2 B	40.0	298.4	
714	float.	1996/02 swap to DEM with floating rate	- 50.0	- 373.0	
716	float.	1996/02 swap to DEM with floating rate	- 50.0	- 373.0	
717	float.	1996/02 swap to DEM with floating rate	- 100.0	- 745.9	
721	float.	1996/02 swap to DEM with floating rate	- 100.0	- 745.9	
723	8.5	1996/02 swap to DEM with fixed rate	- 150.0	- 1,118.9	
725	float.	1996/02 swap to DEM with floating rate	- 150.0	- 1,118.9	
756	5.4	1996/00 EIB-loan, DSB Electrification III F	100.0	745.9	
-	5.4	1996/00 swap to DEM with floating rate	- 100.0	- 745.9	
762	5.01	1996/00 EIB-loan, DSB Electrification III F	25.0	186.5	
-	5.01	1996/00 swap to DEM with fixed rate	- 25.0	- 186.5	
763	5.01	1996/00 EIB-loan. Danish Road By-passes	42.3	315.2	
-	5.01	1996/00 swap to DEM with fixed rate	- 42.3	- 315.2	
877	4.05	1998/03 swapped to floating rate	130.0	969.7	
878	3.7	1998/01 swapped to floating rate	211.0	1,573.9	
879	4.625	1998/08 swapped to floating rate	500.0	3,729.7	
889	3.4	1998/04 swapped to floating rate	100.0	745.9	
Total XEU			1,261.8	9,412.6	
ZAR-loans					
880	0	1998/00 ZAR(redemption)/JPY(interest)	91.1	99.2	
-	0	1998/00 swap to DEM with floating rate	- 91.1	- 99.2	
882	0	1998/00 ZAR(redemption)/JPY(interest)	91.7	99.9	
-	0	1998/00 swap to DEM with floating rate	- 91.7	- 99.9	
Total ZAR			0.0	0.0	
Central-government foreign debt, total				88,338.2	

(1) The outstanding amount as of 31 December 1998 is calculated on the basis of the following exchange rates as of 31 December 1998, expressed as the exchange rate per 100 units: AUD = 392.37, BEF = 18.465, CAD = 412.78, CHF = 463.63, CZK = 21.186, DEM = 380.85, FRF = 113.56, GBP = 1.058.43, GRD = 2.262, JPY = 5.6165, LUF = 18.465, NLG = 338.02, NOK = 83.92, SEK = 78.62, USD = 638.65, XEU = 745.94, ZAR = 108.87.
(2) Swap (in BEF) of LUF-loan.
(3) Redeemable according to the principle of annuities. Semi-annual or annual payments, beginning after a grace period of at least one year.
(4) Multi-currency loan. The creditor can choose which currency to make payments in, however at a fixed rate of exchange.
(5) Semi-annual or annual equal instalments, beginning after a grace period of at least one year.

SERVICE ON CENTRAL-GOVERNMENT DOMESTIC DEBT[1], END OF 1998 Table 7

DKK billion	Interest	Redemptions	Total
1999	43.4	71.5	115.0
2000	39.0	77.8	116.7
2001	32.6	78.7	111.3
2002	27.4	40.4	67.8
2003	25.0	70.0	94.9
2004	19.4	75.4	94.8
2005	14.0	21.0	35.0
2006	13.0	70.0	83.0
2007	7.4	52.6	60.0
2008	3.7	0.0	3.7
2009	3.7	32.8	36.5
2010	1.7	0.1	1.8
2011	1.7	0.0	1.7
2012	1.7	0.0	1.7
2013	1.7	0.0	1.7
2014	1.7	0.0	1.7
2015	1.7	0.0	1.7
2016	1.7	0.0	1.7
2017	1.7	0.0	1.7
2018	1.7	0.0	1.7
2019	1.7	0.0	1.7
2020	1.7	0.0	1.7
2021	1.7	0.0	1.7
2022	1.7	0.0	1.7
2023	1.7	0.0	1.7
2024	1.7	24.9	26.6
Total	254.7	615.2	869.9

[1] Excluding Treasury bills.

SERVICE ON CENTRAL-GOVERNMENT FOREIGN DEBT, END OF 1998 Table 8

DKK billion	Interest	Redemptions	Total
1999	4.4	19.1	23.5
2000	3.4	13.9	17.3
2001	2.7	12.4	15.1
2002	2.1	13.2	15.3
2003	1.3	9.7	11.0
2004	0.8	9.4	10.2
2005	0.4	3.7	4.1
2006	0.3	1.0	1.3
2007	0.2	2.0	2.2
2008	0.2	3.9	4.1
Total	15.8	88.3	104.1

KINGDOM OF DENMARK'S RATING IN DOMESTIC CURRENCY — Table 9a

	Moody's	Standard & Poor's	Fitch IBCA
1986, July	Aa		
1986, August	Aa1[1]		
1986, November	Aaa[2]		
1992		AAA	
1994, August			AAA

Note: The best known rating agencies use the following ratings for debt in general.
Moody's: Aaa, Aa, A, Baa, Ba, B, Caa, Ca and C.
For the categories Aa to B 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.
The categories of Fitch IBCA: correspond to Standard & Poor's.

[1] Moody's Aa category was split into 3 levels, Aa1, Aa2 and Aa3, of which Aa1 is the highest.

[2] Until 1993 Moody's assigned ratings to the individual bond issues. This was subsequently changed, so that ratings to a greater degree represented an evaluation of the issuer. Since no domestic bond issues were rated after September 1992 Moody's did not have a formal rating of Denmark until April 1993.

KINGDOM OF DENMARK'S RATING IN FOREIGN CURRENCY — Table 9b

	Moody's	Standard & Poor's	Fitch IBCA
1981, March	Aa	AAA	
1982, September		AAA[1]	
1983, January		AA+	
1986, August	Aa1[2]		
1987, March		AA	
1990, June		AA[3]	
1991, October		AA+[4]	
1994, August			AA+
1998, May		AA+[5]	

Note: See the note in table 9a for ranking of the rating categories.

[1] Subject to "Credit Watch", i.e. special observation possible changes in ratings.

[2] Moody's Aa category was split into 3 levels, Aa1, Aa2 and Aa3, of which Aa1 is the highest.

[3] From December 1989 Standard & Poor's started to assign outlooks to the ratings expressed as ("positive", "stable" or "negative"). Denmark was assigned "positive outlook".

[4] Outlook "stable".

[5] Outlook "positive".

RATING OF SELECTED COUNTRIES' CENTRAL-GOVERNMENT DEBT Table 10

	Moody's		Standard & Poor's	
	Domestic	Foreign	Domestic	Foreign
Australia	Aaa	Aa2	AAA	AA
Belgium	Aa1	Aa1	AA+	AA+
Denmark	Aaa	Aa1	AAA	AA+
Finland	Aaa	Aaa	AA	AA
France	Aaa	Aaa	AAA	AAA
Netherlands[1)]	Aaa		AAA	AAA
Ireland	Aaa	Aaa	AA+	AA+
Italy	Aa3	Aa3	AA	AA
Japan	Aa1	Aa1	AAA	AAA
New Zealand	Aaa	Aa2	AAA	AA+
Norway	Aaa	Aaa	AAA	AAA
Portugal	Aa2	Aa2	AA-	AA-
Spain	Aa2	Aa2	AA	AA
Great Britain	Aaa	Aaa	AAA	AAA
Sweden	Aa1	Aa2	AAA	AA+
South Africa	Baa1	Baa3	BBB+	BB+
Czech Republic	A1	Baa1[2)]	AA-	A-
Germany[1)]	Aaa		AAA	AAA
USA[1)]	Aaa		AAA	AAA
Austria	Aaa	Aaa	AAA	AAA

Source: Moody's Investors Service and Standard & Poor's.
Note: As published in January 1999. See the note in Table 9a for ranking of the rating categories.
[1)] The country has no central-government debt in foreign currencies.
[2)] Rating of the central bank's foreign debt.

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