



Danmarks
Nationalbank

Government Debt Policy in
the Light of Falling Debt

Summary and Conclusion

Against the background of falling debt, Government Debt Management has analysed the future perspectives of the market for Danish government securities. The aim is to determine how to structure this market in the coming years, given the objectives of:

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

In connection with the preparation of the report, key participants in the market for Danish government securities have been consulted, including primary dealers and other market participants.

IMPLICATION OF FALLING DEBT FOR THE GOVERNMENT-SECURITIES MARKET

The report comprises three parts, analysing the following questions:

- To which extent is the central government expected to have a borrowing requirement in the future?
- What are the costs of suspending central-government borrowing and subsequently re-establishing a domestic market for government bonds?
- Which role do Danish government securities play in the domestic financial market?

Borrowing requirement and strategy

The first part of the analysis is based on the Danish government's report *Towards New Goals – Denmark 2015* (the 2015 plan)¹. This plan envisages central-government surpluses in the coming years, although they are expected to fall towards 2015. There will still be a need to issue government bonds due to maturing government securities. The annual borrowing requirement is expected to average around DKK 30 billion in the period 2008-15.

¹ *Mod nye mål – Danmark 2015*, the Danish government, August 2007. In Danish only.

In the longer term, particularly the ageing of the population will lead to an increase in the borrowing requirement. According to the long-term projections by the Danish government and the Danish Economic Council, the central-government surpluses will cease and the central government will have a substantial borrowing requirement. Consequently, there are no indications that the issuance of government bonds can be suspended. Closing the market for government bonds is only an option in the event of a prolonged period with considerably higher surpluses than those envisaged in the 2015 plan.

If the debt is redeemed and the surplus continues, there will be a need to invest in assets. In a number of countries with sustained surpluses, central-government assets are accumulated in special funds with defined objectives, investment policies and rules for transfers and disbursement. At the same time, these countries have chosen to maintain issuance programmes for government bonds in order to ensure a well-functioning domestic financial market.

Costs of re-establishing a market for government securities

The second part of the analysis investigates the potential costs of temporarily suspending government issuance and subsequently re-establishing the market. Closing the market for government securities is only possible in the event of a sustained period of surpluses that significantly exceed the projection in the 2015 plan. The analysis shows that re-establishment entails costs, primarily relating to a period with less favourable borrowing terms. The costs are analysed from three perspectives:

- Comparison of the borrowing terms under the central government's current borrowing programme with those of other highly rated domestic issuers. The analysis shows that under an established borrowing programme the central government issues loans at a yield that is approximately 25-35 basis points lower than other highly rated domestic issuers. This conclusion is comparable to that of an equivalent review performed by the Australian Department of the Treasury.
- In connection with the start-up of the market for government bonds in the mid-1970s, the yield on government securities was up to 60 basis points higher than the yield on equivalent bonds issued by mortgage-credit institutes.
- Experience from the establishment of the euro-loan programme indicates additional start-up costs of around 10 basis points compared with a well-established programme.

Overall, the analysis shows less favourable borrowing terms for the central government in a start-up phase of a few years. However, the magnitude of the costs and the duration of the start-up phase are subject to considerable uncertainty.

The alternative to closure and subsequent re-establishment is to continue to issue government bonds, even at a time when the central government has no borrowing requirement. It is estimated that loan revenue can be invested at a yield which at least equals the central-government borrowing terms without taking significant financial risks. For example, New Zealand issues domestic bonds despite a period with non-existing borrowing requirement. The revenue is invested in highly rated foreign bonds and the currency risk is hedged via currency swaps.

The role of government securities in Denmark

The final part of the analysis investigates whether government securities play a special role in supporting the financial market in Denmark.

In a number of contexts, the market for government securities functions as a benchmark and reference for other financial instruments in the fixed-income markets. The market for government securities thus contributes to efficient pricing and capital allocation. The reason is that government securities are standardised instruments with low credit risk and high liquidity. The low credit risk on government securities also makes them suitable as safe assets in a diversified investment portfolio.

The analysis focuses on the role of government securities as price references and investment objects. The analysis shows that other types of financial instruments, e.g. mortgage-credit bonds, the swap market or foreign government securities can normally ensure efficient pricing. However, under unusual market conditions differences between government securities and other securities become more apparent. In such situations, the absence of government securities could mean that the financial markets function less efficiently.

GOVERNMENT DEBT POLICY IN THE COMING YEARS

On the basis of the analysis and the perspectives for the future structure of the market for Danish government securities, Government Debt Management and the Ministry of Finance have decided to continue to issue government bonds. In this connection, it has been emphasised that the central government will have a borrowing requirement in the coming years, and that there are costs related to re-establishment of a borrowing programme after it has been closed. In order to ensure a liquid market for government securities, the issuance strategy is as follows:

- To open a new 10-year government bond approximately every second year and build it up to a final outstanding volume of around DKK 50 billion.

To the extent that the government funds invest in domestic government bonds, further issuance will be required in order to maintain a liquid market for government securities.

The intention is still to ensure that the framework of the market for government securities supports a well-functioning market for Danish and international market participants and investors. Agreements between Government Debt Management and a number of banks (primary dealers) concerning issuance of and trading in government securities will remain a core element of the market for government securities in the coming years.

The strategy will be reviewed after 3-4 years.

I. Borrowing Requirement and Issuance Strategy

DEVELOPMENT IN THE CENTRAL-GOVERNMENT BORROWING REQUIREMENT

I.1

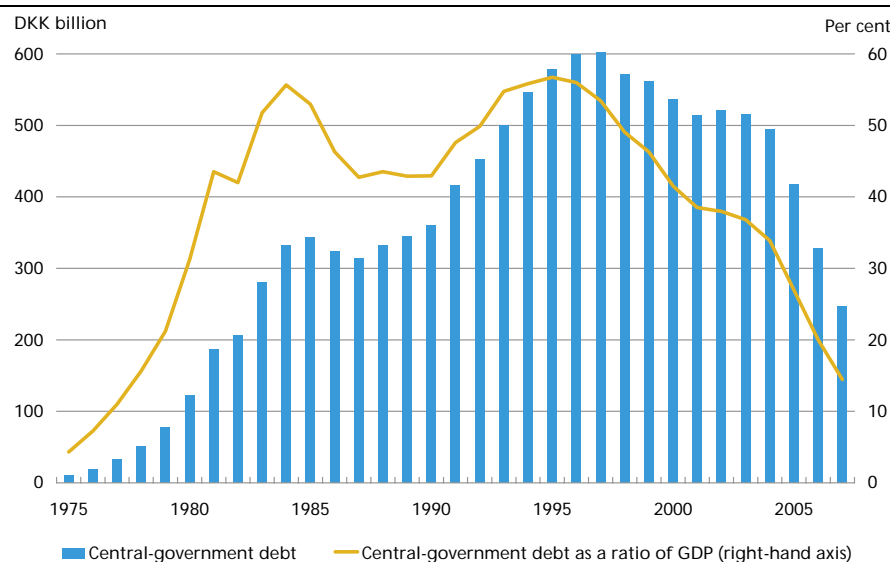
The last 10 years have witnessed a significant reduction of the central-government debt, from approximately DKK 600 billion at end-1997, to approximately DKK 250 billion at end-2007, corresponding to a decline from 53 per cent of GDP to 14 per cent of GDP, cf. Chart I.1.1.

The debt reduction reflects central-government surpluses virtually every year since 1997, particularly in the last three years. The surplus was around DKK 35 billion on average in the period.

A considerable part of the debt reduction can be attributed to revenue from North Sea activities and extraordinary factors (e.g. from the central government's sale of shares in Tele Danmark A/S and extraordinarily high revenue from the pension-fund tax), cf. Chart I.1.2. The decline in the central-government debt and a lower level of interest rates have contributed to a significant reduction of the central government's interest costs from DKK 44 billion in 1997 to DKK 15 billion in 2007.

CENTRAL-GOVERNMENT DEBT, 1975-2007

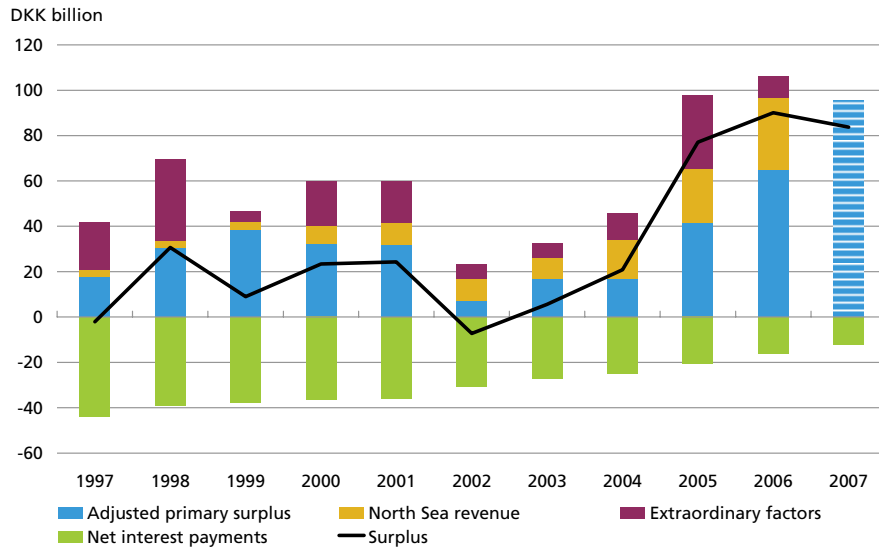
Chart I.1.1



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

BREAKDOWN OF CENTRAL-GOVERNMENT SURPLUS

Chart I.1.2



Note: Surplus compiled as the central government's net cash balance. The adjusted primary surplus excludes North Sea revenue, extraordinary factors and net interest payments. Only surplus and net interest payments have been compiled for 2007.

Source: *Budget Outlook 1*, February 2008 and the *Central-Government Accounts*.

Borrowing requirement up until 2015

The central government has shown extraordinarily large surpluses in recent years, reflecting a combination of temporary factors, all working in the same direction, such as the strong economic condition, high oil prices and capital gains in the financial markets. The Danish government's projection, *Towards New Goals – Denmark 2015* (the 2015 plan)¹, envisages lower surpluses until 2015, cf. Chart I.1.3. Four main factors point to lower surpluses in the 2015 plan:

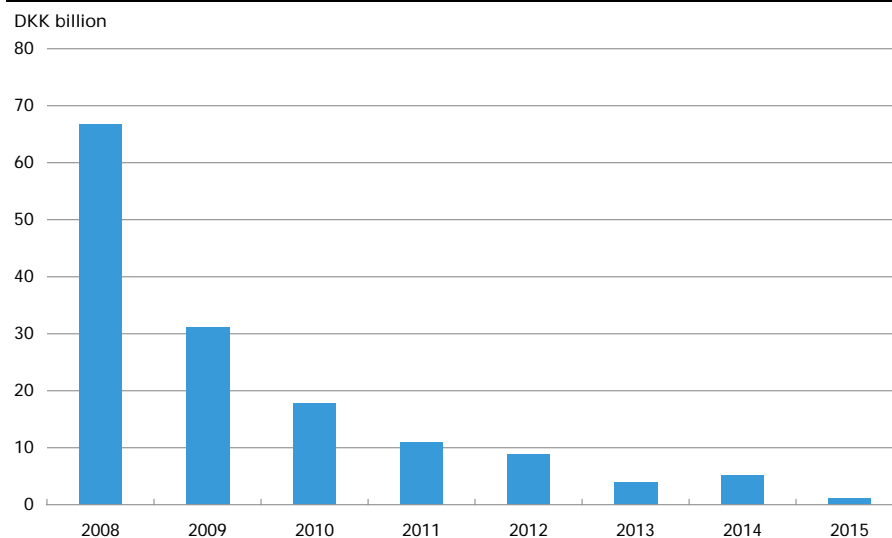
- A gradual normalisation of recent years' strong economic condition is expected. This explains more than half of the expected decrease in the surplus
- A gradual decline in revenue from North Sea production from the current high level
- Increasing expenditure for state retirement pensions in step with the growing number of old-age pensioners
- The priorities in expenditure and tax policies until 2015 imply lower surpluses.

The central government's annual borrowing requirement depends on the government surplus and refinancing of maturing government

¹ *Mod nye mål – Danmark 2015*, the Danish government, August 2007. In Danish only.

PROJECTION OF CENTRAL-GOVERNMENT SURPLUS

Chart I.1.3

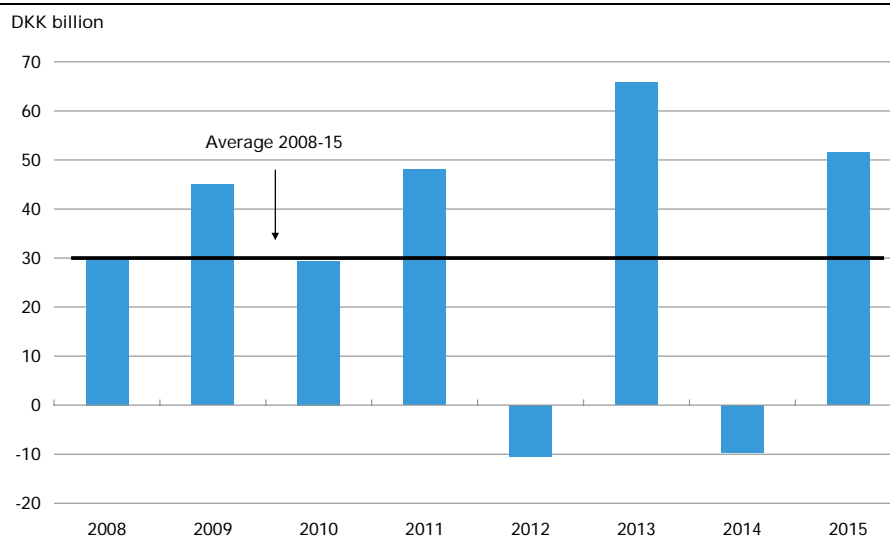


Note: The surplus measure applied is the central government's net cash balance.
 Source: *Towards New Goals – Denmark 2015* and *Budget Outlook 1*, February 2008.

securities. The central government's annual borrowing requirement is expected to average around DKK 30 billion in the period 2008-15, cf. Chart I.1.4.

EXPECTED CENTRAL-GOVERNMENT BORROWING REQUIREMENT IN GOVERNMENT BONDS

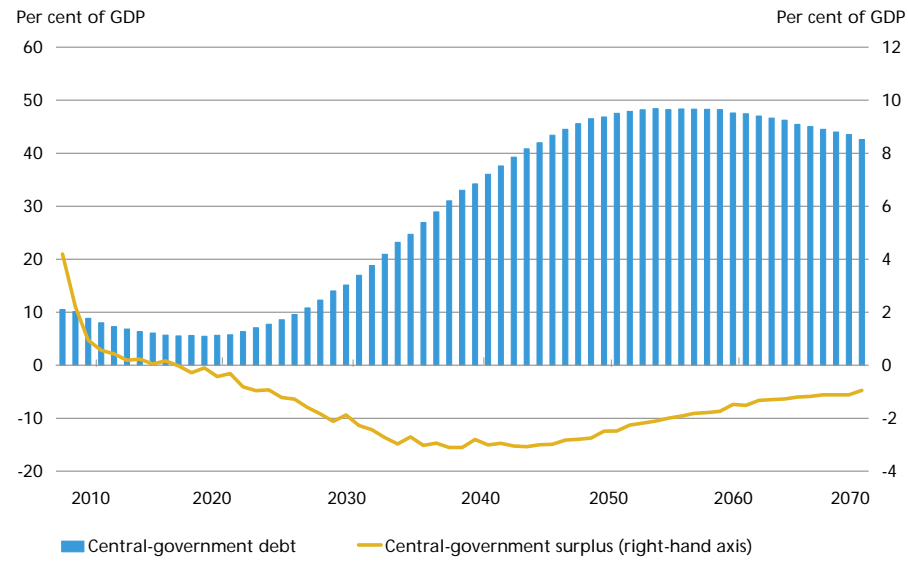
Chart I.1.4



Source: *Towards New Goals – Denmark 2015* and *Budget Outlook 1*, February 2008.

CENTRAL-GOVERNMENT DEBT AND SURPLUS, 2008-70

Chart I.1.5



Source: *Towards New Goals – Denmark 2015*.

The projection in the 2015 plan indicates the central government's expected borrowing requirement in the coming years. The actual borrowing requirement may deviate from this if, for example, the cyclical development of the economy deviates from the projection.

Borrowing requirement in the years after 2015

The 2015 plan projects the central-government balance after 2015 subject to neutral, technical assumptions concerning e.g. life expectancy and its implications for expenditure policy. The projection is subject to high uncertainty.

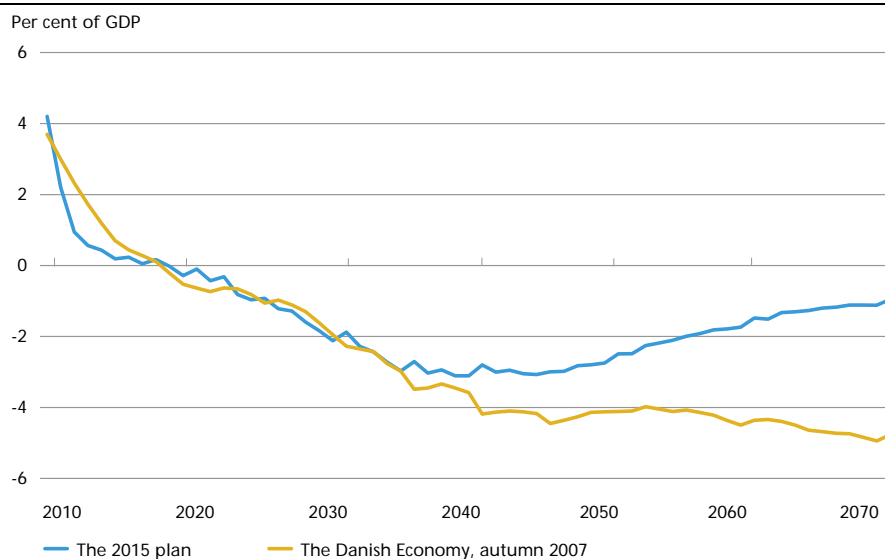
According to the technical projection, the central-government balance will show a deficit after 2015, gradually increasing to around 3 per cent of GDP by 2035, cf. Chart I.1.5.

There are two principal factors explaining the development in the projection:

- From 2020 to 2040 relatively large generations will retire from the labour market, and the ratio of employed to non-employed will decline. This points to a deficit since, inter alia, larger generations in retirement entail increased expenditure for care and healthcare in relation to the elderly.
- Revenue from the North Sea production is expected to decline to the extent that annual proceeds from oil and gas production will fall by approximately 0.5 per cent of GDP from 2015 to 2040.

LONG-TERM PROJECTIONS OF THE GENERAL GOVERNMENT BALANCE

Chart I.1.6



Source: *Towards New Goals – Denmark 2015* and *The Danish Economy, autumn 2007*, the Danish Economic Council.

The latest report from the Danish Economic Council, *The Danish Economy, autumn 2007*, contains a long-term projection of the Danish economy that envisages larger deficits than the 2015 plan, cf. Chart I.1.6. The differences clearly stand out only after 2035 and can be attributed to other assumptions about e.g. developments in the labour force and the impact of higher life expectancy on healthcare expenditure. Both projections point to a considerable central-government borrowing requirement in the longer term.

ADJUSTMENT OF THE ISSUANCE STRATEGY

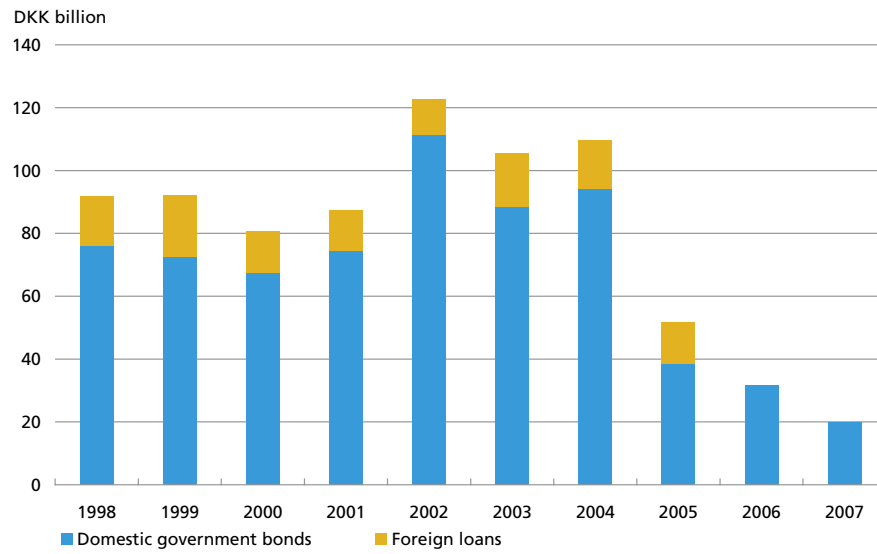
I.2

In the light of considerable surpluses for several years, the aim of the central government's issuance strategy has been to maintain a liquid market for domestic government securities. A few years ago, the central government issued T-bills, 2-, 5- and 10-year domestic government bonds, and 5-year euro loans. Annual issuance totalled approximately DKK 100 billion, cf. Chart I.2.1.

Over the last three years, average annual issuance has been approximately DKK 30 billion. As a result, the strategy has been amended, and government bond issuance is now concentrated in the 10-year maturity segment, while the central government's euro-loan programme has been suspended, and the T-bill programme will be phased out in 2008.

ANNUAL ISSUANCE OF GOVERNMENT BONDS

Chart I.2.1

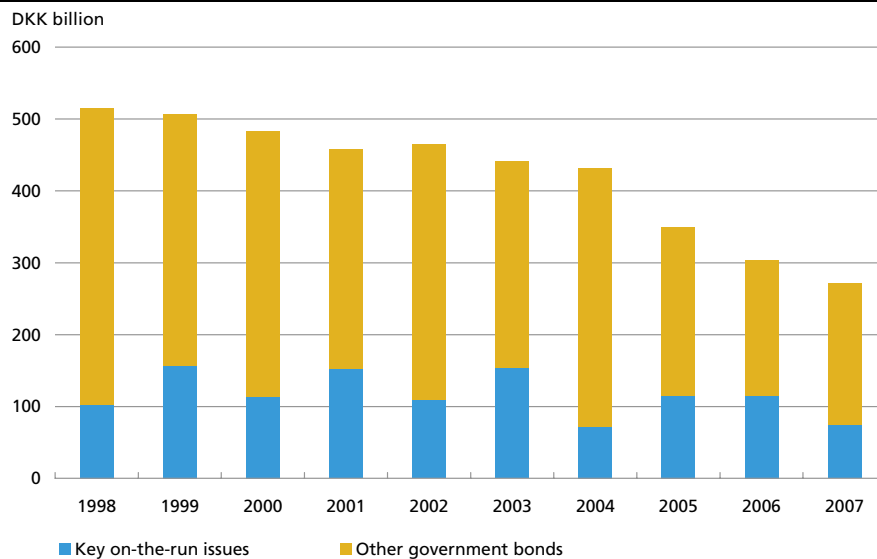


The choice of maturity segment reflects that the central government normally has a comparative advantage in the long maturity segment in view of its high credit standing, and that the 10-year segment is internationally considered to be the most important.

The concentration of issuance in fewer series has contributed to maintaining liquidity in the key on-the-run issues, despite the decrease

GOVERNMENT BONDS, EXCLUDING THE GOVERNMENT FUNDS' PORTFOLIOS

Chart I.2.2



in the total outstanding volume. In the period 1998-2007, outstanding key on-the-run issues totalled around DKK 100 billion, while the total outstanding of other government bonds, excluding government funds, fell from DKK 400 billion to DKK 200 billion, cf. Chart I.2.2.

Adjustment of issuance strategies in Finland and Sweden

Finland and Sweden have reduced their central-government debt in recent years and, like Denmark, concentrated their issuance on a few series.

Finland's central-government debt fell from approximately 65 per cent of GDP in 1997 to approximately 30 per cent of GDP at end-2007. Finland's government debt management office still expects to refinance maturing loans via the financial markets, while preparing for future challenges, including in particular the implications for the central-government balance of the ageing population. Finland does not intend to change its issuance policy.¹

Sweden's central-government debt declined from 75 per cent of GDP in 1997 to approximately 40 per cent of GDP at end-2007. It is expected to be reduced further to around 30 per cent of GDP by the end of 2009 as a result of e.g. high growth and privatisation of state-owned enterprises. The primary objective of the issuance policy is to maintain a liquid market for government bonds. Consequently, Sweden downscaled its T-bill programme in 2007, while issuance of Swedish index-linked bonds and foreign-currency-denominated bonds is being retained. The intention is to ensure a stable issuance policy and well-functioning capital markets.²

CONDITIONS FOR A LIQUID MARKET FOR GOVERNMENT SECURITIES I.3

The issuance strategy is based on the assumption that investors are willing to pay a premium for liquid government bonds. Building up large liquid series in the government-bond market enables the central government to obtain a liquidity premium and thus meet its borrowing requirement at a lower interest rate.

Government Debt Management has previously analysed liquidity in the Danish market for government securities, cf. *Danish Government Borrowing and Debt 2002*, Chapter 8. The analysis showed the existence of a liquidity premium in the Danish market for government securities.

¹ *Debt Management Annual Review 2006*, Finland. See www.treasuryfinland.fi.

² *Central Government Borrowing – Forecast and Analysis 2007:3*, Sweden. See www.rgk.se.

Maintaining a liquid market for government securities requires a large outstanding volume of government bonds. The international standard is to build up series of government securities to at least EUR 5 billion in order to enable trading on international electronic platforms. In the 10-year segment, the series are often somewhat larger, typically around EUR 10 billion. The central government's primary dealers have indicated that the outstanding volume in 10-year government bonds should be at least DKK 50 billion.

In addition, it is important to have a framework for the government-securities market that supports a well-functioning market for Danish and international market participants and investors. This implies continuing trading on electronic platforms and maintaining the central government's agreements with primary dealers.

ISSUANCE STRATEGY IN THE COMING YEARS

I.4

With a view to obtain liquid issuance and on the basis of the expected future borrowing requirement, the issuance strategy is as follows:

- To open a new 10-year government bond series approximately every second year and build it up to a final outstanding volume of around DKK 50 billion.

In the longer term, this strategy will lead to distribution of the central-government loans on five bond series, each amounting to approximately DKK 50 billion, bringing the total outstanding volume of government bonds to approximately DKK 250 billion. The annual issuance under this strategy is consistent with the central government's expected annual borrowing requirement of around DKK 30 billion until 2015. Investment by government funds in domestic government bonds will result in a higher issuance requirement to ensure a liquid market for government securities.

In the event of a larger than expected borrowing requirement over a prolonged period, the issuance strategy may be adjusted, e.g. by building up the securities to a higher outstanding volume or opening additional series of government securities.

Smoothing out the annual borrowing requirements

The intention is to smooth out the redemption profile via buy-backs and by using the central government's account. Flexible use of the account means that the central government does not have to buy back at unfavourable prices. In years when the borrowing requirement is smaller

than the issuance, the balance of the central government's account can increase, whereas it can be reduced in years with a higher borrowing requirement.

GOVERNMENT FUNDS

I.5

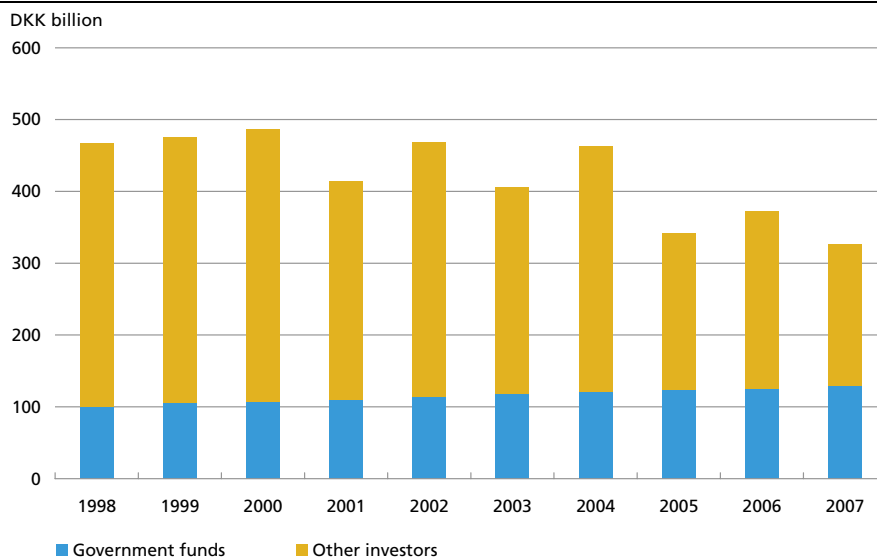
Government Debt Management manages the assets of the Social Pension Fund (SPF), the Danish National Advanced Technology Foundation, the Financing Fund for increased distributions from the Danish National Research Foundation, and the Preventive Measures Foundation. The total assets of the government funds are expected to remain at approximately DKK 135 billion in the coming years.

For a number of years, the funds have primarily invested in government bonds, excluding key on-the-run issues. As the government debt decreases, the funds' portfolios constitute a larger share of the outstanding volume of government bonds, cf. Chart I.5.1.

As a result of the decreasing debt, the outstanding volume and the number of government bonds is lower than previously. This makes it more difficult for the funds to invest in government bonds without pushing up prices. Investment at higher prices reduces the returns on the funds' assets.

OWNERSHIP DISTRIBUTION OF GOVERNMENT BONDS, EXCLUDING KEY ON-THE-RUN ISSUES

Chart I.5.1



In addition, the funds' investments in government bonds can contribute to reducing liquidity in the market for government securities in a situation where the decreasing debt is already exerting pressure on liquidity. This increases the risk of shortages and unusual market conditions for government securities.

Against this background, SPF may have to make increased use of the opportunity to buy other listed bonds than government bonds. SPF's investments will observe the regulations of the fund.

ACCUMULATION AND MANAGEMENT OF CENTRAL-GOVERNMENT ASSETS

I.6

The strategy for the coming years is consistent with the projection in the 2015 plan, i.e. a declining surplus until 2015. Should the government surplus significantly exceed the projection in the 2015 plan, the strategy will be reviewed.

Experience with falling debt and accumulation of assets in Australia, Ireland, New Zealand and Norway is reviewed below. Should a similar situation arise in Denmark, this will call for an analysis of how the central-government assets should be managed.

Accumulation and management of central-government assets in countries with declining debt

If the debt is redeemed and a surplus continues, there will be a need to invest in assets. In a number of countries with sustained surpluses, central-government assets are accumulated in special funds. The funds' objectives have been determined politically, often with a long-term approach. Examples are:

- To contribute to financing higher central-government expenditure related to the ageing of the population
- To contribute to financing specific items of public expenditure in the long term, e.g. education or research
- To strengthen fiscal discipline and smooth out public spending from generation to generation by removing part of the surplus from the annual budget.

There is typically a fixed framework for the transfer of capital to the funds, cf. Table I.6.1. Ireland aims to transfer a fixed percentage of GNP each year, Australia's transfer depends on the size of the government surplus, and Norway transfers the central government's net revenue from oil activities.

 GOVERNMENT FUNDS IN AUSTRALIA, IRELAND, NEW ZEALAND AND NORWAY

Tabel I.6.1

Fund	Transfers	Disbursement	Management	Objective
<i>Australia:</i> Future Fund	The government determines the proportion of the government surplus and proceeds from privatisation to be transferred.	Disbursement may take place when the fund's assets are equivalent to pension obligations (expected around 2020).	An independent unit manages the assets on a day-to-day basis. A board appointed by the Minister of Finance undertakes supervision and plans the investment strategy.	To finance future pension obligations.
<i>Ireland:</i> National Pensions Reserve Fund	Annual transfer: 1 per cent of GNP.	Disbursement may take place as from 2025 in accordance with rules set out by the Minister of Finance.	Irish government debt management office manages the assets on a day-to-day basis under a 10-year mandate. A commission plans the investment strategy and undertakes supervision.	To provide for increasing public expenditure for welfare and pensions as from 2025.
<i>New Zealand:</i> Super-annuation Fund	Approximately NZD 2 billion is expected to be transferred every year in 20 years.	Disbursement may take place as from 2020.	An independent unit manages the assets on a day-to-day basis. Supervision is undertaken by a board, which plans the investment strategy.	To partially finance future pension obligations.
<i>Norway:</i> Government Pension Fund (Statens Pensjonsfond)	Central government's oil revenue is transferred.	The intention is to disburse the fund's real yield.	The Ministry of Finance determines the fund's guidelines. The fund's foreign portfolio is managed by Norges Bank, while the domestic portfolio is managed by Folketrygdfondet.	To smooth out oil revenue over generations and counter increases in pension obligations.

Source: Australia's Future Fund: www.futurefond.gov.au, Ireland's National Pensions Reserve Fund: www.nprf.ie, New Zealand's Superannuation Fund: www.nzsuperfond.co.nz, Norway's Folketrygdfondet: www.ftf.no and Norges Bank: www.norgesbank.no.

These assets are managed under a mandate from the respective ministries of finance. Day-to-day management is undertaken by the government debt management office, the central bank or special units.

In addition, the funds are subject to clear investment rules, and their assets include both bonds and shares. Placements are to a large extent made in foreign shares and bonds, inter alia because the countries' domestic financial markets are not large enough.

Issuance of government bonds in countries with net assets

In the event of a government surplus for a sustained period, the central government may consider discontinuing issuance of government securities. In Australia, New Zealand and Norway the central-government assets exceed the debt. These countries have chosen to maintain an issuance programme for government securities, primarily motivated by the special role of government securities in the domestic financial system, e.g. in maintaining a futures market based on government securities, cf. Chapter III. Furthermore, continued issuance of government bonds will ensure that the central government has access to low-cost borrowing at a later stage, should a borrowing requirement arise again, cf. Chapter II.

II. Costs of Re-Establishing the Market for Danish Government Securities

CLOSING AND RE-ESTABLISHING THE MARKET FOR GOVERNMENT SECURITIES

II.1

In the coming years, the central government will still need to issue government securities, cf. Chapter I. Consequently, there are no indications that the issuance of government securities can be suspended. Closing the market for government securities is only an option in the event of a prolonged period with considerably higher surpluses than those envisaged in the 2015 plan.

If the borrowing programme is closed, it will have to be re-established when a new borrowing requirement arises. In the event of a large and sustained borrowing requirement, the strategy will be to build up a domestic market for government bonds. That would be in accordance with the debt-management recommendations of the IMF, the OECD and the World Bank.

Re-establishing a domestic market for government bonds

Re-establishment of a domestic market for government bonds involves two types of costs:

- Administrative costs
- Costs related to a period with less favourable borrowing terms than under an established borrowing programme.

The build-up of a borrowing programme entails various administrative costs, e.g. for establishing the required expertise within Government Debt Management, IT systems for portfolio and risk management, agreements concerning trading on electronic platforms, market-making agreements and contractual aspects. There are, however, also administrative costs connected with continued issuance that do not apply while the programme is closed. Overall, the administrative costs are deemed to be of little significance to the decision to maintain or close a borrowing programme.

The costs of closing and re-establishing a borrowing programme primarily depend on whether the borrowing terms will temporarily be less favourable than under an established borrowing programme. Less

FACTORS BEHIND LESS FAVOURABLE BORROWING TERMS IN THE START-UP PHASE OF A BORROWING PROGRAMME

Box II.1

A number of factors may contribute to less favourable borrowing terms for the central government:

- A new borrowing programme is not liquid from the outset. In order to ensure liquidity, it is necessary to have large outstanding volumes in the individual series, and the market must be confident that issuance will continue under the programme.
 - It takes time to rebuild the framework in the market for government securities that currently supports a well-functioning market with efficient competition among investors in government bonds, including a primary-dealer system and trading on electronic platforms.
 - Market participants will incur one-off costs to re-familiarise themselves with Danish government securities and adapt their IT systems. Consequently, market participants will pay a lower price for Danish government bonds in the start-up phase.
 - Structural demand for Danish government bonds will be lower in the start-up phase. For example, Danish government bonds will not initially be included in global bond indices or be eligible for use as collateral. Moreover, knowledge of Danish government bonds among international market participants will be lower.
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favourable borrowing terms can be expected in a start-up phase. The primary reasons are that a new borrowing programme will not be liquid from the outset, and that it takes time to build up the framework to support a well-functioning market, cf. Box II.1.

The alternative to closure and subsequent re-establishment is to continue to issue government bonds, even at a time when the central government has no borrowing requirement. It is estimated that the loan revenue can be invested at a yield which at least equals the central-government borrowing terms without taking significant financial risks. For example, New Zealand issues domestic bonds despite a non-existing borrowing requirement. The revenue is invested in highly rated foreign bonds and the currency risk is hedged via currency swaps.

QUANTIFICATION OF BORROWING COSTS ON RE-ESTABLISHMENT II.2

The following analysis of the costs of re-establishment in terms of less favourable borrowing terms in the start-up phase, and of the duration of the start-up phase, is based on three approaches:

- The central government's current borrowing terms are compared with those of other issuers in the domestic market with the same rating as the central government.
- Historical experience from the establishment of the existing market for government securities in Denmark.
- Experience from the establishment of the euro-loan programme.

COMPARISON OF BORROWING COSTS IN 2007 Table II.2.1

Basis points	Central government's borrowing advantage (10-year yield spread)	Additional annual costs of a 10-year issue of DKK 40 billion ¹
Same borrowing terms as mortgage- credit institutes	-25	DKK 100 million
Same borrowing terms as KommuneKredit	-34	DKK 135 million

Note: Yield spreads are the difference between the government yields and the yields on bonds from mortgage-credit institutes and KommuneKredit. Yield spreads are adjusted for differences in maturity and the prepayment option.

¹ Additional annual costs are incurred for 10 years since the loan is financed via a 10-year issue.

The costs and duration of the start-up phase are subject to considerable uncertainty.

Yield spreads to domestic issuers with the same rating as the central government

Loans issued by KommuneKredit¹ and the mortgage-credit institutes have the same rating by the international credit rating agencies as those issued by the central government. However, these loans are typically less liquid than government bonds. For this reason, among others, the central government issues loans at a yield that is approximately 25-35 basis points lower than the equivalent yields on loans issued by KommuneKredit and the mortgage-credit institutes, cf. Table II.2.1.

In the following it is assumed that when the central government re-establishes a borrowing programme, it is able to borrow on the same terms as KommuneKredit and the mortgage-credit institutes. In the case of re-establishment, if the central government issues 10-year government bonds for DKK 40 billion (equivalent to approximately 2 per cent of GDP), the start-up costs may amount to DKK 100-135 million p.a. for 10 years. The total start-up costs for first-year issuance may thus be in the range of DKK 1-1.3 billion over the life of the loan (10 years).

In 2002, the Australian Department of the Treasury reviewed the costs of potentially re-establishing the market for Australian government securities.² The review showed that the central government was able to borrow at a yield approximately 30 basis points lower than that of Australian states with the same rating as the central government. It was assessed that this advantage would temporarily disappear if the market for Australian government bonds was closed and later reopened.

¹ The Credit Institution for Local and Regional Authorities in Denmark.

² See www.debtreview.treasury.gov.au.

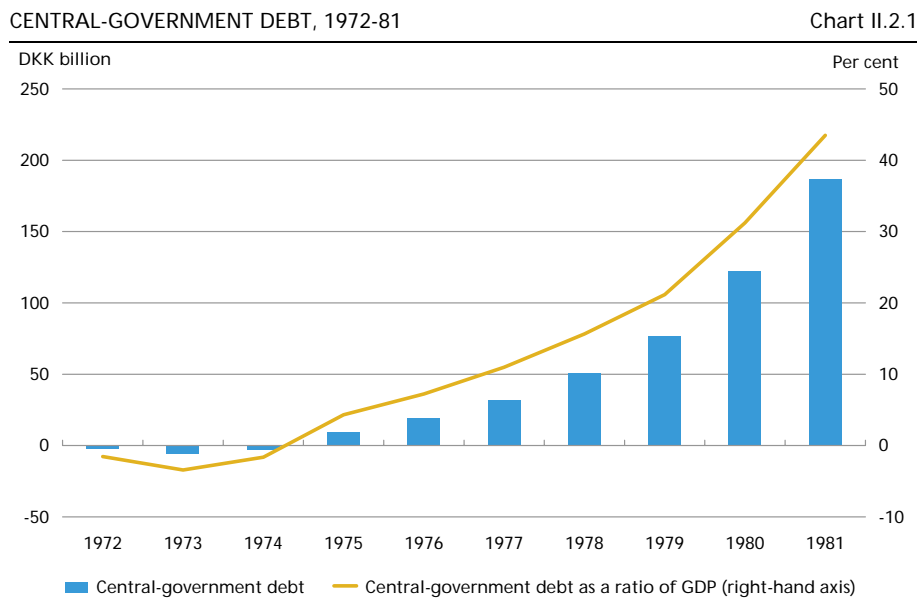
Establishment of the market for Danish government securities in the 1970s

Issuance of Danish government bonds took off in the mid-1970s in line with the mounting central-government deficit, cf. Chart II.2.1.

The Danish market for mortgage-credit bonds was well-functioning at that time. The volume of domestic government securities in circulation was DKK 8.4 billion at the beginning of 1976, while the corresponding volume of mortgage-credit bonds was DKK 176 billion. A comparison of the yields on government bonds and mortgage-credit bonds at the time may give an indication of the additional costs in the start-up phase and the duration of the start-up phase.

In connection with the start-up of the market for government bonds, the yield on government securities was higher than on equivalent bonds issued by mortgage-credit institutes, i.e. the yield spread was positive, cf. Table II.2.2. As the market for government bonds was built up, the central government was able to borrow at a lower yield than the mortgage-credit institutes (negative yield spread). By the early 1980s the spread was approximately -30 basis points, corresponding to the central government's current borrowing advantage.

The narrowing of the spread coincided with two factors that, viewed in isolation, could point to widening spreads. Firstly, there was a higher credit risk as the government debt increased from 7 to 44 per cent of GDP from 1976 to 1981, and secondly demand was low due to the ban in



YIELDS ON 10-YEAR GOVERNMENT AND MORTGAGE-CREDIT BONDS, 1976-81 Table II.2.2

Per cent	Government bonds	Mortgage-credit bonds	Yield spread (basis points)	Additional annual costs of a 10-year issue of DKK 40 billion ¹
1976	17.25	16.67	58	DKK 232 million
1977	17.85	17.61	24	DKK 96 million
1978	18.12	18.39	-27	
1979	19.12	19.04	8	
1980	19.62	19.79	-17	
1981	19.63	19.96	-33	

Note: The government bonds issued were serial loans, while the mortgage-credit bonds were bullet loans or annuity loans. For the same maturity, the duration was thus longer for mortgage-credit than for government bonds.

Source: Danmarks Nationalbank, *Monetary Review*, February 1983.

¹ Additional annual costs are incurred for 10 years since the loan is financed via a 10-year issue.

1979 on sale of government bonds to non-residents. It should be noted that the level of interest rates was considerably higher in those years, which makes comparison difficult.

The following calculations are based on the assumption that in 1976-77 the central government would have been able to borrow on the same terms as mortgage-credit institutes if a well-functioning central-government securities market had existed. Consequently, in the first two years after start-up, the central government borrows at respective yields that are approximately 60 and approximately 25 basis points higher than those of the mortgage-credit institutes. If the central government issues for DKK 40 billion in 10-year government bonds in the first year, the start-up costs will be approximately DKK 230 million p.a. for 10 years, cf. Table II.2.2. Equivalent issuance in the second year will correspond to further start-up costs of around DKK 100 million p.a. for 10 years.

The start-up costs are even higher if, alternatively, it is assumed that the central government can borrow at a lower yield than the mortgage-credit institutes, as is the case today.

Historical experience from the establishment of a market for government securities in Denmark points to considerable start-up costs for a few years.

Establishment of the euro-loan programme

In the period 2002-05, the central government issued an annual euro loan via syndication. A total of four euro loans were issued before the programme was suspended in 2006.

The start-up costs for the euro-loan programme may be indicative of the start-up costs for a new borrowing programme after closure, although the two situations are not fully comparable. When the euro-loan programme was established, it was thus an advantage that Danish government securities were already known in the market, and non-

resident investors were interested in Danish government securities denominated in euro. If other borrowing programmes had not already existed, the start-up costs would presumably have been higher and the start-up phase longer.

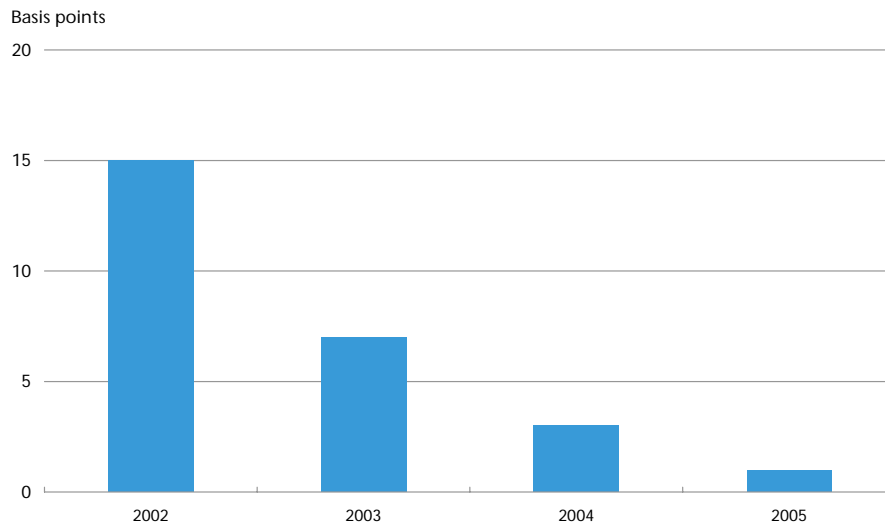
The start-up costs for the euro-loan programme can be assessed by looking at the yields on the issues in relation to the yield curve for German government bonds, which are comparable over time since the securities were issued in euro.

The first syndicated euro loan in 2002 was priced approximately 15 basis points higher than the German government yield curve, cf. Chart II.2.2. In the subsequent years, the yield on the euro loans gradually approached the German government yield curve. This indicates that the euro loans were more and more attractively priced relative to German government securities as the market became more familiar with them.

If it is assumed that the difference in the attractiveness of euro loans in 2002 and 2003, respectively, is purely a result of start-up costs, the additional costs of issuing under a programme that is not yet fully established can be estimated at 15 basis points in the first year, and 6 basis points in the second year.

If the experience from the establishment of the euro-loan programme is applied to re-establishment of a market for government bonds in the 10-

YIELD SPREAD VIS-À-VIS GERMANY FOR EURO LOANS ON ISSUANCE Chart II.2.2



Note: Yield spread is adjusted for differences in maturities.
Source: Bloomberg.

year segment, and DKK 40 billion is borrowed in the first year after re-establishment, the additional costs will be equivalent to approximately DKK 60 million p.a. for 10 years, when compared with issuance under a fully established programme.

III. The Role of Government Securities in the Danish Financial Market

GOVERNMENT SECURITIES AS A BENCHMARK

III.1

Pricing of financial instruments plays an important part in well-functioning financial markets. Good pricing contributes to efficient capital allocation.

Most models for pricing of financial instruments are based on a valuation of the subcomponents of the financial instrument. The price of a bond may, for example, be divided into the risk-free interest rate and the price of risk.¹

With AAA ratings, Danish government securities have a high credit standing and can thus be applied as an estimate of the risk-free interest rate. Furthermore, government securities are liquid, standardised instruments. Were the yield curve to be based on illiquid securities or more complex instrument types there would be a risk that pricing would be disturbed.

If no government securities are available, pricing will have to be based on other financial instruments. The three closest substitutes will be considered in the following: the swap market, the mortgage-credit market and highly rated euro-denominated government securities.

The swap market as a benchmark

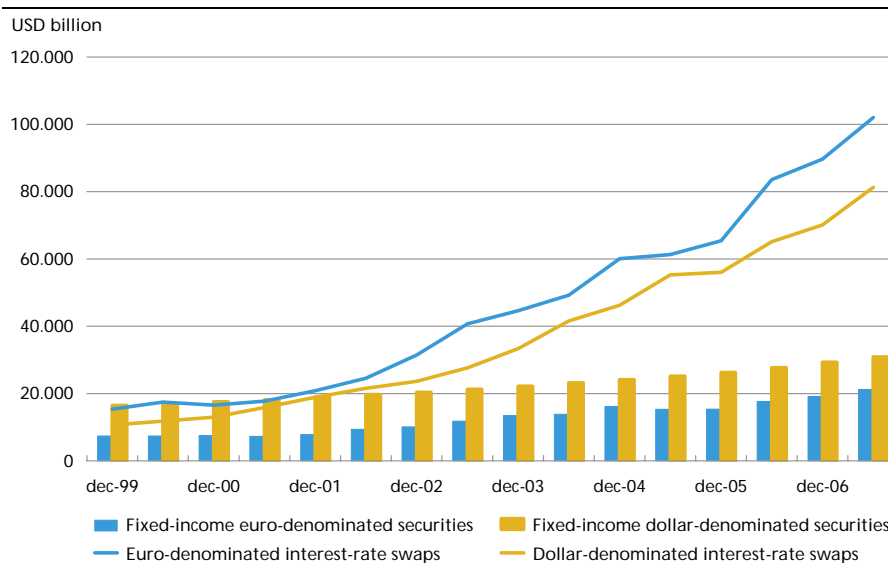
The swap market has increasingly been used as a reference in the pricing of instruments in recent years. The primary reasons are that liquidity in the swap market has increased considerably and that the total outstanding in the swap market (notional value) by far exceeds the total outstanding volume of fixed-income securities in Europe, cf. Chart III.1.1. Besides, interest-rate swaps are standardised instruments that cover the most important points on the curve. The euro-swap market contributes to providing a reference curve across the European countries and thus makes comparison possible.

It may, however, be a challenge to use the swap curve instead of the government yield curve. As swap rates include counterparty risk, the

¹ For example, the Capital Asset Pricing Model (CAPM) is based on the expected return $E(r)$ of a given asset being: $E(r) = r_f + \beta * (E(r_M) - r_f)$, where r_f is the risk-free interest rate, $E(r_M)$ is the expected market return and β is the level of risk.

OUTSTANDING VOLUMES IN THE SWAP MARKET AND IN FIXED-INCOME SECURITIES

Chart III.1.1



Note: Issuance converted to USD.
 Source: BIS.

swap curve depends on the credit standing of the underlying banks. When uncertainty and risk aversion increase in the market, the spread between the government yield curve and the swap curve – the swap spread – will typically widen. It may be inexpedient to use the swap curve for price comparison over time due to its higher vulnerability to uncertainty and risk aversion.

Especially in periods of financial turmoil there is a tendency for differences between government securities and other securities to become more apparent. For example, the turmoil in the financial markets in the 2nd half of 2007 resulted in a widening of the swap spread, cf. Chart III.1.2. Since 1999, the 10-year swap spread has fluctuated between 10 and 70 basis points.

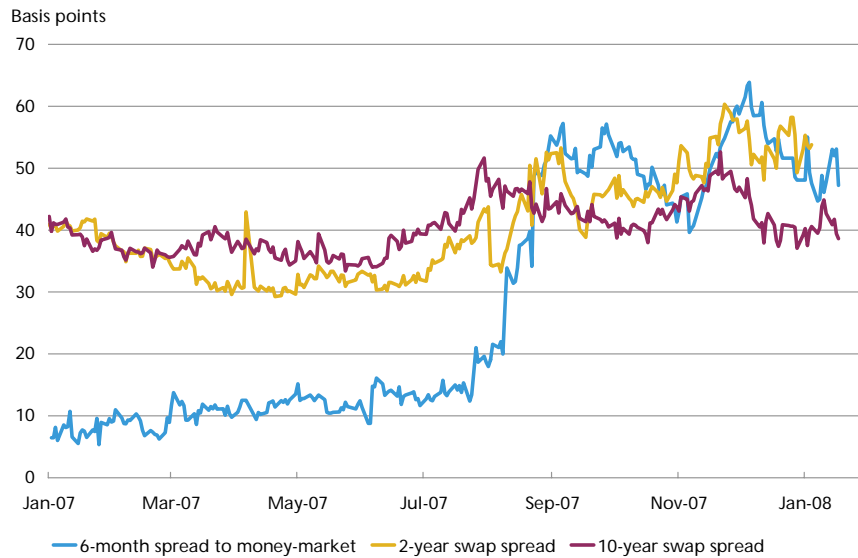
Mortgage-credit bonds as a benchmark

The mortgage-credit market has previously been a benchmark in the Danish bond market. The Danish mortgage-credit market is characterised by a large outstanding volume and low credit risk. Furthermore, there is typically a concentration of liquidity in the short and very long securities.¹ Liquidity in each maturity segment is dispersed among several issuers.

¹ At the short end, uncallable bullet loans and callable loans with various caps are issued. The short-term uncallable bullet loans are immediately comparable to government bonds. Issuance at the long end typically takes place in callable annuity loans that are not immediately comparable to government securities as investors must incorporate the risk of prepayment.

GOVERNMENT SPREADS TO THE MONEY MARKET AND THE SWAP MARKET

Chart III.1.2



Note: The 6-month spread to the money market is the spread between the uncollateralised money-market rate and the T-bill rate. The swap spread is the spread between the swap interest rate and the yield on government securities.
Source: Bloomberg.

The yield spread between government bonds and mortgage-credit bonds is normally limited. In connection with the market turmoil in the 2nd half of 2007, the yield spread between government and mortgage-credit bonds widened in line with the development in the swap market, cf. Chart III.1.3. In these situations it is more difficult to use mortgage-credit bonds as an estimate of the risk-free interest rate.

Euro-denominated government securities as a benchmark

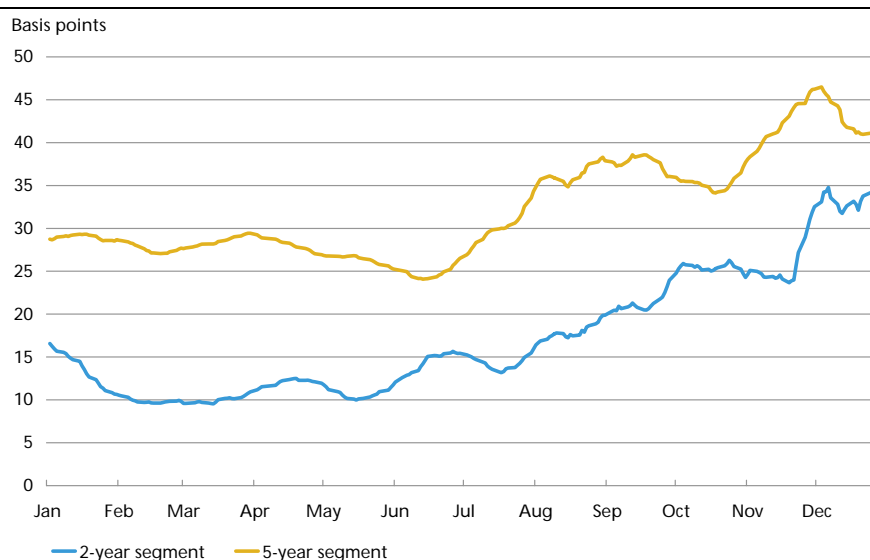
Denmark's fixed-exchange-rate policy vis-à-vis the euro implies that euro-denominated government securities may largely be comparable to Danish government securities in kroner. Investors may therefore, as an alternative to the Danish yield curve, use government securities from euro area member states with a high rating as an estimate of the risk-free interest rate in connection with pricing in the Danish fixed-income markets. The euro-denominated government security market is very liquid, cover the most important points on the yield curve and is largely free of credit risk.

Structure and support of efficient markets

Markets for government securities are often said to be a prerequisite for building up a well-functioning domestic financial market. Government securities may also play a part in well-developed markets, e.g. as an

YIELD SPREADS BETWEEN GOVERNMENT AND MORTGAGE-CREDIT BONDS, 2007

Chart III.1.3



Note: The mortgage-credit curve estimated on the basis of uncallable bonds and yield spreads adjusted for differences in maturities. 10-days moving average.

underlying asset for other types of financial instruments. In 2002 Australia decided to maintain a market for government bonds with reference to its futures market.¹ Government bonds are the underlying assets in interest-rate futures contracts and therefore necessary for maintaining a futures market.

In Europe, there is a large and liquid market for futures on German government bonds that plays a considerable part in respect of pricing in the European fixed-income markets. This market is dependent on continued issuance of German government bonds.

GOVERNMENT SECURITIES AS INVESTMENT OBJECTS

III.2

Traditionally, government bonds have made up a large part of the portfolios of the Danish pension funds, e.g. due to regulatory conditions. The pension funds have obligations with long duration. The interest-rate risk can be hedged by investments in government securities with long duration.

In recent years, the pension funds have extended their investment universe to comprise a wider range of instruments. Especially the derivatives market has attracted more investors since the end of the

¹ See www.debtreview.treasury.gov.au.

1990s. Today, the pension funds undertake a large part of their risk management via the Danish and European interest-rate swap markets.

Danish government securities are still an investment object in the pension funds' asset portfolios. The interest-rate swap market cannot be used to cover the pension funds' need for placements in assets as such.¹ The overall compilation from the pension funds shows that Danish government securities make up a relatively large part of the total bond portfolio. Approximately 15 per cent of the bond portfolio was placed in Danish government securities in 2006.²

According to several pension funds, the interest for Danish government securities reflects that they from time to time yield returns at the same level or slightly higher than other European highly rated government securities. For a number of years, the pension funds have restructured their portfolios on the basis of fluctuations in the yield spread. High tradeability in the Danish government-securities market underpins the opportunity for extensive portfolio restructuring. Since the pension funds' obligations are denominated in kroner, there is thus an incentive to invest in Danish securities (home bias).

¹ As opposed to bonds, no placement takes place in connection with the use of interest-rate swaps.

² *Life insurance companies. Statistical material 2006*, Danish Financial Supervisory Authority.