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Financial Markets Department
16.4.1996

A Cross-Country Study of Market-Based Housing Finance

SUOMEN PANKIN KESKUSTELUALOITTEITA • FINLANDS BANKS DISKUSSIONUNDERLAG

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Abstract[1]

The possibilities to improve households' eligibility for long-term housing loans at fixed interest rates has been a current topic of public discussion. Yet, credit institutions have difficulties in granting such loans, unless they themselves can acquire fixed-rate funding. In many cases, the only feasible way for them to raise such funding is to issue bonds. In a number of countries, such arrangements are already in use.

In this paper we present a cross-country study of housing finance by mortgage-backed bonds. The paper describes and analyses mortgage credit markets in Denmark, Sweden and the United States of America with respect to the institutional structure, loans and bonds characteristics, legal framework and the security underlying the system. We have found that all three markets differ and that these differences originate from the respective countries' national characteristics and financial histories. In Sweden and the United States in particular, the public sector has been involved in developing the system.

Generally, long-term credit is offered in all three countries through relatively well-functioning, efficient markets. However, certain problems are common to all. First, the number of outstanding bond series is relatively large. Second, in many housing loans, the borrower has the option to repay the debt prematurely. In these cases, the credit institution may have to avoid maturity matching problems by issuing bonds with unknown maturity.

We briefly review the history and present circumstances of Finnish bond issuing credit institutions to elucidate why such institutions play a marginal role. Long ago, bond-issuing mortgage institutions were an essential part of the Finnish financial market, but legislative obstacles to their operations almost killed the industry after World War II. The tax system favoured ordinary banks, and bond emissions were restricted by government regulations. Now, these legal obstacles have been abolished. In the light of both foreign and past domestic experience, such institutions have a market niche. Finally, we discuss some of the problems related to setting up a bond-financed mortgage credit market in Finland.

Key words: Housing loans, bonds, mortgage banks

[1] We would like to thank Markku Malkamäki and Tuomas Saarenheimo for their insightful comments.

Tiivistelmä

Suomessa on viime aikoina keskusteltu keinoista parantaa kotitalouksien mahdollisuuksia saada pitkäaikaisia, kiinteäkorkoisia asuntoluottoja. Luottolaitosten on vaikea tarjota tällaisia lainoja, elleivät ne itse voi hankkia pitkäaikaista, kiinteäkorkoista rahoitusta. Useissa tapauksissa tämä on mahdollista vain joukkovelkakirjaemissioin. Monissa maissa onkin joukkovelkakirjoja emittoivia luottolaitoksia, jotka myöntävät pitkäaikaisia asuntoluottoja kiinteäkorkoisina.

Keskustelualoitteessa luodaan katsaus joukkovelkakirjaemissioihin pohjautuviin asuntorahoitusjärjestelmiin kolmessa maassa, Tanskassa, Ruotsissa ja Yhdysvalloissa. Tanskassa ja Ruotsissa kiinnitysluottolaitokset sekä myöntävät luottoja että laskevat liikkeeseen arvopapereita. Yhdysvalloissa tavalliset pankit voivat myydä asuntoluottojen velkomisoikeuksia joukkovelkakirjarahoitteisille erikoisrahoituslaitoksille. Etenkin Ruotsissa ja Yhdysvalloissa julkinen sektori on aktiivisesti osallistunut järjestelmän kehittämiseen.

Näiden kolmen maan järjestelmät tuntuvat pääsääntöisesti toimivan melko hyvin, mutta niissä on myös samantyyppisiä ongelmia. Joukkovelkakirjaemissioiden suuri määrä ja pieni koko vähentävät lainojen likviditeettiä jälkimarkkinoilla. Toisaalta asuntovelalliselle jäävä oikeus maksaa laina takaisin ennen eräpäivää aiheuttaa ongelmia luottolaitokselle erityisesti kiinteäkorkoisessa luotoituksessa. Luottolaitos voi tällaisessa tapauksessa suojautua korkoriskiltä järjestämällä varainhankintaa joukkovelkakirjoilla, joiden maturiteetti riippuu velallisten takaisinmaksuista.

Keskustelualoitteessa tarkastellaan myös Suomen joukkovelkakirjarahoitteisten luottolaitosten historiaa ja nykypäivää. Pohditaan, miksi joukkovelkakirjoihin pohjautuvilla asuntorahoitusjärjestelmillä on niin vähäinen merkitys Suomessa. Joukkovelkakirjoja emittoineet ja kiinnelainoja myöntäneet hypoteekkipankithan olivat olennainen osa suomalaista rahoitussektoria 1900-luvun alussa. Niiden merkitys kuitenkin väheni jyrkästi, koska julkisen vallan säädökset vaikeuttivat niiden toimintaa 1930-luvulta 1980-luvulle saakka. Verojärjestelmä suosi tavallisia pankkeja, ja joukkovelkakirjojen liikkeeseenlaskua rajoitettiin. Nykyään näitä julkisen vallan säädösten aiheuttamia esteitä ei enää ole. Ulkomaisten kokemusten mukaan tällaisille rahoituksenvälityspalveluille olisi kysyntää nykyäänkin. Niinpä viimeisessä luvussa käsitellään tällaisten laitosten perustamiseen ja toimintaedellytyksiin liittyviä kysymyksiä.

Avainsanat: Asuntolainat, joukkovelkakirjat, hypoteekkipankit

Contents

1 Introduction

The last recession has caused an investment slump in the Finnish housing market. Now its persistent effects are threatening the stable functioning of the market for real property. Consequently, construction and renovation activity is deeply depressed, contributing to record unemployment in this country. One feature that contributes to the present situation is the limited development of long-term credit markets in Finland. The barriers to obtaining credit with a maturity longer than 20 years, broad interest rate spreads and juicy commission levels all work to restrain opportunities for obtaining the necessary funding for investing in housing. Quite predictably, it helps constrain demand for real property and depress construction sector.

As in virtually every industrialised country, home buying is typically the largest investment decision made by a private Finnish citizen during his lifetime. Housing purchases have traditionally been financed as bank loans and large shares of own-financing, limiting the possibilities of housing purchase.

The main purpose of efficient financial markets is to reallocate financial resources from lenders to borrowers as efficiently, cheaply and safely as possible. Consequently, financial markets should provide the necessary capital for housing as efficiently and cheaply as possible given the risk and debt capacity of the borrower.

National characteristics such as legislation, and differences in economic history have influenced the structure of the emerging national financial markets. This directly affects the organisation and functioning of national financial markets.

The aim of this paper is to explore alternative avenues of structuring the financial system such that long term credit for real property purchase can be obtained cheaply and safely. In section 2, we present a cross-country study, giving a comprehensive description and analysis of the mortgage market for housing finance in Denmark, Sweden and the United States. The purpose is to describe and analyse how these countries have structured their markets for housing finance to provide long-term credit efficiently. In section 3, existing Finnish arrangements of housing finance are described and analysed. In section 4, several aspects of mortgage credit finance in the countries studied are brought up and discussed with respect to establishing a bond-financed mortgage credit market in Finland.

2 Country studies of mortgage credit systems

National mortgage credit systems often differ, reflecting the national history of financial development and characteristics. National tax legislation is also a significant factor influencing the structure and setting of the market for real property finance. This section aims to give a comprehensive description of mortgage credit financing of real property purchases in the following countries; Denmark, Sweden and the US. Its purpose is to describe the structure of each country's mortgage credit system with special emphasis on the legal framework behind the system as well as how the market functions and the security covering the system. By mortgage credit we understand collerateralised loans financed in the bond market. We seek to highlight common characteristics as well as relative advantages or drawbacks to the systems described.

2.1 Denmark

Denmark has an almost two-hundred-year-old tradition of financing real property purchases through mortgage credit. Today, the Danish mortgage market (considering the size of the Danish economy) is one of the most competitive and best-functioning of its kind in the world. Long experience of mortgage lending based on bonds and strict regulation by the authorities have developed the Danish mortgage market into a market that provides low-cost credit efficiently to home owners.

2.1.1 History

Since the founding of the first Danish mortgage bank in 1797, the Danish mortgage market has expanded considerably (Realkreditrådet 1994). The first Mortgage Credit Act was passed in 1850, and mortgage credit institutions have since held a leading position in the financing of real property in Denmark. The intention of the Act was to create an institutional system that could contribute the national capital market with efficient reallocation of credit from lenders (creditors) to borrowers (debtors). The first Mortgage Credit Act aimed at securing the solidity and stability of the institutions and the credibility of the bonds, which was believed to be an essential condition for a well-functioning capital market. Basically, these principles are still the foundation of the most recent Mortgage Credit Act of 1989.

Before 1970, 24 mortgage credit institutions were granted the right to provide mortgage credit to finance real property purchase with the property as mortgage. These institutions were divided into three categories; (1) first-mortgage credit associations, (2) second-mortgage credit associations and (3) housing mortgage funds. As a result of the Mortgage Credit Reform of 1970, these institutions were

transformed into four unity mortgage institutions and three special mortgage credit institutions.[2] The Mortgage Credit Reform of 1970 reformed the mortgage credit system in Denmark in the following ways:

- A unity mortgage credit system was established.
- The Needs Criterion was introduced, granting the Minister of Housing the right to approve new institutions based on an evaluation of the needs for new institutions.
- Classification of loans according to the property category and the purpose of the loan.

The Reform generally aimed at restraining the number of institutions, and further imposed restrictions on the lending procedure to dampen economic activity. These additional changes mainly involved shorting of the maximum maturity of loans and setting loan ceilings and lending limits.[3]

The role of mortgage credit in the Danish financial system has resulted in mortgage credit regulations on several occasions in the 1970s and 1980s. Such amendments changes were often motivated by the government's economic policy. Nevertheless, the Mortgage Credit Act of 1989 implemented EC legislation requirements into the law, introducing supplementary mortgage loans and allowing for extension of maturity.

2.1.2 Institutions

Prior to the 1970 reform, the Danish mortgage credit market was characterised by a large diversity of small, specialised mortgage institutions. The reform, however, resulted in a series of mergers of these smaller institutions and the creation of a few large unity mortgage credit institutions. The organised mortgage credit market in Denmark today mainly consists of 8 mortgage credit institutions, of which only six provide credit for housing finance. These institutions are:

Nykredit A/S
Realkredit Danmark A/S
Totalkredit Realkreditfond
Danske Kredit A/S
Unikredit A/S
Landsbankernes Reallånefond

Except for Danske Kredit A/S and Unikredit A/S, all these institutions are self-governing. Danske Kredit A/S and Unikredit A/S are owned by Den Danske Bank A/S and Unibank A/S, respectively.

The Mortgage Act of 1989 required all new mortgage institutions to establish themselves as limited liability companies (A/S), and further made it possible for old

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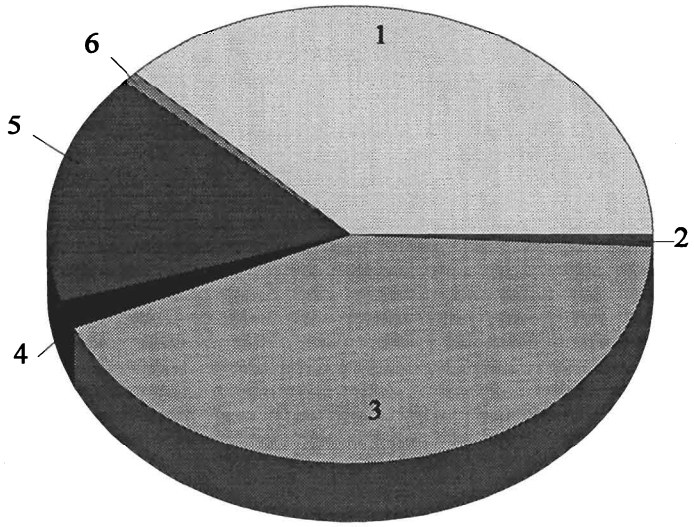
[2] This is in contrast to specialised mortgage credit institutions which only finance property in special sectors. Unity mortgage credit institutions are allowed to provide loans for all purposes and for all categories of property.

[3] Loan ceiling is defined as the maximum percentage of the total value of a building which may be mortgaged. Lending limit is defined as the maximum percentage of the costs for a given purpose that may be mortgaged (Danske Securities, 1992).

institutions to be converted into limited liability companies. All mortgage credit institutions in Denmark must be approved by the Minister of Economic Affairs who was granted the mortgage credit area as resort in the latest amendment to the Mortgage Credit Act (1992).

Figure 2.1. **Market shares of Danish mortgage credit institutions, ultimo 1994**



1 Realkredit Danmark 37.3 %
2 Unitkredit 0.6 %
3 Nykredit 42.2 %
4 Total kredit 1.8 %
5 BRFkredit 16.2 %
6 Danske kredit 0.8 %
Source: Realkreditrådet.

Figure 2.1 shows market shares of Danish mortgage institutions. Nykredit and Realkredit Danmark currently dominate the Danish mortgage market. However, Unikredit and Danske Kredit were established in 1994, so it is still too early to determine their eventual shares of the market.

By the end of 1994, the six mortgage credit institutions in Denmark had an outstanding stock of mortgage bonds of DKK 846bn corresponding to a share of approximately 54 per cent of the total bond stock. Nevertheless, the entry of some of the large Danish commercial banks into the mortgage credit market have resulted in decreased market shares for the old mortgage institutions, with Realkredit Danmark A/S, in particular, losing market share in recent years. The total outstanding stock of bonds on the Copenhagen Stock Exchange at the end of 1994 was DKK 1543bn.

The methods applied by the mortgage credit institutions today are basically the same as those introduced in the first Mortgage Credit Act of 1850. Mortgage credit institutions act as intermediaries between borrower and lender. This gives mortgage credit institutions the right to provide mortgage loans backed by bonds offered for public subscription.

Although the stock of mortgage bonds listed on the Copenhagen Stock Exchange is relatively large compared to the size of the economy, a daily DKK 8bn

turnover mortgage bonds of makes them highly liquid papers. Among the Danish mortgage credit institutions, only few are rated by Standard & Poor and Moody's. Those institutions with credit ratings are listed in Table 2.1.

Table 2.1. **Credit rating**

	Standard & Poor	Moody's
Nykredit A/S	A2	P3
BRFkredit A/S	Not rated	P3

Source: Danske Securities (1992).

In addition to the normal mortgage bonds issued by all the mortgage institutions, the CSE and some institutions offer various derivative products based on mortgage bonds. Their purpose is to provide opportunities for hedging Danish mortgage bonds. Forward contracts have also existed for long time. Since 1988, futures and options contracts have been offered officially on the CSE with mortgage bonds as underlying assets. This has increased the interest of investors in Danish mortgage bonds.

2.1.3 Mortgage credit in Denmark

In practice, mortgage credit in Denmark is provided in the following way. A person who wants to purchase property in Denmark requests a mortgage loan from any of the organised mortgage institutions. Mortgage credit institutions are then obliged to evaluate the property according to the principle that the valuation should not exceed the cash market value of the property under normal conditions.[4] In principle loans are granted as liquid mortgage bonds. In practice, however, the mortgage institution pays the borrower the loan sum in cash and sells the mortgage bonds on the behalf of the borrower on the CSE at actual price.

All lending by mortgage credit institutions is subject to legislation which places requirements on the security offered, its lifetime and the repayment profile. Mortgage institutions are allowed to grant loans up to 80 per cent of the valuation basis of new owner-occupied property for all-year habitation to finance its purchase or construction, while the rest must be financed elsewhere.[5] The maximum maturity of these loans is 30 years. Private rental housing, on the other hand, is also subject to a lending limit of 80 per cent. In contrast to owner-occupied homes, these loans have maturities of up to 50 years (Realkreditrådet 1994).

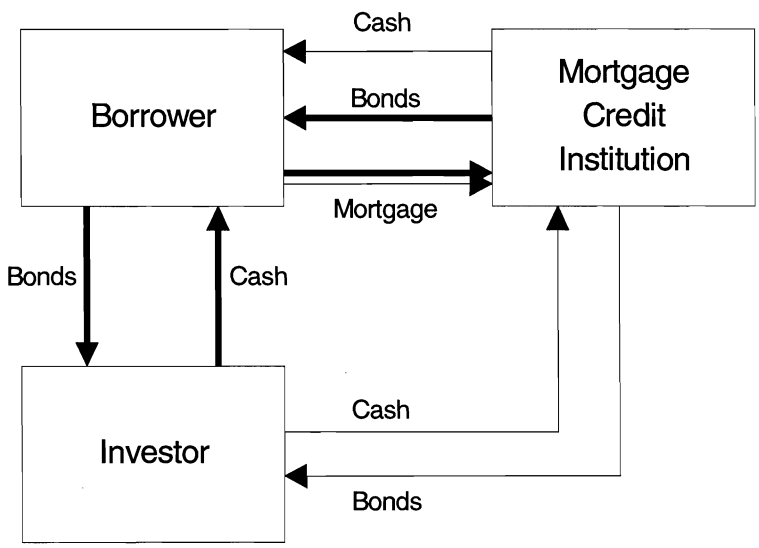
The mortgage credit institutions raise funds for lending by issuing mortgage bonds at the same time as they grant a loan. These bonds are listed on the CSE. Each time a mortgage institution grants a loan, it issues a number of bonds corresponding to the loan with the same repayment profile and lifetime, according to the principle

[4] Price fluctuations should be taken into account by the evaluators when evaluating property during booms and recessions.

[5] The last 20 per cent is typically financed by a bank loan if the borrower does not have these funds already.

of balance.[6] These bonds are sold on the market by the issuing mortgage institution on behalf of the borrower, and the funds obtained are given to the borrower.

Figure 2.2. **The mortgage credit system in Denmark**



Note: Bold lines represent the flows in principle; thin lines represent the flows in practice.
Source: Nordic Mortgage Council.

In principle (bold lines), a borrower granted a mortgage loan receives the loan in bonds issued by the mortgage credit institution. The borrower sells the bonds on the bond market to an investor and receives cash. In practice (thin lines), however, a borrower granted a mortgage loan receives a cash amount from the mortgage credit institution corresponding to the value of the bonds in the bond market. The mortgage credit institution sells the bonds to the investor and obtains cash to pay the borrower. All transactions occure simultaneously.

2.1.4 Loan types

Loans can be granted either as cash loans or as bond loans. A cash loan means that the borrower receives a principal exactly matching the loan amount in cash to which the borrower is entitled on the basis of the value of property, no matter the market value of the underlying bonds. Alternatively, the borrower can be granted a bond loan with a nominal value corresponding to the principal, but where the market value (real value) can vary. The main difference between these two loan types is that, for cash loans, the interest on the debt is unknown until the bonds are sold because the amount of bonds needed is unknown, whereas for bond loans, the cash amount that the borrower receives is unknown until the bonds are sold because the value of the bonds vary, but the interest payments on the debt is fixed.

Mortgage institutions typically offer the borrower the choice of three types of loans; **fixed-interest loans**, **variable-interest loans** and **index-linked loans**. Fixed-

[6] The principle of balance is described in section 3.1.5.

interest loans are most common. They are offered with an amortisation schedule following either an annuity, bullet or serial principle. Payments vary between two and four annual payments, and can be either callable or non-callable. Variable-interest loans (floating-rate loans) are either bullet or annuity loans, for which the coupon for each interest payment is calculated by the CSE as the average yield on a daily basis during three months, three months and 20 days before the next interest-payment date. Variable-interest loans are subject to four interest payments annually. Finally, index-linked loans, only issued since 1982, are created by linking the principal to a debtor index and the outstanding debt to a creditor index.[7] Amortisation of index-linked loans is based on the serial principle and are subject to two annual payments, except the very first instalment payment. Index-linked loans are typically non-callable.

Mortgage institutions offer three types of amortisation. The most common type, annuity loans are structured as follows: The borrower pays an instalment that remains the same during the lifetime of the loan, implying that the interest share of the instalment is continuously declining while the instalment of the principal is increasing. A second type, serial loans, involve repayment of the principal in equal instalments during the lifetime of the loan, but interest payment gradually falls, reducing the service payment. Finally, there are bullet loans, where only the interest is paid during the entire lifetime of the loan, and the loan is entirely redeemed at maturity.

2.1.5 Bonds

Mortgage institutions normally sell bonds on behalf of the borrower in the primary market on the CSE. All mortgage bonds issued by Danish mortgage institutions are listed on the CSE's secondary market. The number of bonds series in circulation on CSE is relatively large compared to the value of the outstanding bond stock. This is mainly due to the large number of mortgage institutions and the previous tendency of these institutions to issue a number of identical bond series. Many older series are relatively small, as their liquidity is rather low. This creates problems for the stock exchange. Nevertheless, the reduction of the number of institutions after the Mortgage Credit Reform of 1970 and loan conversion is beginning to have an effect on the market. This development, however, is threatened by the introduction of 'mix loans', which demand the issuing of two bond series for financing a loan (Danske Securities 1994).

Mortgage bonds are normally issued as freely negotiable bearer instruments that are quoted daily. Mortgage institutions issue bonds of the following three types:

- fixed-rate bonds
- index-linked bonds
- variable-rate bonds.[8]

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[7] Index-linked loans in Denmark are based on the net retail price index and several debtor indices based on net retail price index and average hourly earnings of wage earners in manufacturing and construction.

[8] For a more details on the Danish mortgage bonds, see Realkreditrådet (1994), Danske Securities (1992) or Realkredit Danmark (1994A).

These correspond to the underlying loans granted by the issuing mortgage institution. Fixed-rate bonds are the most common category of bonds on the CSE, they are defined as bonds bearing a fixed nominal rate of interest and an amortisation following either annuity, serial or bullet principle. Repayment normally varies between two and four payments annually depending on the principle of amortisation. Fixed-rate bonds are issued with maturities of 10, 20 and 30 years, depending on the underlying mortgage loan. They can be callable or non-callable. Callable bonds can be redeemed by the borrower any time at par and they currently dominate the market at the CSE, representing over 90 per cent of the total outstanding mortgage bond stock.

Index-linked bonds are a relatively new way of issuing debt on the CSE. Since their introduction in 1982 index-linked bonds have gained popularity. Today they are the second largest bond instrument. They have two annual payments with a repayment schedule before indexation following either annuity, serial or bullet principle. A special feature of index-linked bonds is that there is no instalment on the first payment date. Indexation is done by linking the principal to a debtor index and the outstanding debt to a creditor index. The creditor index is based on the net retail price index recorded by Denmarks Statistics, while the debtor indices normally are based on net retail prices and hourly earnings in manufacturing and construction.[9] Finally, the introduction of a real interest rate tax in 1984 boosted the popularity of index-linked bonds among pension and life-insurance funds because index-linked bonds were tax exempt. This created a strong demand for them and influenced the bond price.

Variable-rate bonds are characterized by a floating interest rate, ie. the coupon for an interest-payment date is calculated as the daily average yield the three months ending, three months and 20 days before interest payment due date.

Mortgage bonds based on an annuity or serial principle are subject to a drawing at each interest-payment, after which some bonds will be redeemed at par. The borrowers' repayments are pooled and bonds are drawn by lottery. Mortgage bonds can be either **callable** or **non-callable** depending on the status of the underlying loan. Callable mortgage bonds can be drawn extraordinarily, when the borrower is calling to redeem the underlying loan at par prematurely. Thus in addition to ordinary drawings, extraordinary drawings can take place depending on the borrower. When a bond has been drawn the owner is informed and the bond can no longer be traded on the market. Premature redemption of a bond is dependent on several factors[10]:

- "A downward call" is used when the interest rate has declined and the borrower repays a high-interest loan at par by obtaining a new loan at the new, lower interest rate level.
- "An upward call" is used when the interest rate has increased and the borrower repays low-interest loans by selling bonds with a higher coupon rate, thereby reducing the remaining cash debt and bond debt.[11]

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[9] For further details on the construction of creditor and debtor indices, see Danske Securities (1992).

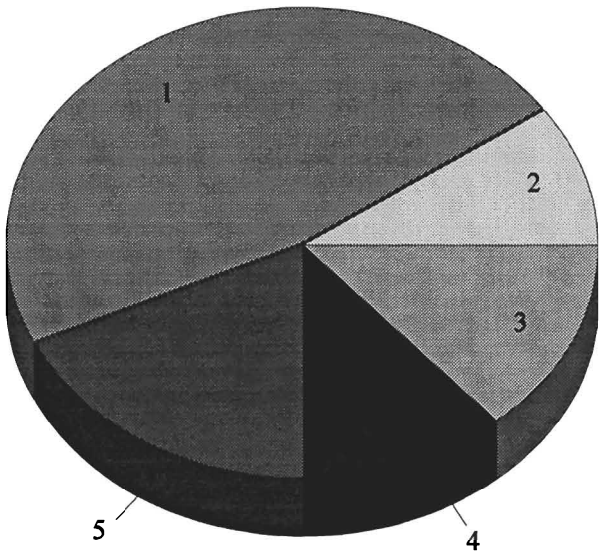
[10] Economic reasons for premature redemption are described in detail in Nykredit (1995) and Danske Securities (1992).

[11] Because bonds are sold at a value above par, fewer bonds are needed to finance loan conversion.

- "A horizontal call" is used when a cash loan is refinanced by a another cash loan having the same characteristics. The result is that the remaining cash debt falls and the cash rate increases.
- "Refinancing and extension" is used when the borrower wishes to change the characteristics of the loan, eg the maturity, principle, amortisation or type of loan.

When purchasing a callable mortgage bond investors are faced with the risk that the borrower will redeem the bond prematurely at face value using any of the above types of redemption. Redemption is not always in the interest of the investor, hence the investor demands a risk premium in compensation for the possible loss he might face from premature repayment.

Figure 2.3. **Bonds in circulation on the CSE by holder, ultimo 1994**



1 Financial sector 47,2 %
2 Non-financial sector 9,8 %
3 Foreign 13,6 %
4 Household sector 11,3 %
5 Public sector 18,1 %

Source: Denmarks Statistics.
Note: Nominal value.

Figure 2.3 shows that the domestic financial sector is the main holder of the bond stock in circulation. The Danish financial sector held almost half of the total bond stock at the end of 1994, whereas the domestic private sector - surprisingly - only held 11 per cent. Even foreign investors hold a greater share of Danish bonds than the household sector. However, the above figure also includes government benchmark bonds, which are attractive particularly to foreign governmental and institutional investors.

Mortgage bonds issued by Danish mortgage institutions are not backed by any government guarantee. Hence, because the government is often considered more credible than private individuals or companies, these will have to pay a risk premium for the additional risk of default of mortgage bonds compared to government bonds.

2.1.6 The legal framework

Mortgage activities in Denmark are subject to the Danish Mortgage Credit Act. The Act contains rules governing the activities of mortgage institutions. Mortgage activities are defined as the granting of loans against a registered mortgage on real property where the provision of capital takes place through the issuing of bonds.

The mortgage system is founded upon the complete registration of all land and property in Denmark. All land is registered by the Danish Ministry of Housing and Building, and an identifying Title Number is attached to each piece of land. 83 registration offices, corresponding to the number of judiciary districts, register all property in Denmark, including all legal transactions concerning the property. Thus, registration is a constitutive act which completes the mortgage process. The Danish system ensures that ownership and encumbrances on each individual property are easily detected, and that such information is publicly available. The registration of land makes valuation of property possible. This is a necessary requisite for efficient functioning of the loan granting system of mortgage credit institutions.

Mortgage Credit Institutions are obliged to follow the rules given by the Ministry of Economic Affairs, also approves these institutions. However, the implementation of the *Single European Market* into Danish legislation has also affected mortgage credit law. First, new mortgage credit institutions were allowed to set up as public limited companies and mortgage institutions organized as associations were allowed to convert themselves public limited companies. Second, the definition of an institution's capital base and the risk weighting of its assets were changed so that a mortgage institution's capital base must equal at least 8 per cent of its risk-weighted assets.

All Danish mortgage credit institutions are subject to supervision of the Danish Financial Supervision Authority, which in turn, supervises the evaluation of property, maintains the principle of balance, and audits institutions to check whether they have conducted business according to the regulations laid out in the Mortgage Credit Act.

During the 1960s, 1970s and early 1980s Danish tax law strongly supported the mortgage credit system. Borrowers could deduct interest expenses from their income tax at their marginal tax rate. This advantage was significantly reduced in 1987. At present, the maximum tax deduction is 50% of all interest expenses, which is still high. The tax deductibility of interest expenses can be regarded as an indirect government subsidy to property owners in Denmark.

2.1.7 Security in the system

The Danish mortgage credit system is designed with the primary objective of security and credibility of the system and the bonds, without resort to government guarantees. Basically, all mortgage loans are backed by mortgages on the real property on which they are obtained. Mortgage loans cannot be obtained without the necessary collateral in real property, the objective valuation of this property prior to mortgaging, and

overcollateralisation which is the foundation of the mortgage system.[12] It is important here to point out that mortgage loans are attached to buildings, not persons. Hence, debt is typically taken over by the buyer of a given property with a change in ownership.

Furthermore, borrowers are subject to the rules of joint and several liabilities within each bond series, ie a collective liability between borrowers. In practice, this has been applied for all bond series within each mortgage credit institution since 1981. This implies that the liabilities of a single insolvent bond series might be transferred to other solvent bond series within a mortgage credit institution if the mortgage credit institution cannot meet its obligations. Thus borrower liability is not only extended toward the mortgage credit institution, but also to the bond series. However, joint and several liabilities may only be exercised for the benefit of the investors (Danske Securities 1992). Moreover, joint and several liabilities of the borrower only extend to the property mortgaged so the borrower cannot face a personal bankruptcy. To cover joint and several liabilities, all mortgage credit institutions have established reserve funds according to the law, into which all borrowers are obliged to contribute. The legislation governing the mortgage credit market in Denmark therefore seeks to protect investors by focusing on the following three areas:

- Regulation concerning borrowing limits, maturities and repayment profiles
- The principle of balance, which requires balance between payment flows for each loan and the underlying bonds issued in connection with the granting of the loan.
- Preferential treatment of investors in case of bankruptcy, implying that joint and several liability only can be exercised for the benefit of bondholders.

Until 1989, the principle of balance was part of the Mortgage Credit Act. However, harmonisation to EU rules has resulted in the abolition of this rule from the legislation. Danish tax legislation still favours the symmetrical fiscal handling of mortgage loans according to the strict principle of balance. It also requires balance between redemption commitments for the loan and the underlying bonds. The result is that mortgage credit institutions are not subject to interest rate losses stemming from interest rate changes.[13]

2.2 Sweden

In Sweden, mortgage credit has also played a significant role in the financing of housing. The tradition of mortgage credit in Sweden dates back to the last century with the establishment of the first mortgage credit institution. The Swedish mortgage system has been traditionally characterized by centralization and a surprisingly strong degree of control by the government given the absence of specific legislation.

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[12] Valuation of property is done by a special staff of evaluators appointed by mortgage credit institutions. These evaluators are required to possess special knowledge of the local property market in which they are practising.

[13] For a more detailed description of the *principle of balance*, see Nordic Mortgage Council (1993), Nykredit (1995) or Realkredit Danmark (1994A).

2.2.1 History

Sweden's first mortgage credit institution was established in 1836. From then until 1861, nine additional mortgage institutions were established. In 1861, Sveriges Allmänna Hypoteksbank was created. Its purpose was to create a common lending institution for the ten existing mortgage institutions (Nordic Mortgage Council 1993). Mortgage institutions serving towns in Sweden with finance were formed in the 1860s. This was the foundation of a centralized mortgage institution network matching the system already existing. The centralization focused on a common lending institution, primarily directed toward the Swedish agricultural sector. With the establishment of Sveriges Stadshypotekskassa in 1909 by the Swedish government, housing finance started to broaden its focus. The entire housing finance system was reorganized into a central system with twenty mortgage institutions served by Sveriges Stadshypotekskassa.

The reform of the Swedish Mortgage Credit Act in 1960 resulted in the establishment of private mortgage credit institutions in the legal form of public limited companies (AB).[14] The new institutions were essentially subsidiaries of Swedish commercial banks entering the mortgage market to expand their business. The reform brought increased competition to the Swedish mortgage system.

2.2.2 Institutions

The Swedish mortgage credit market was quite centralised until the reform in 1960. Stadshypotek, owned by the Swedish government, acted as an umbrella organisation under which 20 local mortgage credit institutions operated in larger cities and towns throughout Sweden (Nordic Mortgage council 1993). It was the central organisation responsible for raising funds granted as mortgage credit for housing finance by the local subsidiaries.

These institutions still provide mortgage credit for housing finance in cities and towns in Sweden. Mortgage credit for financing the Swedish agricultural sector was mainly provided by Sveriges Allmänna Hypoteksbank, which in principle was organised in the same way as Stadshypotek. However, in 1994, both Sveriges Allmänna Hypoteksbank and Stadshypotek were transformed into public limited companies, with most shares becoming tradable on the Stockholm Stock Exchange (SSE).

The reform of 1960 granted the universal right to establish mortgage credit institutions in Sweden.

This right was mainly exercised by domestic commercial banks, allowing them to expand into a part of the financial market that had traditionally been a public monopoly. At present, seven mortgage credit institutions provide mortgage credit for housing financing in Sweden:[15]

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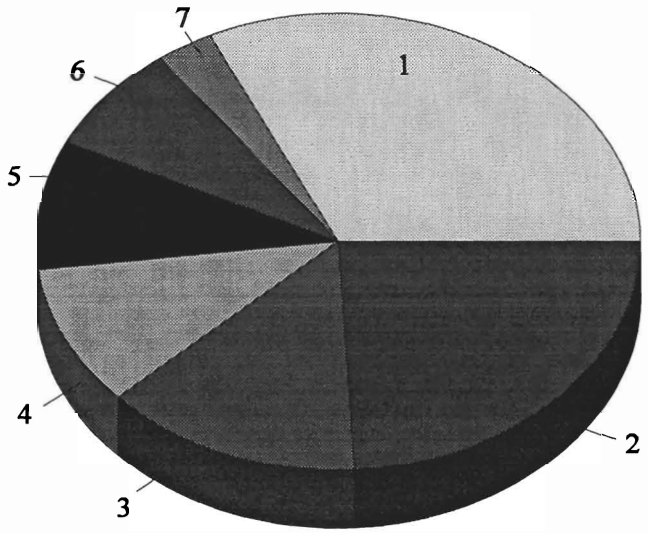
[14] Mortgage credit institutions established in the last century were all created as associations.

[15] Sveriges Allmännä Hypoteksbank is not mentioned here because it provides mortgage credit to the agricultural sector, some of that credit is for productive investments.

Stadshypotek AB
Spintab AB
Statens Bostadsaktiebolag AB (SBAB)
Handelsbanken Hypotek AB
Nordbanken Hypotek/Kredit AB
S-E-banken BoLån AB
Föreningsbanken Kredit AB

Of the above mentioned institutions, Stadshypotek AB is clearly the largest measured in terms of market share at the end of 1994. Figure 2.4, shows that the Swedish mortgage credit market is clearly highly concentrated. The three largest institutions collectively held a market share of 70 per cent in 1994 (Stadshypotek AB 1994). The degree of concentration in the Swedish mortgage credit market has been increasing since the beginning of the 1990s, and this development is expected to continue as Stadshypotek has been transformed into a public limited company with no geographical limitations within Sweden.

Figure 2.4. **Market shares of Swedish mortgage credit institutions, ultimo 1994**



1 Statshypotek 32 %
2 Spintap 24 %
3 SBAB 14 %
4 Handelsbanken Hypotek 10 %
5 Nodbanken Hypotek / kredit 9 %
6 S-B-Banken BoLån 8 %
7 Föreningsbanken Kredit 3 %
Source: Stadshypotek AB (1994).

Most of the credit institutions granted the right to provide mortgage credit are subsidiaries of a larger financial corporation, so developments in Sweden clearly point toward further mergers between the remaining mortgage credit institutions and other financial institutions.

Swedish mortgage credit activities are regulated by the Law on Credit Companies, which also regulates the activities of commercial banks and other companies providing credit. The law was incorporated into the Swedish legislation

together with the Swedish parliaments ratification of the EEA agreement (Nordic Mortgage Council 1993). However, both Sveriges Allmänna Hypoteksbank and Stadshypotek are regulated by two additional laws enacted in 1992, containing specific legislation on the transformation of both state-owned-institutions into public limited companies.[16]

Interestingly, Sweden defines no specific requirements for mortgage credit institutions.[17] In practice, of course, financial institutions cannot be established without a special license obtained from the government. These licences are granted by the Swedish Financial Supervision Authority (FSA) (Nordic Mortgage Council 1993). Mortgage credit institutions are subject to supervision by the FSA, which is under the Ministry of Finance. The FSA also has the right to confiscate the business license of any credit institution that is not operating according to the law (Nordic Mortgage Council 1993). Lately, the legislation concerning credit institutions has been harmonized to fulfill current EU criteria, under which credit institutions in Sweden are obliged to fulfill the minimum capital requirement of 8 per cent.

Bonds issued by mortgage credit institutions in Sweden are not "name protected", so in principle, these bonds are like all other bonds offered on the Stockholm Stock Exchange.[18] Several of the Swedish mortgage institutions are rated by Standard & Poor and Moody's with respect to outstanding bond series.[19]

2.2.3 Mortgage credit in Sweden

In Sweden, construction and purchase of homes is primarily financed by credit institutions specialized in this area. Home financing in Sweden is done using either Stadshypotek or one of the private credit institutions (the result of the credit reform of 1960). In financing by Stadshypotek AB, the borrower requests a loan from one of the 20 local institutions of the organisation. The local subsidiary evaluates the given property which the borrower wishes to purchase and use as mortgage for the loan. The evaluation of the mortgage is done in accordance with the rules of the particular credit institution, and the maximum loan limit is 70 or 85 per cent of the valuation depending on the institution.

Loans granted by Swedish credit institutions are given as nominal cash loans, and their maturity is typically 20 years.[20] Nevertheless, since the principle of balance determines the conditions between borrowing and lending, loans typically have a fixed interest rate for a shorter determined period, often five years. The reason for

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[16] Legislation on Sveriges Allmänna Hypoteksbank and Stadshypotek is contained in laws no. 700 and 701.

[17] Mortgage credit institutions are subject to the same requirements as all other credit institutions in Sweden.

[18] Mortgage bonds are "name protected" if they have a preferential right to use the name mortgage bonds.

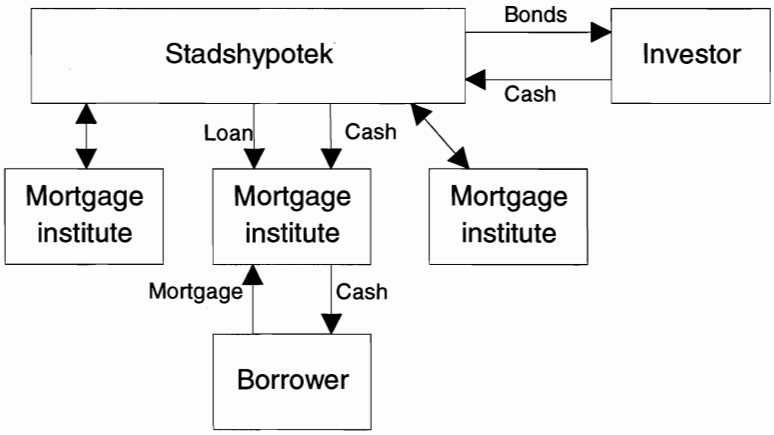
[19] This rating, however, changes frequently. The current rating can be obtained by contacting the respective institutions.

[20] Cash loan is here defined as in section 3.1.4.

this short period of fixed interest rate is that the underlying bonds have a maturity of typically five years. Hence, in order to fulfill the principle of balance, loans can only have fixed interest for the maturity of the underlying bonds. In recent years, loans with variable interest rates have also gained popularity. This is probably only a temporary phenomenon caused by the high and volatile interest rates.

As an alternative to Stadshypotek AB, individuals in Sweden can finance their homes by applying for a mortgage credit from one of the private (often bank-owned) mortgage institutions in Sweden. In this way individuals normally apply for the loan at their local bank. The branch office sends the application to the mortgage credit department which grants the loan and issues the bonds. This system somewhat resembles the system in Denmark, except that the bank branch offices are the ones involved in the direct contact with customers.[21]

Figure 2.5. **The mortgage credit system in Sweden**



Source: Nordic Mortgage Council (1993).

Amortization of housing loans is not regulated by any specific law, though loans with the normal amortization principles are often offered. Loans were previously always granted as annuity loans. Recently, however, Swedish credit institutions have begun to offer loans following the serial and bullet principles.[22]

The government previously contributed to the construction of new residences by subsidizing interest payments. Today, this system of subsidizing is being phased out over a period of ten years (Nordic Mortgage Council 1993). Instead, Swedish institutions can now grant additional loans up to 30 per cent of the lending limit for a new or renovated residence. These loans are backed by a government guarantee, granted by Statens bostadskreditnämnd (BKN) (Nordic Mortgage Council 1993).

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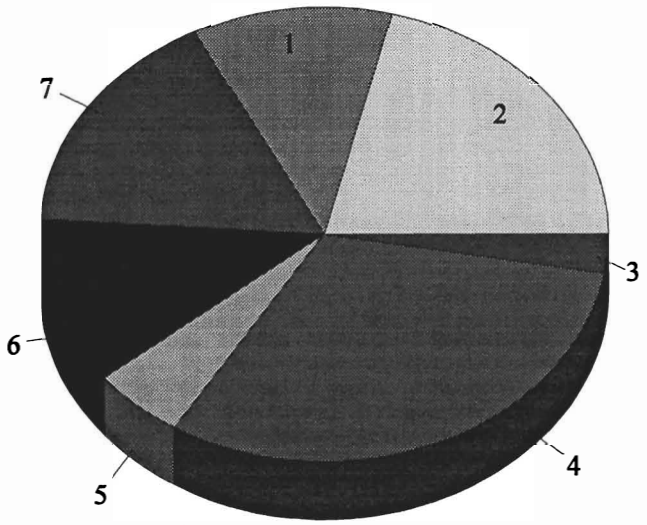
[21] For banks it is also easier to retain customers if all types of financial products can be provided within the bank.

[22] For a definition and description of these different types of amortisation principles, see section 3.1.4.

2.2.4 The bond market

Swedish bonds are issued as bearer bonds, registered in the name of the owner in the Swedish Securities Centre (VPC). The terms of the bonds are solely determined by the issuing credit institution, which is also fully responsible for emission of the bonds. In Sweden, credit institutions typically issue bonds with a fixed interest rate and a relative short maturity of 2 to 5 years without instalments, ie bullet loans.

Figure 2.6. **Bonds in circulation, ultimo September 1994**



1 Commercial banks 11,4 %
2 Pension funds 21.3 %
3 Other 2.7 %
4 Foreign 31.1 %
5 Households 5.3 %
6 Non-financial companies 11,9 %
7 Insurance companies 16.3 %
Source: Statistiska Centralbyrån.

As can be seen from the Figure 2.6, foreign investors are the main holders of Swedish bonds. Nonetheless, it should be noted that the main part of the bonds held by foreign investors are government bonds also included in Figure 2.6. Among Swedish investors, pension funds are clearly the largest bond holders and among the main holders of mortgage backed bonds. Swedish commercial banks, including the central bank, have the second largest share of outstanding bonds. The share of bonds held by households is surprisingly small.

While legislation implicitly says that all bonds should be backed by a mortgage of equivalent value, but there is no direct connection between the individual loan and the individual bond, rather joint and several liability among the borrowers secures the bonds. However, bond investors are not granted any preferential claims by law in the event of bankruptcy of the credit institution. In Sweden, mortgage credit bonds are not granted the right by law to a special name. Therefore, the possibility of separating out mortgage bonds is limited. Anyhow, the issuer's name is protected by law, and thus mortgage bonds can be identified by knowing the name of the institution issuing mortgage bonds for housing finance.

Emission of new bonds normally includes publication of a prospectus providing detailed information about the new bond series. The official approval from the FSA and the Stockholm Stock Exchange are also included in the prospectus. Recently, certain larger institutions, eg Stadshypotek AB have started to issue benchmark loans with larger volume, while having fewer new emissions. Such benchmark loans are typically issued approximately every 9 months. The larger volume of these new loans makes them more liquid on the secondary market (Stadshypotek AB 1994).

Some credit institutions in Sweden have also started to issue mortgage backed bonds outside Sweden. This trend has grown significantly as it has become increasingly difficult to raise the necessary funding on the Swedish bond markets due to stiff competition and massive borrowing by the government which has drained the markets for capital.

2.2.5 The legal framework

In Sweden, all credit market legislation in recent years has been harmonized to meet EU legislation. The main law regulating the Swedish market for housing finance is the Law on Credit Market Companies, a general law regulating all credit institutions in Sweden. Nonetheless, the two former public institutions are regulated by special laws concerning their establishment and business.[23]

The issuing of bonds on the Stockholm Stock Exchange is regulated by the Law on Debt Letters of 1936.[24] The law defines the rules for emission of bonds on the SSE, the information required and the registration of bonds. Tax legislation concerning interest deduction has been changed in the 1980s and early 1990s. The upper limit of tax deductions of interest expenses is 30 per cent, and only 70 per cent of the deductible interest expenses above SEK 100 000 are tax-deductible.[25]

2.2.6 Security

In Sweden, all loans are granted against a mortgage on real property whose value should be at least equivalent to that of the corresponding loan. The property is evaluated by special evaluators. These evaluators are either directly employed by the credit institutions or at least approved by them. However, no law implicitly defines the criteria of the valuation, hence, overpricing is possible. In Sweden, mortgage loans are implicitly attached to the property they are financing, but this is not explicitly stated in the Swedish law.

From the investors point of view, the Swedish system of mortgage-backed bonds is relatively unsecured. Borrowers who obtain loans from Swedish mortgage have joint and several liability for serving the bond debt within the credit institution. However, in case of simultaneous default by many borrowers in a single institution,

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[23] As mentioned above, Stadshypotek and Sveriges Allmänna Hypoteksbank are regulated by law no. 701 and 700.

[24] "Lag om Skuldebrev", 1936.

[25] Tax rules from 1992.

bondholders are not favoured by law over other creditors. In practice, the government has intervened in the market and bailed out credit institutions that suffered serious loan losses. However, the government guarentee will end by 1 July 1996.

In addition, mortgage credit institutions are obliged to meet the solvency requirement of 8 per cent of risk-weighted assets as defined in EU regulations. Finally, it can be argued that the lending limit serves as a security to investors, since borrowers are generally not allowed to obtain debt exceeding 70 per cent of the property value without government guarantee.

Credit institutions issuing bonds in Sweden are obliged to follow the principle of balance. In this way, credit institutions are not faced with interest rate risk. The only risk[26] is the risk of default by the borrowers.

A relatively new form of security for the investors is to hedge against unfavourable price or interest changes. This can be done using options and futures. The Stockholm Option Market (OM) allows the purchase of options and forward contracts against almost any underlying Swedish bond traded on the Stockholm Stock Exchange.

While raising funds abroad has recently become popular, it can be a dangerous game for both credit institutions and borrowers. Credit institutions face exchange-rate risk which they cannot pass on directly to their borrowers. If they did, borrowers would face interest-rate risk of another country.

2.3 The United States of America

Until the 1970s, the US housing loan system was relatively similar to several European arrangements. Credit institutions held housing loans on their own balance sheets. Since then, the system has been entirely restructured. Like the US financial market in general, the entire mortgage bond system is far more sophisticated than in Scandinavia. Most changes are the result of financial innovation rather than changes in the legislation.

At present, many different institution categories are involved in the process of granting and financing a typical home loan. The originator grants it, the securitiser acquires the funds in the capital market, and the servicer collects and processes the payments. All these three agents have different duties, responsibilities and sources of revenue. The system is quite complicated, but it seems to work efficiently.

2.3.1 Housing loans from the point of view of the debtor

In the US, home mortgages are normally granted for long periods, with 30 years often considered the norm. Mortgage loans can be obtained from credit institutions, mainly commercial banks and savings and loan associations (S & Ls). Fixed rate lending has been more common than lending at variable interest rates. In the late 1980s, over 80 % of borrowers obtained their mortgages as fixed rate loans (Canner & Luckett 1990).

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[26] These are typically sold as contracts with bonds of certain benchmark loans.

The US tax system has favoured mortgage credit. Borrowers are allowed to deduct all interest paid on mortgage loans on their main home or a secondary home from their taxable income, provided the loan sum does not exceed the purchase price. Furthermore, no capital gain obtained from the sale of a principal residence is regarded as taxable income (Carron 1991).

2.3.2 Securitisation in a nutshell

Under the prevailing securitisation practice applied in the US, the bank or any other credit institution acting as the original lender grants the loan to the individual who intends to buy a private house. When the loan has been granted, the lender sells its creditor rights to a specific institution. However, from the point of view of the original borrower, the terms of the mortgage loan do not undergo any changes. This practice, whereby the original lender sells his creditor rights to a third party, is known as securitisation.

Mortgage loans sold by local banks and S & Ls are purchased by institutions specialised in financing these acquisitions by issuing bonds. These bonds are known as Mortgage-backed Securities (MBS). In most cases, these are "pass-through" bonds. These bonds are characterised by the following three properties:

- Every home mortgage belongs to one, particular pool, consisting of thousands of home loans.
- The pool, in turn, corresponds to one particular bond issue.
- The cash flows received by investors are directly determined by the cash flows of the underlying pool of residential mortgages. (However, in case of borrower default, the bond issuer guarantees the payments to bond holders.)

Today, most mortgage-backed securities in the US are of this type. The first pass-through mortgage-backed securities were issued in 1970. Before their introduction, funds for mortgage loans were occasionally borrowed in the capital market, but mortgage loans were not pooled, and bond issues were used to finance the operations of the credit institution in general.

In 1975, the share of securitised mortgage loans was still as low as 4%. Securitisation became common in the US mortgage market in the late 1970s and early 1980s, and the turbulent financial environment of the late 1970s caused fundamental changes in the mortgage market. Nominal money market interest rates rose dramatically. It was a time when S & Ls were still obliged by government regulations to apply relatively low interest rates to deposits. Hence, depositors found it more worthwhile to invest in money market securities than to make deposits in banks. Consequently, the mortgage market had to turn to the capital market. In addition, increased interest rate volatility aggravated the risk of maturity mismatches in the balance sheets of primary financial institutions, making them more willing to dispose of their long-term receivables. In the 1980s securitisation continued, so that today slightly more than 50% of all home mortgages loans are securitised. According to recent estimates, the total outstanding stock of MBSs exceeds USD 1 300 billion, and the growth does not seem to have ceased (OECD II 1995).

Apparently the securitisation of mortgage loans has been a successful strategy for US financial institutions because they have tried to apply it on a large scale. Since

the early 1980s, they have experimented with the securitisation of several other types of receivables, such as consumer credit.[27] Recently, "repackaging" of securities has been introduced; a new security is created by purchasing an existing pool of securities and financing these purchases by issuing bonds (OECD II 1995).

2.3.3 The institutions involved

2.3.3.1 Originators

The bank or savings and loan association that originally grants the loan to a borrower is referred to as the originator. The role of S & Ls as originators has declined over time, and consequently the role of commercial banks has increased (Capozza & Order 1992).

Mortgage loan origination has become a fee-oriented activity. Revenues are to a significant extent obtained from fees charged in the lending activity. The potential profit on sale of mortgage loans is another possible source of revenue. The activity ties up very little capital, but on the other hand, it does not offer a safe and stable source of revenue because the demand for securitisable loans is highly sensitive to business and interest rate cycles. Another important risk related to this activity is the "pipeline" effect, whereby at any given moment the originator has a pool of loans to be sold, and it is possible that interest rates increase while the originator is holding a large amount of such loans. If this happens, the market value of these mortgage loans declines. Mortgage loan origination can thus be a highly volatile, risk-bearing source of income for a bank (Gilkeson et al. 1994).

In the US, it is common among banks to securitise mortgage loans from the balance sheet and to simultaneously buy mortgage-backed securities in the secondary market. There are several reasons for doing so. For example, in many cases MBS issuers are government-backed institutions, so swapping these two seemingly comparable assets eliminates the default risk, and thereby reduces the required capital reserves. In addition, the bank receives a portfolio that is geographically more diversified than the pool originally collected by the credit institution. However, the sale and repurchase also reduces the total amount of revenue because institutions involved in this transaction always charge certain profit margins. Hence, this operation may not be reasonable if adequate capital is not scarce and there is no need to lower risk-based capital requirements (Gilkeson et al. 1994). Despite securitisation, the share of mortgage-based assets (including MBSs) out of total assets has increased in the balance sheets of commercial banks, partly because the housing loan system has been gradually taken over by commercial banks as the share of S & Ls as holders of mortgage-backed assets has decreased, and partly because risk-based capital guidelines have forced banks to increase their share of low-risk assets such as mortgages (Capozza & Order 1992).

[27] Even credit card receivables have been securitised.

2.3.3.2 Security issuers

In the US, there are three major institutions acting as security issuers. These institutions are often called secondary mortgage institutions. The federal government has to some extent been involved in the establishment of all of them. In 1993, the share of these three major institutions out of the total stock of issued MBSs was about 72 %.

1) The Federal National Mortgage Association ("Fannie Mae") was established in 1938 as a governmental body by an act of Congress. The intention was to smooth housing cycles and pass federal subsidies on to mortgage lenders. The establishment of this institution was part of New Deal economic policies. For most of its history, Fannie Mae has issued ordinary bonds and purchased loans guaranteed by the Federal Housing Administration from local credit institutions. When deposit rate ceilings limited the ability of ordinary S & Ls to collect deposits, Fannie Mae maintained its ability to grant new loans by purchasing old mortgage loans. However, these activities did not expand significantly in the 1950s and 1960s because interest rate volatility was rather moderate. Since 1968, Fannie Mae has been a corporation. It buys mortgage loans from various lenders on a regular basis. Many loans purchased are still granted either to low-income households or persons with special housing needs. Apart from that, the company also purchases large quantities of mortgages in under-served areas. Currently, Fannie Mae is the largest private issuer of securities in the US. In April 1995, its outstanding debt totalled USD 258 billion (Fed Res Bull, Sept 1995, Statistical Annex).

2) The Federal Home Loan Mortgage Corporation ("Freddie Mac") is another major securitiser. From the very beginning, S & Ls had a hostile attitude towards the development of secondary mortgage institutions. However, when Fannie Mae was privatised, S & Ls changed their policies and began to plan the establishment of their own institution. In 1970, Freddie Mac was established as a secondary mortgage agency. It is owned by regional banks, which in turn are owned by S & Ls. Freddie Mac buys loans from its owners and institutions belonging to their reference groups. Financial institutions that have little to do with S & Ls are normally unable to sell their mortgage loans to Freddie Mac. The mortgage loans securitised are normally guaranteed by the mortgage, but not by the government. (Metaxas-Vittas & Vittas). The amount of outstanding debt in April 1995 totalled USD 106 billion (Fed Res Bull, Sept 1995, Stat Annex).

Both Fannie Mae and Freddie Mac are Government-Sponsored Enterprises (GSE). In practice, this implies that they are privately owned by their shareholders, but they enjoy several privileges, such as exemption from state and local taxes, exemption from Securities and Exchange Commission registration and state securities laws. In addition, these institutions can borrow up to USD 2.25 billion from the US treasury an emergency.[28] Their "Agency Status" also provides them with a significant

[28] In practice, these institutions are still backed by the federal government, even though they operate as private companies.

advantage in the capital market, because it is implicitly understood that the federal government would guarantee their debts in case of insolvency. On the other hand, these companies do not enjoy the same degree of freedom and independence as normal corporations. The President appoints five members out of 18 to the governing board of both institutions. These GSEs not only securitise loans; they also hold relatively large portfolios of MBS themselves. (Weicher 1994)

3) The Government National Mortgage Association ("Ginnie Mae") is a governmental body, although the federal government does not formally provide any direct guarantee to its debts. It was separated from Fannie Mae in 1968 to continue the policy-related duties of Fannie Mae. It only securitises mortgage loans that are guaranteed either by the Federal Housing Administration or by the Veterans Administration. The institution issues bonds both domestically and internationally. Since the institution purchases government-backed loans only, it is to a large extent involved in mortgage loans extended to low- or moderate-income households. In 1993, about 55 % of securitised loans were granted to households with incomes lower than the median of their respective metropolitan statistical areas. The comparable figures were 30 % for Fannie Mae and 29 % for Freddie Mac (Canner, Passmore, Cook, Kirsch, McLeod & Myers). The exact amount of outstanding bonds is not known precisely.

In addition to these three major institutions, there are a large number of minor competing firms in the business. Mortgage-backed securities have been issued by these minor institutions since 1977. In 1993, their share was estimated to be about 28 % of the 7.4 million loans sold in the secondary market. These minor institutions are often referred to as "private label issuers", although, in practice, most of them have close relationships to local, state or federal government. It has been estimated that 95 % of all mortgage-backed securities have been issued by institutions that in some way are sponsored, backed or administered by governmental bodies (OECD I 1995).

Regulations imposed by the federal government have contributed to the segmentation of the market according to loan sizes. The Federal Housing Administration (FHA) offers guarantees to mortgage loans granted to first-time home buyers. The loans to be guaranteed by the FHA have a dollar-denominated maximum ceiling that cannot be exceeded. Because Ginnie Mae does not buy any loans without this guarantee, the mortgages purchased by Ginnie Mae cannot exceed this ceiling.

Freddie Mac and Fannie Mae, in turn, are bound by another government regulation, the conforming loan limit. The conforming loan limit sets a maximum ceiling for the dollar denomination of loans, although this limit is significantly higher than the ceiling that binds Ginnie Mae.

Loans that exceed both maximum ceilings ("Jumbo loans") are the most important remaining market segment for loans held by banks or S & Ls, and eventually, securitised by private label issuers. It has been argued that the business is evolving towards a duopoly situation, whereby the two major GSE, Fannie Mae and Freddie Mac, will dominate the industry to an increasing extent. Minor issuers will be marginalised to specific market niches with little potential for growth (Weicher 1994).

2.3.3.3 The Servicer

The servicer is the institution that collects interest and principal payments, and then passes them on to the securitisation institution. In many cases, the original issuer of the loans continues as the servicer. From the point of view of the borrower it appears that the bank or credit institution continues to collect both principal and interest payments as if the loan had not been securitised. However, these payments are immediately transferred to the MBS issuer. It is also possible to pass the rights and duties of the servicer on to another institution that takes care of collecting interest and principal payments on behalf of the MBS holders (Weicher 1994).

The servicer is paid. In most cases, the payment is embodied in the profit margin between the borrower and the investors. The difference between these interest rates may be 25 basis points, which in most cases is significantly more than the costs of this activity. Even these servicing contracts are valuable assets, and they have a market, ie the contract to service the mortgage loan can be sold to another servicer. The costs of servicing one particular mortgage do not normally depend on the outstanding debt; servicing a home loan of USD 10 million does not cost much more than servicing a loan of USD 10 thousand. Hence, there are significant scale economies associated with this business. (Gilkeson et al. 1994)

The most important risk element of servicing as a line of business is related to prepayments. The borrower is allowed to make repayments before the agreed date. Servicing as a business is especially vulnerable to prepayments by mortgagors. When a loan is prepaid, servicer rights disappear, so the institution no longer receives compensation.

If servicers fail to satisfy the requirements set by MBS issuers, agencies can withdraw the servicing contract. In cases of borrower insolvency, the skills of the servicer may be of paramount importance to holding down the amount of loan losses suffered by bond holders.

2.3.4 Credit risk enhancement

The default rates of original mortgage loans have been very low, in fact as low as four-to-one thousand, even among loans that according to background information (such as debtor income, loan to value ratio etc.) belong to the highest risk category. As a rule, low-income households and surprisingly, high income households are more likely to default their payments than middle income households (Deng & Quigley 1995). Home price declines, unemployment and net emigration explain a significant share of defaults at regional level (Case et al. 1995).

Although each issue corresponds to a given pool of securitised loans, the mortgage institution guarantees full payment of both interest and principal, irrespective of the amount of loan losses suffered by the original pool. Mortgage-backed securities issued by the three major institutions are given the highest ratings both by Moody's and Standard & Poor, ie triple A. The highest- quality rating can mainly be explained by the implicit guarantee offered by the federal government; as the federal government participates in the administration of these institutions, it is also believed that in case of insolvency, the government would take care of amortising their debts. However, there is no formal agreement concerning this issue, and because no such GSE has ever gone bankrupt, there is no historical evidence

about the policies of the federal government in such a situation. However, the three major institutions are regarded as so creditworthy that even the Federal Reserve System accepts their bonds as collateral.

With private label securities, the problem of credit risk is much more accentuated. Because the credit risk is recognised to exist, credit rating agencies are requested to measure it. The standard practice is to use at least two different rating agencies to examine each issue. Most private label issuers also have relatively high credit ratings, although not necessarily triple A. (OECD II 1995).

It is also possible to use various credit enhancing techniques such as subordinated loans, over-collateralisation, reserve funds and third-party guarantees. There is a specific insurer category that has specialised in offering third-party guarantees, the so-called monoline insurers. Unlike general insurance companies, they have only one line of business: they offer bond issuers third-party guarantees for a fee. These firms have retained their triple A ratings, and consequently, their guarantees are among the most expensive. The monoline industry originally sprang up in the municipal bond market, but it has since become increasingly common also among MBS issuers to use their services. In the late 1980s, the monoline industry's total exposure almost doubled. In many cases, monoline insurers required first loss guarantees from other third parties. In recent years, some of these companies have established subsidiaries abroad, but on the whole, the monoline insurance industry is still a national particularity of the US (Euroweek 1991).

It is also possible for the originator to sell the pool without credit risks, whereby the guarantee is offered by the originating bank. However, in these "with recourse" sales, the originator is still obliged to maintain capital reserves to cover expected losses, so this arrangement is rare (Gilkeson et al. 1994).

2.3.5 Prepayments – the main source of uncertainty

2.3.5.1 The problem

The most important difference between mortgage-baked securities and ordinary corporate or government bonds is the risk of early repayment. The borrower is allowed to repay the entire loan or a part of it prematurely. When borrowers make such prepayments, the security issuer pays a certain amount of the principal to bondholders. From the point of view of an investor, this option makes MBSs less attractive, especially as it is not possible to buy MBS without simultaneously issuing these implicit prepayment options. Thus, when investors evaluate mortgage-backed securities as an alternative, they have to consider the likely amount of future prepayments.

To make things worse, prepayments have the built-in tendency to occur when they are least welcome to investors. The most important determinant of prepayments seems to be the interest rate level. When cheap refinancing is available, ie when bond prices are high, many debtors will take advantage of the situation by repaying the old mortgage loans with new cheaper loans. This causes bondholders serious losses. In principle, of course, it will always be profitable for the debtor to repay the mortgage and replace it with another loan whenever the interest rate is lower than the interest rate on the old mortgage. However, the prepayment option is not always used when it, in principle, is profitable for the debtor and cause the bondholder losses. This may

reflect such factors as a lack of competition in the local markets for credit, incomplete information, costs related to refinancing and other market imperfections (Archer et al. 1995).

Another important reason for prepayment is relocation. In most cases, when the debtor sells the real estate, the mortgage is prepaid. However, in some cases, it is possible to pass the loan on to the buyer. This was especially common in the early 1980s when interest rates were high, and old mortgage loans at low interest rates were comparable to valuable assets. There were still no restrictions on such deals. Now, relocations normally cause prepayment. (Patruno 1994)

As borrowers are allowed to make prepayments and the credit risk is in most cases rather low, these prepayments are the most important uncertainty element involved in MBSs. It has even been argued that the existence of this prepayment risk was one of the main reasons why MBSs did not become popular before financial innovations made it possible to protect oneself against this risk in the mid-1980s (Patruno 1994).

Financial specialists have tried to develop statistical models that should be able to predict the amount of future repayments. In most cases, these models have not produced satisfactory forecasts (Patruno 1994). The fact that prepayments are non-predictable has been extremely important to the development of MBSs. If it were possible to predict prepayments, investors would know the maturity of their MBS investments. The special arrangements presented in the following section would be of very limited use, and there would be hardly any difference between investing in government bonds and MBSs.

2.3.5.2 How the problem has been handled

Prepayment risk has been a major motivations for several financial innovations within the MBS field. In fact, it would seem that no other issue related to this category of securities has stimulated investment bankers' imagination to a comparable extent. Now, we shall take a closer look at different ways to handle the prepayment risk by dividing a MBS issue into different types of bonds. These techniques do not eliminate the prepayment risk, but, instead, they enable each investor to choose the preferred combination of risk and expected return.

In 1983, the first Collateralised Mortgage Obligations (CMO) were issued by Freddie Mac. In this arrangement, mortgage-backed security issues are divided into tranches, coded as A, B, C and so on. When principal repayments take place, first the bonds in the tranche A are redeemed, then the bonds in the tranche B, and so on. The original 30-year callable securities are transformed into a sequence of instruments with differing maturities. Hence, investors can choose which tranche they would like to invest in, depending on their preferences concerning maturity and related uncertainty. The tax problems of CMOs were solved in 1986 with the introduction of the "Real Estate Mortgage Investment Conduits" (REMIC). REMICs and CMOs are very similar and the names are sometimes used interchangeably. Today, most securitised loans are pooled into REMICs (Carron 1992).

At present, most CMOs include a Z tranche. Bonds of this category do not receive any monetary coupon interest payment. Instead, bond holders receive more bonds. When all other tranches have been repaid, the status of the Z tranche changes and the bond holders begin to receive both interest and principal repayments as

money. This arrangement shortens the expected maturity of ordinary tranches (Carron 1992).

Some issues include Planned Amortization Class (PAC) bonds. These bonds are repaid according to a fixed schedule. The fixed repayment must be met before any principal payments can be made to other tranches. With the exception of extreme cases, future principal repayments on a PAC bond are predictable. The rest of the securities of the issue are called companion bonds. The uncertainty related to their moment of principal repayment is particularly high. The effective yield on them is higher than the return on PAC bonds whenever interest rates remain stable. In case of declining interest rates, PAC bonds earn higher capital gains, but companion bonds are likely to be called at face value (Carron 1992).

2.3.6 The market for mortgage-backed securities

It has been said that the market for mortgage-backed securities is the only USD-denominated rival to the US Treasury market. Mortgage-backed securities account for 27 % of the total stock of fixed-income instruments.

Even though the default risk related to most mortgage-backed securities is minimal, the yield on these bonds has normally been somewhat higher than the yield on government securities. Typically, the difference has been 100–150 basis points. There are mainly two reasons for the existence of this spread. First, there is a significant risk that a large proportion of the loans are prepaid whenever interest rates are low enough. When cheaper financing is available, rational borrowers would normally replace old mortgage loans with new loans. Secondly, mortgage-backed bonds are significantly less liquid than government bonds. These liquidity problems are largely caused by the great variety of issues in circulation.

In order to avoid liquidity problems, MBS trading takes place on a To-Be-Announced (TBA) basis, ie when deals are struck, nothing but the coupon rate and the security type are disclosed. The seller can deliver any securities that belong to the relatively loosely defined category, such as 8% coupon A tranche loans granted by Fannie Mae. Because the issuing institution guarantees the bonds, all bonds issued by the same institution belong to the same credit quality category.

2.4 Summary

Housing finance based on mortgage credit is a nearly two-hundred-years-old tradition in Denmark. Using property as collateral long-term credit is offered to the population in general by a well-organised market. Objective evaluation of the property by experts and over-collateralisation determined by the Mortgage Credit Act is the basic security of the system. A limited number of institutions provide the necessary mortgage credit cost efficiently through economies of scale.

Mortgage bonds are traded daily on the Copenhagen Stock Exchange. The size of the national bond market and the credibility of the mortgage bonds makes such bonds attractive to investors and limits the interest rate spread compared to government bonds. However, small bond series tend to make markets less liquid, while call-options on a major part of bonds in circulation increases the interest-rate

spread in relation to government bonds. The Danish system is based on legislation, the government's role is that of regulator, rather than participant. Defaults have never been a serious problem in Denmark.

The Swedish mortgage credit system was created by the government. However, competition was introduced into the mortgage credit system through liberalisation in 1960 and the privatisation of public-owned institutions in 1994. Many of the institutions established as a result of the liberalisation are owned by Swedish commercial banks. Mortgage loans are long-term loans with interest rates fixed for shorter periods (2–5 years). This corresponds to the maturity of the underlying bonds which are also short-term.

Although the government previously had strong control over the mortgage credit market, it has been in the absence of specific legislation. Valuation of property in Sweden is done by professionals. As no criteria are explicitly defined for this evaluation, overpricing is possible. Thus, while the government does not guarantee the bonds explicitly, losses during the last recession were so large that the government intervened in the market.

In the US, housing loans have been securitised since the 1970s. When local banks have granted ordinary mortgage loans, they often sell their creditor rights to specific secondary institutions. These secondary institutions finance the purchase by issuing bonds, mortgage-backed securities (MBS). Each bond issue corresponds to a specific pool of mortgages. The underlying loans in a pool are often collected from different states. In most cases, these security issues are of the "pass-through" type in the sense that the payments received by bond holders are directly determined by the payments on the underlying mortgages.

There are three major secondary institutions. All of them are, in one way or another, controlled by the federal government. In addition, there are several small, independent securitisers.

Loan losses have not been a major problem in the system, simply because overcollateralisation has prevented them from becoming common. When loan losses occur, the secondary institution guarantees the receivables of the bond holders. The fact that the borrower has the right to repay the loan prematurely makes the MBS less attractive. Whenever interest rates are low, the risk of early repayment increases. This problem has been handled relatively successfully by creating a sophisticated system where bond holders can affect the likely amount of repayments by choosing bonds of a suitable category.

3 Finnish arrangements

3.1 The private sector

3.1.1 The present situation

At the moment, security issues are not widely used as a source of funding for housing loans. Most housing loans are granted within the ordinary banking system. The funds are mainly collected as short-term deposits from the public, or as short-term interbank loans. Because of maturity matching policies, banks are not normally interested in offering their customers fixed-rate loans.

In addition to ordinary banks, there is a specific group of financial institutions, called hypothec or mortgage banks. Before the new Credit Institution Act was enacted in 1992, there was a specific law concerning such mortgage banks, but today they are subject to the same law as ordinary banks. Hence, one could argue that in the legal sense, these institutions no more exist as a specific group. However, financial institutions that were regulated by the old Hypothec Bank Act still operate to a large extent according to their traditional practices. They grant loans with a low default risk, namely loans backed by real estate collateral and loans to the public sector. They fund themselves mainly by issuing bonds. Earlier, Finnish mortgage banks had special privileges as bond issuers.

There are five such mortgage banks in Finland. All of them are relatively small, and all are owned by commercial banks. In the business strategies of the major banking groups, housing loans belong to the field of operation of ordinary branches, not to these specific units. Instead, they grant mortgage-backed loans to the corporate sector, especially to investments that are related to real estate. Their business strategy is still to remain particularly creditworthy by granting loans with the lowest possible risk. (Suomen rahoitusmarkkinat 1995)

In addition to corporate loans, OKO Mortgage Bank (OKO-investointipankki, owned by cooperative banks) grants ordinary housing loans to private individuals. The Industrial Bank of Finland (Suomen Teollisuuspankki, owned by Merita) and Ålands Hypoteksbank (owned by Ålandsbanken) do not market housing loans. PSP Municipality Bank (PSP-kuntapankki, owned by Postipankki) grants many loans to the local government sector, and it is also an important source of funding for investments in rental housing. (Annual Reports for the year 1994) The Finnish Real Estate Bank (Suomen kiinteistöpankki), previously owned by the savings bank group, was taken over in 1995 by a Swedish bank, Svenska Handelsbanken. In 1995, it did not issue any new bonds.

Although the law concerning mortgage banks has been abolished, there is still a specific law concerning mortgage or hypothec associations, credit institutions which are comparable to mortgage banks. According to the law, a mortgage association is owned and controlled by its debtors, and every debtor automatically becomes a member of the association. Basically the association is a joint lending project of its members. Every member has one vote in the general assembly, irrespective of the amount of their outstanding debt. However, a debtor-member who has not paid all interest and principal payments has no voting rights. Members are not responsible for the debts of the association, nor do they have any right to receive any part of the profit of the association. All loans should normally be backed by real

property or guaranteed by the public sector. The law does specify the highest acceptable loan-to-value ratio. A mortgage association must have a license granted by the Ministry of Finance.

Since 1979, there has only been one mortgage association in Finland, Suomen Hypoteekkiyhdistys. It was established in 1860, making it one of the oldest credit institutions in Finland. Because its balance sheet now barely exceeds FIM 2 billion, it is also among the smallest financial institutions. The institution acquires funding by issuing bonds and borrowing from banks. Housing loans are its main field of activity. Until recently, most of the loans were pegged to long-term rates, but at the moment, they are normally pegged to the 12-month interbank rate.

In 1993, a committee published its report concerning the possibilities to securitise housing loans granted by banks. According to the scheme devised, banks would have sold their creditor rights on outstanding loans to a specific institution that would finance these purchases by issuing bonds. It was concluded that one of the main barriers to implementation was related to taxation; it was unclear which tax laws would apply (Arvopaperistamistyöryhmä 1993). To date, no Finnish bank has securitised its housing loans.

3.1.2 The limited role of mortgage institutions in Finland – A historical perspective

When one studies the history of housing finance in different countries, it is difficult not to notice the pronounced differences between Finland and the two other Nordic countries covered by our study. Why do hypothec banks have such a small market share in Finland, while similar mortgage institutions virtually dominate the market in Denmark and in Sweden? Perhaps the present marginal role of mortgage banks in the Finnish financial sector can best be explained from a historical perspective. In the past, legislation discriminated against Finnish mortgage banks, and although it no longer does, the industry has never recovered.

Before World War I, Finland had several financial institutions that financed themselves by issuing bonds. They played a major role in the financial sector of the time. In 1913, for example the outstanding stock of ordinary loans granted by commercial banks totalled FIM 220 million, a hefty amount by modern standards, and the outstanding stock of the two major mortgage institutions totalled FIM 145 million (Brofeldt 1915). Even though domestic demand for long-maturity bonds was weak, these institutions were able to finance their operations by issuing bonds abroad. (Kuusterä 1980)

Many financial institutions did not survive the general crisis of the financial sector in the early 1920s. Mortgage banks had, in addition, suffered from serious exchange rate losses because of the devaluation of the markka during the World War I (Korpisaari 1922). The boom in the construction sector in the late 1920s offered hypothec banks new opportunities, and the industry recovered. In 1929, the mortgage institutions had a market share of 42 % of all loans granted against mortgage on real estate in urban areas. This recovery was temporary. With the depression of the early 1930s, mortgage institutions had to allow many of their customers to restructure interest and principal payments. Because many bond issues had been denominated in gold, the devaluation of the Finnish markka caused serious exchange rate losses (Kuusterä 1980). The income tax reform that favoured bank

deposits reduced savers' incentives to invest in fixed income securities (Nordic mortgage council 1993). It was the first in a series of legislative obstacles to operations of mortgage banks.

After World War II, financial market regulations further hampered the operations of mortgage banks. The central government imposed restrictions on bond issues for about 40 years. During this time, mortgage banks had to have a license for all tax-exempt bond issues. And because the central government was using tax-exempt bond emissions for its own purposes, such licenses were not granted without taking into account the borrowing needs of the central government. Taxable bonds issued by mortgage banks were normally held in the portfolios of parent banks, and hypothec banks that were not owned by banks had difficulties finding investors. Hence, in order to continue their activities, mortgage banks had to be owned by ordinary banks, and these parent companies preferred to keep housing loans on their own balance sheets. Ironically, mortgage banks ended up mainly financing the corporate sector.

An independent entrant could have tried to conquer its share of the unofficial tax-exempt bond issue quota at the cost of its rivals.Acquiring funds by issuing taxable bonds would have been allowed, but because ordinary customer deposit accounts were tax-exempt until the late 1980s, the commercial bank could undercut market rates. As the tax system favoured certain behaviour, there was no incentive to establish independent hypotec banks.

Since the 1980s, no restrictions on bond issues have existed. The tax treatment of bank deposits is no longer as preferential as it used to be. Hence, a private mortgage institution that finances itself with bond issues could, in principle, now enter the market. In the light of foreign experience, such institutions probably could occupy a market niche. For instance, a foreign mortgage credit institution might find it reasonable to establish a subsidiary in Finland.

However, there are still serious legal obstacles to the functioning of the European single market for mortgage loans; the terms of such loans vary across EU member countries, there are serious problems related to taxation, in several countries there are governmental subsidies to home buyers, these subsidies vary across countries, and so on. (Fédération Hypothécaire Européenne 1996)

3.2 The public sector

The public sector has acquired funding for housing purposes with bond issues on a much larger scale than the private sector.

The Government Housing Fund is the central government body that grants "Arava" loans, a type of subsidised housing loan. These loans are normally granted either to private individuals or to local governments for the purpose of building, purchasing or renovating dwellings. Basically, any institution can be granted an Arava loan for rental dwellings, but all rental dwellings built with these loans are subject to rental regulation. Most of these loans have been granted to local governments. Private individuals can obtain Arava loans only if their personal incomes do not exceed certain limits that depend on the geographic area and the number of children. These limits are adjusted annually. A couple with two children

would not be eligible if both parents are working and if they both earn a salary that is close to the median income of all Finnish wage earners.

The Government Housing Fund acquires funding in three different ways:

- Redemptions and interest payments on the outstanding loan stock.
- Directly from the central government.
- By issuing bonds.

Government Housing Fund bonds are of high credit quality because in practice they are guaranteed by the central government. In 1994, the total amount of outstanding government housing bonds equalled FIM 13.4 billion. One of these bonds is a benchmark bond, which primary dealers of the government benchmark bond system quote on a regular basis.

In November 1995, the securitisation of Arava loans was introduced. A specific institution, called Fennica Number 1, was registered in Ireland. This company has only done one operation ever, a securitisation operation. The company issued USD-denominated bonds and used these funds to purchase creditor rights to rental dwelling Arava loans. The operation involved two security issues, a A-rated junior loan series of USD 350 million, and a AAA-rated senior loan series of USD 13.7 billion. The Finnish government does not guarantee these bonds. The bonds issued by Fennica Number 1 pay a variable interest fixed according to the 6-month LIBOR rate. Because the rate of interest paid on these loans is lower than the market rate, the government pays the institution an annual fee to cover the difference. In addition, the institution has made derivative contracts to eliminate the associated exchange rate risk and interest rate risk. Fennica Number 1 was registered abroad because it never was clarified how Finnish tax authorities would have treated it.

The Government Housing Fund has plans to securitise more housing loans in the future. It would be possible to acquire funding by issuing traditional housing bonds, but in this case securitisation has been chosen as a way to limit the growth of government debt. On the other hand, local governments are the debtor in most rental housing Arava loans, so this operation as an alternative to ordinary housing bond emissions will have little impact on public sector gross debt as defined in the Maastricht treaty. From the point of view of private bond holders, the central government is no longer the debtor; from the point of view of Fennica Number 1, local governments are. As Fennica Number 1 is classified in the category of private institutions, its receivables from a local government belong to the gross public debt.

In 1993, a new credit institution was established as a joint project of about 200 municipalities. The new company, Kuntien Asuntoluotto Oy, finances public sector housing investments only. Both construction of new dwellings and renovation of old ones can be financed with these funds. As the company finances the public sector only, and because many of the loans granted by it are both guaranteed by the central government and backed by real estate mortgage, the company belongs to the highest possible credit rating category. However, it has not been rated by any credit rating agency. The first bond issue, consisting of 10-year bullet bonds worth FIM 150 million, took place in December 1993 (Talouselämä 40/1993). The first loan, FIM 160 million, was granted to the city of Helsinki in January 1994. The local government authorities invested these funds in building new rental dwellings in Helsinki. Each bond issued by Kuntien Asuntoluotto is identical to a specific government benchmark loan: the coupon rate, the maturity date and all other details

are completely identical. However, the effective yield is somewhat higher. For instance, in the issue of January 1995, the difference was 48 basis points. When these bonds are auctioned, investors are asked to present their offers as the effective yield margin to the yield of the respective benchmark bond (Startel News). The existence of this spread in the effective yields can probably be explained to a large extent with the liquidity problems related to it. In addition, financial institutions may prefer government benchmark bonds because they are eligible for repurchase agreements with the central bank.

4 Discussion

Whatever the mortgage-bond system is, it cannot provide loans at attractive interest rates if it cannot collect funds itself at low cost. The spread over the yield on government benchmark bonds depends on:

- The default risk.
- The prepayment risk.
- The liquidity premium.

The default risk has so far been handled successfully by over-collateralisation at least in Denmark and in the United States. If the loan cannot exceed 70–80% of the price of the dwelling, the default rate has been minimal at least in the two above-mentioned countries. Consequently, its impact on the effective yield of mortgage bonds is of minor importance. In Sweden, where the dwelling can be accepted as collateral to its full value, loan losses have been a moderate problem, and the default risk has affected bond yields. The risk can be controlled especially well if the dwelling cannot be used as collateral unless it has been valued by an third party with at least some expertise in real estate markets. Any person who intends to buy a house or an apartment must ultimately pay for it with personal income, so it seems remarkable to expect the would-be home buyer to save a certain percentage of the value of the home before buying it.

Prepayment risk, on the other hand, present a tougher problem. It is the reason callable mortgage bonds normally carry a higher yield than government bonds. There are at least two ways to solve the problem:

- In case of prepayment, the debtor must pay for the eventual losses caused to investors, or
- Bonds could be divided into tranches as in the US

In the light of US experience, the latter alternative has demonstrated itself to be an efficient solution to the problem. However, it may accentuate liquidity problems because it cannot be applied without dividing each issue into several sub-issues. This reduces the average size of a single bond issue. One could even imagine that the mortgage institution could be obliged to accept prepayments, but instead of calling bonds, it would protect itself with insurance or derivative contracts.

The liquidity problem is also potentially serious. Consider, for example, Kuntien Asuntoluotto Oy, the real estate credit institution of the Finnish local government sector, which grants loans solely to the government sector. About 70% of the loan stock is either granted to the central government or guaranteed by it. In addition, the loans are normally guaranteed by real estate mortgage. Public authorities have allowed insurance companies to classify bonds issued by Kuntien Asuntoluotto in the same credit risk category as central government bonds. Despite this, the effective yield on the bonds of Kuntien Asuntoluotto can be about 50 basis points higher than the yield on otherwise similar benchmark bonds of the central government. This difference is most likely the result of the lack of a liquid secondary market. In addition, bonds issued by Kuntien Asuntoluotto are not eligible for repurchase agreements with the central bank.

Hence, if mortgage loans are ever to be securitised in Finland, it seems reasonable to pool as many housing loans as possible in one bond issue. In the light of the evidence obtained from the Finnish government benchmark bond system, a bond with an outstanding stock of less than FIM 10-20 billion is not liquid, even if its liquidity is artificially improved by a primary dealer system. At the moment, the stock of housing loans in the books of Finnish banks is about FIM 100 billion. If all these housing loans were securitised (the extreme case), the stock of outstanding loans would need to be pooled so that there would be fewer than 5-10 issues in circulation. This might be possible, for instance, by securitising all housing loans through one secondary institution, a Finnish "Ginnie Mae". Or alternatively, if housing loan originators had identical credit ratings, it might be possible to create industry standards for bond issues; all mortgage bonds would have maturity dates and coupon rates that suit one of these standards. All bonds that suit the standard would then be traded on a To-Be-Announced basis, and would be treated as perfect substitutes in the trading system. For instance, one could offer a certain price for 7 % coupon bonds maturing on 15 October 2016. The seller would have the right to deliver bonds issued by any recognised issuer, provided they are in conformity with the standard.

Housing loan systems simultaneously both reflect the general financial structure of the country and affect it. In the US economy, securities markets are of paramount importance, whereas the role of banks is not especially accentuated. US banks have, to a large extent, become mere intermediaries between security issuers and borrowers. In Finland, by contrast, ordinary banks have traditionally played a key role in all economic activities, even as major shareholders of large manufacturing corporations. Given their central role, their share of housing loans is understandably high. In Sweden, the government has traditionally been involved in the economy to a much larger extent than in most other Western nations, and the housing loan system has been planned and controlled by public authorities. Denmark, in turn, could be used as an example of a country where the housing loan system has affected the general financial and economic structure of the country rather than *vice versa*.

These national differences are to a large extent due to historical and institutional factors. Legislation may have a lasting impact on the financial structure of the country. As already concluded, Finnish economic policies almost killed the mortgage bank industry in the post-WWII era, whereas Danish legislation favoured local mortgage institutions. In the US, disintermediation was encouraged by restrictive legislation that made it very difficult for local banks and S & Ls to operate in a turbulent financial environment according to their traditional practices. Thus, when certain legislative factors are abolished, it is likely that their impact on the market shares and policies of local institutions will still last for a lengthy period, although the impact is unlikely to be permanent.

Because mortgage institutions that finance themselves in the security market are able to maintain their high market share in Denmark, Sweden and many other countries, it is difficult to understand why they could not become an important part of the financial sector in Finland. Legal obstacles to their entry have been largely abolished. At the moment, the main reason why such institutions do not enter the market may simply be the current weak demand for housing loans. If the demand for housing loans strengthens, which is likely to happen at least in the long run, new companies may enter the market. Therefore, we believe that it is completely realistic to expect bond-issuing mortgage institutions to emerge spontaneously in Finland,

simply because there is likely to be demand for such financial intermediation services.

The role of the government is an important issue. Because the government budget deficit has become a major problem, one should consider the situation extremely carefully before implementing any policies that would either increase public expenditures or otherwise increase the financial responsibilities of the government. Swedish experience has demonstrated that even a third-party guarantee offered by the government may turn out to be very costly, at least, if no over-collateralisation is required. Instead, the government is always involved in the market as the legislator, and it cannot dispose of this responsibility.

In an efficient market economy, the private sector establishes companies whenever there is adequate demand for their services and public authorities do not intervene in the market without good reason. On the other hand, in the case of bond issuing mortgage banks, the business could be competitive enough with just a few players. In fact, it can even be argued that an excessive number of institutions could easily damage the liquidity of the market for mortgage bonds. At the moment, however, the question of artificial barriers to entry to limit the number of bond-issuing mortgage institutions is far removed from the main issues at hand, so we do not believe a needs criterion is applicable when licenses are granted to credit institutions. In addition, it would most likely be against international agreements.

It is easy to argue that the public sector should take an active role in promoting lending to individuals who intend to buy new dwellings. A stronger demand would help the construction sector to recover, which would create employment possibilities and increase the stock of dwellings. But this does not necessarily imply that the government should make a direct monetary contribution to such activities. Take a real-life example: in the United States, the federal government has been involved in establishing the three major secondary mortgage institutions, but in the case of Government Sponsored Enterprises, the amount of taxpayers' money spent on the housing loan system has been minimal.

The most compelling argument enhancing the demand for old dwellings might be desirable is the present difficult situation of the banking sector. Many loans granted in the 1980s are backed by residential real estate that has lost as much as 50 % of its nominal value since the price bubble of the late 1980s burst. A stronger demand for dwellings would certainly have a clear impact on the price level. This would both help over-indebted borrowers and reduce the amount of loan losses. On the other hand, it would also force home buyers to incur higher levels of debt.

If a specific law about the functioning of bond-issuing mortgage banks or comparable institutions will again be introduced in Finland, these institutions could be granted certain privileges, and in exchange for that a special status, they could be obliged to prioritise loans granted to buyers of new homes. For instance, to be eligible as a higher priority category institution, the mortgage bank's lending policies might require an especially high ratio of over-collateralisation in the case of old dwellings. It is easy to invent various ways to prioritise this specific category of credit institutions. For example:

- The preferential right to use a specific name (such as "Kiinnelainaobligaatio") for their bond issues, so that no other issuers would be allowed to use this name.
- Minor local credit institutions could be established even though their equity capital does not satisfy the standard EU requirement of ECU 5 million. Rather an ECU 1 million requirement could be applied in cases where other specific institution definitions were satisfied. Large corporations thus, could establish such institutions as a part of their personnel policies, so that the employee status would make a person eligible to get a housing loan from the corporate mortgage bank.

It might also be worthwhile to consider whether it should be legally feasible to grant loans that are dwelling-specific rather than individual-specific. Dwelling-specific loans make sense because the borrower can easily dispose of debtor status whenever the loan is no longer needed for its original purpose. The buyer, in turn, would automatically get a significant part of the required financing. On the other hand, the institutions that grant the loans should have the right to choose the debtors they are willing to finance. It may be difficult to combine these two aspects.

If mortgage institutions that finance themselves by issuing bonds do emerge in Finland on a large scale, the market for fixed-income securities will undoubtably undergo deep change. These institutions would have an incentive to issue bonds with maturities exceeding 20 years. Such fixed-income securities do not now exist in Finland. There might be demand for them among pension insurers, even if there would be no liquid secondary market for them. However, if housing loans were mainly financed in the bond market, the demand for long-maturity fixed rate loans would increase, whereas the demand for loans with interest payments pegged to short money market rates would weaken. It is less obvious how the supply of financing in different parts of the maturity spectrum would react. Hence, one could even speculate with the possibility that widespread use of bond-financed mortgage loans might alter the shape of the yield curve, perhaps permanently. An interesting question is the nature of potential competition between the central government and mortgage bond issuers in the financial market. If large amounts of long-maturity FIM denominated securities are issued, one has to ask if this potentially could make it more difficult for the central government to acquire long-term funding.

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Appendix A comparison of mortgage loans financed in security markets

	USA	Denmark	Sweden
Bond issuer and loan originator the same institution	No	Yes	Yes (except for Stadshypotek)
Bonds callable at face value if mortgage prepaid	Yes	Both callable and non-callable bonds exist	Yes
Bond issuers guaranteed by the government	In most cases implicitly	No	Implicitly
Liquidity problems in the secondary market for bonds	Some	Some	Some
Spread over government bonds	100–150 basis points	50–150 basis points	50–150 basis points
Mortgage bonds/GDP	20 % (1994)	91 % (1994)	59 % (1992)
Share of mortgage loans financed in the security market out of all housing loans	Slightly more than 50 %	> 90 %	Significantly more than 50 %
Is the loan personal or property-specific?	Partly personal, partly depends on the state	Property-specific	Personal
Fixed/variable rate loans	Mostly fixed rate	Mostly fixed rate	Often fixed for a period of 2–5 years
Maximum loan to value ratio in mortgages financed with bond issues	80 %	80 %	70 or 85 %
Mortgage loan maturity	Max 30 years	Max 30 years	Typically 20 years

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