The Economic and Financial Importance of Mortgage Bonds in Europe[1]

by Judith Hardt and Jung-Duk Lichtenberger

THE EUROPEAN CAPITAL MARKET

The mortgage bond is one of the dominant components of the European capital market. The volume outstanding at the end of 1999 amounted to more than 1.3 trillion euros (mortgage bonds covered by mortgage loans and public-sector loans), which represents around 18% of the European bond market. The mortgage bond plays an important role in the financial system and, thereby, contributes to the efficient allocation of capital and ultimately economic development and prosperity. (See Figure 1.)

The European bond market amounted to more than 7.6 trillion euros in terms of volume outstanding at the end of 1999 and is, thereby, slightly smaller than the European equities market. Equities market are particularly well developed in comparison to bond markets in the United Kingdom and Ireland, the Netherlands, Finland, Greece and Switzerland. The German bond market is by far the largest in Europe and ranks third world-wide behind the United States and Japan. The European bond market represents 98% of its gross domestic product (GDP), which compares with 130% in the U.S. The Danish bond market is the largest measured as a proportion of GDP (159%).

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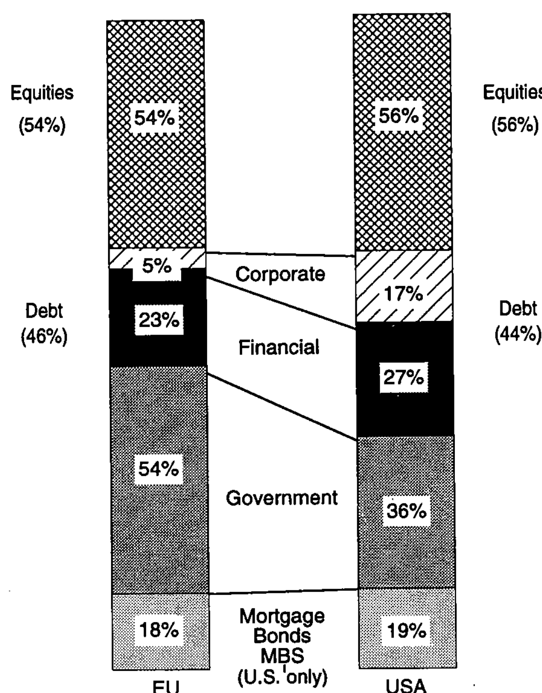
The largest borrowers in the bond market are governments, which finance a large proportion of their expenditure by issuing debt securities. Around 54% of the E.U. bond market in terms of volume outstanding is sovereign debt. Government bonds are popular securities because of the little or no risk of non-payment, i.e., it is certain that interest will be paid and that they will be redeemed (unless it is a perpetual bond) on the due date.

Corporations issue bonds in order to obtain capital for financing investments in the real economy. These corporations will usually be large multinationals. In the E.U. this type of financing is however very small and, as a result, corporate bonds amount to only 5% of the European bond market in terms of volume outstanding. This contrasts considerably with the U.S. and Japan where the size of the corporate bond market is significantly higher. Other corporations (financial institutions) issue bonds to finance loans granted to private and public borrowers. This type of issuance for "financial" purposes is much more developed in the E.U. The financial bond market amounts to 23% of the total E.U. bond markets in terms of volume outstanding (end 1999).

Compared to government bonds, debt securities issued by financial and non-financial corporations must offer a premium for the default risk, which is commonly perceived to be higher in the case of private institutions as borrower. This will be reflected in a higher yield for these bonds. The higher yield is not necessarily an advantage to the holder of the security since it constitutes a compensation for higher default risk. The risk premium required as compensation for default risk is strongly related to signals of the safety the market receives. Rating agencies help in the provision of reliable assessments of the credit quality.

Some bonds will have a higher credibility because they are secured by collateral. Other bonds will have higher credibility because the issuing institution is considered to be very safe. These two elements enhance the safety of the bond and they can be combined. This is the case, most notably, for the mortgage bond. Mortgage bonds are essentially secured debt securities issued by mortgage credit institutions and covered by certain types of assets, usually mortgage loans, that remain on the balance sheet of the is-

Figure 1 Capital Market Structure in European Countries and in the United States (Domestic debt and equity securities, nominal value of volume outstanding (debt) or market capitalization (equities), billions in euros, end-1999)



Debt refers to *domestic debt securities*, i.e., bonds, medium-term notes and money market instruments (commercial paper, Treasury-bills and other short-term paper (mainly CD)) that are either (i) issued by residents in domestic currency on their national market (whether purchased by residents or non-residents) or (ii) issued in euros by residents of a given country but explicitly targeted at domestic investors (domestic euro-denominated bonds).

Mortgage bonds refer to bonds issued by European credit institutions that are covered by mortgage loans. Figures for A, D and F include also bonds issued by European credit institutions that are covered by public-sector loans (öffentlicher Pfandbrief, obligation foncière). The term captures a variety of similar but heterogeneous assets with significant national characteristics :

Realkreditobligation	DK
Pfandbrief : Hypotheken- & öffentlicher Pfandbrief	D
Cedula hipotecaria	E
Obligation foncière	F
Pfandbrief	NL
Obrigaçoe hypothecaria	P
Bostadsobligation	S
Pfandbrief: Hypotheken- & öffentlicher Pfandbrief	A
Pfandbrief or lettre de gage	CH

MBS (mortgage-backed securities) refers to debt securities issued by the Government National Mortgage Association (GNMA or "Ginnie Mae "), the Federal Home Loan Mortgage Corporation (FHLMC or "Freddie Mac"), the Federal National Mortgage Association (FNMA or "Fannie Mae ") and private conduits (total subtracted from U.S. public-sector). Figures refer to the U.S. only and are reported under the column "mortgage bond."

Financial refers to debt securities issued by financial institutions other than mortgage bonds.

Government refers to public-sector (government, state agencies and international institutions).

Country	*Mortgage bonds*		*Government*		*Financial*		*Corporate*		*Total Debt Securities*	*Equities*
	Volume	*% Debt*	*Volume*	*% Debt*	*Volume*	*% Debt*	*Volume*	*% Debt*	*Volume*	*Mkt. Cap.*
Austria	12.2	8.8	75.2	54.3	47.3	34.2	3.7	2.7	138.4	32.9
Belgium	0.0	0.0	226.4	69.3	73.5	22.5	26.6	8.2	326.5	186.1
Denmark	153.1	59.0	88.3	34.0	2.0	0.8	16.1	6.2	259.6	105.0
Finland	1.2	1.5	46.5	59.9	22.6	29.1	7.4	9.5	77.6	348.6
France	37.7	3.4	655.5	58.7	320.6	28.7	102.9	9.2	1,116.7	1,499.5
Germany	1,056.3	44.0	768.8	32.0	570.8	23.8	6.3	0.3	2,402.2	1,428.9
Greece	0.0	0.0	90.0	99.6	0.4	0.4	0.0	0.0	90.4	203.8
Ireland	0.0	0.0	25.2	79.1	0.0	0.0	6.7	20.9	31.9	68.8
Italy	0.0	0.0	1,062.6	76.5	320.1	23.0	6.5	0.5	1,389.1	726.6
Netherlands	1.2	0.5	181.6	78.5	36.0	15.6	12.5	5.4	231.3	693.6
Portugal	0.1	0.2	36.2	58.4	14.8	23.9	10.9	17.6	62.0	68.0
Spain	11.5	3.4	285.0	83.1	21.3	6.2	25.1	7.3	342.8	429.9
Sweden	80.7	33.9	125.4	52.6	15.2	6.4	16.9	7.1	238.2	372.5
U.K.	0.0	0.0	465.5	50.0	315.5	33.9	149.7	16.1	930.7	2,947.8
E.U.	1,354.0	17.7	4,132.2	54.1	1,760.0	23.0	391.3	5.1	7,637.5	9,112.0
Norway	10.9	17.6	33.9	54.8	13.6	22.0	3.4	5.5	61.8	63.4
Switzerland	25.9	15.1	60.6	35.4	54.4	31.8	30.1	17.6	171.1	678.1
Europe	1,390.8	17.7	4,226.7	53.7	1,828.0	23.2	424.8	5.4	7,870.3	9,853.5
U.S.	2,312.0	19.3	4,357.0	36.4	3,253.0	27.2	2,054.0	17.2	11,976.0	14,966.0

Sources: Bank for International Settlement, European Mortgage Federation, Federation of European Stock Exchanges, The Economist

suer. In a number of E.U. member states, mortgage bonds are also secured against loans to the public sector (also called "public mortgage bonds").

Mortgage bonds were first issued over 200 years ago in Germany ("Pfandbrief") and have subsequently developed in other parts of Europe, most notably in Denmark, Sweden, Austria, France and Spain. Today, the mortgage bond has established itself as one of the dominant components of the European bond market. The volume of mortgage bonds outstanding in the E.U. exceeded 1,300 billion euros, which corresponds to 18% of total domestic debt securities outstanding in the European Union at the end of 1999.

Despite its long European tradition there is today, however, no common definition of the mortgage bond. Plans for common legislation were abandoned by the European Commission in 1985, following the publication of the White Paper on the Internal Market which put forward the principle of mutual recognition as an alternative to harmonization. Nevertheless, the special character of mortgage bonds has since then been enshrined in the 1988 Directive on Undertakings for Collective Investments in Transferable Securities (UCITS). Article 22(4) of this directive recognizes that the different types of mortgage bond share certain common characteristics that make them a particularly safe financial instrument. They must:

- Be issued by credit institutions.
- Be subject to special supervision by public authorities.
- Have sufficient cover for the liabilities deriving from the bonds.
- Have a privilege for bondholders in the event of the bankruptcy of the issuer.

Article 22(4) has subsequently been used in other E.U. regulations, including the solvency ratio, the large exposures, the third life and the third non-life insurance directives.

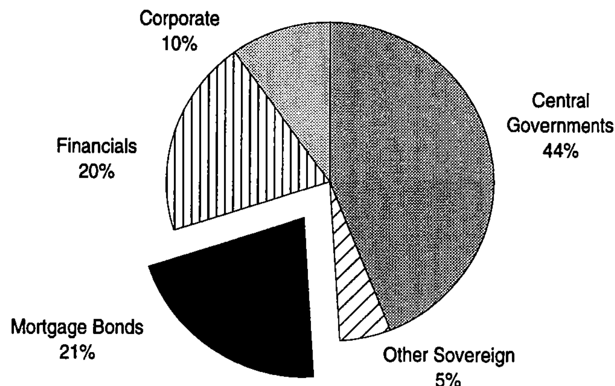
The development of the mortgage bond in Europe has been supported by its ability to combine relatively low risk with attractive returns. Between January 1998 and December 1999, the 10-year mortgage bond spreads expressing the yield differential between mortgage bonds and benchmark government bonds in Austria, Denmark and Germany ranged between 15 and 50 basis points (approximately 30 basis points).[2] In Sweden (five-year yield differential) and Norway the spreads were much higher at, respectively, 67 and 85 basis points. The factors giving rise to spreads for mortgage bonds however differ from one country to another.

The yield is an effective rate of interest obtained from a bond because it measures the interest return on fixed-income securities. The yield is calculated on the basis of the coupon and the price at which the bond has been purchased. The yield reflects the market perception of risks inherent to the bond itself (credit, liquidity and financial risk) and risk related to external factors such as interest rates, inflation and, in some cases, exchange rate movements.

One of the most significant factors explaining the spread on realkreditobligationer in Denmark is the possibility for the borrower to remortgage (prepay) a loan. The reason for the yield spread of Pfandbriefe over Bunds could be attributed primarily to lower liquidity. The higher spreads in Sweden and Norway may be explained by the fact that the mortgage bonds do not fully meet the criteria set out in Article 22(4) of the UCITS directive, thereby increasing the credit risk. Mortgage bonds in Sweden and Norway refer to debt securities issued by credit institutions and covered by mortgage loans but without the legal preferential right of the investors to these assets. However, since no other creditors would compete for these assets in case of the issuer going into liquidation, a de facto preferential right exists.

The strong increase in private issuing activity was perhaps the most striking development in the European bond markets in 1999. Figures published by the European

Figure 2 Gross Issuance in the Euro-Denominated Bond Markets in 1999



Source : European Commission

Commission indicate that mortgage bonds in particular have established themselves as one of the dominant components of the E.U. capital market denominated in euros. Mortgage bonds (and asset-backed securities) account for 21% of the volume of bonds denominated in the euro currency issued in 1999 (total of 1,407 billion euros). (See Figure 2.)

The preparations towards the euro and its subsequent introduction have indeed provided a strong incentive for the development of mortgage bond markets in Europe. Historically, low nominal interest rates have given rise to an environment that pushes mortgage lenders to adjust their methods of funding. The high demand for mortgages, coupled with low interest rates on deposits, raises questions over the continued ability of lenders to finance mortgages primarily through retail funds. At the same time, the elimination of exchange rate risk in the euro area and the initiatives undertaken by the European Commission to create a deep and liquid European capital market are encouraging many lenders to put greater emphasis on the wholesale markets as an alternative method for funding mortgage loans. Largely inspired by the success of the Pfandbrief in Germany, this has resulted in a number of measures to "re-activate" the use of mortgage bonds (France and Spain) or to introduce a mortgage bond law (Luxembourg and Finland). Similar discussions are taking place in Belgium and Ireland.

In this context, Article 22(4) of the UCITS directive has served as a formal recognition of the outstanding quality of the mortgage bonds and has considerably increased the transparency for the cross-border investor. This is important at a time when the euro is creating a vast E.U. capital market and expanding the opportunities for investment portfolio diversification while, at the same time, forcing governments to tighten the control over budget deficits to comply with the Maastricht criteria. Mortgage bonds can be expected to play an increasingly crucial role in this process of "crowding-in."

In a number of countries the mortgage bond shares some of the important roles of government bonds in a financial system. First, in many countries, prudential regulations (to ensure the stability of the financial system) require pension funds, insurance corporations and credit institutions (solvency ratio) to invest in securities with outstanding safety. Second, central banks use debt securities for liquidity-providing operations to implement monetary policy in order to minimize their risk exposure to counterparties. The collateral must therefore be a liquid instrument that meets high credit standards (i.e., ensure a high protection of the bondholder). Third, risk-free government bonds are used as a benchmark to price corporate bonds and other financial assets. If government bonds dried up (or if the market becomes less liquid), corporate bonds become harder to price and investors demand higher risk premiums. Derivatives would also become more complex and risky to trade and price. If the supply of government bonds dwindles (due to the Stability Pact), mortgage bonds could replace them as the benchmark used for pricing other fixed-income securities.

THE ISSUERS

There are more than 70 mortgage bond issuers in the European Union: 45 in Germany, 10 in Denmark, five in Sweden, three respectively in France, Luxembourg and Austria, two respectively in Finland and Switzerland as well as in Spain (see Figure 3). In most member states, mortgage bond issuers are credit institutions as laid down in European Union law and are subject to special public supervision. (These are two criteria set out in Article 22(4) of the UCITS directive.) Securities houses or other financial institutions are not allowed to issue this type of debt security. Beyond these common characteristics, however, there are considerable differences between the issuers in the different countries, and, in some cases, between issuer categories within the same country.

The right to issue mortgage bonds is confined, in nearly all countries, to specialized credit institutions whose activities are subject to restrictions. These restrictions relate to the nature of their activities both on the lending and on the liabilities side. This is the case most notably in Germany, Denmark, Sweden, France, Finland and Luxembourg. In several other European countries, including Austria, Spain, Portugal and Greece, the issuance of mortgage bonds is not restricted to specialized credit institutions. In Switzerland, any credit institution is allowed to grant mortgage loans but Pfandbriefe can only be issued by one of the two central Pfandbrief institutions.

The issuance of Pfandbriefe in Germany is subject to stringent legal provisions. At present, this privilege is granted to 45 German financial institutions which fall into three categories.

The first group is constituted of 23 private mortgage banks whose lending operations are limited essentially to mortgage loans and public-sector loans. They make up Germany's most important group of specialized banks. Commercial banks and/or insurance companies hold large stakes in most of these mortgage banks. In addition to these "pure" mortgage banks, there are also two "mixed" mortgage banks. Beyond the scope of business conducted by the pure mortgage banks, the mixed institutions are also licensed to engage in universal banking operations. The assets of the pure and mixed mortgage banks together represent around 20% of the total domestic assets held by all German banks.

The second group of Pfandbrief issuers contains the public-sector credit institutions (12 Landesbanken and 7 other public-sector issuers). Landesbanken are legally indepen-

dent public-sector entities. In the majority of cases, the owners are regional savings banks associations together with the respective federal state. The two largest groups of Pfandbrief issuers—private mortgage banks and (public-sector) Landesbanken—together account for almost 38% of the total domestic bond market in Germany (end-1999). The third group of issuers contains the two private ship mortgage banks.

Danish *realkreditobligationer* are issued by mortgage banks which, according to the law, are specialized credit institutions as they cannot undertake activities other than mortgage business or accessory activities. Their lending activity is funded through the issuance of mortgage bonds and they may not take deposits. There are currently ten mortgage banks operating in the market: eight are organized as public limited companies and two as independent institutions. The capital of mortgage banks organized as independent institutions is provided by commercial banks, savings banks and the Nationalbanken.

Bostadsobligationer in Sweden are issued by mortgage companies, which are limited liability companies with a special authorization under the 1992 act on financing operations to carry out mortgage business. There are currently five mortgage companies operating in the market; four are fully owned by banks and one is owned by the government.

In France, *obligations foncières* were traditionally issued by two institutions: Crédit Foncier de France and Caisse de Refinancement de l'Habitat (CRH). Since 25 June 1999, the issuers are "société de crédit foncier" (SCF). SCFs are specialized credit institutions. Since October 1999, there are two SCFs in operation.

In Finland, mortgage bonds can be issued by mortgage credit banks. These credit institutions may not take deposits. They concentrate solely on long-term raising of financing and on the granting of credit with adequate collateral. There are currently two mortgage credit banks. In Luxembourg, *lettres de gage* can be issued by specialized credit institutions whose principal activity is the issuance of mortgage bonds. There are currently three such institutions.

In Austria, Pfandbriefe are issued by the two mixed mortgage banks and the *Pfandbriefstelle der österreichischen Landeshypothekenbanken* (which groups the Pfandbrief issuance of the eight *Landeshypothekenbanken*). The mixed mortgage banks and the *Landeshypothekenbanken* are private joint stock companies. Only the *Pfandbriefstelle der österreichischen Landeshypothekenbanken* is a public-law credit institution. The Pfandbrief issuers are not specialized credit institutions.

In Spain, *cedulas hipotecarias* may be issued by any credit institution. They can be issued by commercial banks, savings banks, credit cooperatives and specialized financial institutions, but it is the first two types of institutions that have carried out most of the issuing activity so far.

In Switzerland, Pfandbriefe are issued by the two central Pfandbrief institutions which are private joint stock companies. One of them groups the 24 Canton Banks (state banks of the Cantons) and the second brings together all the other banks that have a dominant part of their business in the area of mortgage lending (224 banks). The business sector of the central Pfandbrief institutions comprises exclusively the issuing of Pfandbriefe and the on-lending of the proceeds as Pfandbrief loans to their member institutions.

MORTGAGE BOND MARKETS IN THE EUROPEAN UNION

Mortgage bonds are an essential component of the financial intermediation bringing

Figure 3 Mortgage Bond Issuers in Europe (1999)

Country	*Type(s) of Issuer*	*Number of Issuers*
Germany	Mortgage banks (23 pure and 2 mixed), public-sector credit institutions (12 Landesbanken, DGZ DekaBank and 6 public-sector real estate credit institutions), ship mortgage banks (2)	45
Denmark	Mortgage banks	10
Sweden	Mortgage companies	5
France	*Société de crédit foncier* (literally real-estate credit company) and *Caisse de refinancement de l'Habitat*	3
Luxembourg	Mortgage banks	3
Austria	Mixed mortgage banks (2) and the 8 Landeshypothekenbanken issuing through their central mortgage bond institution (Pfandbriefstelle der österreichischen Landeshypothekenbanken)	3
Spain	Any credit institution (commercial banks, savings banks and credit cooperatives and specialized financial institutions)	2
Finland	Mortgage credit banks	2
Switzerland	Central Pfandbrief institutions	2

together the demand for funds by households (other private entities or, in some countries, public authorities) in order to finance real estate at an efficient cost of capital and the supply of funds by portfolio investors who wish to obtain an attractive return on safe and liquid fixed-income debt securities. The safety of the mortgage bond allows lenders to obtain funds in capital markets at a reduced borrowing cost. The possibility to issue mortgage bonds, therefore, encourages lenders to provide medium- or long-term finance for housing, non-residential property or urban development at the lowest and most stable rate of interest possible for the borrower.

Households will borrow to invest mostly in residential property. Other types of borrowers will need capital to finance commercial buildings or other non-residential property such as ships, airplanes and agricultural property. In both cases, the lender could extend a loan to the borrower that is secured by a first-ranking mortgage on property or secured by an equivalent right, at a cost of capital that is lower than for a loan without such guarantees. In order to fund mortgage loans, the lending credit institution may choose to issue debt securities, which have as collateral the corresponding mortgage loans, and sell these debt securities to portfolio investors.

A mortgage bond, in this sense, is a security giving the holder of the bond a claim against the issuer, as with any binding security of this type, but enjoying a degree of special security because of it is covered by mortgage loans. This additional security significantly reduces the risk to the bondholder and he or she, therefore, will not require as high a return as for a similar bond that is not covered by mortgage loans. The issuance of mortgage bonds allows lenders to obtain funding at a reduced borrowing cost in the capital market and it is, therefore, a cost-efficient method of funding a mortgage loan.

The EMF estimates that around 20% of the total volume of residential mortgage loans outstanding in the E.U. is funded through the issuance of mortgage bonds (end 1998). (See Figure 4.)The issuance of mortgage bonds is the main specialized method used by lenders to fund mortgage loans granted to borrowers to finance the acquisition or construction of residential property.

The importance of the bond market as a source of funds for mortgage credit institutions, however, will vary significantly from one country to another. Countries which traditionally have recourse to the use of mortgage bonds are Germany, Denmark, Sweden and Austria. In Denmark, mortgage lending by mortgage banks is nearly fully funded through the issue of *realkreditobligationer.* The law does not allow Danish mortgage banks to take deposits but does allow them to issue other types of bonds, although this is not done in practice. In Sweden, *bostadsobligationer* constitute the leading source of mortgage finance. Swedish mortgage companies obtain around 70% of their funding through the issuance of *bostadsobligationer.* They may also request loans from other microfinance institutions (MFIs) (usually a parent company) but may not take deposits. Mortgage bonds constitute the second source of financing in France and Spain but represent only 17% and 6%, respectively, of total mortgage funding well behind deposits. In the Netherlands and Norway mortgage bonds are issued but fund a relatively a small part of lending (7% and 1%, respectively).

In Germany, *Hypotheken-Pfandbriefe* fund around 20% of the mortgage loans outstanding but the instrument (236 billion euros outstanding at the end of 1999) has established itself as one of the dominant asset classes in the European fixed-income market.

The mortgage bond market in Europe is highly concentrated. Three countries share more than 85% of the overall mortgage bond market. Germany leads with 44% of the volume outstanding, followed by Denmark (29%) and Sweden (15%). The remainder of the market is shared between Spain, France, Austria, Netherlands, Portugal, Finland and Norway. (See Figure 5.)

Figure 4 Recourse to Mortgage Bond Funding in the E.U. (% based on volumes outstanding, end-1998)

Country	*Mortgage Bonds/ Residential Mortgage Loans*
Denmark	100.0%
Sweden	65.0%
Austria	51.0%
Germany	19.0%
Norway	9.0%
Spain	4.4%
Netherlands	0.5%
Portugal	0.3%

Source: European Mortgage Federation and national sources

In a number of European countries, mortgage bonds are also used to fund loans to the public sector (national, regional and local authorities). These entities usually borrow to invest in infrastructure projects. The bonds are sometimes referred to as public mortgage bonds and are as well subject to restrictive laws. Public mortgage bonds are widely used in Germany and Austria where public sector loans now constitute the dominant collateral for mortgage bonds (See Figure 6.) Public mortgage bonds are also issued in France and Luxembourg.

Mortgage credit institutions play an important role in financing housing and, in some countries, public debt. The issuance of mortgage bonds to fund these loans is cost effi-

Figure 5 Distribution of Mortgage Bonds Outstanding by Country (1999) & Mortgage Bonds Outstanding as a Percentage of National GDP (end-1999; millions in euros)

Country	*Mortgage Bonds*	*Share of Mortgage Bond Market*	*% of GDP*
Germany	235,797	44.3%	48.8%
Denmark	153,118	28.6%	93.9%
Sweden	80,694	15.1%	34.1%
France	33,386	6.3%	3.4%
Austria	4,959	0.9%	6.8%
Spain	11,533	2.2%	1.5%
Netherlands	1,171	0.2%	0.5%
Finland	1,163	0.2%	1.1%
Portugal	100	0.0%	0.1%
Norway	10,894	2.0%	7.1%
Total	**532,814**	**100%**	**22.0%**

Note: For Germany and Austria only Hypotheken-Pfandbriefe are taken into account.

Source: European Mortgage Federation and national sources

Figure 6 Mortgage Bonds and Public Mortgage Bonds (volume outstanding, end-1999, millions in euros)

Country	*Mortgage Loans*	*Public-Sector Loans*	*All Mortgage Bonds*	*% Mortgage Loans*
Germany	235,797	820,477	1,056,274	22%
Denmark	153,118	0	153,118	100%
Sweden	80,694	0	80,694	100%
France	33,386	4,330	37,716	89%
Austria	4,959	7,220	12,179	41%
Spain	11,533	0	11,533	100%
Netherlands	1,171	0	1,171	100%
Finland	1,163	0	1,163	100%
Portugal	100	0	100	100%
Total	**521,921**	**832,027**	**1,353,948**	**39%**

Source: European Mortgage Federation and national sources

cient because portfolio investors are given a preferential right on a pool of assets that covers the mortgage bond. Mortgage credit institutions must cover mortgage bonds at all times by an asset pool (cover principle) and observe strict rules regarding the relationship between their assets and liabilities (congruence principle).

The asset pool covering mortgage bonds includes mortgage loans (residential and non-residential), loans to the public sector, and, in some countries, loans of an equivalent safety. The value of the cover pools has to be at least as high as the liabilities from outstanding issues and their interest payments. In a number of countries, mortgage credit institutions must create separate asset pools for each type of cover. For instance, in Germany, the public-sector loan pool consists of loans to public-sector funded by öffentliche Pfandbriefe, and, similarly, the mortgage asset pool consists of residential and non-residential mortgage loans funded by *hypothekenpfandbriefe*.

Moreover, mortgage loans covering mortgage bonds cannot exceed a certain percentage of the conservatively calculated mortgageable value of the residential or non-residential property. This percentage differs according to national requirements. For instance, in Germany and Austria this percentage is 60%, whereas in Denmark it is up to 80% for residential property and 60% for non-residential property.

The congruence principle ensures that mortgage banks match the maturity of their assets and liabilities. A mortgage bank may not lend money with fixed conditions for a longer time period than these funds are available with fixed conditions. Borrowers when taking out a loan from a mortgage bank can choose the term. In order to hedge interest rate risk, the mortgage bank then matches the maturity of the loans with the maturity of the mortgage bonds, which are issued to fund the

loans. In addition, in a number of countries, there exists a clause which excludes the borrowers' right to prepay their loans, thus protecting mortgage banks from prepayment risk and reducing the likelihood of future mismatches concerning the banks' asset and liability structure.

The mortgage loans granted by Danish mortgage banks are funded through the sale of bonds on the Copenhagen Stock Exchange. The bonds are usually divided into series (or lots, if the mortgage bank grants loans without joint and several liability) whose characteristics will depend on the time of the taking-up of the underlying loan, the interest rate and the repayment terms. The bonds are subject to the so-called "balance principle" which ensures that there is a close match between the loans granted and the bonds issued to cover the loans (protection against interest rate risk). In principle, Danish mortgage bank issue bonds with precisely the same amount and interest rate as the principal and interest on the loans which the bonds finance.

MORTGAGE-BACKED SECURITIES

In a number of European countries, mortgage loans are also funded through the issuance of mortgage-backed securities (MBS). However, overall their use remains rather limited. The EMF estimates that around 1% of the total value of residential mortgage loans outstanding in the E.U. (end 1998) are funded by this method. (The estimate excludes the U.K. where figures on MBS outstanding are not available).

The U.K. is the largest MBS market in the European Union. New issues of MBS in the U.K. in 1999 totalled 8.2 billion euros, which represents 4.5% of gross mortgage lending in the period (see Figure 7). MBS are becoming more popular as a method of removing assets from balance sheets to reduce the amount of capital which has to be retained. As the market for mortgages becomes more competitive in the U.K. the use of MBS is likely to become more common.

In Ireland, securitization is likely to increase in importance as a funding source as more mortgage lenders acquire the expertise and systems required to issue MBS. With the volume of new lending increasing each year on the back of the buoyant Irish economy, lenders are likely to look to issues of MBS to move quality existing loans off the balance sheet and hence free up capital for additional new lending.

Elsewhere in Europe, securitization of mortgage loans has been relatively active in Spain (3.2 % of mortgage lending in March 1999) and France. Other countries that issue MBS include the Netherlands, Belgium and Germany, but activity remains limited. MBS have not been issued in Denmark, Greece and Austria. As for the other Scandinavian countries, some U.K.-style MBS were issued in the beginning of the 1990s. In June 2000, a 1-billion-euro issue was made by a Swedish issuer using U.K.-style techniques.

MBS and mortgage bonds are both based on the concept of using the mortgage loans held by an institution as collateral for the issuance of debt securities in the capital market. But beyond this common element, the two are quite different (see Figure 8).

The difference may perhaps best be seen by summarizing the process of production of a new mortgage loan into the following three phases: A mortgage loan is extended to the borrower (also referred to as "origination"). Similar loans are then grouped or bundled. The mortgage loan is funded. The process whereby a mortgage credit institution issues a mortgage bond combines these three phases. The same institution carries out all the phases. It originates the mortgage loan and issues the securities to fund the loan.

Securitization, on the other hand, "unbundles" this process. The credit institution creates a legal entity known as a special purpose vehicle (SPV) and sells mortgage loans that it has originated ("receivables") to this SPV. The purpose of the SPV is to iso-

Figure 7 European MBS Markets: Market Size and Importance as a Funding Instrument (millions in euros, 1999)

Country	MBS Market Size		MBS as a Funding Instrument	
	Gross Issuance	Volume Outstanding	% Gross Lending	% Loans Outstanding
Belgium	0	1,909	8%	3%
Spain	5,932	9,772	14%	6%
France	3,474	10,290	9%	4%
Ireland	1,150	1,750	18%	7%
Netherlands	0	1,815	1%	0.7%
United Kingdom	8,245	nav	4%	nav
European Union	18,801	25,536	4%	0.8%

* Belgium refers to 1998

Source : European Mortgage Federation and national sources

late the receivables and the associated cash flows from the originator and to perform certain other closely related operations (such as restructuring of cash flows and credit enhancement). The SPV issues the securities which are sold to investors. (If the originating institution continues to participate, it is usually as "servicer," i.e., collector of principal and interest payments and processor of other related back-office functions.)

The significant difference is that in the case of mortgage bonds, the originating institution keeps the assets on its balance sheet and maintains ultimate responsibility for the credit risk of the bond. The mortgage loans and the bonds remain on the balance sheet of the originating mortgage credit institution. From the point of view of the issuer, the mortgage bond forms part of the liabilities of the institution. It is linked to a certain amount

Figure 8 Comparison of Mortgage Bonds and Mortgage-Backed Securities

Criteria	*Mortgage Bonds*	*MBS*
Mortgage loan production	Bundled process	Unbundled process
Type of securitization (balance sheet treatment)	Assets remain on the balance sheet of the originating institution ("on-balance sheet securitization")	Generally, assets are removed from the balance sheet of the originating institution ("off-balance sheet securitization")
Source of principal and interest payments	Issuer cashflow	Collateral cashflow
Risk exposure		
• credit risk	Issuer	Investor
• prepayment risk	Issuer	Investor
• market risk	Investor	Investor
Investor protection in the event of issuer bankruptcy	Bankruptcy privilege : The bondholder has a priority claim on assets in case the issuer goes bankrupt (quasi-bankruptcy remoteness).	Bankruptcy remoteness is built into the structure of the MBS. (The bankruptcy of the originating institution does not affect the servicing of the MBS.)
Credit quality	In addition to the asset quality, depends mainly on the strength of the originating institution and the legal framework.	In addition to the asset quality, depends mainly on the strength of the structure created.
Over-collaterization	Defined by law	Usually required for a high credit rating.
Tiered capital structure	Subordination is inherent in the system (e.g., requirement to respect certain LTV ratios).	A structure distinguishing between senior and subordinated securities needs to be created.
Guarantee	A guarantee (if given) will be provided by the originating mortgage credit institution.	Guarantee provided by a third party such as insurance company or a bank ("credit enhancement").
Collateral pool structure	1. Individual components of the asset pool are substitutable. 2. Mainly heterogeneous assets 3. Eligible assets defined by law (e.g.,requirement to respect certain loan-to-value ratios and sound property valuation methods)	1. Individual components of the asset pool are (in general) not substitutable. 2. Mainly homogeneous assets. 3. Eligible assets are not necessarily de-fined by law.
Interest payment	Typically yearly	Typically monthly
Principal redemption	Bullet form	Amortization and prepayment

Sources: European Mortgage Federation, Organization for Economic Cooperation and Development (OECD)

of mortgage loan assets, but normally not to a specific set of mortgage loans.

The use of MBS, by contrast, involves the sale of mortgage loans and their complete removal from the balance sheet. (In some cases, the assets supporting the securities never appear on the balance sheet of the originator.) The institution retains any excess interest from the loans over the all-in cost of the securitization in the form of servicing commissions or other types of income, but removes the loans and any associated capital requirement or risk provision from the balance sheet.

The fact that whether or not mortgage loan assets and mortgage bond liabilities remain on the balance sheet of the originating credit institution will give rise to a number of further differences.

With the use of mortgage bonds, the credit institution generally remains exposed to the credit, market, prepayment and other risks inherent in the mortgage loans themselves, but is able to obtain cheaper financing because the bonds are covered not only by the underlying mortgage loans but also by the reserves and other funds of the mortgage banks. In addition, the entire mortgage bond system is subject to banking supervision. The MBS investor, on the other hand, purchases a security which is based upon the cashflows resulting from the securitized assets without recourse to the originating institution. The investor thus accepts the credit and the prepayment risks on top of the market risk. These risks and all other risks inherent in the mortgage loans are eliminated for the originating institution, but transferred to the investor.

From the point of view of the investor, the mortgage bond is still essentially the credit risk of the issuing institution, but it does involve the additional security of a claim through the underlying mortgage loan and a strict legal framework. In the event of bankruptcy, the cover pool becomes, in most countries, a separate trust structure that ensures the continuity of the cashflows to the mortgage bondholder. For MBS, the investor's purchasing decision is separate from the credit standing of the originating institution. The decision instead depends on the investor's assessment of the capacity of the underlying assets to generate the cash flows needed to meet contractual payments, the degree of protection incorporated in the structure of the security itself and/or on the quality of the guarantor.

Securitization was initially developed during the 1970s to promote residential mortgage finance in the United States where MBS have become major instruments in the capital markets. At the end of 1999, the volume outstanding of MBS amounted to 2.7 trillion euros, which represent around 57% of the volume of residential mortgage loans outstanding in the U.S. and 39 % of GDP (see Figure 9).

The MBS market is dominated by the three agencies that purchase or insure mortgage loans from banks, savings institutions and mortgage companies. They are the Government National Mortgage Association (GNMA or "Ginnie Mae"), the Federal Home Loan Mortgage Corporation (FHLMC or "Freddie Mac") and the Federal National Mortgage Association (FNMA or "Fannie Mae").

As part of the Department of Housing and Urban Development, Ginnie Mae is a federal institution. MBS issued as Ginnie Maes are

Figure 9 MBS Market in the U.S.: Market Size and Importance as a Funding Instrument (1997–1999, billions in euros*)

Year	*MBS Volume Outstanding*					*Mortgage Loans (Residential)*	*Funding*	
	Total	*GNMA*	*FHLMC*	*FNMA*	*Private Conduits*	*Volume Outstanding*	*MBS Share*	*Loans in Portfolio***
1997	2,123	527	581	694	321	4,031	53%	1,908
1998	2,400	527	649	811	414	4,363	55%	1,963
1999	2,719	570	751	932	466	4,798	57%	2,079

*Euro/U.S. dollar = 0.992
**Includes loans held in portfolio by FNMA and FHLMC

Source : Federal Reserve Board (quoted by Mortgage Bankers Association of America)

guaranteed by the full faith and credit of the United States government with respect to timely payment of both interest and principal. For the guarantee, Ginnie Mae receives a fee ("guaranteeing fee"). Freddie Mac and Fannie Mae are commonly referred to as agencies of the U.S. government. Their stocks trade on the New York Stock Exchange and they are quasi-private corporations. Although their guarantee does not carry the full faith and credit of the U.S. government, the market believes that there is an "implicit" government guarantee.

In addition to securities issued by the three agencies, there are also mortgage-backed securities issued by private banks or corporations ("private conduits"). The MBS issued by agencies are restricted to mortgage loans that satisfy a certain standard of underwriting. Such mortgages are called conforming mortgages. The private conduits, on the other hand, can also bundle loans that do not satisfy those underwriting standards. Such mortgages are called non-conforming.

NOTES

[1] This article is a shortened version of the introductory chapter of "Mortgage Banks and The Mortgage Bonds In Europe," published by the European Mortgage Federation, NOMOS Verlagsgesellschaft Baden-Baden, May 2001.The full chapter contains sections on investors and the market for mortgage bonds. See also Judith Hardt, "Recent Developments in European Mortgage Markets," December 2000, *Housing Finance International.*

[2] The level of mortgage bond spreads fluctuates over time. The figures refer to a particular moment in time in order to provide a very rough indication of the yield differential between mortgage bonds and benchmark government bonds of comparable duration. The figures do not reflect a cross-country comparison of the cost of mortgage bond issuance.

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