A heavenly match
or
Recent developments in mortgage lending in the EU and some tentative reflections on its positioning in the financial structure

by [1,2]

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ABSTRACT: This paper reviews developments in mortgage lending in the EU, including the assessment of covered bonds – a major source of finance for mortgages – by rating agencies. Mortgage models in the EU come in many different varieties reflecting that EU legislation allows a diversity of models. The different mortgage models are assessed against four criteria and in a structural context. It is possible to draw some tentative conclusions as to the relative performance of mortgage models.

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[1] The authors are all employees of Nykredit, However, the views expressed do not necessarily represent the views of Nykredit.
[2] Data work by Lasse Pedersen.

Mortgages are by far the biggest liability on households balance sheet and make up a substantial chunk of bank's lending, in the Euro area more than 30 pct. of lending of the MFIs. In some sense they are an anomaly on banks' balance sheets or at least an extreme stretch of the maturity transmission of banking. The typical maturity of a mortgage in the EU is 30 years.

Stop for a moment and reflect on what has happened over the last 30 years. The fall of the Berlin Wall, the integration of Eastern Europe in the EU, the rise of China, the internet, the shift from stagflation to fears of deflation etc. And in the narrow financial world, the S+L crisis, The Asian crisis, the dot com bubble, the financial crisis and the government debt crisis. Or a very specific development as the disappearance of the market for anything but very short term unsecured interbank lending leaving long term contracts dependant on a LIBOR that is set with limited foundation in actual transactions. Who knows what will happen over the next 30 years?

The match of institutions dependant on short term funding with borrowers who need a 30 year commitment must have been made in heaven, if it is to be a stable relationship. Funnily enough more earthly (re)designers of the financial system has considered changing many aspects of the financial system, but not this part. Both the Vickers Report[3] and the Liikanen report[4] focus instead of leaving market functions and non-retail operations outside the perimeter of core banking. The biggest issue in relation to the policy considerations on mortgage lending is the risk weights, where there seems to be an increased consensus on the need to raise the risk weights or at least set a limit on how low they can be.

Mortgage lending comes in more than fifty shades of grey. The variety across countries is immense, cf. ECB(2009)[5].

Developments in mortgage lending in the EU has differed dramatically across countries during the financial crisis. While there is some pattern that suggests that countries that saw significant growth up to the financial crisis, has suffered particular hardship during the crisis, in line with Reinhart and Rogoff

[3] Final Report Recommendations, September 2011, ICB, London.
[4] High-level Expert Group on reforming the structure of the EU banking sector, Chaired by Erkki Liikanen, FINAL REPORT, Brussels, 2 October 2012.
[5] OCCASIONAL PAPER SERIES, NO 101 / MARCH 2009, Task Force of the Monetary Policy Committee of the European System of Central Banks, HOUSING FINANCE IN THE EURO AREA.

(2009)[6] more general results, there are also differences as to how hard a fall similar upturns gave rise too.

To make a more systematic assessment, we need some criteria. There are many possible criteria for assessing a mortgage system. Here we focus on four: Affordability, resilience towards falling property prices, robustness during and after periods of financial stress, and government intervention, cf. also Berg and Nielsen (2012)[7].

We are not the only ones assessing mortgage systems. Credit rating agencies are in this business for money. While their recent record is somewhat wobbly, so is the record of most others. Credit rating agencies assessment is particular easy to monitor in relation to the covered bonds that they rate.

In this paper, we mostly take a narrow perspective on mortgage lending. A next step would be to analyze mortgage lending in a broader perspective. The overall objective of financial reform should be to allocate risk in a sensible manner, rather than take all risk out of the system or push it to the least regulated segment.

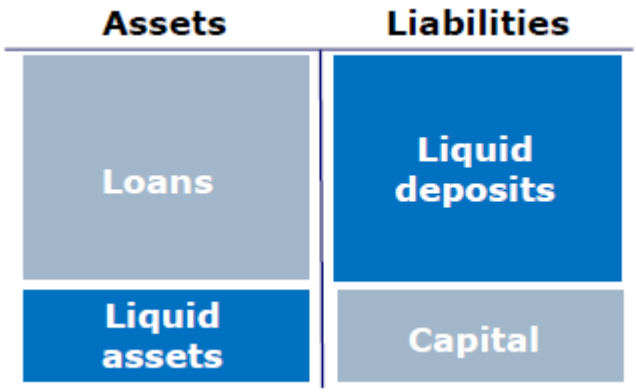
The structure of this paper runs as follows. Section 1 is a primer on banking, the inherent instability of banking and structural ways of addressing this instability, including recent proposals. Section 2 updates some of the key numbers in the 2009 ECB report on Housing Finance in the Euro area to cover the years of the financial crisis and broadens it to include numbers from four important non-Euro EU counties. Section 3 is a generic introduction to mortgage lending and the many possible permutations of mortgage lending parameters. Section 4 reviews developments in rating agencies assessments of covered bonds from different EU countries. Section 5 assesses the developments across countries, including some important non-EU countries, on the basis of the four mentioned criteria. Section 6 concludes and provide a link to broader issues in relation to the financial structure.

[6] This Time Is Different: Eight Centuries of Financial Folly, Carmen M. Reinhart and Kenneth Rogoff, Priceton University Press, 2009.
[7] A NEW HOUSING FINANCE SYSTEM FOR THE US?, Jesper Berg and Morten Baekmand Nielsen, to be published in Re-developing America, University of Pennsylvania Press.

1. *A primer on banking instability and structural remedies*

Financial intermediation can be illustrated by a balance sheet of a very simple bank that has deposits and capital as liabilities and loans and liquid assets as assets, cf. chart 1. This balance sheet can illustrate the benefits and risks, the externalities associated with bank failure, and a number of different ways to contain these risks, including – but not limited to – increases in capital requirements and the introduction of liquidity requirements.

CHART 1 - A SIMPLIFIED BANK BALANCE SHEET



Banks creates welfare by paying interest on liquid deposits and by making loans available at comparable low rates because of the maturity transformation and credit transformation banks performs. The bank relies on the fact that normally the withdrawals and deposits more or less cancel each other out. The liquidity of deposits can thus under normal circumstances be maintained at low cost. Furthermore, banks skill set and scale gives them a comparative advantage as monitors of credit quality.

As described by *Bagehot* in 1873[8] and modeled 110 years later by *Diamond and Dybvig*[9] this is not a stable equilibrium. If a run starts there is an incentive to be among the first that get out. Or in a slight rephrasing of Mervin King's statement, while it is not smart to start a bank run, it is definitely smart to be among the first in the pack running. The reason is that a bank is worth much more as a going concern than in a forced liquidation. The first, who get out,

[8] Bagehot, Lombard Street: A description of the money market, London, 1873.
[9] Diamoind and Dybvig, Bank runs, deposit insurance, and Liquidity, JPE, 1983.

gets paid from the liquid assets. At some stage the less liquid loans has to be sold. In a market under pressure that is likely to happen at prices below par. Thus the capital of the bank will be reduced. When the capital is gone, there is not enough assets left to pay the remaining depositors. A depositor with perfect foresight thus has an incentive to be among the first that gets out.

The failure of a bank is costly also for others than those who have contributed capital and deposits. There are negative externalities.

Most countries have deposit insurance that protects ordinary depositors. The deposit insurance entails costs for those that finance the pay outs. This create negative externalities. The case for deposit insurance is twofold. One, bank's accounts are opaque and the ordinary depositor has little chance of understanding them. Two, deposit insurance reinserts some stability in the unstable banking model by lessening the incentive to run.

Bank failures also have social costs, as a result of that credits are cut and projects abandoned. Other banks have difficulties in stepping in as new lenders because of the informational asymmetries, or in bankers language the lack of credit history. In some cases the forced liquidation of assets depresses the valuation of assets owned by other banks, and starts a financial accelerator effect. *Bernanke* describes in his work on the Great Depression, how the financial accelerator drove falling collateral values and declining overall capacity by banks to lend. This, much more than losses on counterparty exposures, was a main driver of the recent financial crisis[10].

The fact that the negative externalities can both be associated with the liability side of a financial intermediary and the asset side is very important for the design of financial regulation. It may not be a trivial exercise to handle the negative externalities arising from the liability side. However, it is much more complex to deal with the negative externalities arising from the asset side, cf. recent work on shadow banking[11]. While the regulatory perimeter is fairly well defined in relation to the liability side, i.e. deposit takers (banks), it is much wider and less well defined in relation to the asset side, the funding of the economy.

[10] cf. Journal of Economic Perspectives, Winter 2011.
[11] EUROPEAN COMMISSION, Brussels, 19.3.2012, COM(2012) 102 final, GREEN PAPER, SHADOW BANKING.

It is very important to be clear on which externalities should be addressed. Measures that address the externalities associated with the liability side could unintentionally shift activity to the unregulated funding industry. The end result could be that, while we have a safe banking system, non-banks dominates funding, which becomes very volatile.

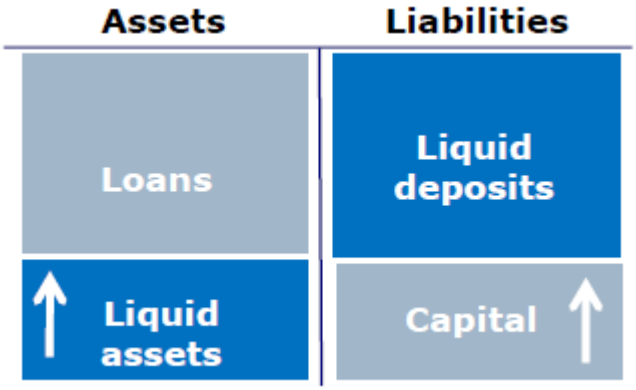
The relation between solvency and liquidity is a difficult one. Economists think of solvency as a question of whether there is any equity left. Lawyers think of solvency as a question of whether you can be expected to meet your obligations, i.e. more as a question of liquidity. Prior to this crisis, many economists – but not *Rochet and Vives*[12] - thought that illiquidity reflected insolvency. Thus there was deep skepticism on whether Bagehot's old advice on lending to illiquid but solvent institutions was lending to the empty set. This crisis has shown that illiquidity can lead to insolvency not only for one institution, but also thru fire sales for other institutions.

Thus, central banks, acting as lenders of last resort and standing ready to provide liquidity against illiquid assets, is another way of safeguarding the system. Bagehot as well as Diamond and Dybvig described this avenue. It can be argued that lender of last resort liquidity support creates moral hazard in a similar general manner as deposit insurance. With the notable exception of the Bank of England in the early phase of the financial crisis, most central banks have seen the moral hazard issue in relation to liquidity support as a second order issue. It may play a role that the social costs of liquidity support are much less than the costs of deposit insurance.

Supervisors have traditionally focused on capital buffers that could cover losses on the loans, cf. chart 2. In the most recent proposals for a new regulatory framework, international liquidity standards are introduced for the first time. Liquid assets protect a bank from having to do forced selling and thereby serves as a buffer to capital.

[12] Coordination Failures and the Lender of Last Resort: Was Bagehot Right After All?, Jean-Charles Rochet and Xavier Vives, July 6, 2004.

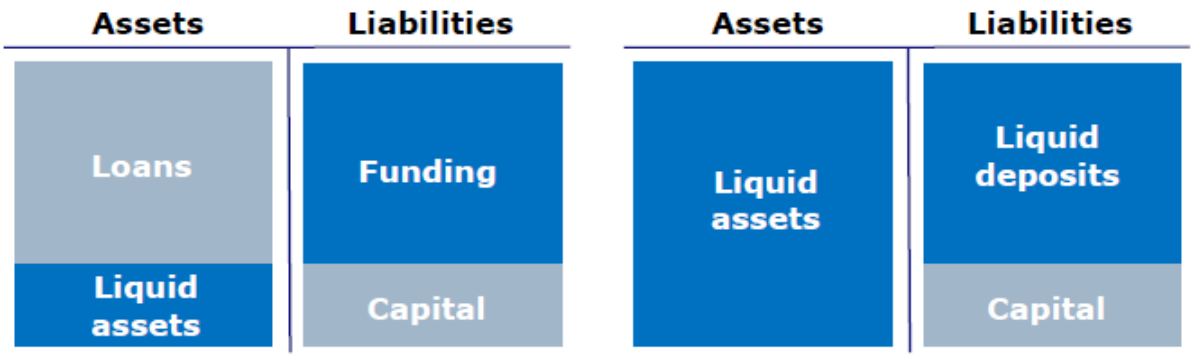
CHART 2 – BANKING REGULATION 101



There are many ways to address the inherent risks of banks. Looking at the simple balance sheet, there are more handles that can be adjusted, than is usually being considered.

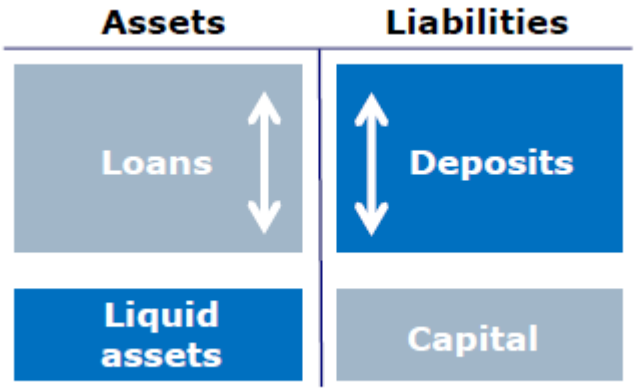
Narrow banking is another possibility, cf. chart 3. In Narrow banking the assets of banks are restricted; in the most restrictive version to short government bonds, i.e. there are no loans in the simple balance sheet, and these will have to be granted by other institutions. In less restrictive version only certain assets or activities are "no go". The Volcker rule and the recommendations of the *Vickers Commission* are examples of such less restrictive versions. Both the Volcker rule and the recommendations of the Vickers Commission face difficult delineation issues. What constitutes proprietary trading and what is retail banking? Presumably the latter will include mortgages and their financing and thereby the very significant maturity transformation associated with mortgages.

CHART 3 – NARROW BANKING



The risks can also be reduced by changing the deposit contract, cf. chart 4. The deposit contract can be made similar to mutual funds, where you have the right to a share of the pie rather than a fixed amount. The practical difficulty is to value the pie. The run on the mutual funds during the financial crisis and the stigma associated with breaking the buck also suggests that the model was not as watertight as some thought. However, valuing the assets could be left to the markets, if there is no possibility of redemption, i.e. if it is a closed fund.

CHART 4 – THE MUTUTAL FUND MODEL

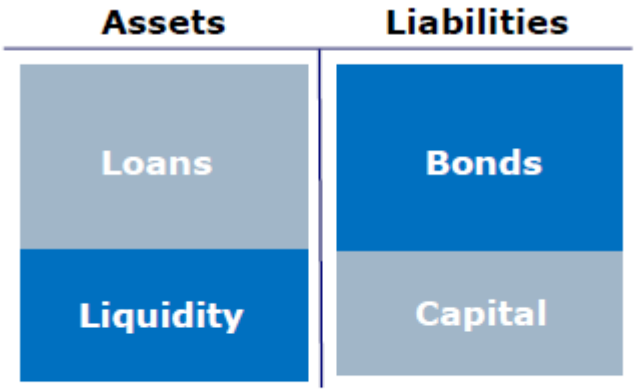


The riskiness of the bank construction also depends on the more general design of the surrounding economy. If creditor protection is limited, defaults on loans are more likely and the costs in case of default will be higher. Similarly, a social safety net lowers risks of default and costs.

The non deposit taking specialized mortgage system that exists in a number of European countries, including but not only Denmark, combine some of these

features with a balance principle that makes it a very "dull" system, cf. chart 5. These days, "dull" is a plus word, as it implies safe.

CHART 5 – THE SPECIALIZED MORTGAGE BANK



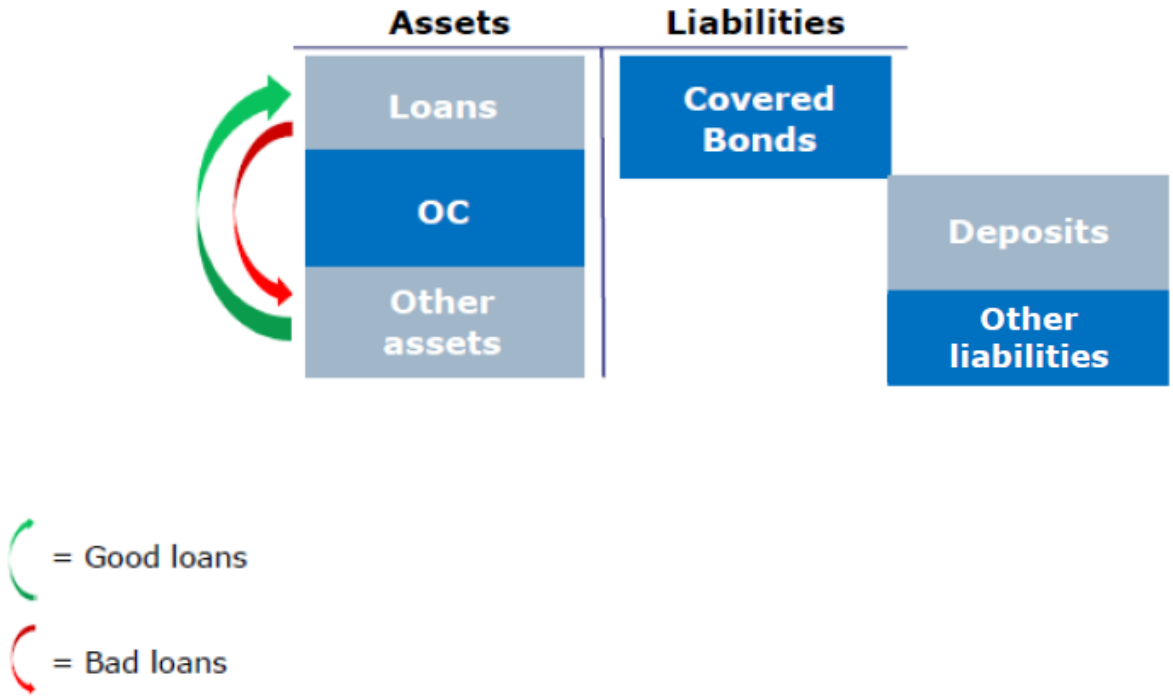
The Danish mortgage system is a pass through system, where payments on loans pass through to bondholders. The bond holder cannot withdraw her funds as a depositor can. There is no maturity transformation and the intermediary is not exposed to interest rate risk[13]. Credit risk is contained through personal liability as opposed to the no recourse loans that caused so many problems in the US. The legal system ensures that foreclosure is unusually quick, around 6 months, and the social safety net means that in most parts of the country families can service their debt with one family member unemployed. Originate to hold as opposed to originate to distribute results in sharp credit assessments.

Covered bonds have been criticized for creating structural subordination of depositors as assets are set aside for covered bond holders. It is important to note that such structural subordination per definition does not apply to specialized institutions that do not take deposits. Here, any other creditors are consenting adults, who do not rely on deposit insurance.

[13] It is sometimes mentioned that the Danish version of ARMs creates a liquidity risk. Traditionally Danish mortgage loans were 20 or 30 year fixed rate mortgages with a conversion option should interest rates fall. The bonds issued to finance the mortgages matched the loans in terms of maturity, interest rate and conversion option. In the 1990ties ARMs were introduced, where interest rates were reset from once a year to once every ten years. The ARM loans were financed by auctioning mortgage bonds compatible with the interest rate reset. Thus, the mortgage institutions are exposed to a liquidity risk should they not be able to sell the bonds. However, that risk is much more limited than in systems where the interest rate reset on mortgages is not aligned with the refinancing. In the Danish system mortgage institutions are obliged to pass on the rate set at the auctions to the borrower. Therefore, they are never left with an interest rate risk that in turn can create a liquidity risk, as buyers of the bonds will be reluctant to acquire bonds issued by institutions that are potentially at risk in the event of increases in interest rates.

In institutions that do take deposits, the structural subordination created by covered bond issuance depends on the overcollateralization of the covered bonds, cf. chart 6. The more assets reserved for covered bonds, the less available for depositors, and the larger the potential bill for the deposit insurance scheme and in the worst case the tax payers; if a bank is bailed out by the government.

CHART 6 – STRUCTURAL SUBORDINATION OF DEPOSITORS



Thus, there is a case for limiting overcollateralization. Canada in fact recently introduced legislation to limit overcollateralization. The argument was partly structural subordination, and partly that the combination of limits on overcollateralization and the need to uphold a decent rating, required lenders to maintain much higher credit standards.

Limits to overcollateralization would also make stand alone systems more stable, as overcollateralization introduces a liquidity risk in such systems

In this context, it is important to note that overcollateralization is a result not only of the requirements of rating agencies, but also of the requirement in CRD/CRR that covered bonds maintain an LTV below certain limits on a

continuous basis on each mortgage. The Danish mortgage system functioned for almost 200 years without losses to bondholders with an LTV limitations that only applied to loans at origination.

The continuous LTV requirement is a good example of a requirement that on the surface makes sense in relation to the objective of setting aside adequate capital on the risk in holding the bonds. Covered bonds of lesser regulatory quality, so called UCITS compliant bonds where the LTV is only observed at issuance, carry double the risk weight of CRD compliant covered bonds. However, from the perspective of the risk of the issuer, this creates an incentive to issue CRD compliant bonds, which increases the risk of structural subordination of deposit taking issuers and the liquidity risks of both deposit taking and non-deposit taking issuers. Thus, when you look at the financial system as a whole, it is not clear, whether the regulatory framework in this area contributes to financial stability.

2. *Mortgage lending in the EU during the financial crisis*

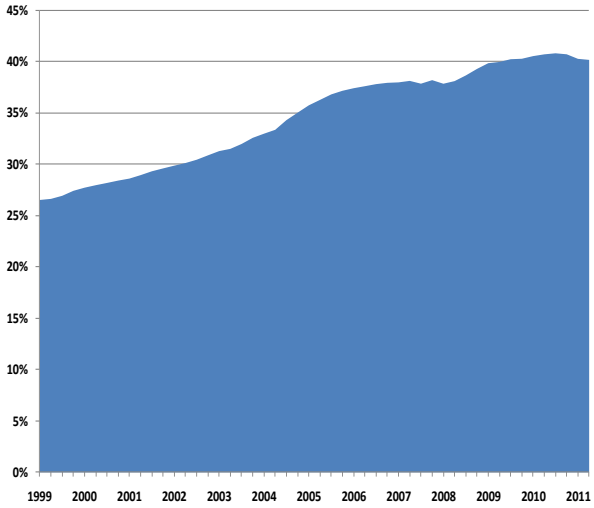
This section describes the development of key housing related statistics before and during the financial crisis. ECB (2009) conducted a similar analysis of the pre-crisis trends; hence, the data presented here is an updated version of the ECB analysis extended in both the time dimension as well as a broader set of countries, thus including some of the non-euro members.

For the Euro-zone on aggregate, housing related debt levels for households have increased remarkably since the introduction of the Euro in 1999. As of 2011, housing related debt constitutes roughly 40 percent of Euro-zone GDP up from 25 percent in 1999, cf. chart 7. The growth rate in housing debt among European households was particularly pronounced in the pre-crisis years whereas levels have stabilized since 2008.

On a disaggregate level there are large differences among European countries reflecting the different mortgage market structures across member states (see chart 8). Most countries (with Belgium, Germany and Ireland as exceptions) have experienced rather large increases in the level of indebtedness from pre-

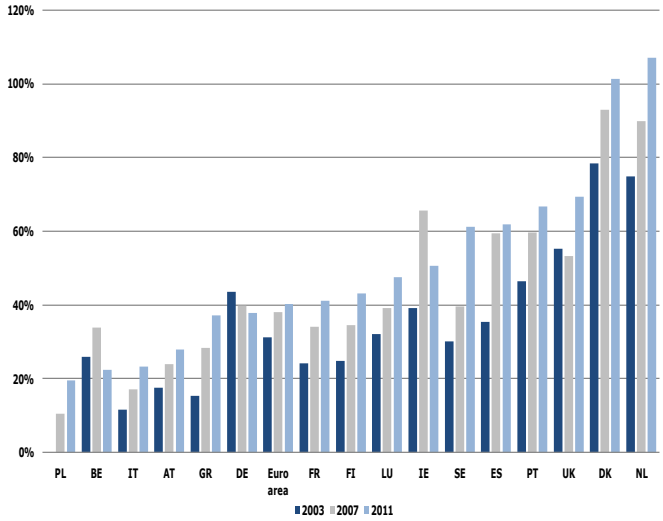
crisis levels. The Netherlands rank as the most indebted Euro-member relative to domestic GDP sharply followed by non-Euro member Denmark.

CHART 7 – EURO-ZONE HOUSEHOLD HOUSING-RELATED DEBT IN PERCENT OF EURO-ZONE GDP



Source: ECB

CHART 8 – HOUSEHOLD HOUSING-RELATED DEBT IN PERCENT OF DOMESTIC GDP



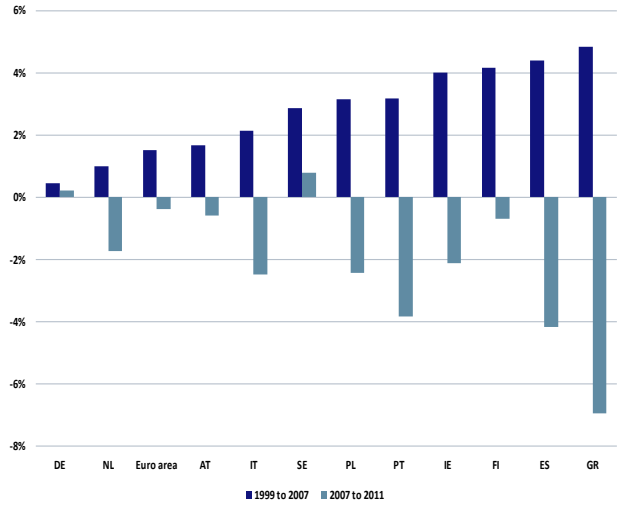
Source: ECB and European Mortgage Federation

The increase in indebtedness reflects development of a range of factors such as disposable income growth, low interest rates and increasing house prices. From 1999 to 2007 real disposable incomes were characterized by steady positive annual growth rates averaging 1.5 percent for the Euro-zone countries, cf. chart 9. Among member states growth rates display great diversity; real disposable incomes thus increased by more than four percent per annum in Greece, Spain and Ireland whereas Germany and the Netherlands experienced annual growth rates of less than one percent. The crisis years since 2007, in contrast, reveals the exact opposite figures. Accordingly, the countries that experienced the most rapid growth prior to the crisis tend to be the countries hit hardest (with Sweden and Finland as notable exceptions).

Chart 10 plots the average annual growth rate of nominal GDP against the average annual growth rate of housing related debt. In the pre-crisis period 2003 to 2007, there was a strong positive correlation between the two variables. This correlation both reflects the increased ability of the more wealthy households to take up more debt as well as simultaneous credit multiplier affecting GDP positively following financial liberalization and

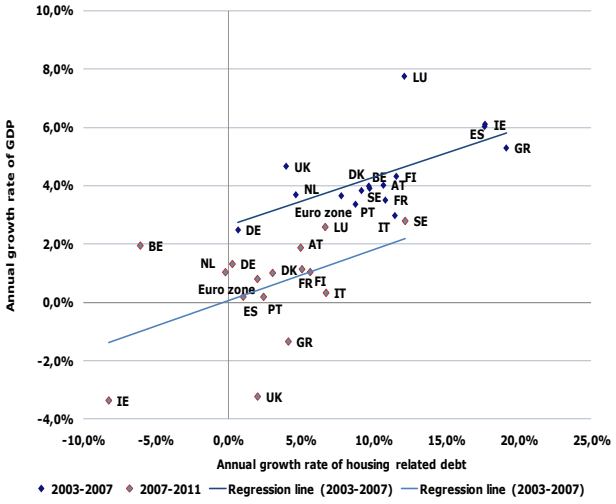
increased competition among mortgage banks, cf. ECB (2009). In the crisis years after 2007 the positive correlation has persisted; the lower intercept reflects that a given growth rate of loans for house purchase is associated with a lower growth rate of GDP. Note also that the growth rate of the housing-related debt both tends to be positive and higher than the growth rate of nominal GDP.

CHART 9 – AVERAGE ANNUAL GROWTH RATES OF REAL DISPOSABLE INCOME



Note: Data only available for a subset of European Union member states.
Sources: ECB and Eurostat

CHART 10 – AVERAGE ANNUAL GROWTH RATE OF NOMINAL GDP AGAINST ANNUAL GROWTH RATE OF HOUSING RELATED DEBT

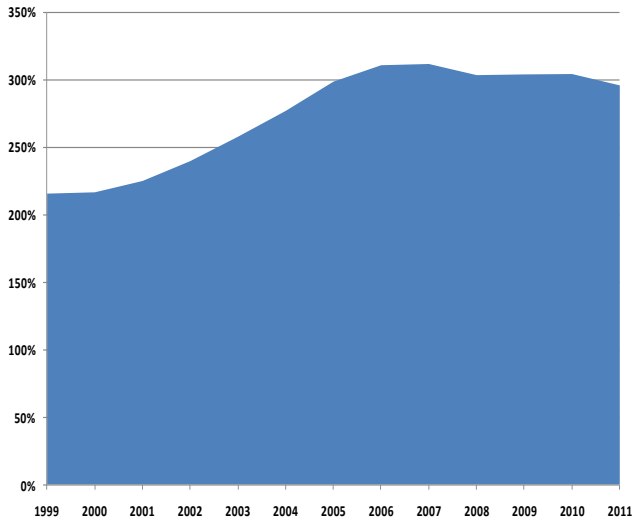


Source: ECB and EUROSTAT.

The asset side of the households balance sheets as measured by the stock of non-financial assets relative to GDP reflect a similar pre-crisis pattern as the liability side (chart 11). Hence, the gross wealth of the Euro-zone households increased rapidly up until 2006. As declining house prices have deteriorated the gross non-financial wealth since 2007/08, the net wealth of Euro-zone households has also declined.

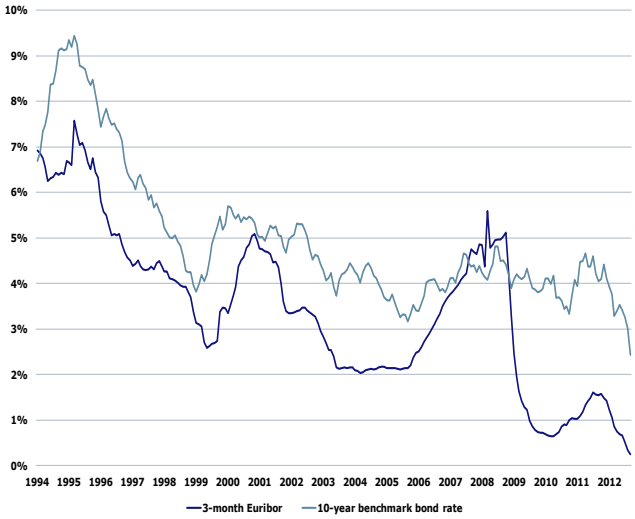
The increase in debt levels since the introduction of the Euro has also been fueled by declining interest rates up until 2006, cf. chart 12. The expansive monetary policy conducted by ECB since the onset of the financial crisis has pushed down interest levels which has made debt servicing easier for households. Accordingly, in spite of the vast decline in disposable incomes, the average housing burden for the Euro-zone expressed as total housing related interest expenditures in percent of disposable income, has declined sharply since the peak in 2008 (see chart 13).

CHART 11 – STOCK OF NON-FINANCIAL ASSETS FOR EURO-ZONE HOUSEHOLDS IN PERCENT OF GDP



Source: ECB

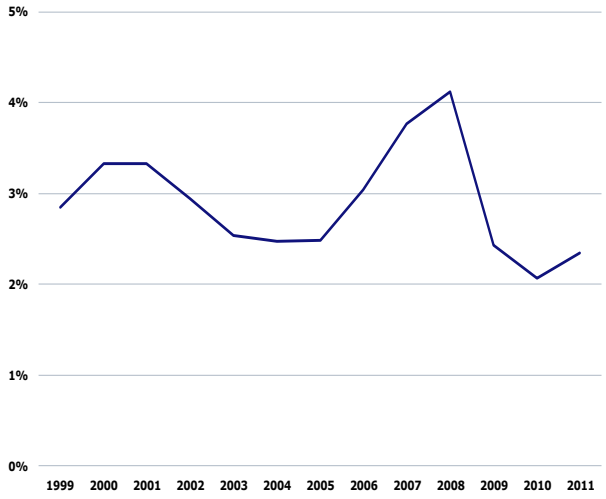
CHART 12 – INTEREST RATES



Source: ECB

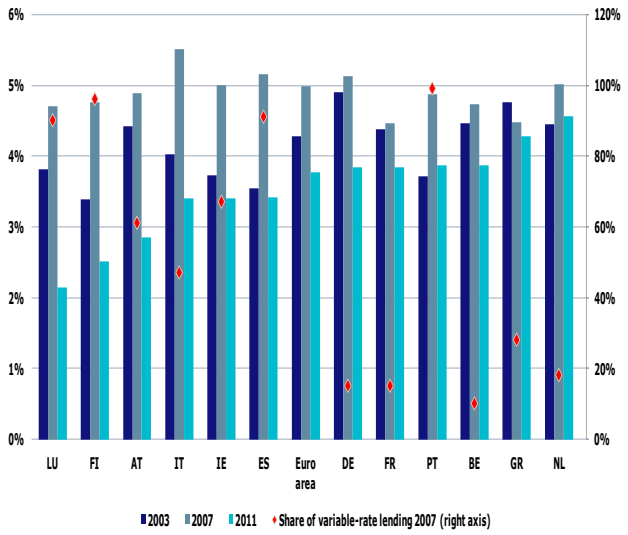
The extent to which the expansive monetary policy has counteracted the adverse economic shocks following the financial crisis depends among other things on the mortgage structure of the member states. Households in countries with a high share of mortgage lending based on adjustable-rate mortgages should, ceteris paribus, face lower interest rates on their mortgage. This is indeed the case, cf. chart 14.

CHART 13 – EURO-ZONE HOUSEHOLDS' INTEREST EXPENDITURE IN PERCENT OF DISPOSABLE INCOME



Source: ECB

CHART 14 – AVERAGE COST OF HOUSING LOANS AND SHARE OF VARIABLE LENDING

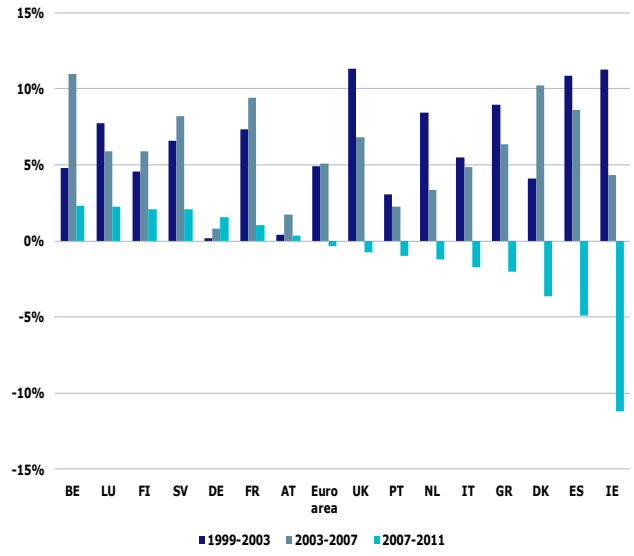


Note: Data only available for members of the Euro-zone.
Source: EUROSTAT.

Not surprisingly, households in countries like Luxembourg and Finland are the ones benefitting the most from the expansive monetary policy. But so does households in Spain, Ireland and Italy that on average face lower interests on their mortgage than the typical German or Dutch household.

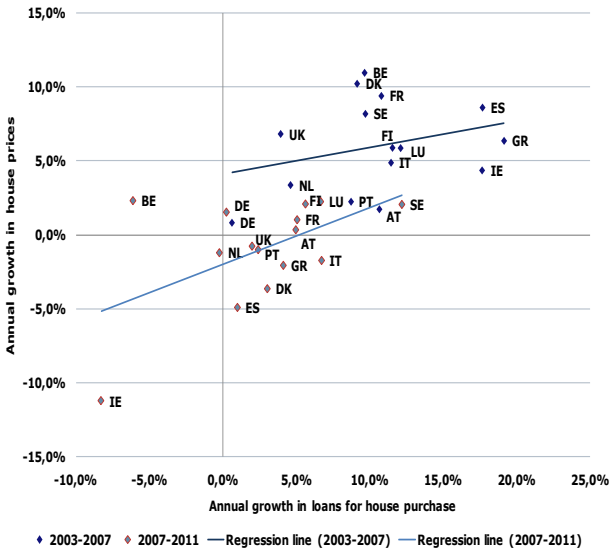
House price dynamics and housing debt dynamics are closely related. Chart 15 displays the average annual growth rates of nominal house prices across the European Union member states. Not surprisingly, the countries experiencing the largest pre-crisis increases in house prices also tend to be the countries with the largest declines during the crisis. Chart 16 plots the average annual growth rates against the average annual growth rates of housing loans. The regression lines is not to be interpreted as a causal relationship, but it does reveal some interesting points. Hence, it seems that the positive correlation that one would expect has persisted throughout the crisis though with a lower intercept.

CHART 15 – ANNUAL NOMINAL HOUSE PRICE GROWTH



Sources: EUROSTAT and European mortgage federation

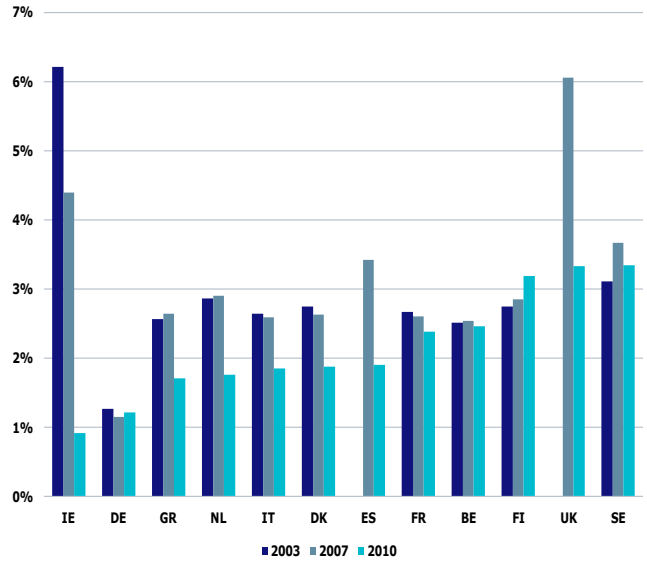
CHART 16 – ANNUAL GROWTH IN LOANS FOR HOUSE PURCHASE AGAINST ANNUAL HOUSEPRICE GROWTH



Source: EUROSTAT and European mortgage federation

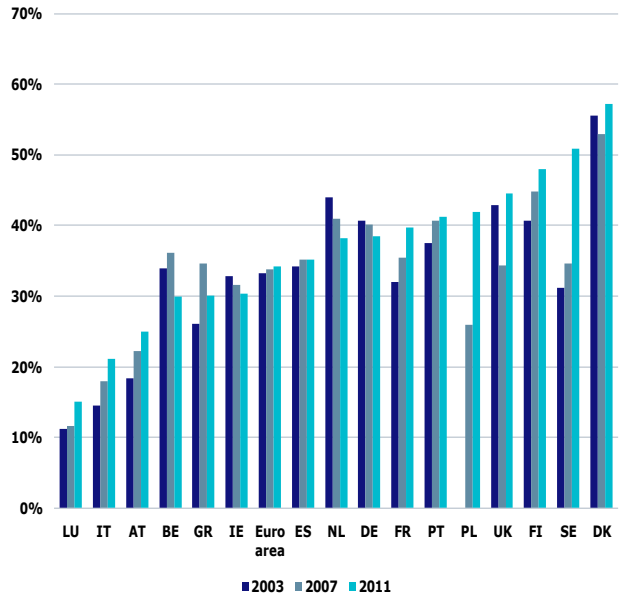
The health of national housing markets can also be illustrated by the change in the ratio of sales to total stock of dwellings. Ireland, the UK and Spain have experienced the greatest drop from pre-crisis levels whereas the activity rates of Germany and France have remained fairly constant, cf. chart 17.

CHART 17 – NUMBER OF TRANSACTIONS IN PERCENT OF TOTAL STOCK OF DWELLINGS



Source: European Mortgage Federation

CHART 18 – LOANS FOR HOUSE PURCHASE IN PERCENT OF TOTAL NON-MFI LOANS



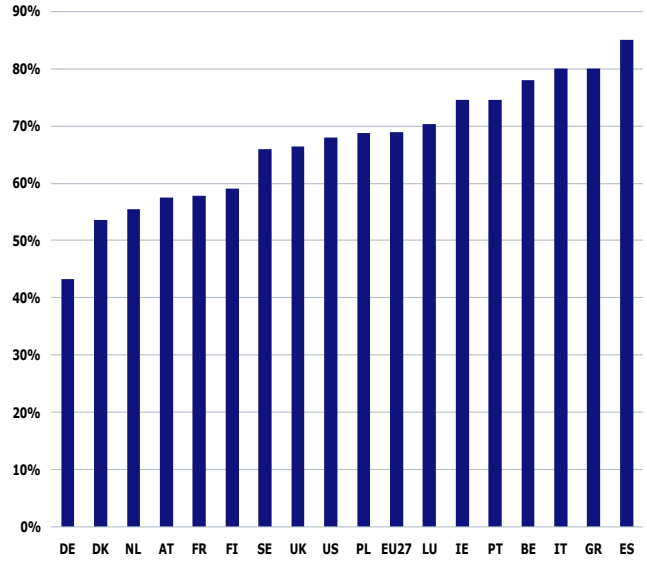
Source: ECB

ECB (2009) concluded that housing finance was a growing area of business for European banks as the share of loans for house purchase accounted for a growing share of total loans to non-MFIs. With local exceptions, this trend has continued throughout the financial crisis, cf. chart 18.

The relative effect of shocks to the mortgage market on the wider domestic economy depends among other things on the share of home ownership. In this respect it is interesting that the distressed economies around the Mediterranean and Ireland rank highest on this figure, cf. chart 19.

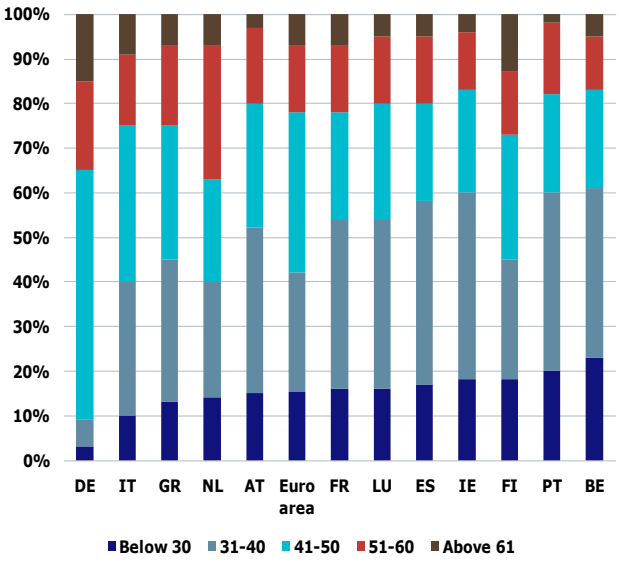
As a final illustration of the differences of housing markets across the European Union, chart 20 shows the distribution of housing loans granted depending on the age of the head of the household. German house buyers are by far the oldest in Europe which is also reflected in the low owner occupy rates in Germany. On average across the member states, the generations aged 31-40 and 41-50 constitute the majority of people taking up new housing loans.

CHART 19 – OWNER OCCUPY RATES



Note: Latest available year. Numbers for Denmark do not include cooperative housing.
Source: European Mortgage Federation

CHART 20 – DISTRIBUTION OF HOUSING LOANS GRANTED IN 2007, BY AGE OF THE HEAD OF THE HOUSEHOLD



Source: ECB

3. The diversity of mortgage models

If you believe a mortgage is a simple product, you have not studied the permutations that are possible in the EU. Mortgage models come in more than 50 shades of grey. You can look at a mortgage from the perspective of a borrower and from the perspective of how the mortgage is financed.

From the borrowers perspective ECB(2009) covers the questions of:

- The interest rate.
- The maturity.
- The loan to value.
- The repayment profile.
- The possibilities for early repayment.
- The non-interest costs of a mortgage.
- The purpose of a mortgage.
- The Taxation issues.
- The bankruptcy and foreclosure practices.

Table 1 lists possible options in relation to each parameter. Other conditions such as LTI, consumer protection and the distribution, e.g. through brokers or lenders are not covered.

The basic choices with regard to interest rates are whether the rates are fixed or variable, and whether they are capped. The choices made in the Euro area span the whole spectrum and there are substantial differences across countries.

With regard to maturity, the bulk of mortgages are within the 20-30 year interval, but in some cases can go to 60 years, and in others are individual and linked to years to retirement. Furthermore, there are models that allow for variable maturity, where the maturity depends on the level of interest rates, i.e. the higher the interest rates/payments, the lower the amortization and the longer the maturity.

Loan to value ranges from 60-100+ percent. However, the differences on LTVs extend beyond percentages. The definition of value also differs. Models include the German Mortgage Lending Value that is set conservatively to avoid business cycle fluctuations to result in lower market prices than the initially set lending value, the Dutch value practice that assumes a "fire sale" and other models that are based on a more normal sale process. Anecdotal evidence suggests that the financial crisis has resulted in a reduction in LTVs on new loans in many countries.

The repayment profile range from models, where not even the full interest is paid to models where there are substantial amortization payments. As with LTV, the financial crisis has made lenders more cautious in granting interest only loans and teaser loans. Furthermore, repayment profiles are increasingly dependent on how aggressive other parameters are set, i.e. the higher the LTV, the more required repayments.

Early repayment possibilities also differ. In many countries early repayment possibilities are regulated by contracts, but in some also by law.

Table 1: Parameters in mortgage loans

Parameter	***Options***
Interest rate	Fixed, Variable or mixed. - If fixed, for how long. - If variable (< 1 year fixed), linked to what benchmark, ▪ Euribor, Minimum Refi Rate, T-Bill, swap rate. ▪ What margin (fixed or variable). Capped, and if yes how. - By usury law. - In contract.
Maturity	20-30 (60) years. Link to individual circumstance. Fixed or variable.
Loan to value	60-100 pct. Definition of value - Market Value. - Fire sale value. - Business cycle adjusted value.
Repayment profile	Annuity. Interest only. Fixed annual amortization. Balloon loans. Teaser Loans. Flexible, i.e. can be reduced with income shortfall. Linked to savings.
Early repayment possibility	Redemption option at par or other price. Possible only w. administrative fee. Possible w. compensation - If fixed rate - If floating rate. Not possible. Within institution or with new lender. Portability - By borrower. - By house.
Non-Interest cost	Fixed/Variable Fees to lender/others
Loan purpose	New house/Existing house. Primary residence. Secondary residence.

	Buy to let. Home equity withdrawal - Reverse mortgage.
Taxation	Tax on imputed rent. Tax deductibility of interest payments. Capital gains tax - Dependant on length of ownership. - Differentiated to treatment of other assets. - Tax rate. Inheritance tax - On principal home. - On other residences. - Differentiation to treatment of other assets. Wealth tax. Real estate tax. Transaction tax.
Bankruptcy and foreclosure	Personal liability or not - Law or practice. Regulated by personal bankruptcy law or not. Requirement of personal bankruptcy declaration before foreclosure or not. Requirements prior to forced sale. Duration and cost of foreclosure.

The non-interest costs of a loan can be fixed or variable, and any combination of the two. They include fees to the lender and fees to others, including taxes.

There can also be restrictions on the purpose of loans, and differing parameters, cf. above, according to loan purposes. Compared to the US, the practice of home equity withdrawal is fairly limited.

Houses are favorite tax objects, not least because a house is not mobile. However, most countries also have tax deductibility of interest, although typically subject to many limitations.

Bankruptcy and foreclosure procedures have proved very important during the financial crisis. In the Euro area countries, borrowers are generally personally liable, as opposed to the US. However, the length of foreclosure procedures

differ substantially, from around 6 months to more than 5 years; the latter making mortgage lending a questionable business.

ECB(2009) only covers the euro countries. Table 2 provides information on four non-Euro EU countries; UK, Poland, Sweden and Denmark.

Table 2: Mortgage characteristics in the UK, Poland, Sweden and Denmark

	UK	*Poland*	*Sweden*	*Denmark*
Interest rate	Predominantly variable, but also some fixed	Variable	Mostly floating rate or fixed for a year.	Fixed, adjustable and variable.
Maturity	Typically 25 years	25-35 Y	30-50 years	Typically 30 years
LTV	Up to 100% (although availability is dependent on market and funding conditions, such that >95% availability currently very limited.	Around half of new loans have LTVs > 80%	75-85 pct.	60-80 pct.
Repayment profile	Historically often IO. Almost all new residential lending is on a capital repayment basis, and new regulations from FSA will entrench this further. However the vast majority of buy-to-let lending is on an interest-only basis.	Annuity/ decreasing installments	Mostly IO	Annuity or bullets. IO only up to 10 years without amortization payments.
Early repayment	May carry an early repayment	The prepayment fee on the Polish	No fee if variable. Fee	Typically at minimum of

	charge, but usually only for the duration of any initial incentivised rate period.	market ranges between 0% and 3% (usually: 1,5-2%) of the prepaid amount. The borrower is charged with those fees if the loan is prepaid during the first 3-5 years of the loan's tenure – afterwards the prepayment is usually free of charge, but the client needs to inform the bank (in advance) that he/she plans an early repayment.	covering interest difference, if fixed rate.	market price of covered bond or par
Non-interest costs	Up-front arrangement fees apply for many (but not all) products. Fees vary but are usually flat-fee and generally <£1,000	Fixed and variable To lender and to government	Fixed and variable To lender and to government	Fixed and variable To lender and to government
Purpose of loan	No restrictions, but residential market is FSA-regulated, BTL is currently outside FSA-regulations	Virtually no restrictions.	No restrictions	No restrictions
Taxation	Since 2000, mortgage interest is no-longer eligible for tax relief in the residential	A tax on civil law transactions amounting to 2% of the residential property value is	Interest is deductible, but at reduced rate. Capital gains Tax.	Fully deductible but at reduced tax rate

	market. However as a business cost, interest payments are tax-deductible for BTL loans.	charged for the purchase of a dwelling (on a secondary market, on a primary market usually no tax will be paid). Captial Gains Tax derived from the sale of property is liable to tax at 19%, unless the sale takes place after 5 calendar years from the acquisition date after which time it is exempt from CGT. Interest is not tax-deductible.		
Bankruptcy and foreclosure	Banks try to avoid foreclosure because expensive and lenghty	Personal liability; foreclosure: several months up to 2 years	Personally liable, but foreclosures are rare.	Foreclosure within 6 months

Source: EMF and national mortgage organizations.

Also outside the euro area, there is a wide variety of models. Rates are predominantly variable, maturities are as diverse as in the Euro area, LTVs are in the high end, repayment profile and prepayment fees differs as in the Euro area, non-interest costs are the norm, there is greater scope for home equity withdrawal than in the Euro area, and taxation differs as does foreclosure procedures.

In addition to these more hard characteristics of a mortgage, there is a number of parameters that can differ in relation to the process of obtaining a mortgage. The EU Commission has issued directives on misleading advertising,

and unfair business-to-consumer commercial practices in the internal market[14]. Unfair terms in consumer contracts are also regulated by a directive, which introduces a notion of 'good faith' in order to prevent significant imbalances in the rights and obligations of consumers on the one hand and sellers and suppliers on the other hand. Pre-contractual information for mortgage loans is the subject of a European Voluntary Code of Conduct on Pre-contractual Information for Home Loans.

A number of Member States apply selected provisions of the directive on credit agreements for consumers to mortgage credit. That Directive covers consumer credit loans from EUR 200 to EUR 75,000 and regulates advertising, pre-contractual and contractual information, creditworthiness assessments, adequate explanations, as well as disclosure requirements for credit intermediaries. Credits to purchase a property secured by a mortgage or another comparable security or loans for renovation in excess of EUR 75,000 are outside the scope of that Directive.

The EU Commission has made a proposal for a new directive on mortgage credit agreements. The proposal complements the Consumer Credit Directive by creating a similar framework for mortgage credit. The proposal largely draws on the conduct of business provisions in the Consumer Credit Directive; however, where appropriate the specific features of mortgage credit have been taken into account, for example by introducing risk warnings in the pre-contractual information provisions and by strengthening creditworthiness assessment provisions.

The requirements in the proposed directive can be seen in relation to the value chain of making a mortgage loan, which help illustrate some of the permutations that apply to the value chain. The typical value chain in relation to any product includes development and design, sourcing, producing, marketing, sale, and servicing. Table 3 illustrates where the proposed directive imposes restrictions.

[14] Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on credit agreements relating to residential property, Brussels, 31.3.2011, COM(2011) 142 final 2011/0062 (COD).

Table 3: Value chain of a mortgage loan and restrictions in proposed directive

	Restrictions in Directive	*Unrestricted parameters*
Development and design	Formula for calculating Annual Percentage Rate of Charge Early repayment should be possible	See Table 1.
Sourcing	Information requirements concerning credit intermediaries	Possibility to break up value chain in any thinkable way as long as information is provided
Producing	Competency requirements	Mostly free
Marketing	Advertising information requirements	Somewhat restrictive on information that needs to be provided.
Sale	Pre-contractural information Obligation to assess the creditworthiness of the consumer, including when to reject credit application and obligation to inform applicant of reasons for rejection. Advice standards, including obligation to search for most appropriate contract and to obtain information on borrower.	More restrictive
Servicing	Information concerning changes in the borrowing rate Dispute resolution mechanism – out of court	Few EU-wide restrictions on foreclosue

The basic principle behind the directive is that borrowers should be provided with adequate information and then they can make the appropriate choice among a very wide variety of offered products that are not subject to many restrictions. The one area, where the products are more restricted, is in relation to sales, where lenders are expected to make prudent choices on behalf of borrowers.

On the funding side, there are basically three choices:

- Funded by deposits.
- Funded by covered bonds.
- Funded by (R)MBS.

Most countries use a combination of the three funding models. The major difference between a covered bond and an RMBS is that a covered bond is an on-balance sheet funding tool, where the bondholders have recourse against the issuing bank, whereas an RMBS is issued out of a special vehicle and the bondholder does not have recourse to the originator, cf. ECBC (2012).

Comparisons are easiest to make across countries in relation to the framework for issuing covered bonds. According to ECB(2009) covered bond issuance was possible in all but two of the Euro area countries, an additional four countries had, however, never seen an issuance of a covered bond. All but the two countries, where covered bond issuance was not possible, had a special law at the national level for covered bonds. However, in only three countries did the law precede 1990.

According to ECBC (2012) one of the two countries that did not have a legislative framework has since established it and the last country is in the process of doing so. Only three countries have yet to issue a covered bond.

The four non-Euro EU countries earlier covered, all have frameworks that makes it possible to issue covered bonds and have all seen issuance. The UK as the exception has a framework that builds primarily on existing general law and contractural structures.

Like the mortgage contract, covered bonds come in many varieties, cf. ECBC(2012) including:

- Issued by specialised issuer or general bank/credit institution.
- Eligible assets.
- Valuation methods and LTV criteria, cf. above.
- Asset-Liability management requirements.
- Transparency of cover pool.
- Cover pool monitoring and general supervision.
- Segregation of cover assets and bankruptcy remoteness of covered bonds.
- Compliance with EU legislation.

The institutions that are allowed to issue covered bonds differ widely across the EU. In some countries, the right is limited to banks, in other countries to specialized mortgage lenders, and in yet other countries both banks and specialized institutions can issue covered bonds.

The cover pools can generally include:

- Residential mortgages.
- Commercial mortgages.
- Exposures to public institutions.
- Risk on financial institutions.
- Derivatives.

Typically there are restrictions on the two latter components. In some countries loans backed by ships or airplanes can also be included. In a few countries loans from securitization vehicles can also be included, often related to the sourcing of mortgages from smaller institutions.

Valuations can be based on sales prices, lender employed or independent appraisers. The valuations are either market values or a prudent value, i.e. corrected for cyclical fluctuations/fire sale effects/minimum long term value. LTVs are generally set at 60-80 pct., with commercial real estate typically in the lower end and residential real estate in the higher end.

Requirements as to asset-liability management differs a lot across countries. Requirements include tests of the value of cover assets to outstanding covered

bonds, liquidity tests, and market risk tests. Often there is a requirement for excess capital, i.e. that the value of the cover pool exceed the value of the covered bonds by a certain percentage. In a few instances there is a perfect or near perfect match of cash flows on mortgages and covered bonds.

The official requirements on transparency differ widely, and in practice various market initiatives as well as individual disclosures are setting the standard. There are two prominent market initiatives. The European Covered Bond Councils label initiative (ECBC) and the Covered Bond Investors Councils (CBIC) template guidelines on transparency. ECBC guidelines cover general information on the covered bond as well as more detailed information on the underlying assets. The CBIC guideline include requests for data on the cover pool composition, more qualitative information explaining various concepts in relation to the covered bond, e.g. how nonperforming loans are defined, and ratings information.

Cover pools are often, but not always, monitored by external cover pool monitors. In some instances, cover pools are monitored by the issuer under the supervision of the national FSA. Covered bond issuers are almost everywhere supervised by the national FSA.

Cover assets are always registered and with a few exceptions segregated from the issuing institution in case of insolvency of the latter. A special administrator is normally appointed to manage the cover pool. Covered bonds do not normally automatically accelerate in case of insolvency of the issuing bank. The objective is instead to repay bondholders according to the bonds contractual maturity.

In EU legislation covered bonds can fulfill the UCITS 52(4) definition or the CRD requirements[15]. Most covered bonds fulfill both UCITS 52(4) and CRD requirements. UCITS 52(4) requirements give covered bonds a preferential status as an investment object of collective investment funds as well as a lower risk weighting in CRD than other claims on credit institutions (20 pct.). CRD requirements lower the risk weight further; to 10 pct.

[15] See http://ecbc.hypo.org/Content/Default.asp?PageID=311.

The UCITS definition requires that:

(i) The covered bond issuer must be a credit institution.
(ii) Covered bond issuance has to be governed by a special legal framework.
(iii) Issuing institutions must be subject to special prudential public supervision.
(iv) The set of eligible cover assets must be defined by law.
(v) The cover asset pool must provide sufficient collateral to cover bondholder claims throughout the whole term of the covered bond.
(vi) Bondholders must have priority claim on the cover asset pool in case of default of the issuer.

The CRD definition requires:

(i) Compliance with the standards of Article 22(4) of Directive 85/611/EEC (UCITS)
(ii) The asset pools that back the covered bonds must be constituted only of assets of specifically-defined types and credit quality . The comprehensive list of classes of assets that are eligible as collateral for covered bonds are:

Exposures to public sector entities;
Exposures to institutions;
Mortgage loans (commercial & residential);
Senior MBS issued by securitization entities;
Loans secured by ships

(iii) The issuers of covered bonds backed by mortgage loans must meet certain minimum requirements regarding mortgage property valuation and monitoring.

In addition, the CRD includes a general exception, whereby any covered bond meeting the UCITS definition (but not asset eligibility criteria) to be issue prior to December 2007 will benefit from the preferential treatment until maturity.

4. Ratings of covered bonds

There are four global rating agencies that rate covered bonds: Moody's, S&P, Fitch and DBRS[16]. A rating of a covered bond is an assessment of whether payments will be made on a timely basis.

In broad terms all the rating agencies evaluates the same parameters but the exact methodologies varies. The starting point for a rating of a covered bond is the rating of the issuer reflecting that the covered bond holder has recourse to the issuer. For all three agencies analysed here the rating of the issuer provides a floor for the rating of the covered bond. The issuer rating furthermore plays a significant role throughout Moody's methodology, while S&P and Fitch only look at the issuer rating with regard to capping the number of notches a covered bond can be rated above the rating of the issuer.

Each of the three agencies has a different name for the cap and slightly differing methodologies are used in arriving at the cap for a specific covered bond issuance, cf. table 4.

Table 4: Cap on rating of covered bond relative to issuer rating

	Moody's	*S&P*	*Fitch*
Name	TPI	n.a./Potential uplift	Discontinuity Cap
Methodology (parameters considered in order of importance)	Refinancing risk, including likelihood of systemic support	ALMM risk and funding availability, including systemic support	Asset segregation, liquidity gap, alternative management
Notches	1-8	3-7[17]	0-6, 8

Source: ECBC(2012).

Compared to securitizations such as RMBS, covered bonds with a similar cover pool could be rated lower because of the cap on the rating relative to the issuer rating.

All of the rating agencies do extensive analysis of the cover assets and projected cash flows to determine the likelihood of the cover being capable of meeting the payment obligations. The rating of a covered bond is then based on the rating of the cover pools capacity to meet payment obligations subject

[16] DBRS has as of yet only played a minor role and is therefore not included in the discussion below.
[17] Potentially unrestricted if zero ALM risk.

to the lower bound of the issuer rating and the upper bound of the issuer rating plus the cap.

The analysis of the cover assets and the projected cash flow includes stress test of losses, interest and currency risk. If needed assets are assumed to be sold or refinancing obtained in stressed markets.

Overcollateralization is included in the analysis, although subject to varying restrictions. Not only the quantity, but also the quality of overcollateralization differs among cover pools.

Annex 1 provides a more detailed overview of the rating methodologies of S&P, Fitch and Moody's.

Ratings of covered bonds has over the last years in particular been influenced by the downward adjustment of sovereign and issuer ratings as well as changes by all the rating agencies to their covered bond rating methodology.

Moody's and S&P publishes data on their covered bond ratings, including the calculation of the cover pools, that is somewhat comparable and can be used to illustrate the two rating bureaus assessment of the quality of the specific covered bonds, including the differences across countries[18].

Moody's rate as of Q2 2012 over 200 covered bond programs of which 80 have primarily public sector assets and are excluded from the analysis below. Three programs from the two non-EU countries that have rated programs are also excluded. This leaves 103 programs from 18 EU countries.

S&P rate as of Q2 2012 over 150 covered bond programs of which 54 have ratings that are not linked to the issuer and therefore not part of the analysis. 25 of the remaining programs have primarily public sector assets and are excluded from the analysis below. Five programs from three non-EU countries are also excluded. This leaves 68 programs from 12 EU countries.

[18] Moody's European Covered Bonds Monitoring Overview: Q2 2012, Moody's Investors Service, and Global Covered Bond Characteristics and Rating Summary Q2 2012, Standard & Poor's.

Table 5 and 6, respectively, show Moody's and S&P covered bond ratings relative to the corresponding issuer rating at end Q2 2012. Covered bonds are generally highly rated, 70% are rated AAA, and much better rated than the issuer. However there is a close link to the issuer rating, where banks rated below A have difficulties obtaining a AAA rating.

In annex 2 the same data is shown country by country. It is easy to see that the countries that have suffered most during the debt crisis has had greatest difficulties in upholding AAA ratings.

There is no systematic difference between the rating patterns of Moody's and S&P.

Table 5: Moody's covered bond ratings relative to issuer rating
(All countries)

CB Rating / Issuer Rating	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Ba1	Ba2	Ba3	B1	B2	B3	Caa1	Caa2
Aa2	1																	
Aa3	11	1																
A1	12																	
A2	36		2															
A3	10	3																
Baa1	2	2	2				1											
Baa2		2	4	2		3	1	1										
Baa3					2	5	4		1									
Ba1							7	1		2								
Ba2							1	2		1								
Ba3									1	8	1							
B1										2								
B2										1				1				
B3												1		1	1			
Caa1																		
Caa2																		5

Table 6: S&P covered bond ratings relative to issuer rating
(All countries)

CB Rating / Issuer Rating	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB
AA+	1								
AA		1							
AA-	10								
A+	18								
A	9								
A-	13			1					
BBB+		3						1	
BBB		1							
BBB-			3						
BB+				1	1				
BB					1	1			1
BB-							1		

Chart 21 and 22 show the two rating agencies assessment of how much higher the covered bond rating can be than the issuer rating; For Moody's the TPI and for S&P the Max potential uplift. The upper bound that is set by the two caps is a significant restriction. Moody's TPI was at the end of Q2 2012 a binding restriction for 23 pct. of the rated covered bonds and an additional 43 pct. only had a leeway of 1 notch, implying that a downgrade of 2 notches of the issuer would result in a downgrade of the covered bond.

Chart 21 – Moody's TPI distribution

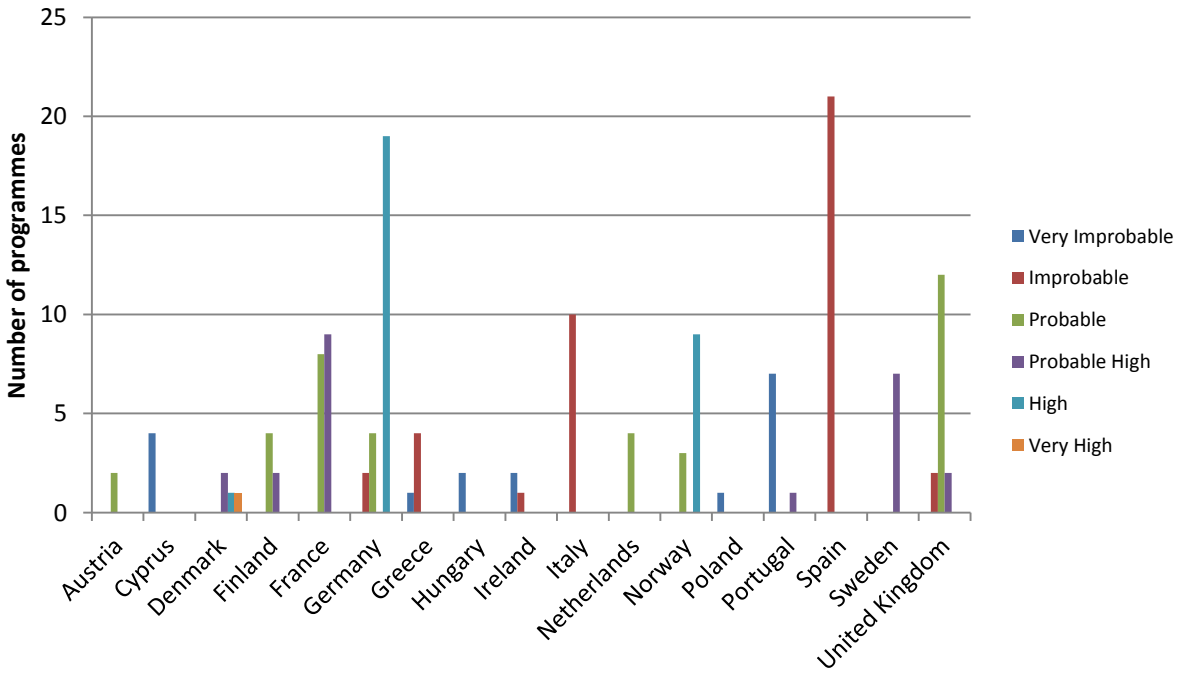
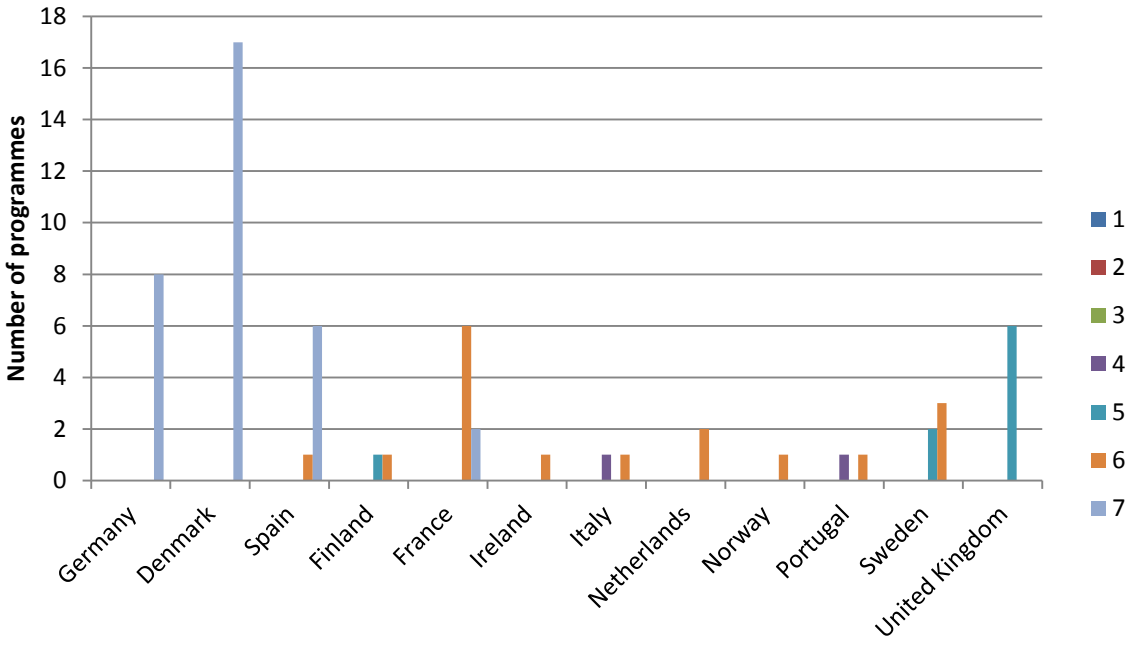


Chart 22 – S&P Max potential uplift distribution



Moody's is generally more restrictive than S&P. Denmark and Germany fares best across the board.

Chart 23 and 24 show how the two rating agencies assess collateral risk and market risk, respectively. Collateral risk, with a few exceptions in particular related to countries that have suffered during the debt crisis, does not differ that much. What differs and also matters most is market risk. Again, there is no systematic difference between the rating patterns of the two rating agencies. Over the last three years, Moody's has increased significantly its assessment of market risk, whereas collateral risk has remained remarkably stable.

Chart 23 – Moody's assessment of collateral and market risk

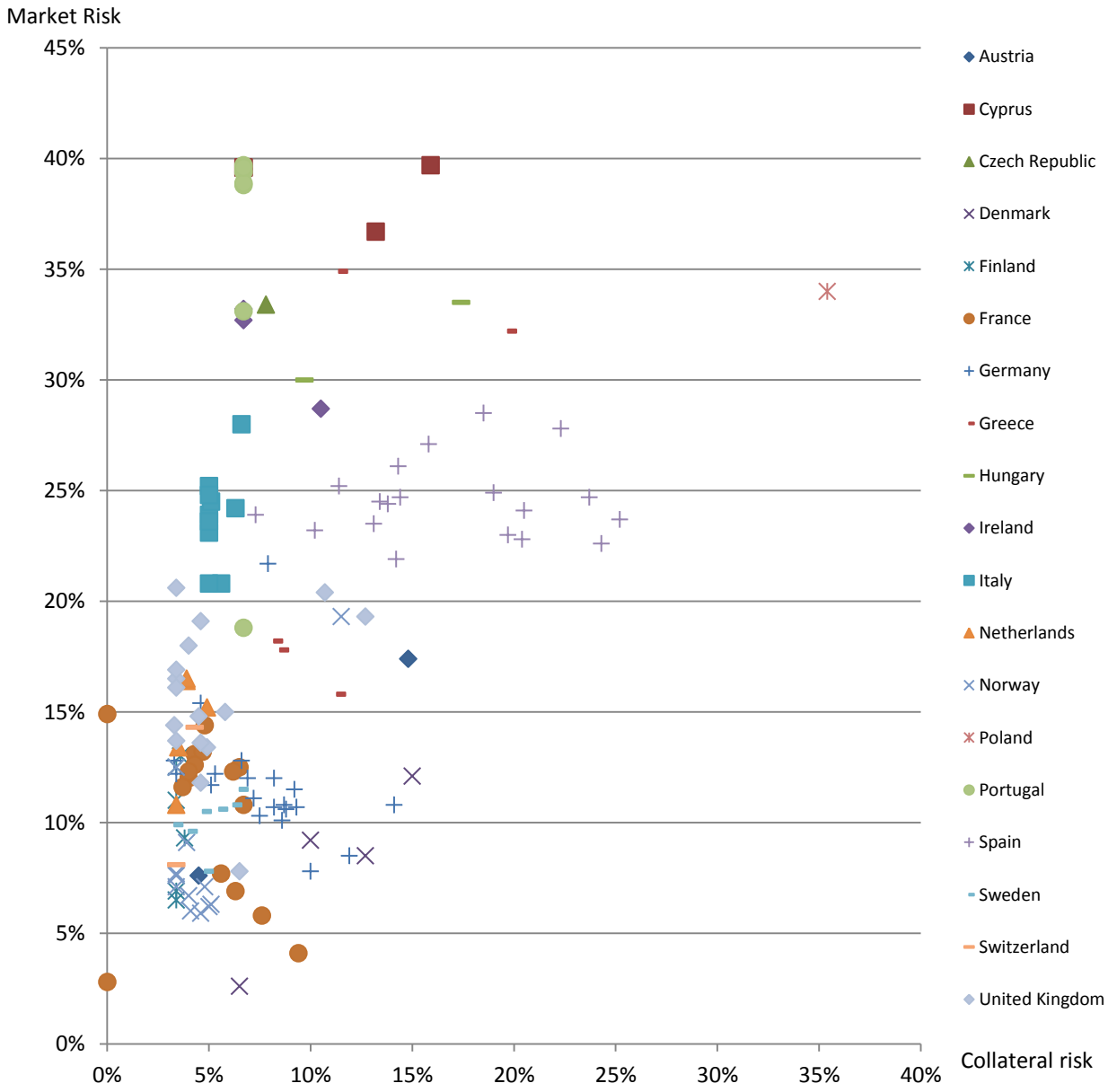
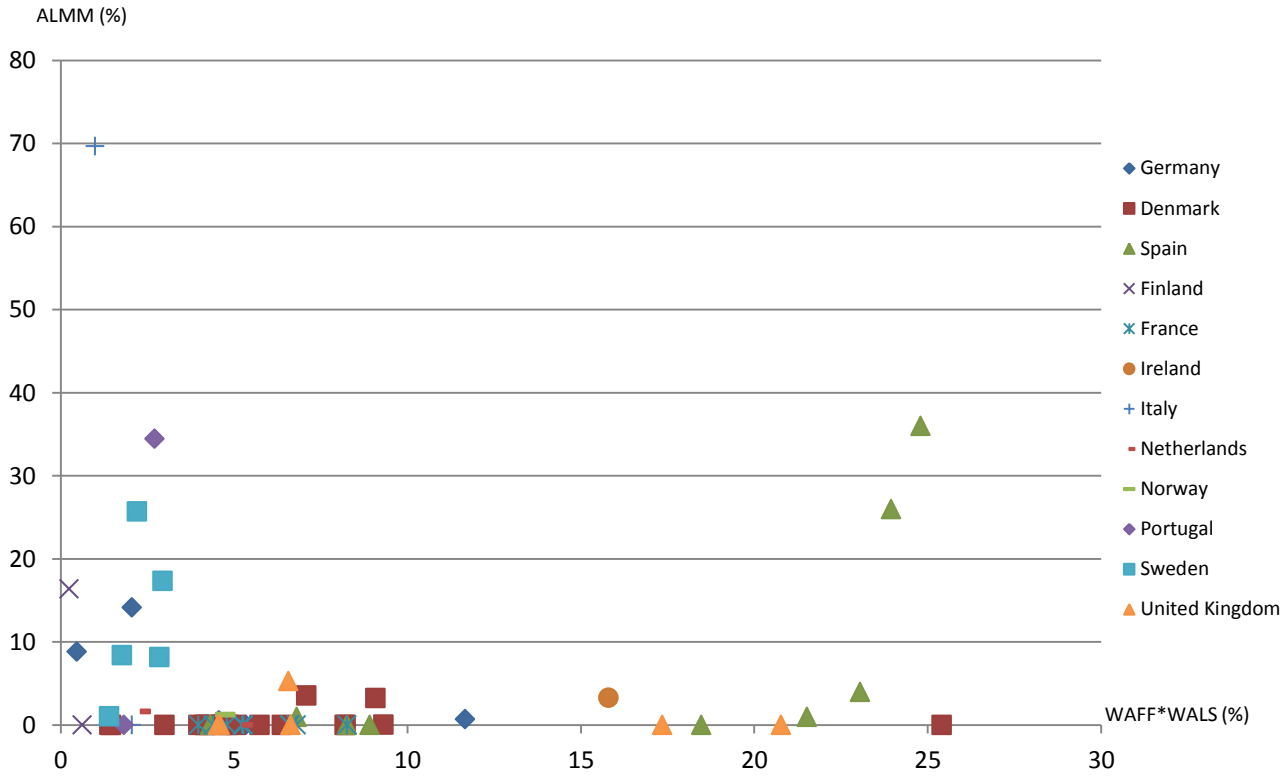


Chart 24 – S&P assessment of asset default risk and ALMM risk



Spain stands out in terms of high credit and market risk. In particular on the market risk side issues from the same country tend to be clustered.

Chart 25 and 26 show the required actual overcollateralization and total overcollateralization to achieve a AAA rating, disregarding any restrictions from TPI/Maximum potential uplift.

Chart 25 – Moody's assessment of actual overcollateralization and required overcollateralization for Aaa

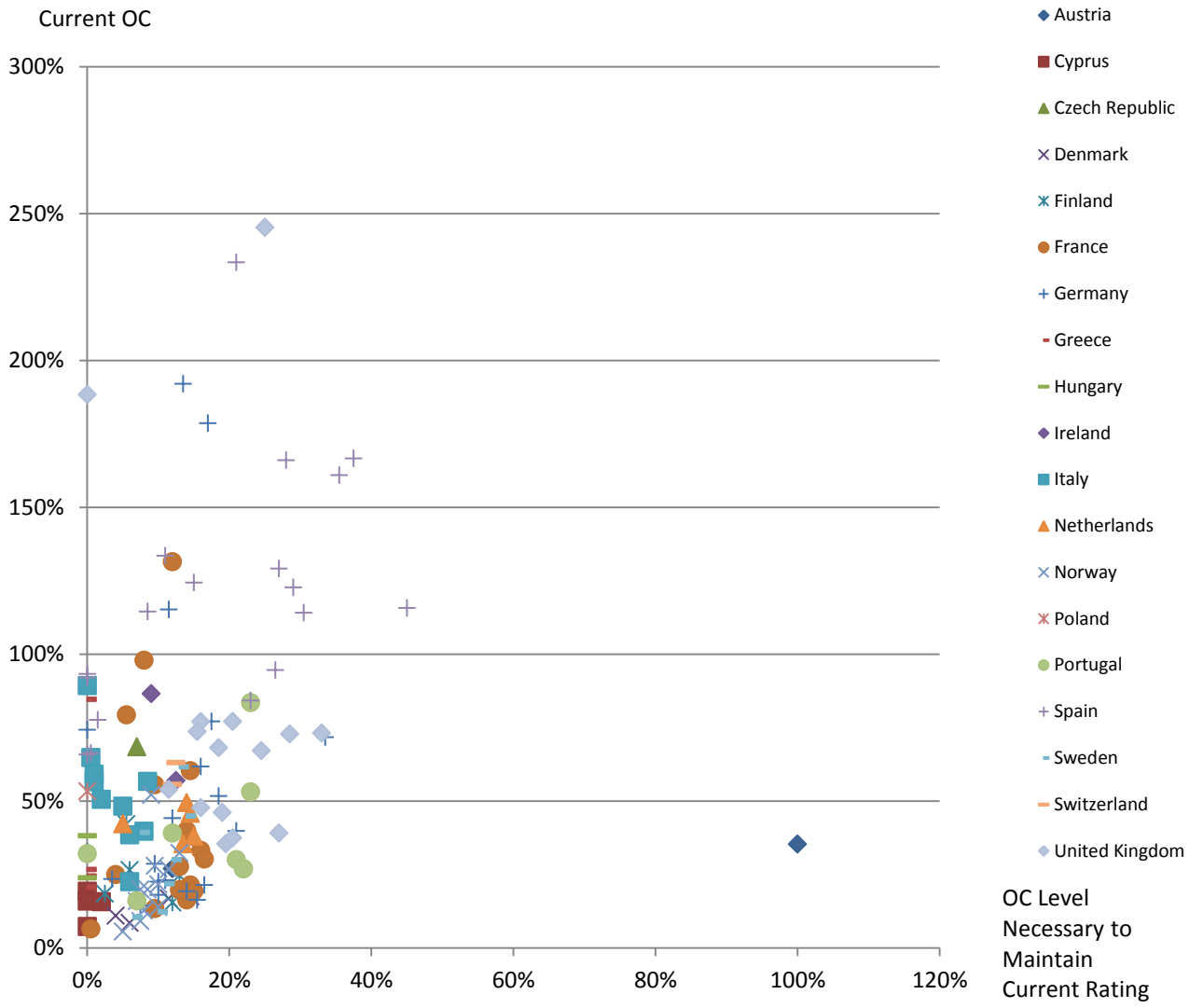
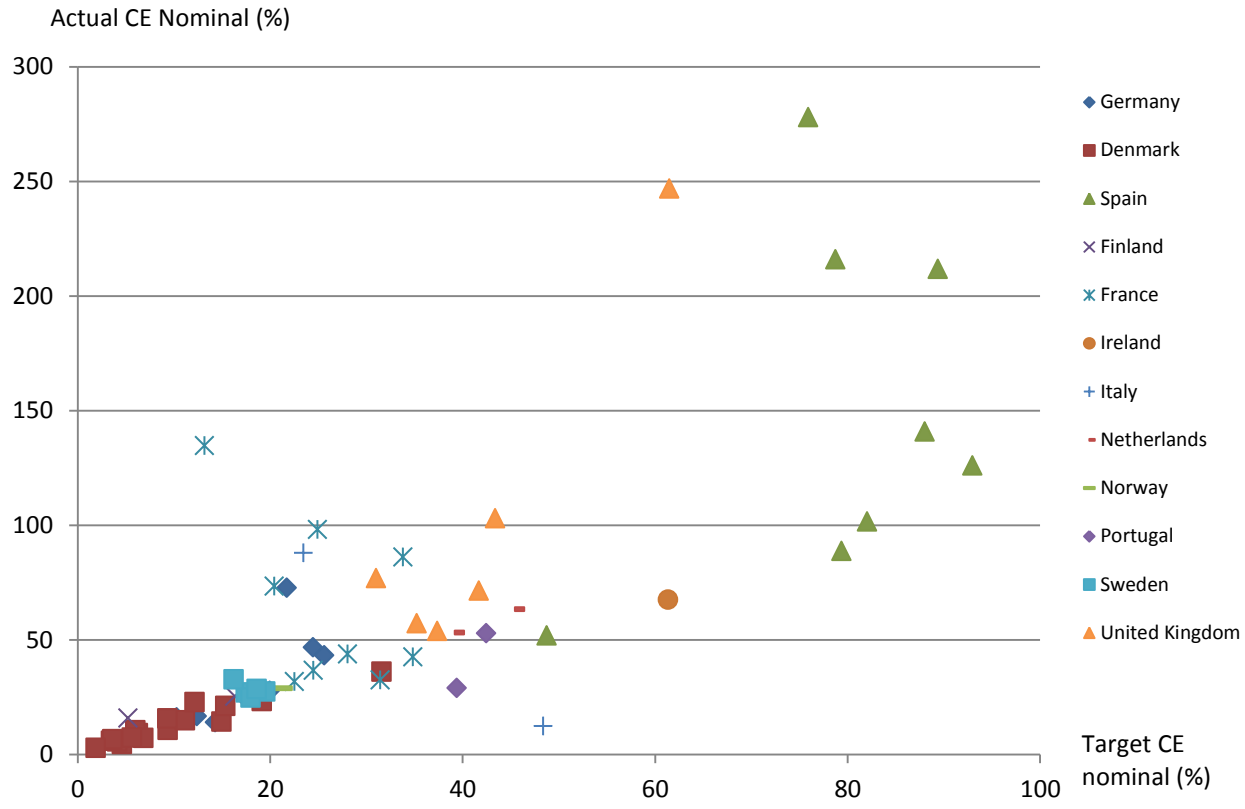


Chart 26 – S&P assessment of actual overcollateralization and required overcollateralization for AAA



Many programs have substantially more collateral than required and a number of programs have more than 50% actual overcollateralization. Again Spain is the outlier. UK, France and Italy are among the countries where many covered bond programs suffer from high overcollateralization.

5. An Assessment of Mortgage Models

The characteristics of housing finance systems, including also some prominent non-EU countries, are summarized in table 7.

Table 7: Housing finance model comparison

	Canada	*Denmark Covered Bond*	*Euro Covered Bond*	*Australia/UK Depository*	*US*
Instrument	Rollover 3-5 years	Long term fixed, Short term fixed	Roll over ARM	Reviewable ARM	Long term fixed, hybrid ARM
Prepayment	Penalty	No penalty, symmetric	Penalty if fixed	Penalty if discount	No penalty
Funding	Deposits, CB & Securitization	Covered bonds	Deposit, covered bonds	Deposits Securitization	Securitization/Deposit
Mortgage Interest Deducibility	No	Yes	Yes, some countries	No	Yes, amount capped
Government Mortgage Insurance	Yes	No	Only in The Netherlands	No	Yes
Government Security Guarantee	Yes	No	No	No	Yes
GSE	No	No	No	No	Yes
Regulation	Strong unitary	Strong unitary; covered bond legislation	Strong unitary; covered bond legislation	Unitary, covered bond legislation	Weak, fragmented

Note: Government Mortgage Insurance means that a public entity provides a credit guarantee to the lender on behalf of the borrower (for a fee).
Source: Adapted from Michael Lea (2011)

We focus on four objectives for a mortgage system:

1. A mortgage system should make it possible for households to acquire a home when they need it most i.e. early in an individual's productive life when income and savings are likely to be lowest (the affordability problem). This rules out systems with high owner down payment requirements, which would otherwise have been an obvious way to reduce the risks in mortgage finance.

2. A mortgage system should be robust when house prices fall, e.g. a fall in house prices should not put the financial system at risk. This suggests that the risks should be distributed to those who can handle them.

3. A mortgage system shall be able to continue to finance mortgage lending during and after a financial crisis.

4. Government involvement in the form of guarantees, regulatory benefits or other subsidies should be minimal.

5.1. Affordability

A mortgage system should make it possible for individuals to acquire a home when they need it most i.e. early in an individual's productive life when income and savings are likely to be lowest (the affordability problem). Low income tend to result in relatively high debt-to-income ratios for young borrowers which lenders normally associate with higher credit risk. The quest for affordability rule out systems with high owner financing requirements, which would otherwise have been an obvious way to reduce the risks in mortgage finance.

Germany, and to some extend Netherlands, are outliers in the Euro area, when it comes to the time in the life cycle housing loans are granted, cf. chart 20 in section 2. When it comes to owner occupy rates, Germany is an outlier and Spain is the leader, cf. chart 19.

The mortgage products available in most developed economies are long dated, interest rates are low to moderate and access to credit has historically been easy – also for young families. Hence affordability is at first sight not a major concern. But the ongoing regulatory changes will lead to higher capital requirements for banks overall and will likely lead to upwards pressure on bank's required margins on the products they offer – including mortgage loans.

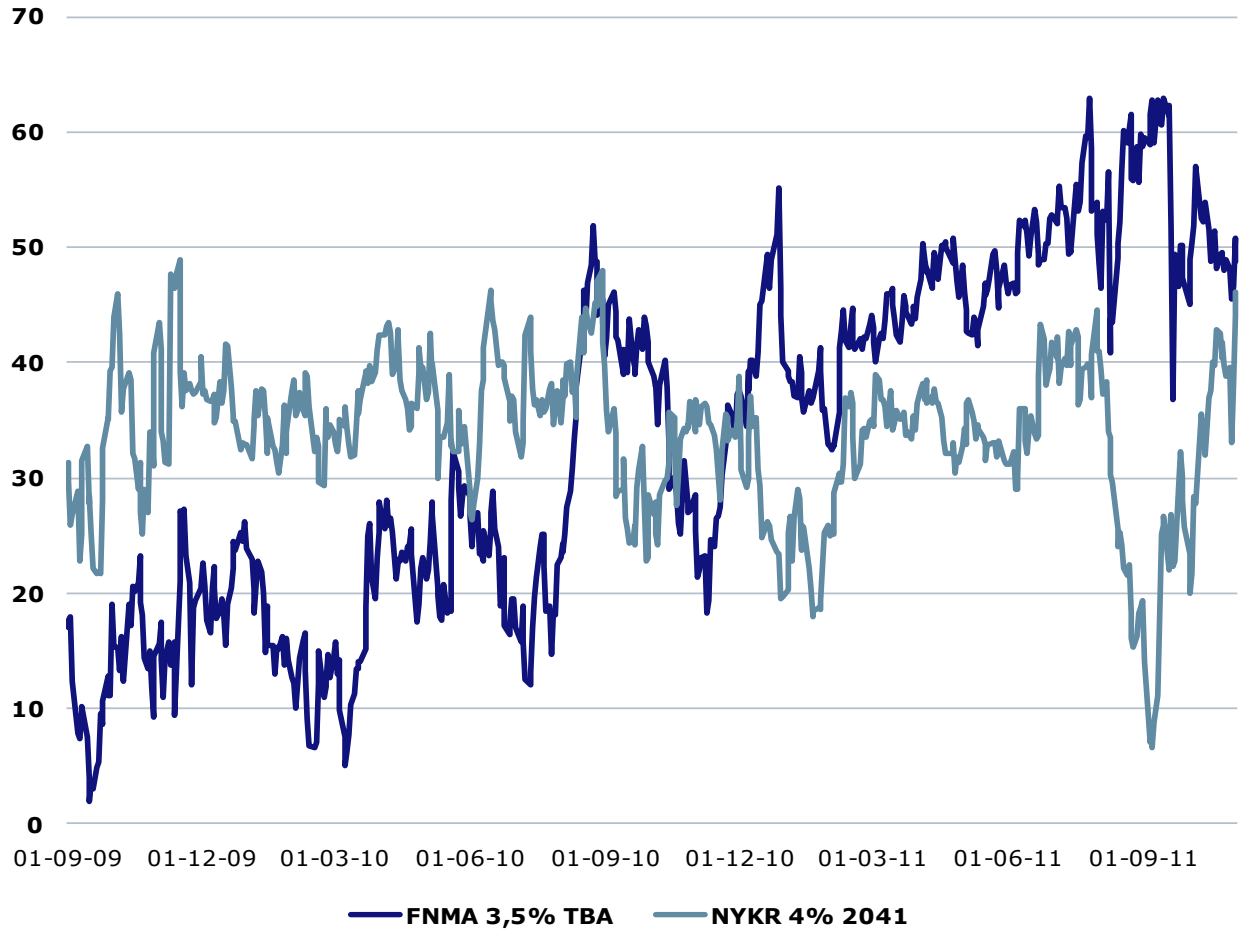
Affordability of mortgage loans cannot be assessed in isolation. In some countries like the US, Germany, Denmark and Sweden there are large specialized mortgage lenders that will sell mortgage loans to consumers as a stand-alone product. In many countries mortgage loans are provided by universal banks as part of a packed financial offering. Sometimes a mortgage loan can be conditioned on the customer buying a life insurance contract at the same time. Hence you should be cautious when comparing mortgage rates across countries as the rates may not reflect the true cost of achieving housing finance. Moreover many countries lightens the burden of mortgage payment by allowing full or partial tax deductibility for interests paid on mortgages. The comparison of after-tax interest expenses on mortgage loans between countries is thus complicated by large differences in tax regimes.

The average costs of housing loans are also difficult to compare because they are highly dependent on the interest rate definition, in particular whether it is variable or fixed.

Another crucial aspect of affordability is the cost of operating the housing finance value chain. An example of a very costly system is the United States, where the process of extending, servicing and funding a mortgage loan is divided between numerous agents that each have to run independent and costly procedures to process documents, conduct due diligence etc. This atomized value chain adds significant costs to the consumer and has proved to work as an impediment to efficient refinancing and funding.

The perceived (and later realized) government backing of the Government Sponsored Enterprises in the USA bestowed a funding advantage on the GSEs that has been estimated to at least 50 bps. The true cost of a mortgage loan in the US would therefore probably be significantly higher without the government backing of the GSEs. It can be argued that the subsidy has allowed a very costly mortgage system with many participants simply because it was “affordable” and that in a system without the funding subsidy the system would have to be leaner and more efficient.

CHART 27 – SWAP SPREADS FOR MORTGAGE BACKED BONDS IN THE US AND DENMARK
BASISPOINTS



Source: Marcrobond and Nykredit.

As can be seen from chart 27 it is possible to run a market based mortgage system without government backing and provide mortgage finance at interest rates that can compare favorably to those achieved in the American system. In this example we compare the US with Denmark, but the funding costs of mortgage lenders issuing covered bonds in other Northern European countries are broadly similar to those of the Danish mortgage banks.

5.2. Resilience towards falling property prices

A mortgage system should be robust in case of falls in house prices, e.g. a fall in house prices should not put the financial system at risk. This suggests that the risks associated with housing finance should be distributed to those agents who are best suited to handle them.

Falling house prices erodes the value of the collateral behind the mortgage loans and hence reduces the credit quality of the mortgage loan portfolios. In

combination with increasing unemployment or other factors reducing the borrower's ability to meet their mortgage obligations falling house prices is a key driver of delinquencies and foreclosures. The widespread use of non-recourse or limited recourse mortgage loans in some countries creates an extra risk in connection with a deterioration in property values namely an incentive for homeowners with negative equity in their homes to walk away from their mortgages. The most extreme examples of this has been some states in the USA during the recent financial crisis, but the phenomenon has also been seen in the UK in the 1990s.

Credit risk should at least for some meaningful part be shouldered by the lenders and house price risk should be mitigated by prudent loan-to-value thresholds. There should also be some sort of recourse to the homeowner in order to secure that the homeowner retains an incentive to keep making mortgage payments even after his home equity has been depleted by falling property prices.

Ireland, and to a lesser extent Spain and Denmark, stand out as the countries, where house prices have declined substantially during the financial crisis, cf. chart 15 in section 2. In Spain, the covered bond issuers have to pose substantial overcollateralization on collateral/credit risk in order to maintain their rating, cf. charts 25 and 26 of section 4. This suggests that the system has not been very resilient in the face of falling property prices. Overcollateralization levels in Denmark are much lower suggesting greater resilience.

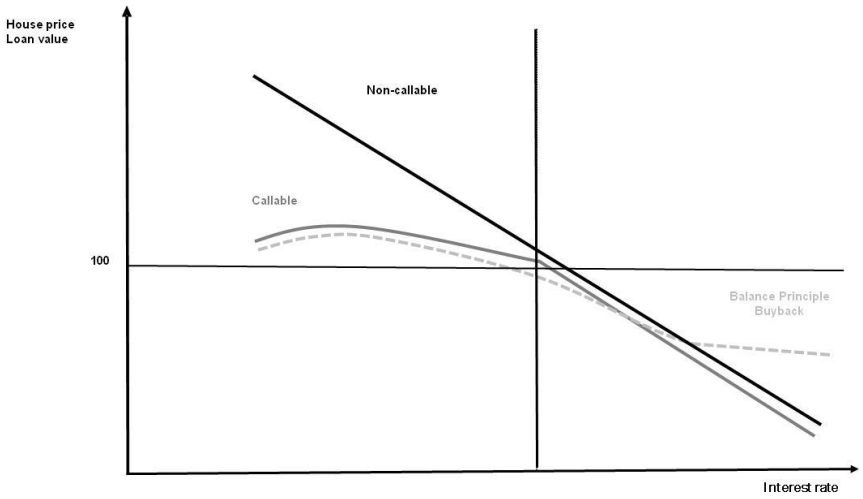
The ratings of covered bonds and the possible TPI/potential uplift also suggest that the covered bond systems of Germany, Denmark , France and Sweden are seen as the stronger systems, cf. chart 21 and 22.

A special feature in the Danish housing finance system is the so-called alternative redemption clause.[19] This clause allows homeowner — as an alternative to normal prepayment— to redeem his loan by buying back the bonds issued to fund his mortgage in the secondary market and delivering them to the mortgage bank. Thus, a borrower may buy back his loan and refinance at a higher coupon, thereby reducing the size of the loan, when

[19] Gyntelberg, Kjeldsen et al., in Bardhan (2011), and Frankel, Gyntelberg et al. in BIS Quartely Review, March 2004.

interest rates rise[20]. Buyback opportunities, cf. chart 28, typically occur as a result of a general upward shift in the interest level but could also be the result of increased credit spreads. The latter was the case with many MBS issues in the US and Europe and with covered bonds in Southern Europe since the collapse of Lehman Brothers in 2008. An alternative redemption clause would have made it possible for homeowners in these countries to redeem their loans at a discount and thereby protecting the equity in their homes and potentially avoid large losses in connection with a foreclosure.

CHART 28 – RELATION BETWEEN LOAN-TO-VALUE AND INTEREST RATE MOVEMENTS



Source: Joachim Dübel and Alan Boyce (2007)

5.3. Robustness during and after periods of financial stress

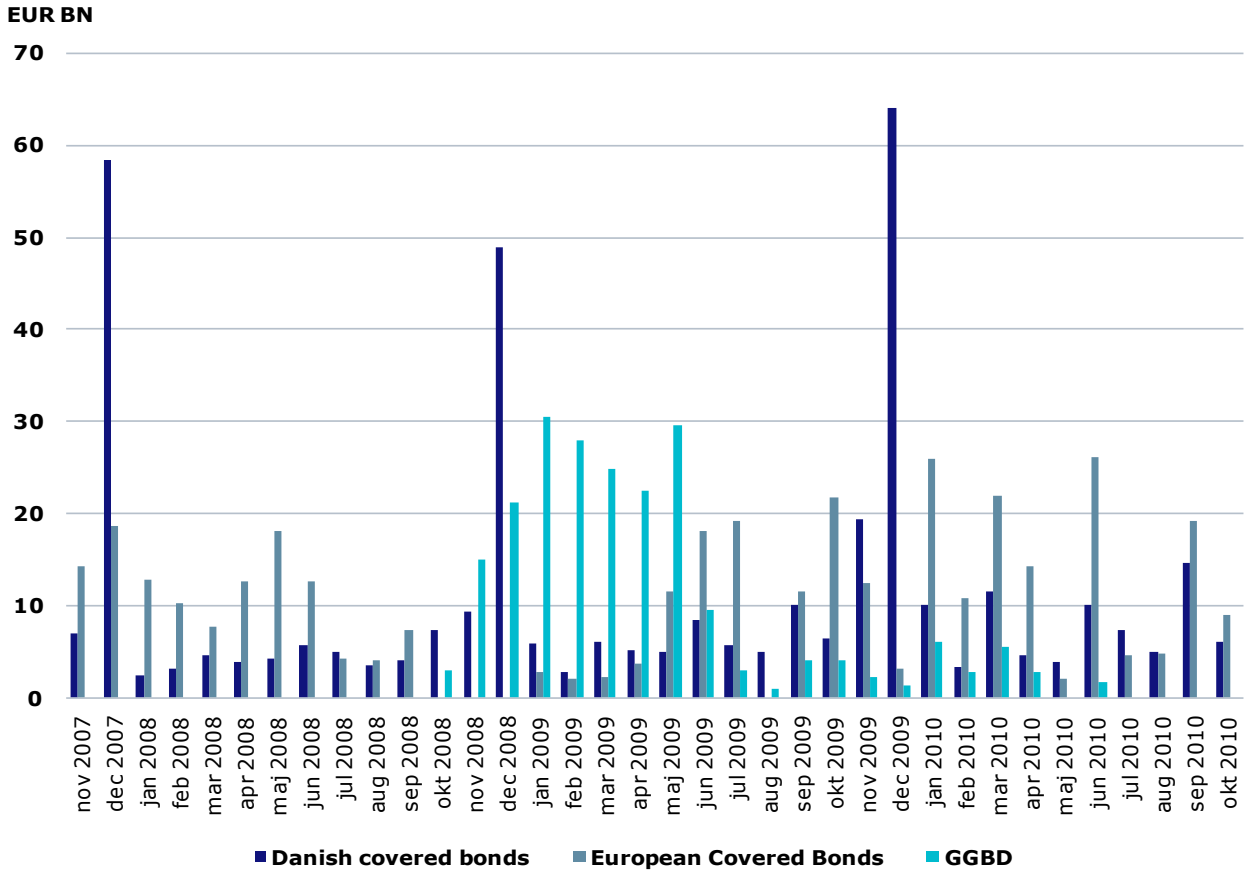
Transparency is key to investor confidence in the housing finance system and the individual lender /issuer and hence to a well functioning funding market for mortgages. The US MBS market has for many years been characterized by low transparency and this opaqueness was multiplied in the run-up to the crisis by ever more sophisticated structured bond funding tools. The ability of the GSEs to retain mortgages as portfolio investments did not make matters better. It created risks where none were necessary. The proximate cause for the September, 2008, nationalization of the GSEs was their inability to roll their

[20] In the Danish system covered bonds include the options granted to borrowers. E.g. the option to redeem at either market price or par. The investor prices these risks, when the bond is acquired. Interest rate risk and prepayment risk are thus handled by the capital markets i.e. professional bond investors and distributed prudently in the financial system with investors with sufficient capital to withstand interest rate and prepayment chocks. In the US system interest rate risks from options are managed by the GSEs, and constitutes an added risk in the US system.

debt. These financial innovations made it virtually impossible for investors – and perhaps also regulators – to assess risks. The result was that during financial stress investors lost all confidence in the issuers and refused to invest in the new bond issues necessary to roll over the funding of the mortgage lenders..

Without any investor appetite for new mortgage backed bond issues, governments in both Europe and the United States had to resort to various interventions – in Europe by issuing guarantees and in the United States by nationalizing Fannie Mae and Freddie Mac in order to make credit available to households.

CHART 29 – ISSUANCE OF COVERED BONDS AND GOVERNMENT GUARANTEED BANK DEBT



Source: Nykredit Markets

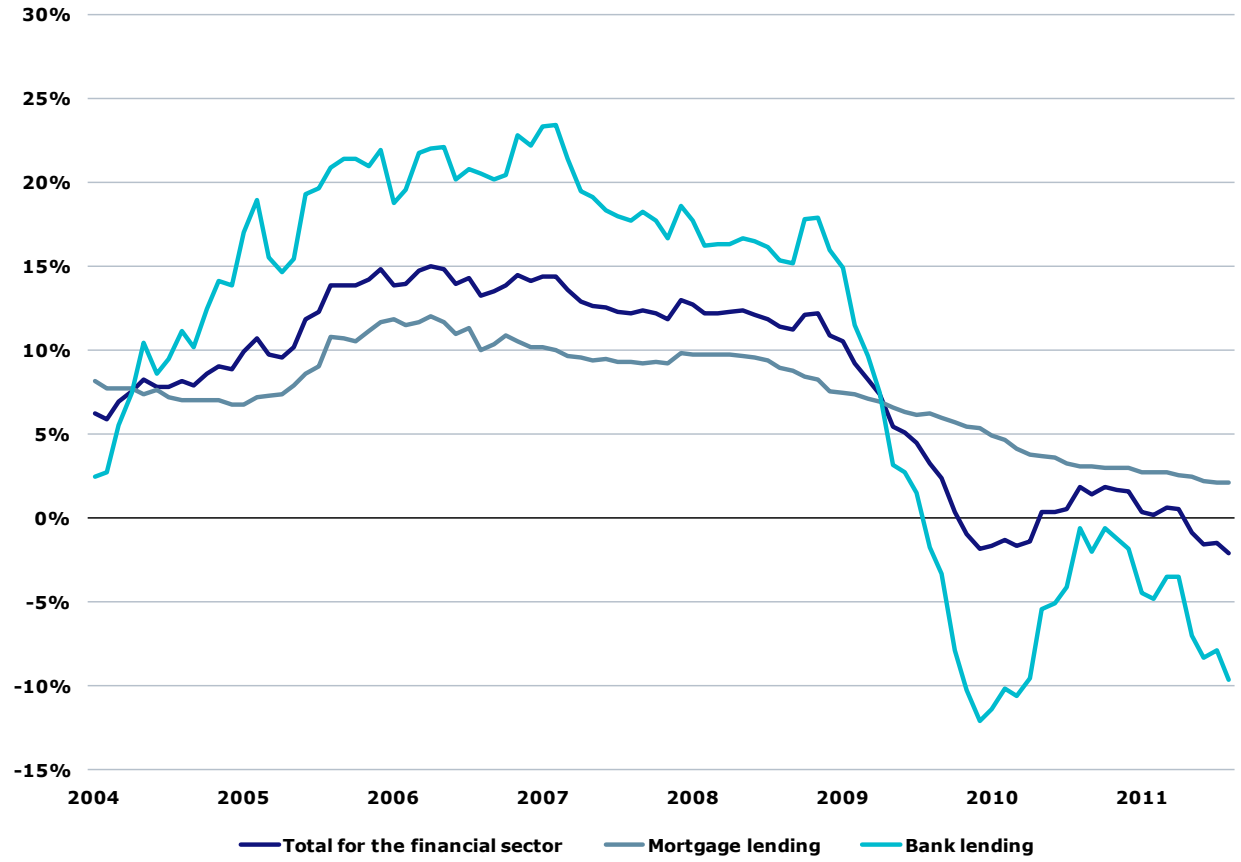
It is interesting to observe that there were a few exceptions to this government intervention in the mortgage funding arena. Both Denmark and Sweden avoided bailing out its mortgage lenders. When Fannie Mae and Freddie Mac had to rely on explicit backing by the federal government and a

very large proportion of covered bond issuers in Europe had to resort to Government Guaranteed Bank Debt in order to attract funding both the Danish and the Swedish covered bond market remained open for both new issuance and trading without government sponsorship, cf. chart 29. The market for senior unsecured debt for banks saw similar developments putting pressure on banks' balance sheets and ability to extend credit to households and businesses.

The effect on the real economy of this pressure on the funding markets is not trivial. It is therefore crucial to secure access to funding for the lenders. The Danish experience show that the banks stopped lending because of lack of funding and that the mortgage banks on the other hand kept extending mortgage secured credit to both retail and corporate clients because they had ample access to funding via the Danish covered bond market, cf. chart 30.

As can be seen from the earlier shown data, growth in mortgage lending in Europe did slow down after the collapse of Lehman. With Belgium and Ireland as significant exceptions all other countries maintained positive growth rates in mortgage lending indicating that the housing finance systems was indeed robust in times of stress. Even in countries that experienced significant drops in house prices and/or GDP like Denmark and Spain the total amount of mortgage loans outstanding kept growing during and after the crisis.

CHART 30 – GROWTH IN MORTGAGE BANK LENDING AND BANK LENDING IN DENMARK



Source: Danmarks Nationalbank.

5.4. Government intervention

The US housing finance system has for many years been characterized by a high degree of government intervention. Even before the government had to step in and nationalize Fannie Mae and Freddie Mac and thereby de facto putting most of the housing finance system under government control there were a number of government schemes in place to support the housing finance system. The US has socialized the cost of residential mortgages, while excluding most existing borrowers from the system. Denmark has socialized mortgage credit availability, while keeping mortgage credit risk taking in the private sector.

Looking only at owner-occupied housing it is striking that the Nordic countries with its welfare state models seems to have taken a much more market oriented approach to housing finance than the United States, cf. table 8.

Table 8: Government Mortgage Market Support

	Government Mortgage Insurer	Government Security Guarantees	Government Sponsored Enterprise	Housing Goals
Denmark	No	No	No	No
Sweden	No	No	No	No
The Netherlands	NHG	No	No	No
Ireland	No	No	No	No
Spain	No	No	No	No
Switzerland	No	No	No	No
Canada	CMHC	CMHC	No	No
UK	No	No	No	No
Germany	No	No	No	No
Australia	No	No	No	No
US	FHA	GNMA	Fannie Mae Freddie Mac FHLBs	Yes

Source: Michael Lea (2011) and own research.

The table above does not take into the consideration the implicit government support to mortgage systems from deposit insured funding, which recent experience show have extended well beyond the insured deposits. In the EU most bank creditors have been bailed out, with the prominent exception of two Danish cases. In fact even subordinated creditors have suffered losses only in Denmark and Ireland[21].

If we take the explicit government support into consideration, there is a strong case for specialized mortgage banks that do not use deposits as funding.

Furthermore, given the preferential status of covered bonds, covered bond systems with extensive overcollateralization poses a potential greater risk to other creditors with implications for calls for bail out. It was earlier shown that overcollateralization is to a very large extend driven by market risk in covered bond systems. Covered bond systems that limit market risk therefore deserves promotion.

[21] Here we exclude a small British savings bank.

6. Concluding Remarks

We have moved from a financial crisis, where banks have been saved by government, but on occasions have caused the fall of sovereigns, to a government debt crisis, where governments are pulling down banks. In the discussion of regulatory policies, the focus is still on how to avoid the repercussions of the financial system on the sovereign and the economy at large.

The last decades have seen a series of financial crisis that offers different lessons for policy makers. The Savings and Loan crisis in the US was driven by the interest mismatch of financial intermediaries. The Scandinavian banking crisis in the early 1990ties was a classical cycle in the Reinhart-Rogoff mode, where real estate prices went through a boom and a subsequent bust. However, as opposed to the Japanese banking crisis, the problems in the banking sector in Scandinavia were swiftly addressed, and the banking sector was quickly able to serve the real economy. The Asian banking crisis in the late 1990ties showed the danger of short term external financing and exchange rate mismatches. The recent financial crisis has had elements of both a liquidity induced crisis in the spirit of Diamond and Dybvig, but more complex given the long intermediation chains cf. Shin(2010)[22], and a boom bust cycle. The financial crisis has also shown that the costs to the economy is not just a question of bail out costs, but also of the costs to the real economy of a financial system that is hampered in its ability to provide finance to the real economy.

The regulatory response has been one of reducing the risks in financial intermediaries. The primary measures has been increases in capital and liquidity requirements, but also structural measures are being considered, cf. the recent Liikanen report. There are ways to structure financial intermediation so that risks are removed from the financial intermediaries. However, this leaves the question of where in the economy the risk should then be allocated.

In this paper, we have looked narrowly on mortgage finance and recent developments in that area. Mortgage finance matters; it is by far the biggest liability of households and mortgages account for a significant share of MFI

[22] BIS Working Papers No 304, Financial intermediation and the post-crisis financial system, by Hyun Song Shin, March 2010.

assets in the EU. We have shown that developments in mortgage finance in the EU has been influenced by the financial crisis, but that there has also been differences across countries. We have shown that mortgage finance can be structured in an almost infinite amount of combinations and that there is a very diverse set of models operating across the EU. One major difference is whether interest rate are variable or fixed. A similarity is that mortgage finance is long term finance; really long term. We have shown the rating agencies assessment of the various covered bond systems that finance a large part of the mortgages. A notable lesson here is that credit risk play a lesser and more stable role than market risks.

We have finally assessed how the various systems have performed against four performance criteria. The good news for Europe is that we are doing a lot better than the US, although that is a low benchmark. Other observations are that the German system is on the restrictive side in terms of making housing finance available, whereas the Spanish system seems to have been too accommodating resulting in too little resilience towards falling property prices. European mortgage systems have generally done well in terms of maintaining the capacity to lend during the crisis, with the Swedish and Danish system performing at the upper end in terms of ability to sell covered bonds. The European mortgage finance systems were fortunately less entangled in government support than in the US. However, in most deposit taking banks there is an implicit subsidy that is amplified, if covered bonds are used as a financing instrument and where overcollateralization in relation to covered bond issuance is substantial. The latter is particularly apparent in systems, where there is substantial market risk embedded in the covered bond construction. Thus, there is a case for specialized mortgage institutions that are not deposit funded, and where market risk is relatively limited.

The risks in financial intermediation include credit risk, market risk, liquidity risk and operational risk. Credit and operational risk are characterized by being more opaque than market risk, which suggest that they should not be outsourced, given potential principal agent problems, whereas outsourcing of market risk may make more sense. Given the long maturity of mortgage loans, the potential size of market risk is also large, which is a further argument for outsourcing, as also indicated by the importance of market risk for rating agencies. The long maturity of mortgage loans also increase the potential of liquidity risks to create havoc.

The challenge is then to find investors that are willing to pick up market risk and liquidity risk. The obvious candidate is pension funds and other forms of long term savings. This raises at least two questions that deserves further analysis. One, can we match the parameters that borrowers desire with the parameters that investors want. Two, do we have enough long term savings to cater for long term borrowing needs.

A big issue in relation to matching borrowers and investors preferences are the choice between variable and fixed rates. Miles(2004)[23] suggested that many borrowers in the UK would be better off with fixed rate loans instead of the prevalent variable rate loans. This would create a better match to the historical preferences of pension funds. However, One could query, whether fixed rate investments is the sensible instrument for pensions or rather reflects the prevalence of nominally defined benefit schemes that may not deliver the best return characteristics for pensions, including real certainty.

There is a lot of emphasis on the need to move from a microprudential focus, where the objective is the stability of a single institution, to a macroprudential focus, where the objective is the stability of the financial system as a whole. Still most regulatory initiatives at best aim at a segment of the financial system. In the EU the two biggest regulatory initiatives are CRDIV/CRR for credit institutions and Solvency 2 for life insurance companies, and soon to be used also in relation to pension funds. Both reflect a goal of reducing risks for institutions in the respective sectors, but few thoughts have been given to the interaction among the two sectors and the implications for the overall economy.

[23] The UK Mortgage Market: Taking a Longer-Term View, Final Report and Recommendations
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ANNEX 1

Rating methodologies for covered bonds

Rating agencies undertaking to assign credit ratings to covered bond programs have devised frameworks that based on analysis of numerous factors arrives at i) a specific rating of a given bond program and ii) the level of additional credit enhancement – if any – necessary to achieve this rating. Such possible credit enhancement is referred to as overcollateralization (OC).

Common to both Standard & Poor's (S&P), Fitch Ratings and Moody's Investors Service is the belief that the issuer rating (IR) is a key factor in determining the rating of a covered bond. Below is an overview of the covered bonds rating methodologies used by the three rating agencies.

Standard & Poor's

Assessment of

Legal and regulatory risks

- Asset and cash flow segregation if issuer becomes insolvent
- Acceleration of payments to bondholders if issuer becomes insolvent
- Payment moratorium or forces restructuring
- Limits to OC-levels
- Treatment of hedging agreements
- Management of cover pool before and after insolvency of issuer

Operational and administrative risks

- Origination, underwriting and servicing

Counterparty risks

- Does hedging agreements conform to S&P's counterparty criteria?

Country risks

- Determining the covered bond's maximum rating uplift relative to sovereigns rating

Asset credit quality, payment structure and cash flow risks

Step 1 Asset-liability mismatch classification (ALMM)
Calculation of ALMM includes cash flow stresses to cover credit risks and timing of mismatches. Based on stresses and assumptions each covered bond program is classified as "low", "moderate" or "high" ALMM risk.

Step 2 Program categorisation
Covered bond programs are segmented into three categories 1, 2 or 3 predominantly by country based on assessment of funding options available to the program and the likelihood of obtaining such funding. Each category has a range of maximum ratings uplift from the issuer rating. A broad range of funding option and a high systemic importance of the mortgage product in a country will positively impact the potential uplift.

Step 3 Maximum potential covered bond rating
By combining the ALMM classification from step 1 and the program categorisation from step 2, S&P determines the maximum number of notches the rating of a covered bond program may potentially exceed the rating of the issuing bank assuming the available OC meets the OC requirement for maximum uplift calculated in step 4.

ALMM risk	**Category**		
	1	**2**	**3**
Zero	Unrestricted	Unrestricted	Unrestricted
Low	7	6	5
Moderate	6	5	4
High	5	4	3

Step 4 Cash flow and market value analysis
In this step S&P determines the OC-level necessary to achieve maximum potential ratings uplift (target credit enhancement). In the analysis S&P reviews asset default risk, interest rate and currency risks, and market value risks arising from asset-liability mismatches. OC is a function of cover pool characteristics only i.e. independent from the issuer rating.

Step 5 The covered bond rating
In this final step S&P determines a rating on a program by comparing the actual OC available with the target credit enhancement determined in step 4. If the available OC is equal to or higher than the target credit enhancement, the program can achieve the maximum potential rating.

Fitch

Fitch applies a four-step model.

Step 1 Minimum covered bond rating on probability of default (PD) basis defined as the issuer rating.

Step 2 Determining the Discontinuity Cap (D-Cap).
The D-Cap

- Assessment of likelihood of interruptions in payments to covered bond holders in the immediate aftermath of issuer insolvency
- Ranges from 0 (bonds would default following insolvency of issuer) to 6 and 8 (continuity)
- Denotes the maximum number of notches the rating of a covered bond program may potentially exceed the rating of the issuing bank on a PD-basis.

- Actual uplift on a PD-basis from rating of issuing bank subject to stress-test in step 3.

Discontinuity Caps	Risk Description
D-Cap 8	Minimal discontinuity
D-Cap 6	Very low
D-Cap 5	Low
D-Cap 4	Moderate
D-Cap 3	Moderate High
D-Cap 2	High
D-Cap 1	Very High
D-Cap 0	Full discontinuity

The D-Cap is based on the highest risk assessment (0-6,8) among the factors

- Asset segregation
- Liquidity gap and systemic risk (banks in countries rated A+ and below exposed to systemic risk (sovereign and bank downgrades can cause increased bank funding costs, decreased interbank liquidity, etc.)).
- Alternative management (swift appointment of third-party cover pool manager post issuer insolvency)
- Privileged derivatives (hedging agreements)

Step 3 Stress-testing OC to set the covered bond rating on a PD basis.

Using cash flow analysis Fitch stresses cover pool, including OC, to determine the highest achievable covered bond rating based on a PD approach. In the analysis Fitch reviews asset default risk, interest rate and currency risks, and market value risks arising from asset-liability mismatches. OC is a function of cover pool characteristics only i.e. independent from the issuer rating.

Step 4 Defining the Recovery Uplift

Covered bonds defaulting post issuer insolvency may still benefit from high recoveries stemming from the residual cover pool. This is recognised by Fitch through a potential uplift above the covered bond rating set on a PD basis in step 3. For stressed recoveries estimated in the 91-100% range, the uplift can reach up to two notches if the rating on a PD basis is BBB- or higher (investment grade), and three notches if the rating on a PD basis is BB+ or lower (non-investment grade) cf. the table below.

Recovery prospects	Recovery range (%)	Investment grade	Non-investment grade
Outstanding	91-100	+2	+3
Superior	71-90	+1	+2
Good	51-70	+1	+1
Average	31-50	-	-
Below average	11-30	-1	-1
Poor	0-10	-1/-2	-2/-3

Moody's

Moody's applies a two-step model.

Step 1 Moody's Expected Loss (EL) model

Moody's rating of a covered bond is primarily determined by the expected loss. Under the EL model the expected loss is calculated as a function of a) the probability of issuer default and b) any subsequent losses on the cover pool, assuming a stressed environment following issuer default. Loss assumptions are primarily affected by the credit quality of the cover pool, refinancing risk and interest-rate and currency risks. Refinancing risk and interest-rate and currency risks are together referred to as market risks.

Step 1.a The issuer

- Key driver is the issuer rating assigned by Moody's

Step 1.b Credit quality of the cover pool

- The "collateral score" measures the level of loss
- The lower the collateral score the stronger the credit quality of the cover pool
- Collateral score affected by
  - Performance of relevant property market(s)
  - Range and distribution of LTV-ratios
  - Quality of loan underwriting
  - Seasoning of cover pool
  - Type of loan products (e.g. amortising or interest-only)
- Haircut to collateral score may be applied for highly rated issuers

Refinancing risk

- Relevant where assets in the cover pool have longer expected maturity than that of the covered bonds
- Under the EL model it is assumed that when funds must be raised against the cover pool post issuer insolvency this will be done at a discount
- OC necessary to address refinancing risk is based on three factors
  - Level of discount required to sell or refinance the assets
  - Volume of the cover pool exposed to refinancing risk
  - Average duration of the refinancing risk

Interest-rate and currency risk

- OC necessary to address possible interest-rate of currency risk is based on
  - Size of possible interest-rate or currency movements
  - Volume of assets exposed to interest-rate or currency mismatches
  - Duration of possible interest-rate mismatches
  - Hedging arrangements

Step 2 Moody's Timely Payment Indicators (TPIs)

- Assessment of likelihood of interruptions in payments to covered bond holders in the immediate aftermath of issuer insolvency
- TPIs are Very High, High, Probable-High, Probable, Improbable and Very Improbable.
- A TPI of Very High indicates a very high likelihood of timely payments on covered bonds following default of the issuing bank, and vice versa for a TPI of Very Improbable.
- Determines the maximum number of notches the rating of a covered bond program may potentially exceed the rating of the issuing bank.

Determinants of the TPIs

- Refinancing risk (most important factor)
- Sovereign and financial system
- Strength of legislation
- Hedging agreements
- Type of assets

- Correlation between the performance of the issuer and the cover pool
- Additional OC

		Timely Payment Indicators					
		Very Improbable	Improbable	Probable	Probable-High	High	Very High
Issuer Rating	A1	**Aaa**	**Aaa**	**Aaa**	**Aaa**	**Aaa**	**Aaa**
	A2	**Aa1**	**Aa1**	**Aaa**	**Aaa**	**Aaa**	**Aaa**
	A3	**Aa2**	**Aa2**	**Aaa**	**Aaa**	**Aaa**	**Aaa**
	Baa1	**Aa3**	**Aa3**	**Aa1**	**Aa1**	**Aaa**	**Aaa**
	Baa2	**A1**	**A1**	**Aa2**	**Aa2**	**Aa1**	**Aaa**
	Baa3	**A3**	**A2**	**A1**	**Aa3**	**Aa2**	**Aa1**
	Ba1	**Baa3**	**Baa2**	**Baa1**	**A3**	**A2**	**A1**
	Ba2	**Baa3**	**Baa2**	**Baa1**	**A3**	**A2**	**A1**
	Ba3	**Baa3**	**Baa2**	**Baa1**	**A3**	**A2**	**A1**
	B1	**Ba3**	**Ba2**	**Ba1**	**Baa3**	**Baa2**	**Baa1**
	B2	**Ba3**	**Ba2**	**Ba1**	**Baa3**	**Baa2**	**Baa1**
	B3	**Ba3**	**Ba2**	**Ba1**	**Baa3**	**Baa2**	**Baa1**

Annex 2

Moody´s and S&Ps Covered bond rating relative to issuer rating

Moody´s:

Austria

Issuer Rating \ CB Rating	Aaa	Aa1	Aa2	Aa3
A3	1	-	-	-
Baa1	-	-	-	-
Baa2	-	-	1	-

Cyprus

Issuer Rating \ CB Rating	Baa3	B1	B2
B2	1	1	-
B3	-	1	1

Denmark

Issuer Rating \ CB Rating	Aaa	Aa1	Aa2
A1	2	-	-
A2	-	-	-
A3	-	-	-
Baa1	-	-	2

Finland

Issuer Rating \ CB Rating	Aaa	Aa1
Aa3	3	-
A1	-	-
A2	1	-
A3	-	2

France

Issuer Rating \ CB Rating	Aaa	Aa1
Aa3	2	-
A1	2	-
A2	12	-
A3	-	-
Baa1	-	1

Germany

Issuer Rating \ CB Rating	Aaa	Aa1	Aa2	Aa3	A1	A2	A3	Baa1
Aa2	1	-	-	-	-	-	-	-
Aa3	-	-	-	-	-	-	-	-
A1	6	-	-	-	-	-	-	-
A2	4	-	-	-	-	-	-	-
A3	2	2	-	-	-	-	-	-
Baa1	1	1	-	-	-	-	1	-
Baa2	-	2	1	-	-	-	-	1

S&P:

Denmark

Issuer Rating \ CB Rating	AAA	AA+	AA	AA-
AA-	2	-	-	-
A+	6	-	-	-
A	-	-	-	-
A-	8	-	-	1

Finland

Issuer Rating \ CB Rating	AAA
AA-	2

France

Issuer Rating \ CB Rating	AAA	AA+
AA+	1	-
AA	-	1
AA-	2	-
A+	2	-
A	4	-

Germany

Issuer Rating	AAA	AA+	AA
AA-	3	-	-
A+	3	-	-
A	1	-	-
A-	1	-	-
BBB+	-	-	-
BBB	-	1	-
BBB-	-	-	1

Moody´s:

S&P:

Greece

Issuer Rating \ CB Rating	Caa2
Caa2	5

Hungary

Issuer Rating \ CB Rating	Baa3	Ba1
Ba1	1	-
Ba2	-	-
Ba3	-	1

Ireland

Issuer Rating \ CB Rating	Baa3
Ba2	1
Ba3	2

Ireland

Issuer Rating \ CB Rating	A
BB	1

Italy

Issuer Rating \ CB Rating	A2	A3
Baa2	3	-
Baa3	5	-
Ba1	-	1

Italy

Issuer Rating \ CB Rating	AA+	AA	AA-	A+	A	A-	BBB+
BBB+	1	-	-	-	-	-	1

Netherlands

Issuer Rating \ CB Rating	Aaa	Aa1	Aa2	Aa3	A1
A2	2	-	1	-	-
A3	-	-	-	-	-
Baa1	-	-	-	-	-
Baa2	-	-	1	-	-
Baa3	-	-	-	-	1

Netherlands

Issuer Rating \ CB Rating	AAA
A+	2

Norway

Issuer Rating \ CB Rating	Aaa
Aa3	1
A1	-
A2	3
A3	3
Baa1	1

Norway

Issuer Rating \ CB Rating	AAA
A+	1

Moody´s:

S&P:

Poland

Issuer Rating \ CB Rating	Baa2
Baa3	1

Spain

Issuer Rating \ CB Rating	A3	Baa1	Baa2	Baa3	Ba1	Ba2
Baa2	1	-	-	-	-	-
Baa3	4		-	-	-	-
Ba1	6	1	-	-	-	-
Ba2	1	2	-	-	-	-
Ba3	-	-	1	-	-	-
B1	-	1	-	1	1	-
B2	-	-	-	-	-	-
B3	-	-	-	-	-	1

Spain

Issuer Rating \ CB Rating	AA+	AA	AA-	A+
BBB+	2	-	-	-
BBB	-	-	-	-
BBB-	-	2	-	-
BB+	-	-	1	1
BB	-	-	-	1

Sweden

Issuer Rating \ CB Rating	Aaa
Aa3	3
A1	1
A2	3

Sweden

Issuer Rating \ CB Rating	AAA
AA-	1
A+	2
A	2

Switzerland

Issuer Rating \ CB Rating	Aaa
A1	1
A2	1

United Kingdom

Issuer Rating \ CB Rating	Aaa	Aa1	Aa2
Aa3	2	1	-
A1	-	-	-
A2	8	-	-
A3	4	-	-
Baa1	-	-	-
Baa2	-	-	1

United Kingdom

Issuer Rating \ CB Rating	AAA
A+	2
A	4