SPECIAL REPORT

# International Comparison of Mortgage Product Offerings

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RESEARCH INSTITUTE for HOUSING AMERICA

MORTGAGE BANKERS ASSOCIATION®
Investing in communities

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# Research Institute for Housing America

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# Executive Summary

The recently passed Dodd-Frank Financial Reform Bill has significant implications for the provision of mortgage credit in the United States. The bill stipulates the characteristics of qualified mortgages, which are likely to become the standard instruments in the market going forward. The bill bans or restricts the use of pre-payment penalties, balloon payments, interest-only payments and other features commonly offered in the mortgage choice set. A likely outcome of the bill is to perpetuate the use of the long-term fixed rate pre-payable mortgage (FRM) with implications for the future of the mortgage GSEs.

This study examines the issue of mortgage product design from the viewpoint of international experience. What mortgage designs and characteristics exist in different markets and why? How have they performed prior to and during the crisis? The study will focus on five important aspects of mortgage design:

- Interest rate determination: fixed versus adjustable-rate mortgages;
- Pre-payment penalties and restrictions;
- Loan-term and amortization limits;
- Mortgage default and foreclosure; and
- Consumer protection regulation

This comparison of mortgage product offerings in developed countries has revealed significant differences in the dominant product offerings. Countries differ in terms of the market share of adjustable versus fixed-rate mortgages, the use of pre-payment penalties, maximum term and the offering of features such as interest-only payments and assumability. Our findings suggest that the United States is internationally unusual in several respects:

- The United States has an unusually high proportion of long-term fixed-rate mortgages as well as use of securitization in the finance of housing. The dominance of the FRM and

securitization is driven in part by the presence of government-backed secondary mortgage market institutions that lower the relative price of this type of mortgage.

- The United States is unusual in the banning or restriction of pre-payment penalties on fixed-rate mortgages. Most countries in the survey allow such penalties to compensate lenders for loss associated with the financing of the instruments. As a result, mortgage rates do not include a significant pre-payment option premium and other financing techniques, such as covered bonds, are more common.

- The only other country that utilizes the FRM is Denmark. The Danish system offers a superior alternative in the form of the "Principal of Balance" that equates individual mortgages and bonds. This system allows borrowers to pre-pay their loans when rates fall, as in the United States, and allows them to buy back their bond when rates rise. This feature allows the borrower to benefit from interest rate increases and decreases and facilitates de-leveraging when rates rise, reducing the incidence of negative equity.

- Features that are restricted in the Dodd-Frank Bill such as longer terms, interest-only periods and flexible payment designs are quite common in other countries and do not appear to have been associated with higher rates of default.

- Mortgage default rates have been far lower in other countries than in the United States, despite the fact that several countries had greater house price volatility. The lack of subprime lending (outside of the United Kingdom) and less use of limited or no documentation lending were major factors. Mortgage products did not play a role in mortgage default — in fact the dominance of ARMs in several countries was noted as a reason for lower default rates.

- Mortgage foreclosure and repossession regimes are varied, with some more efficient and some less efficient than in the United States. However all other countries in the survey have recourse mortgages and lenders routinely pursue deficiencies. Research in Europe and the United States has found that recourse reduces the incidence of default.

- Consumer protection regulation has advanced in a number of countries. The focus has been on borrower qualification and suitability standards and for the most part has not constrained mortgage product design.

# Introduction

In the aftermath of the U.S. mortgage-market crisis there have been numerous actions and proposals to restrict mortgage product design. The Federal Reserve Board created guidelines for high cost loans in 2008 that restrict or prohibit the use of certain features such as pre-payment penalties on high cost loans.[1] The trend continued with the passage of the Dodd-Frank Financial Reform Bill [2010] in July 2010, which contains a section entitled the "Mortgage Reform and Anti-Predatory Lending Act," that is likely to substantially change the mix of product offerings available in the U.S. market.

The bill introduces the concept of a "qualified" mortgage that seriously constrains the characteristics of mortgages. The qualified mortgage is basically an instrument with low-risk characteristics such as fully amortizing payments and a term no longer than 30 years. Qualifying loans can be fixed rate or adjustable rate but qualification on the former has to be on a fully amortizing payment and on the latter is based on the highest possible rate in the first five years with full amortization. Pre-payment penalties on qualified fixed-rate mortgages are capped and not allowed on adjustable-rate mortgages. The law also allows regulators to prohibit or further restrict "...the use of balloon payments, negative amortization, pre-payment penalties, interest-only payments, and other features that have been demonstrated to exhibit a higher risk of borrower default." (p. 533).

Although the law allows lenders to make non-qualified mortgages, they too have constraints. For example pre-payment penalties are not allowed on non-qualified mortgages. More importantly, lenders that make qualified mortgages enjoy a safe harbor where they are not subject to certain restrictions — in particular, that they must retain at least five percent of the credit risk on the loans. If a mortgage is qualified the lender is not obliged to retain any of the risk of loss. Furthermore, lenders that make loans that are not qualified or are later found to have violated qualification provisions may find themselves subject to penalties and loss of the ability to pursue deficiency judgments in foreclosure.

The likely effect of these regulations will be to limit the offering of products that are not deemed to be qualified. Those that are offered will have a higher price, reflecting the required risk retention, greater risk of rules violations and greater cost of documenting affordability and compliance. In particular the law may result in a greater proportion of long-term FRMs that enjoy favored status as qualified mortgages.

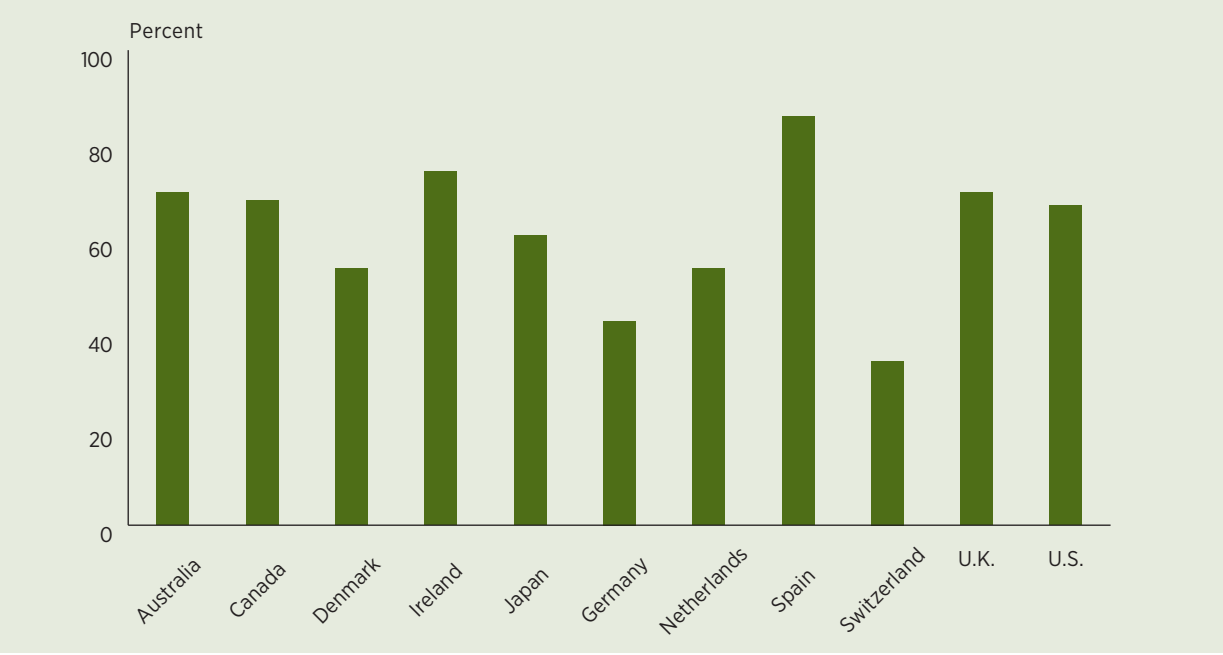
Is it a good idea to place restrictions on loan design? While many borrowers were offered inappropriate or highly risky products during the mortgage market boom, proposals to limit mortgage product offerings, either explicitly or implicitly, run the risk of eliminating valuable features from the mortgage marketplace and stifling mortgage product innovation.[2] For example, pre-payment penalties can be an efficient mechanism to lower mortgage rates and facilitate interest rate risk management for lenders and investors. Negative amortization can cushion the payment shock potential of adjustable-rate mortgages (ARMs). Lower start rates due to discounts, interest-only periods or graduated payments can reduce affordability constraints for borrowers. Arguably the problem with loan design during the crisis was one of a mismatch between borrowers and particular loan designs — not the existence of the loan features themselves. Furthermore steering the market further towards FRMs has implications for the finance of mortgages, market structure and stability.

In this study we examine 12 major developed countries with distinctly different mortgage market and product configurations. The countries chosen have relatively large and well developed mortgage markets with a variety of instruments and funding mechanisms. They all have relatively high homeownership rates and mortgage indebtedness. The purpose of the study is to inform U.S. market participants and policy makers about the range of product offerings available in other countries and identify potential features or products that could safely expand market offerings in the United States.

# Country Background

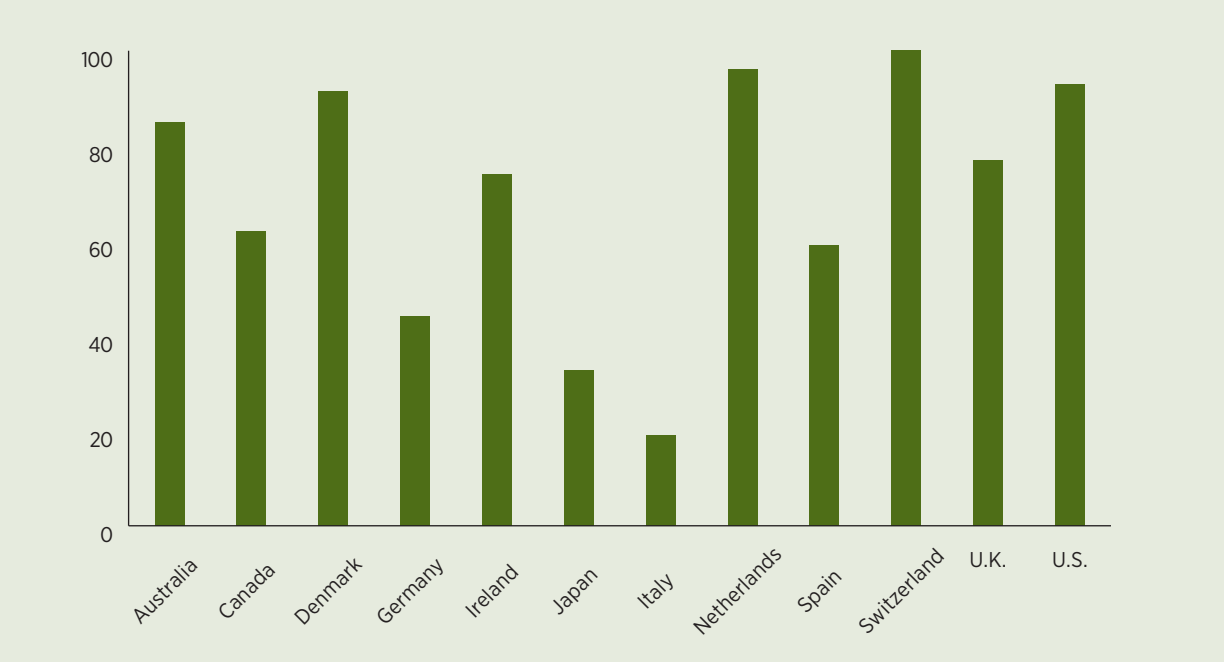
With the exception of Germany and Switzerland, the countries in this study have similar rates of homeownership (Figure 1). Australia, Ireland, Spain and the U.K. all have higher rates of homeownership and Canada's rate is comparable to that of the United States. This is noteworthy as these countries provide far less government support for homeownership than the United States does. Most western European countries have lower rates of homeownership, in part due to strong social rental systems. Germany provides incentives for rental investment but not for homeownership. Switzerland has historically had a low homeownership rate, reflecting a high cost of housing and a large foreign-born (often transient) population. Southern European countries like Italy, Greece and Spain have higher rates of homeownership, reflecting cultural values, discriminatory policies towards private rental

**Figure 1**
**Homeownership Rate**




*Source:* ABS, CHMC, Delft University, EMF, Bureau of the Census.

**Figure 2**
**Mortgage Debt Outstanding-to-GDP, 2008**




*Source:* Central Banks, World Bank 2008 except Japan 2006.

housing and weaker support of social rental housing.

Mortgage indebtedness, as measured by mortgage debt outstanding relative to GDP, is also high in most countries — ranging from 38 percent in Japan to 100 percent in Switzerland (Figure 2). The ratios are low in Germany and Japan, reflecting more than a decade of stagnant house prices and mortgage lending. Many countries, including Australia, Ireland, the Netherlands and Spain had more rapid growth in mortgage indebtedness than the United States during the past decade.

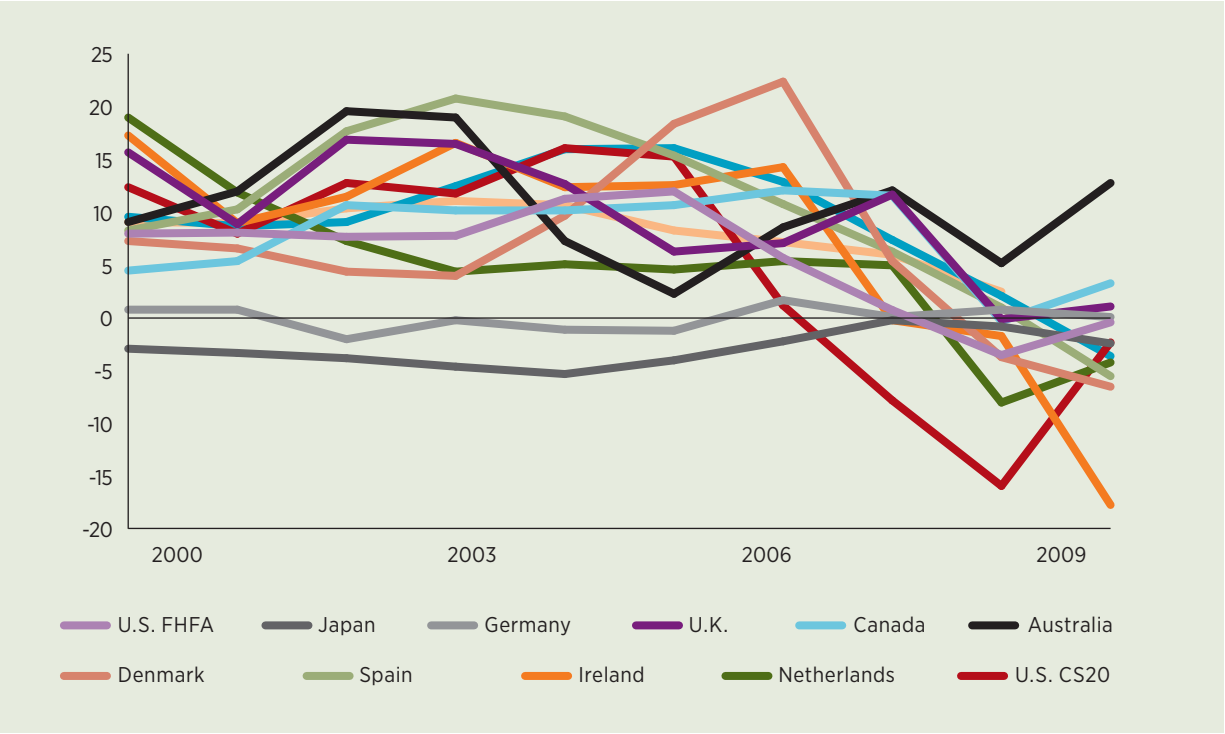
Although the United States had an unprecedented run-up of house prices during the decade, it was not alone, as shown in Figure 3. Many OECD countries had greater house price increases between 2000 and 2006 than did the United States. Australia and the United States were the first of the bubble countries in which house prices fell (the Australian housing market has since recovered). The magnitude of the U.S. house price fall as measured by the S&P Case Shiller 20 Metro Area Index has been greater than that of other countries.

Mortgage interest rates in most countries declined during the decade except in Australia (Figure 4). The Reserve Bank of Australia increased interest rates in 2003, in part to head off a housing price bubble. The rates are specific to the dominant instrument. Australia, Ireland, Spain and the U.K. are predominately short-term variable-rate markets. Their mortgage rates declined more sharply than those in other countries during the crisis.

There are significant differences among countries in the presence of government-owned or -sponsored mortgage institutions. Table 1 compares select countries in this dimension. The United

**Figure 3**

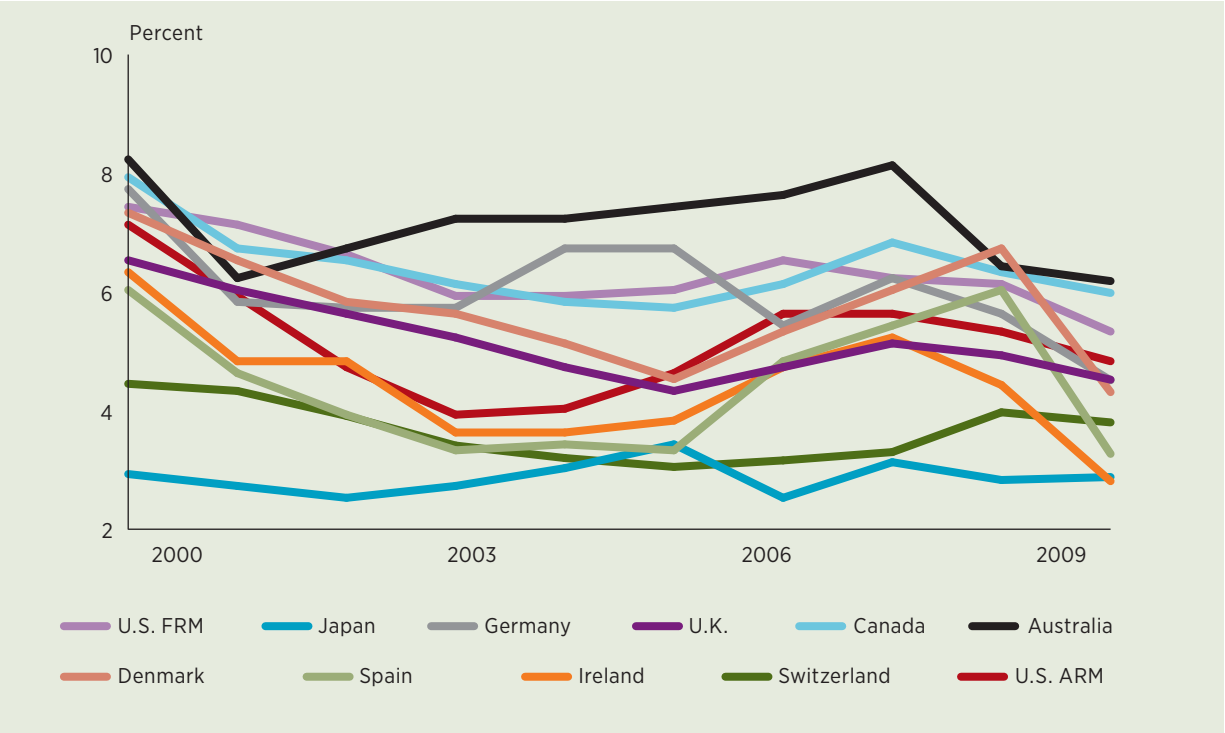
## House Price Change




*Source:* CMHC, EMF, FHFA, S&P.

**Figure 4**

## Mortgage Interest Rates




*Source:* Central Banks, EMF, MBA.

States is unusual in its use of all three types of government-supported mortgage institutions or guarantee programs: mortgage insurance, mortgage guarantees and government-sponsored mortgage enterprises. Canada and Japan have government guarantee programs and Canada and the Netherlands have government-backed mortgage insurance programs. Korea has a GSE modeled after those in the United States. The market share of government-backed institutions in Canada, Japan and Korea is significantly less than that of the United States.

**Table 1**
**Government Mortgage Market Support**

| Country | Government Mortgage Insurer | Government Security Guarantees | Government Sponsored Enterprises |
|---|---|---|---|
| Denmark | No | No | No |
| Germany | No | No | No |
| Ireland | No | No | No |
| Netherlands | NHG | No | No |
| Spain | No | No | No |
| U.K. | No | No | No |
| Australia | No | No | No |
| Canada | CMHC | CMHC | No |
| Japan | No | JHF | Possible |
| Korea | No | No | Korean Housing Finance Corp. |
| Switzerland | No | No | No |
| U.S. | FHA | GNMA | Fannie Mae, Freddi Mac, FHLBs |

# Mortgage Characteristics

A mortgage is a complex mix of different features.[3] There are terms that dictate how the interest rate is determined, how the loan is amortized, its final maturity and the options for and requirements of the lender and borrower.

What are the desirable features in a mortgage instrument? The answer to this question is not straightforward as it depends on whether viewed from the borrower or the lender/investor perspective. Features attractive to borrowers may be costly or impossible for lenders to provide. Features attractive to lenders may not be acceptable to borrowers. A borrower is interested in the affordability of the loan, both at inception and over its life. The lender is interested in getting an acceptable risk-adjusted rate of return over the life of the loan. This presents a conundrum — often an attempt to improve the attractiveness of the loan for one party creates a problem for the other. For example, an interest rate cap on an ARM reduces potential payment shock and default risk for borrowers but can reduce yield for lenders.

There is no perfect mortgage — the dominant instrument in any country represents a balance between borrower and lender/investor needs. Regulation may have an important influence if it bans or dictates certain features. History too may play a role — an instrument that has been dominant in a market for a long period of time is familiar to both borrowers and lenders and may be difficult to dislodge.

In general there is no one ideal mortgage instrument for a market. A wide variety of mortgage instrument designs have been created to meet the varying needs of borrowers and lenders. A robust mortgage market will have a several different instruments that can be tailored to the varying needs of borrowers and lenders with the mix determined by market forces rather than prescriptive regulation.

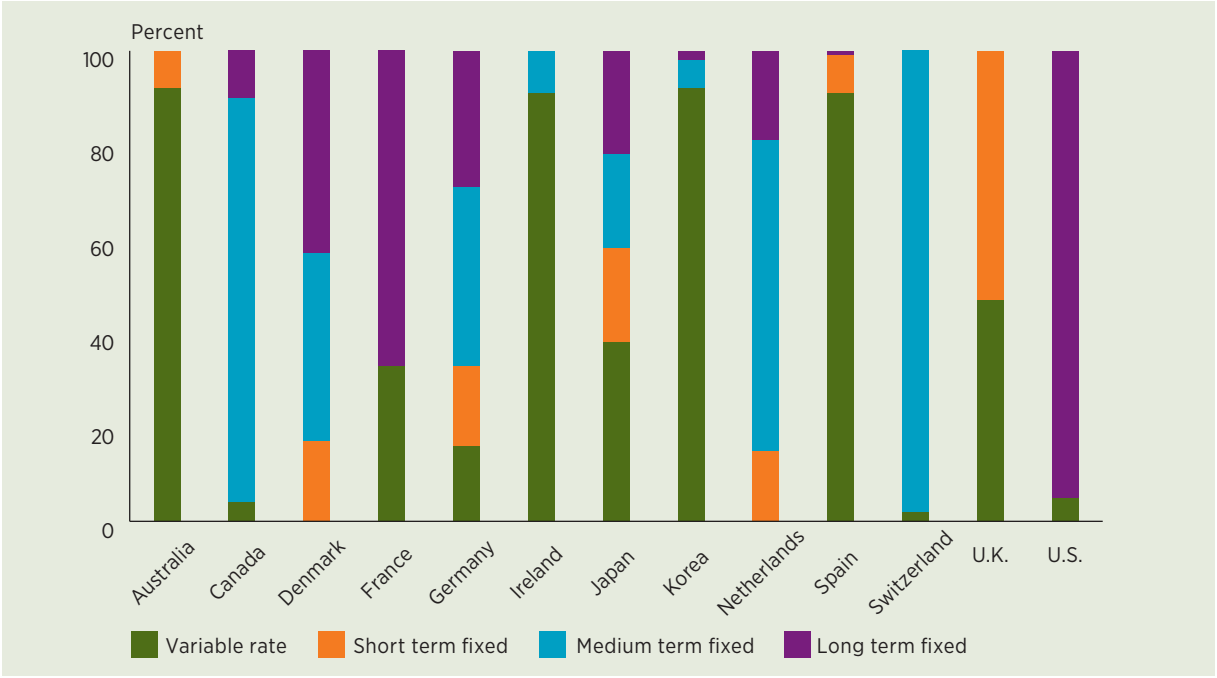
# Interest Rate Determination: Fixed Versus Adjustable Rate

Perhaps the most important parameter in mortgage instrument design is the determination of the periodic interest rate. There is a wide range of possibilities for setting interest rates. Table 2, adapted from a 2006 study by the European Mortgage Federation (EMF), defines the different types.

**Table 2**
**Types of Interest Rates**

| Type of interest rate | Description | Length of initial period of fixation | Definition |
|---|---|---|---|
| Fixed interest rate | Remains unchanged through the entire duration of the loan | | |
| Initial period fixed rate | Starts with a period during which the interest rate is fixed. After the initial period, the interest rate can either be fixed for another period or vary | The initial fixed rate period is smaller than the loan maturity and can be broken into different maturity categories:<br>$<1 \leqslant 5$ years<br>$5 \leqslant 10$ years<br>$>10$ years | *Rollover/Renegotiable* refers to a series of fixed rate terms<br><br>*Hybrid* refers to loans with an initial fixed rate period greater than 1 year that revert to a variable rate after the fixed term |
| Variable or adjustable rate | In a variable rate contract the interest rate can vary periodically (daily, weekly, monthly, quarterly) or remain fixed up to 1 year, varying thereafter | $\leqslant 1$ year | *Reviewable* — rate determined by the lender<br><br>*Indexed/Referenced* — rate adjustment determined by index value |
| Convertible | Loan can have initial fixed or variable rate with the borrower having an option to change either at a particular date or at the borrower's option | Can be variable, initial fixed rate | *Convertible* |

**Figure 5**
**Mortgage Product Interest Variability**




*Source:* RBA, CHMC, KHFC, EMF,GPG, MBA and S&P.

Figure 5 shows market shares by interest rate variability for the subject countries as of 2009. The data reported in Figure 5 refer to new loans made during different parts of 2009.

There is considerable difference in interest determination across countries. Australia, Ireland, Korea, Spain and the United Kingdom (U.K.) are dominated by variable-rate mortgages often with a short-term initial fixed rate. Designs vary — in Australia, Ireland and the U.K. the standard variable-rate mortgage has a rate set by the lender at its discretion (a reviewable-rate loan).[4] Rates on these loans are changed for all borrowers at the same time. Spain, Korea and the United States have indexed ARMs with rate changes determined by changes in the underlying index.[5] Recently, "tracker" mortgages, which are indexed ARMs, have become common in the U.K. Initial fixed-rate discounts are prevalent in Australia and the U.K. The magnitudes of the discounts are less than those in the U.S. ARMs were during the boom — typically around 100 basis points, lasting one to two years.

Short- to medium-term fixed-rate mortgages are the dominant instrument in a number of countries, including Canada, Denmark (recently), Germany, the Netherlands and Switzerland. These instruments are rollover or renegotiable rate loans in which the rate is fixed typically for a period of one to five years with a longer amortization period (25 to 35 years — briefly up to 40 years in Canada).[6] The rate is reset to the market rate at rollover. There is a substantial (as high as yield maintenance) pre-payment penalty during the fixed-rate period (discussed below).

The United States is unusual in the high proportion of long-term fixed-rate mortgages. Long-term fixed-rate pre-payable mortgages used to be the dominant product in Denmark, but low and falling short-

term rates have led Danish borrowers to shift to medium-term (one- to five-year) rollover mortgages in recent years.[7] France is the only other country with a majority of fixed-rate mortgages. Unlike the penalty-free pre-payable Danish and U.S. FRMs, French fixed-rate loans have pre-payment penalties (maximum three percent of outstanding balance or three months' interest). German mortgages can be fixed up to 15 years with a 30-year amortization. The loans are subject to a yield maintenance pre-payment penalty during the time the rate is fixed, up to 10 years.

**Box 1**

### Foreign Currency Loans

Loans denominated in a foreign currency have been quite popular in the transition countries of Central and Eastern Europe as well as Austria. The loans either require payments in the foreign currency or index amounts in domestic currency to the exchange rate. The most common indices have been the Euro and the Swiss franc. Use of these instruments typically arises as the result of domestic inflation. The appeal of the loans is a lower initial rate that spreads the payment burden more evenly over the life of the loan. Such loans carry significant default risk, however, as the income of most borrowers is not in the same currency as the mortgage. Regulatory response as ranged from information campaigns (Latvia), to LTV restrictions (Hungary), debt service stress tests (Poland) and outright product bans (Austria, Ukraine) [Dübel and Walley, 2010].

The dominant mortgage product in a country can change over time. During 2004–2006 between 30 and 35 percent of U.S. mortgages were hybrid ARMs with short- to medium-term initial fixed rates reverting to variable rates after the end of the fixed-rate period. These loans were designed to improve affordability compared to the FRM. The shift back to FRMs reflects their historically low rates (brought about in part by Federal Reserve purchases of mortgage-backed securities), the poor experience of subprime ARMs and possibly fears of future rate increases. In 2005, 50 percent of Danish mortgages were FRMs and another 20 percent were medium-term fixed-rate loans. The market shifted towards variable-rate and short-term fixed-rate loans as interest rates declined, with 80 percent of Danish borrowers taking such loans in 2009 [Realkreditrådet 2010]. Spanish mortgages shifted from fixed to variable after the government restricted the ability of lenders to charge pre-payment penalties in the mid-1990s. A declining interest rate environment after Spain moved to the Euro also contributed to the shift.

Indexed adjustable-rate loans in many countries have caps and floors (Appendix, Table A-1). The specific cap amounts are fixed by contract. In most cases loans will have both a cap and a floor. In Germany, borrowers can purchase interest rate risk insurance that will cap the loan rate at adjustment. Alternatively the borrower can execute a forward mortgage rate contract to lock in their rate up to three years prior to adjustment. In Switzerland lenders sell interest rate caps as separate contracts.

Small (one percentage point or less) initial rate discounts are common on ARMs, taking the form of initial fixed rates that are less than the fully indexed rate or standard variable rates (SVR) on

reviewable-rate ARMs. For reviewable-rate loans the rate may be fixed for a set period (one-three years) or variable when the SVR is changed.

Adjustable-rate mortgages in other countries have a number of interesting features. About half of Japanese loans are convertible (after the end of the fixed-rate term the borrower can select another fixed-rate period or switch to a variable rate) [Standard and Poors 2009]. Japanese floating-rate loans have fixed payments for five years with potential deferral and negative amortization. Conversion options (variable to fixed) are available in a number of countries. Several countries, including Australia, Canada, the Netherlands and Spain allow loans that are part fixed rate (short- to medium-term) and part variable rate. Borrowers can also manage interest rate risk by taking out multiple loans with varying short- to medium-term fixed rates (Canada, Germany and Switzerland) or fixed- and variable-rate loans (Australia, U.K.) secured by the same property. Canada, France and Japan offer flexible-term loans in which the payment remains constant but the term adjusts with interest rate changes. Flexible-term loans are subject to maximum term constraints (e.g., 35 years in Canada).

# Early Repayment

Other than Denmark (FRM), Japan and the United States, fixed-rate mortgages are typically subject to an early repayment penalty.[8] Table 3 shows the treatment of early repayment in different countries. In a number of countries early repayment is restricted to certain conditions (e.g., in Germany if the borrower is moving or the lender refuses a request to increase the mortgage). In Australia, Canada, Denmark, Germany, the Netherlands and Switzerland the penalties are designed to compensate the lender for lost interest over the remaining term of the fixed rate (yield maintenance). The specific

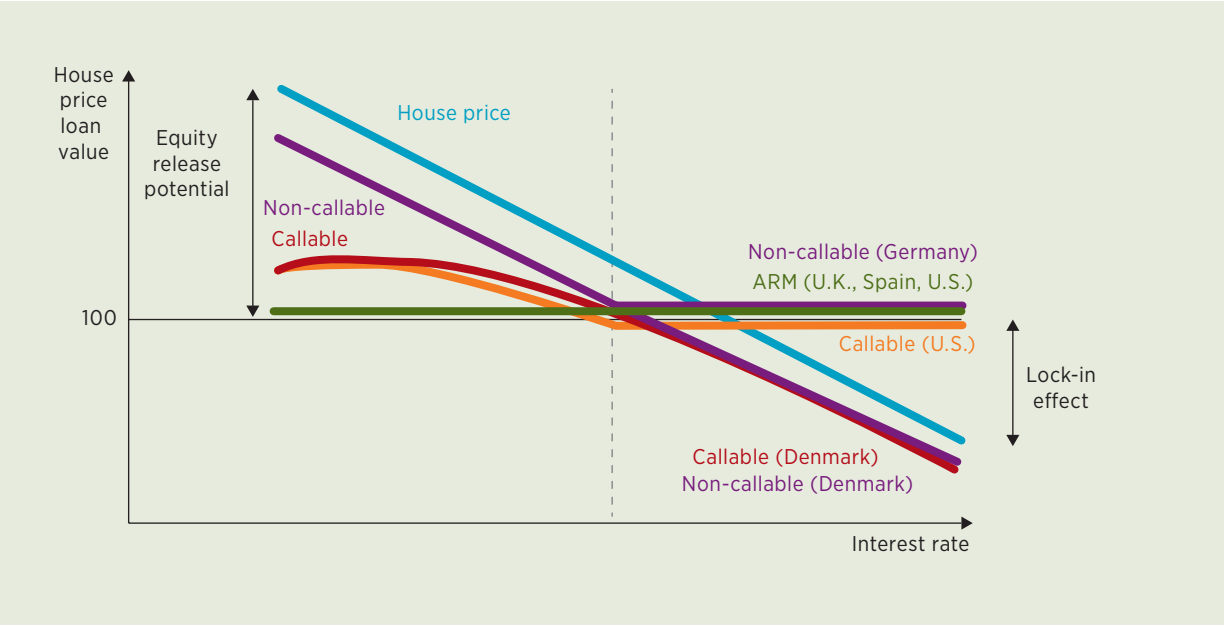
**Table 3**
**Prepayment Penalties**

| Country | Amount | Applicability | Penalty Free Payment |
|---|---|---|---|
| Denmark | Yield maintenance | ST fixed: loans with non-callable bonds | |
| Germany | Interest margin damage and reinvestment loss | All fixed rate; no penalty on variable rate; maximum 10 year | No penalty if property sold |
| Spain | 2.5% up to yield maintenance | Fixed rate | Maximum 10% per year |
| | 0.5% | Variable rate | |
| France | Maximum 6 months interest or 3% of outstanding balance | Variable or fixed rate | No fee if unemployed, death, or job change |
| Netherlands | Yield maintenance | Fixed rate | 10% per year; hardship or relocation with no penalty |
| U.K. | 2–5% of amount repaid | Discounts and fixed rates; in contract roughly 3 monthly payments | |
| Canada | Higher of lost interest or 3 months | Lender may wiave for own customer | up to 20% per year |
| Australia | Change in cost of funds | Discounts and fixed rates; in contract | |
| U.S. | Up to 5%; more typically 3% | ARMs only. Typically declining over 5 years | 20% |
| Korea | Declining over 3 years: 1.5%, 1%, 0.5% | ARMs | |
| Switzerland | Yield maintenance | Fixed rate | |
| Japan | None | Borrowers make semi-annual bonus payments | |

penalty calculations differ and are typically set by contract as opposed to regulation. Lenders may also charge borrowers for the cost of processing the repayment (Denmark, Germany). Pre-payment penalties are capped by law in France and Spain (although the Spanish law was recently changed to allow lenders to charge yield maintenance penalties on fixed-rate mortgages). In some countries borrowers must give advance notice of early repayment (two months in Denmark, six months in Germany). Partial pre-payment is quite common in Japan, in part reflecting the practice of paying employees semi-annual bonuses.

Denmark has the most unique system with respect to early repayment. The Danish system is based on the Principle of Balance (POB) [Realkreditrådet 2009]. When the borrower obtains a mortgage loan, the mortgage credit institution (MCI) issues a bond into an existing bond series. Thus there is a 1:1 equivalence between the loan and the bond.[9] The Danish mortgage is cancelable at the lower of the market price or par. As in the U.S., the borrower can refinance the loan at par if rates fall. But in the Danish system, if rates rise the borrower can buy her loan out of the mortgage bond at a discount and present to the MCI to repay the mortgage. This feature has several important benefits. For example, it allows automatic de-leveraging as rates rise and reduces the probability of negative equity. Figure 6 from Boyce (2010) illustrates the difference between different mortgages as rates change. A non-callable mortgage (i.e., one with a pre-payment lock out or yield maintenance penalty) or a short-term ARM locks the borrower into the par (book) value of the loan when rates rise. This can create negative equity if house prices fall with a rate increase. In the Danish system the borrower buys back the bond at a discount and cancels the mortgage, allowing the mortgage balance to fall along with house prices.

**Figure 6**
**Price/Yield Graph of Various Mortgage Risk Transfer Structures**




*Source:* Boyce 2010.

Danish lenders also offer mortgages with pre-payment penalties. Loans with fixed-interest periods of one and five years are funded by bullet bonds with corresponding maturity.[10] The loans may have terms up to 30 years and initial interest-only periods of up to 10 or 30 years. In the event of an early repayment the lender would charge a yield-maintenance penalty plus processing cost.

Although the United States does not allow pre-payment penalties on most FRMs, it has been pointed out that points paid by the borrower can have an effect similar to a pre-payment penalty [Colwell and Dehring 1997]. Pre-payment penalties on FRMs are not allowed in a number of states, but Fannie Mae and Freddie Mac have historically not enforced such penalties. Points are unique to the United States, arising in the 1970s in response to interest rate regulation. As mortgages in other countries are typically not subject to usury caps and lenders can charge early repayment penalties, there has been no apparent need to charge points.[11] Kiff [2009] points out that the transactions cost of mortgage refinance is more expensive in the United States than in Canada, which substantially offsets the cost of the pre-payment penalty.[12]

# Amortization and Term

Mortgages in most countries are annuity loans with a level payment. Terms typically range between 20 and 40 years. The European Central Bank (ECB) reports that in 2007 the typical maturity in the Euro area was between 20 and 30 years. Longer maturity products exist in several countries — up to 50 years in Spain and France and up to 60 years in Finland, although they have a very low market share. The maximum maturity granted is often linked to the retirement age. Japan and Switzerland have 100-year (inter-generational) mortgages. Scanlon et. al. [2009] note that the maximum maturity was shortened in several countries, including France and Spain, during the crisis.

Interest-only loans are common in a number of countries. Scanlon et. al. [2008] reported that interest-only mortgages were available in at least 10 European countries as well as Australia and Korea. Table 4 provides data on the incidence of interest-only mortgages in a number of countries in 2005 and 2009.[13]

There are several factors in the rising importance of this feature. First are tax benefits. Mortgage interest is fully tax deductible in Denmark, Korea, the Netherlands and Switzerland.[14] Even in countries like the Australia and the U.K. where there is no deductibility of mortgage interest, there can be a tax angle associated with interest-only loans. If mortgage repayment comes from a tax-advantaged insurance or savings account it may be preferable to de-link the mortgage and repayment vehicle. For example,

**Table 4**
**Interest-Only Mortgages**

| Country | 2005–2006 | 2009–2010 |
|---|---|---|
| Australia | 15% | 27% |
| Denmark | 32% | 50% |
| Ireland | 13% | 10% |
| Korea | 48% | 43% |
| The Netherlands | 88% | 79% |
| U.K. | 24% | 43% |

interest on a companion investment or savings account can accumulate free of tax during the term of the mortgage.

A second reason for interest-only mortgages is low interest rates. The repayment of principal accounts for a higher percentage of the monthly payment when interest rates are low. Thus, borrower ability to reduce mortgage payments through interest-only loans is greatest with low interest rates.

Interest-only loans vary across countries.[15] In Denmark, the Netherlands and the U.K., the loan can be interest only to maturity (maximum 30 years).[16] Switzerland has a unique instrument — the "infinite" mortgage, which does not have a maturity date and can be passed down through generations. The maximum LTV on an interest-only loan is 65 percent. This loan can be combined with an amortizing second loan of an additional 15 percent.

There are a number of different repayment options with interest-only loans. According to Scanlon et. al. [2008] in 2005, 20 percent of U.K. loans and 44 percent of Dutch interest-only loans had no identified repayment vehicle. In these cases it is assumed that the borrower will refinance or pay off the mortgage through sale of the house, business or through an inheritance. More commonly there is a companion repayment vehicle. The dominant instrument in the U.K. through the mid-1990s was the "endowment" mortgage. The borrower took out an interest-only mortgage to term and repaid with the proceeds of a life insurance policy on which she paid premiums throughout the life of the loan. Until 1984, endowment mortgages enjoyed a tax advantage through interest deductibility on the life insurance premiums.[17] In addition, mortgage interest was tax deductible until the late 1990s. Endowment mortgages remained popular until hit by scandals and charges of mis-selling in the late 1990s. Many borrowers were lured into endowment mortgages by promises of high returns on invested premiums. When those high returns failed to materialize, borrowers reached the end of term with insufficient funds to repay the mortgage.

Despite the problems with U.K. endowment mortgages, interest-only loans with companion savings vehicles remain popular in the U.K., the Netherlands and Switzerland. In the U.K., the individual savings account (ISA) mortgage is linked with an account invested tax-free in equities. However, like the endowment mortgage, there is no guarantee that there will be sufficient funds to fully repay the mortgage at term. Investment and pension-linked mortgages are significant in the Netherlands. According to the Netherlands Housing Survey (VROM 2009) approximately 35 percent of Dutch interest-only mortgages were linked to a savings or investment account.

"Flexible" mortgages that allow non-constant amortization are quite common outside the United States. Flexible mortgages allow borrowers to skip payments or take payment holidays. The flexible mortgage arose in Australia and the U.K. in the 1990s as a measure to deal with payment fluctuations arising from short-term unemployment or variable income. In both countries it has become a common feature whereby borrowers can underpay, take payment holidays, overpay and borrow back without taking a second mortgage. The number of missed payments per year is restricted and unpaid interest is capitalized

into the loan balance.[18] A survey of major lenders in the subject countries found flexible mortgage options available in Canada, France, Germany, the Netherlands and Spain, as well as Australia and the U.K. According to the Council of Mortgage Lenders in the U.K. most U.K. mortgages have a flexible option.

A more recent and sophisticated variant of the flexible mortgage is the "offset" or "current account" mortgage (Australia, U.K.), which allows the borrower to control mortgage borrowing through a current account. Salary is deposited into the current account, lowering the balance outstanding by the salary amount. As debits come through on the current account, the balance rises. An attraction of this instrument is the interest savings that arise from paying down the debt, as interest is charged daily. An offset mortgage allows the borrower to keep balances on mortgage, savings and current account in separate accounts but all balances are offset against each other, allowing the possibility of reducing the interest paid and the mortgage being repaid early. Offset mortgage rates can be fixed or variable and there is a maximum LTV.

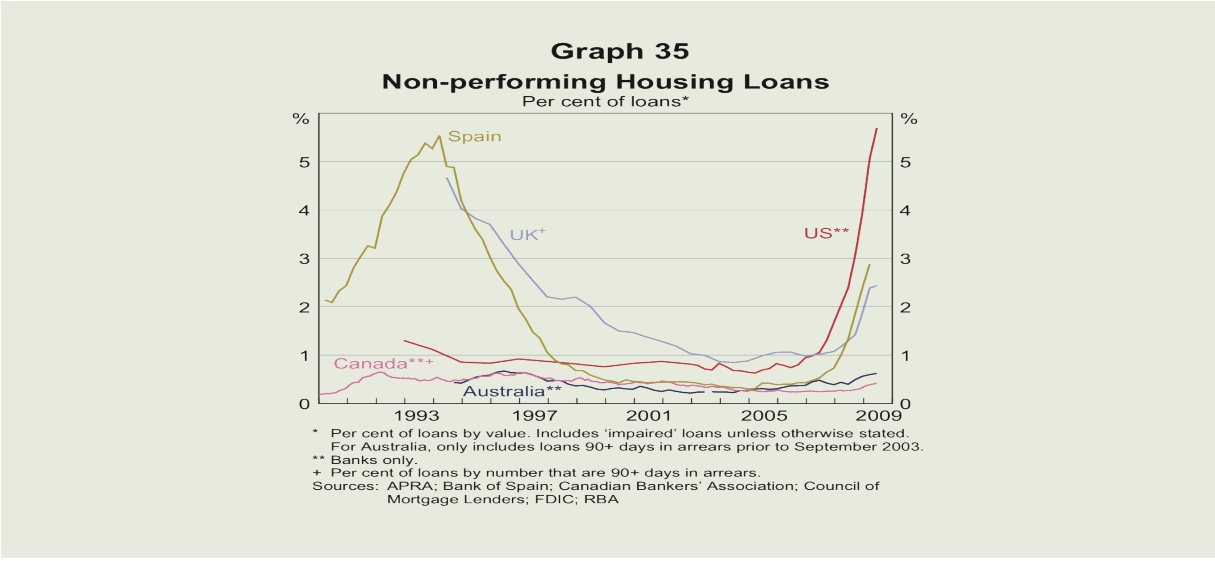
Loans with pre-programmed negative amortization (e.g., graduated payment mortgages or pay-option ARMs) are not common outside the United States. Flexible mortgages have a maximum number of missed payments and LTV caps. Japanese loans have payments fixed for five years regardless of whether the interest rate changes. Unpaid interest is deferred and capitalized into the loan balance. At the end of five years the payment will change to amortize the balance over the remaining term, subject to a cap of 125 percent of the current payment.

# Mortgage Default and Foreclosure

Mortgage default rates are far lower outside the United States (Figure 7) for bank loans. Of the countries in this survey only Spain and the U.K. have seen a significant increase in mortgage default during the crisis. Despite greater house price volatility than the United States on average, the incidence of default and prevalence of negative equity in other nations remains far below that of the United States.

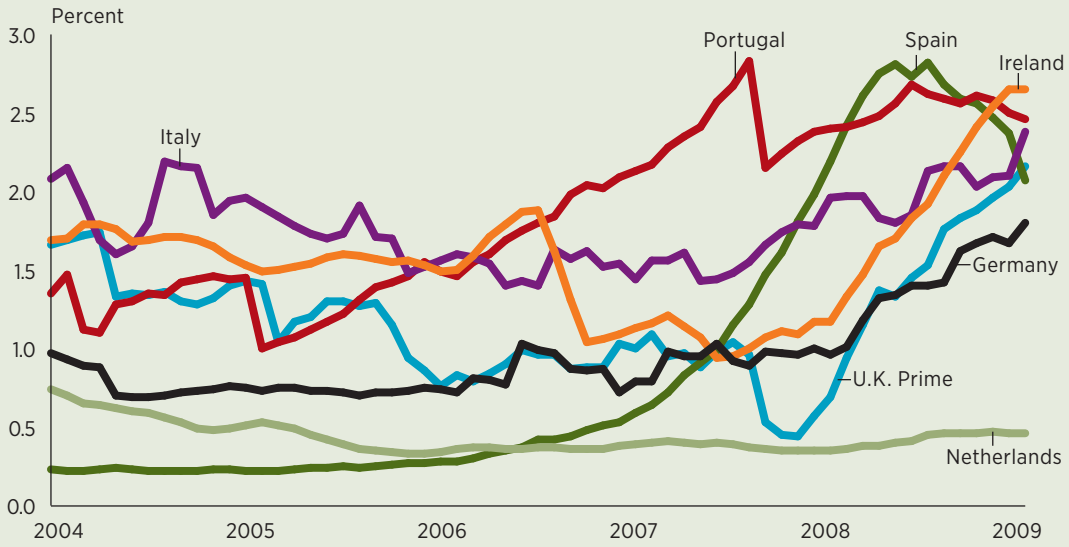
Delinquencies on European securitized loans have increased during the crisis but remain well below those in the United States (Figure 8). Default rates on Australian securitized loans are less than 1.5 percent and in Canada less than 1 percent. These results reflect the fact that subprime lending was rare or non-existent outside of the United States. The only country with a significant subprime share was the U.K. (a peak of eight percent of mortgages in 2006). Subprime accounted for five percent of mortgages in Canada, less than two percent in Australia and negligible proportions elsewhere. Subprime loans in Australia and Canada were more similar to U.S. Alt-A (limited documentation) than true subprime loans.

**Figure 7**
**Non-performing Housing Loans**




*Source:* Reserve Bank of Australia 2009.

**Figure 8**
**European Mortgage Arrears Rates, 30 or more days**

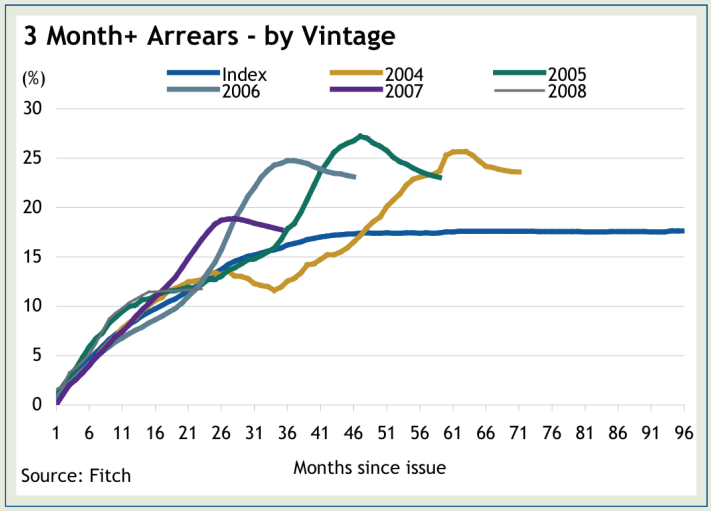



*Source:* Fitch Ratings 2010.

The only comparable performance experience to the United States is in U.K. non-conforming mortgages. U.K. lenders provided loans to borrowers with both adverse credit and low documentation. U.K. non-conforming securitized loans have high delinquency rates (Figure 9) but their foreclosure rate is far less than in the U.S.[19]

In the United States, mortgage product design has been linked to high rates of mortgage default, though underwriting variables appear to be the dominant factor.[20] To date, mortgage product design

**Figure 9**
**Three Months or more in Arrears, by Vintage**



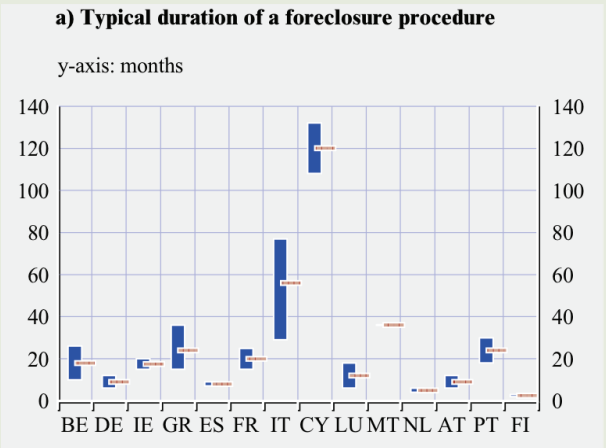

*Source:* Fitch Ratings 2010.

has not been implicated as a cause of mortgage default outside the United States.[21] In fact the use of ARMs has been cited as a cause in lower than expected default rates in Spain and the U.K. In the U.K., borrowers have been helped by the high incidence of ARMs linked to the U.K. base rate (equivalent to the Fed Funds rate in the United States), which have kept rates low [CML 2009b]. In Spain, the decline in rates and dominance of variable-rate loans has reduced the proportion of income used to service a loan from 46 percent in 2006–2008 to 38.6 percent in 2009 [Hugh 2009]. Both sources note the vulnerability of borrowers to potential future rate increases and the systemic risk of an ARM-dominated market. Australian interest rates have been higher than those in other countries and have impacted default rates [RBA 2009]. The Reserve Bank of Australia notes: "Arrears rates are also likely to have been affected by movements in interest rates. The arrears rate on (securitised) variable-rate loans increased 35 basis points over the 12 months to December 2008, and has since declined by 20 basis points; this compares to an increase of 10 basis points for fixed-rate loan arrears over the same period, with no subsequent decline."

An important factor in lower default rates in other countries is the foreclosure process and the possibility of deficiency judgments. The ECB [2009] reports that the duration of the foreclosure process in the Euro area has significant variation ranging between two months in Finland to 132 months in Italy (Figure 10). The average time frame is close to two years. In the U.K. the average time is 8–12 months [EMF 2008]. The cost of the enforcement procedure also varies across countries. The average cost (not including the loss on the mortgage after sale of the property) in 2007 was nine percent. In the U.K. the cost varied from 2.5 to 7 percent.

The mortgage arrears and foreclosure methods in Australia and Canada are very efficient. Both countries have judicial foreclosure processes, which are procedural unless the borrower mounts a

**Figure 10**
**Typical Duration of a Foreclosure Procedure**




*Source:* ECB.

defense. In both countries the lender or insurer can go after the borrower for a deficiency judgment. Per Canada Mortgage and Housing Corp. (CMHC), the time frame between reporting of arrears (three months in Canada) to possession of collateral is seven to nine months. In Australia the process appears shorter (Hicksons 2010). Once a notice of default is filed there are 21 days to serve and 28 days for the borrower to determine whether to mount a defense. If there is no defense, the court process for judgment takes two to four weeks with an additional two to four weeks to obtain a writ of possession. Eviction takes place seven to 30 days later. The typical loss per default in Australia is 20 to 25 percent of the initial loan balance. In Canada, CMHC claims appear to be somewhat lower — 18 to 20 percent of initial balance.[22]

An important difference between much of the United States and the subject countries is the possibility of recourse, or allowing lenders to pursue deficiency judgments. Research in the United States has shown that recourse decreases the probability of default [Ghent and Kudylak 2009]. Research by Duygan-Bump and Grant [2008] find a similar result in Europe. *Mortgage loans in all the survey countries are recourse.* The EMF study on the efficiency of mortgage collateral [EMF 2007] found that borrowers remain liable for deficiencies in Belgium, Germany, Greece, the Netherlands, Spain, France, Ireland, Portugal and the U.K. The duration of debtor liability was without limit in Belgium, Germany, France and the Netherlands; 20 years in Greece; 15 years in Spain; and 12 years by law, six years in practice following voluntary industry agreement in the U.K. Loans are recourse in Australia, Canada, Japan and Korea as well.

The Reserve Bank of Australia [2009] sums up the difference in delinquency experience between Australia and the United States as follows:

- Lending standards were not eased to the same extent as elsewhere. For example, riskier types of mortgages, such as non-conforming and negative amortisation loans, that became common in the United States, were not features of Australian banks' lending.
- The level of interest rates in Australia did not reach the very low levels that had made it temporarily possible for many borrowers with limited repayment ability to obtain loans, as in some other countries.
- All Australian mortgages are "full recourse" following a court repossession action, and households generally understand that they cannot just hand the keys to the lender to extinguish the debt.
- The legal environment in Australia places a stronger obligation on lenders to make responsible lending decisions than is the case in the United States.
- The Australian Prudential Regulation Authority (APRA) has been relatively proactive in its approach to prudential supervision, conducting several stress tests of ADIs' housing loan portfolios and strengthening the capital requirements for higher-risk housing loans.

# What Determines Mortgage Instrument Design?

The set of mortgage instruments offered in a country reflect demand and supply considerations as well as the legal and regulatory environment. Borrower mortgage choice literature is based on a framework wherein a risk-adverse borrower decides which type of debt to hold against the collateral of her house based on the trade-off she makes between current and future consumption, given uncertainty about future income, interest rates and house prices [Campbell and Cocco, 2002; Miles 2004]. Miles develops a simple numerical model to simulate borrower choice under different assumptions about the trend and volatility of interest rates and house prices. He finds that borrowers will prefer long-term fixed-rate mortgages when there is a significant positive correlation between inflation shocks and real interest rates and the borrower has a relatively high debt-to-income ratio. When the income risks are less extreme and inflation and real interest rates are not positively correlated, mortgages with a series of short fixed-rate periods are more favorable contracts. He also finds that households that are older, more indebted or with higher degree of unemployment certainty are more likely to prefer longer-term fixed-rate mortgages. Although his results apply only to the comparison between mortgages with rates fixed for two years versus those with rates fixed for the life of the contract, he infers that similar results would be obtained if comparing a variable-rate loan with a long-term fixed-rate loan.

Svenstrup [2002] analyzes the choice between capped ARMs (short-term fixed-rate loans) and the FRM in Denmark. ARMs are popular because of their low start rate, but he suggests that it is dangerous to qualify borrowers for a 30-year obligation based on the first-year payment, as is standard in short-term variable-rate mortgages. Conversely a long-term FRM has a substantial inflation risk premium built into the rate, reducing initial affordability. Furthermore, the FRM requires payment of transactions costs and a pre-payment risk premium by the borrower to manage interest rate risk. With the shorter term (one- to five-year) fixed rate and an out-of-the-money interest rate cap, the borrower can get interest rate risk protection at a modest cost. Svenstrup also finds that the delivery option (ability to buy back the bonds at a discount and cancel the mortgage) in the Danish model is an efficient means to ensure a tighter match between assets and liabilities in a household portfolio and can increase the mobility of the labor force as a whole.

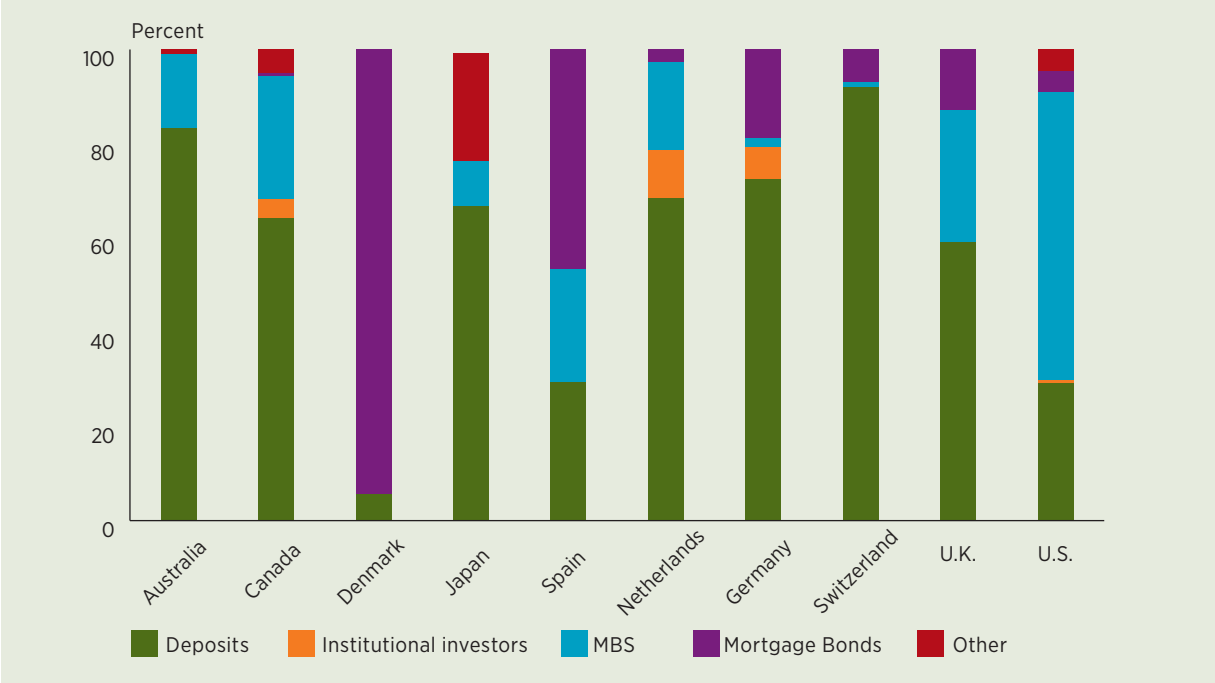
If the theoretical literature suggests that borrowers are better off with fixed-rate mortgages why do we see so many countries with ARMs as the dominant instrument and so few with long-term fixed-rate mortgages?

Miles points to several reasons for the dominance of ARMs in the U.K. These include relatively low debt-to-income ratios (at the time in 2003) for U.K. borrowers, belief by borrowers in their ability to manage interest rate and payment change and, most importantly, the greater attention borrowers pay to the initial mortgage payment than to any other factor in mortgage choice. The U.K. also was in the midst of an extended period of interest rate stability (since the early 1990s).

The dominance of ARMs in many countries has supply-side explanations as well. Banks (commercial, savings, cooperative) in most countries dominate mortgage lending. These institutions rely significantly on deposit funding (Figure 11). ARMs are a natural product for banks that hold loans on balance sheet funded with deposits, as they minimize interest rate risk. Of the ARM countries in this survey, only Spain relies on the capital markets for a majority of funding (over 70 percent of funding comes from covered bonds and securitization). The high use of the capital markets reflects the rapid growth in mortgage lending in Spain in the 2000 decade and the acceptance of AAA-rated security tranches and covered bonds as repo collateral at the ECB.

Funding availability and characteristics are also major factors in the dominance of short- to medium-term fixed-rate mortgages in many countries. In developed markets, such instruments are easy for banks to fund on balance sheet. The bank can swap its short-term deposits for medium maturity

**Figure 11**
**Developed Country Mortgage Funding**



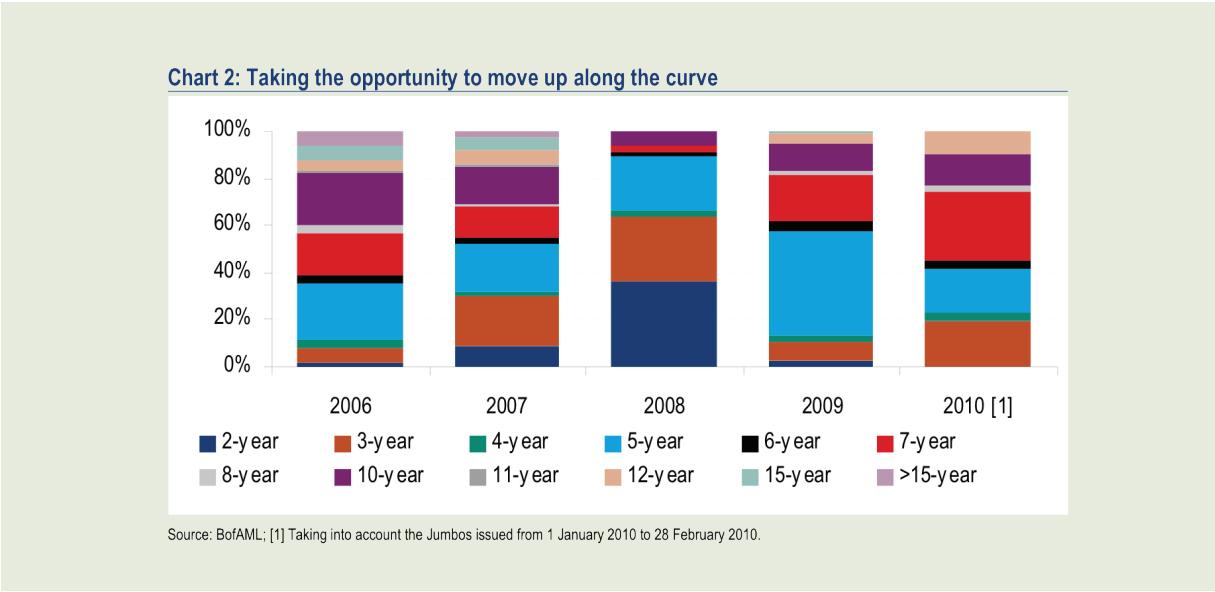

*Source:* ABS, CMHC, EMF, ESF, FRB, Merrill Lynch Europe, AU, CA, U.S. 2008, Japan 2006.

fixed-rate liabilities. Or it can use corporate or covered bond markets to issue medium-term fixed-rate debt (see Figure 12 on maturities of covered bond debt, which shows a significant proportion of issuance in three- to five-year maturity until early 2010 when issuers took advantage of low rates to extend maturities). This funding approach has implications for mortgage design as well. Outside the United States almost all corporate debt is non-callable. Thus, a lender using covered bond or non-callable corporate debt will incorporate a pre-payment penalty in order to maintain a relative match with its funding. The importance of pre-payment penalties has increased with the strengthening of asset-liability matching requirements in European covered bond legislation. Nearly all such legislation requires strict matching with requirements to match balances, coupons and cash flows between the cover pool and bonds.[23] In addition to matching requirements, covered bond legislation also restricts LTV ratios and loan purpose for cover pool assets.

Mortgage pricing has a major impact on the dominant instruments offered in various countries. Miles points to the relative expense of long-term finance as a significant factor in the U.K. preference for ARMs. He notes that the practice of offering initial period discounts on variable-rate mortgages offered to new borrowers, subsidized by the (above market) rates paid by existing borrowers (the back book) for whom the discounts had expired, also contributes to the dominance of ARMs. Specifically:

**The two-year discounted deals are likely to be very attractive to borrowers focusing on the scale of their initial repayments on mortgages. The two-year discounted deals are probably only feasible because a substantial gap exists between such rates and the Standard Variable Rate — a gap of over 180 basis points for many lenders. The substantial number of borrowers paying Standard Variable Rates — a group that may currently constitute more than a third of all borrowers and a little over 20**

**Figure 12**
**Taking the Opportunity to Move Up Along the Curve**




*Source:* Bank of America Merrill Lynch [2010].

**per cent of all mortgage loans outstanding — allows pricing of this sort to be feasible... This apparent cross-subsidisation, which in itself is undesirable, has as a side effect that longer-term fixed-rate mortgages with flat repayment schedules — where sustainable margins over the marginal cost of funds are unlikely to be under 50 basis — appear expensive. Miles (p. 47.)**

Despite Miles' view of the unsustainability of such pricing, it remains a major factor in U.K. mortgage pricing to this day. The prevalence of initial period discounts on reviewable-rate mortgages in Australia also likely explains the dominance of this instrument there.

The pricing and availability of capital market funding is a significant factor in the dominance of FRMs in Denmark and the U.S. The deep and liquid Danish mortgage bond market provides efficient pricing and risk allocation for Danish lenders, allowing them to offer FRMs. The Danish POB has created a system where banks do not offer mortgages funded by deposits for competitive reasons. In the POB the mortgage rate is the same as the security coupon. The mortgage lender adds a small margin (50 basis points) to cover its administrative costs, credit risk and profit. Thus, even for short-term fixed-rate or indexed variable-rate mortgages the bond-funded loan is cheaper than that offered by a commercial bank with deposit funding.

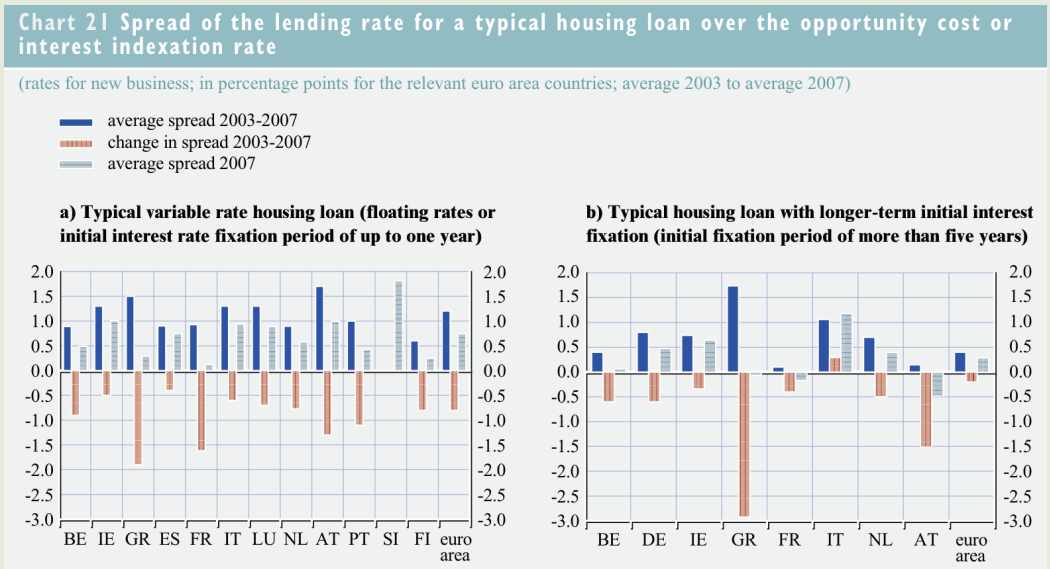
Recent research in the United States points to the support of FRMs by the GSEs as a significant factor in the predominance of the FRM.[24] Vickery [2007] analyzes the FRM/ARM market share as a function of the relative price of the instruments, controlling for the term structure of interest rates and other time-series factors. He finds that a 20 basis-point increase in the retail FRM interest rate is estimated to cause a 17 percentage-point decline in the FRM market share. He compares the U.K. and U.S. markets in terms of mortgage product. His estimates imply that if U.S. mortgages were priced by lenders at the same margins to the risk-free rate as in the U.K., the average U.S. FRM share in the non-jumbo market would decline from 76 percent to only 37 percent. In his view, differences in secondary market liquidity are the most plausible explanation for these pricing differences. Although the GSEs purchase ARMs and have issued ARM securities, their pricing has not been attractive to depository institutions and the securities are not liquid.

Krainer [2010] finds more recently that the Federal Reserve policy of buying agency MBS has lowered FRM rates and the FRM-ARM spread and contributed to the declining share of ARMs. Krainer's research finds that the FRM-ARM spread is the most important explanatory variable in an estimation of the ARM share. This spread is typically highly related to the Treasury term spread (10 year to one year).[25] This latter relationship broke down in 2009 due to heavy Federal Reserve purchasing of FRM-backed securities. The FRM-ARM spread declined to near zero in early 2009 and has remained depressed (50 basis points or less) ever since. The decline in spread reflects a widening ARM to one-year Treasury spread and a narrowing FRM to 10-year Treasury spread.

Pre-crisis mortgage spreads in Europe appear lower than those in the United States Figure 13 shows spreads on variable and fixed-rate mortgages relative to an index or benchmark rate. Spreads declined in most countries between 2003 and 2007. Fixed-rate spreads are lower in Europe than in the United

**Figure 13**

**Spread of the Lending Rate for a Typical Housing Loan over the Opportunity Cost or Interest Indexation Rate**




*Source:* ECB and NCBs.

States due to the widespread use of pre-payment penalties. Thus the value of the pre-payment option is not reflected in mortgage rates.

As shown in Table A-1, U.S. ARM margins are higher than those in most other countries. European indexed ARM margins are typically in the one-two percentage point range. U.S. ARM margins have been constant at 275 basis points since 1990 [Freddie Mac 2010].[26] Spreads between reviewable ARMs and lender cost of funds in Australia and the U.K. were in the 100-150 basis point range pre-crisis. Recently U.K. tracker margins have risen to 300 basis points reflecting the historically low level of the base rate (50 basis points).

The U.K. Council of Mortgage Lenders [2009] analyzed margins in the summer of 2009. They note several reasons for the widening of margins. For example, lenders are under greater pressure from the Financial Services Authority (FSA) to have a better match between the duration of their sources of funding and their mortgage assets. As more borrowers have taken short-term fixed-rate loans, lenders have had to respond to the regulatory requirement by raising more medium-term funding — at greater expense (relative to deposits).

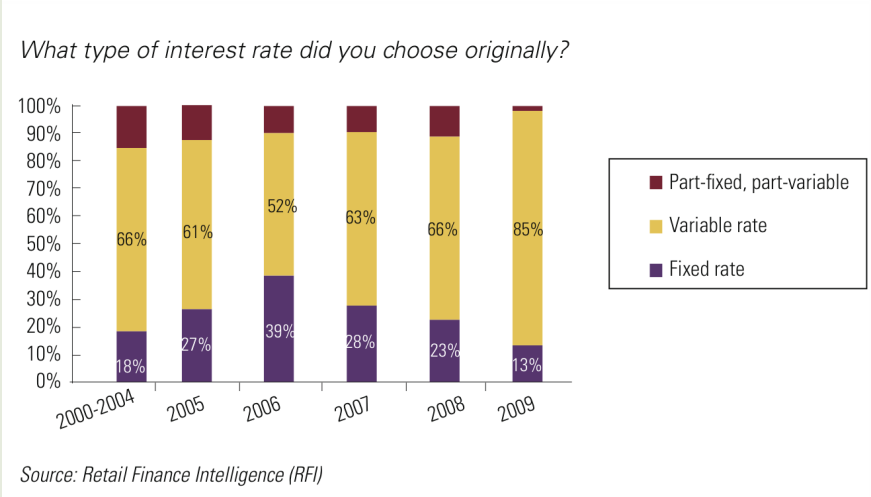
Rising rates of arrears have added to the costs of mortgage lending, putting pressure on margins. The impact of the Basel 2 regime also means that the cost of capital is greater for loans with higher LTVs.

Thus there has been both a tightening of lending criteria and higher borrowing costs. Investors providing equity for lenders now expect higher returns, which is exerting upward pressure on mortgage pricing.

A similar pricing change has developed in Australia [2010]. The Reserve Bank of Australia reports that mortgage rates have risen by 110 basis points relative to the cash rate. However margins in Australia have been squeezed as funding costs have risen by 130 to 140 basis points. Part of the margin squeeze has been funded by cross-subsidization from the back book, similar to that in the U.K. Australian mortgage rates were declining through most of 2009 and borrowers shifted from short-term fixed to variable-rate loans [Figure 14, Genworth 2009]. Fixed-rate loans declined from 28 percent to 13 percent and mixed (part fixed, part variable) loans declined from 10 percent to one percent.

**Figure 14**

**What Type of Interest Rate Did You Choose Originally?**




*Source:* Genworth 2009.

# The Role of Regulation

Both consumer protection and financial safety and soundness regulation can have an impact on mortgage design. The virtual absence of pre-payment penalties on FRMs in the United States is an example of such an impact. The borrower preference for FRMs in the United States also has its origins in the preclusion of ARMs for most lenders prior to 1981.

The treatment of pre-payment penalties has been a contentious issue and a major influence on European mortgage design. The European Commission (EC) has been pushing for a market-wide Mortgage Directive for more than 15 years to harmonize mortgage product offerings and encourage more cross-border lending [Dübel et. al 1997]. One of the Commission's key objectives is to establish a right of early repayment for borrowers, with limits on pre-payment penalties.[27] To date such limits have been passed in several countries, notably France, Italy and Spain.[28] French law caps the pre-payment penalty at [the greater of] six months' interest or 3 percent of the outstanding balance. The penalty cap does not appear to have deterred French lenders from offering long-term FRMs.[29] Legislation in Spain has had a more significant effect on product offerings. Prior to Spain's adoption of the Euro, lenders offered long-term fixed-rate loans with refinance penalties and restrictions. In order to allow borrowers to benefit from falling interest rates prior to and after introduction of the Euro, the government allowed borrowers the right to refinance existing mortgages and capped the pre-payment penalties [specific reference]. More recently there has been concern about the high proportion of Spanish mortgages that are variable rate (in terms of the ability of borrowers to manage interest rate risk). The government has raised the cap on fixed-rate pre-payment penalties — first to 2.5 percent and now to yield maintenance — in an effort to stimulate the offering of such loans. Italy (as of 2007) and Latvia are the only countries in Europe that ban pre-payment penalties on mortgages.

A European Commission Staff White Paper [2007] has suggested the need to restrict certain product offerings. They recommended allowing early repayment in certain circumstances (mobility, hardship) and capping the penalty. Commission staff also recommended standardization of borrower qualification, requiring suitability standards or tests of borrower ability to repay.

European legislation and regulation also impacts adjustable-rate mortgage design. Several countries (Denmark, France, Spain, Switzerland) require ARMs to be indexed. Other countries (particularly those with reviewable-rate mortgages) have no such requirements.

European consumer protection legislation has been blamed for a lack of product competition in the EU [Dübel 2008]. For example, France rejects the German yield maintenance pre-payment indemnity protecting fixed-rate lenders against reinvestment loss upon pre-payment, Spain rejects British practices of reviewable-rate mortgages (standard variable rate) and Germany rejects indexed contracts dominant in the Spanish market. Dübel states:

- National legal-regulatory regimes tend to be biased "in favour" of lenders providing national core products, which draw the greatest lobbyist pressure. Consider again the cases of Spain and Germany when dealing with early repayment, which is a focus of the Commission's White Paper.
- In Spain, adjustable-rate mortgages may fetch a 1 percent early repayment fee to stem the loss of servicing profit. Fees on adjustable-rate loans are strictly prohibited by German law, a legal relic of two periods of hyperinflation in the 20th century.
- In striking contrast, under German law, a consumer willing to prepay a fixed-rate mortgage has to pay a yield maintenance indemnity that not only compensates the lender for reinvestment loss but also includes a considerable element of lost servicing profit. In Spain, until a very recent reform, pre-payment fees for fixed-rate loans were capped at 2.5 percent, which did not even cover reinvestment loss.

As a result of the crisis, lenders are tightening guidelines in many countries.[30] Scanlon et. al. conducted a survey in early 2009 to assess the types of mortgage tightening taking place. As shown in Table 5, mortgage product availability was lessened in a number of the countries surveyed. The maximum mortgage term was reduced in four countries (also Canada) and the availability of interest-only mortgages was reduced or constrained in five countries (including the United States).

New or forthcoming consumer protection legislation may have a significant impact on mortgage product design in the future. Canada made several regulatory changes in response to the crisis in late 2007 including reductions in the maximum amortization period (from 40 to 35 years), an increase in the minimum downpayment (with mortgage insurance) from zero to 5 percent. More recently (February 2010) the Ministry of Finance lowered the maximum LTV on refinance loans to 90 percent and on insured non-owner occupied loans to 20 percent [CMHC Observer 2010]. More significantly they now require borrowers taking out mortgages with variable rates or fixed-rate terms less than five years to be qualified at the average major lender-posted five-year rate. This change is likely to reduce demand for variable-rate mortgages reflecting both the use of a longer-term interest rate and the posted rate for qualification.

**Table 5**

**Change in Mortgage Product Characteristics, Late 2007–Late 2008**

| Country | Lower Loan-to-Value Ratios | 100% Mortgages Less Available | Loan-to-Income Criteria Tightened | Maximum Mortgage Term Shortened | Reduction in Interest Only Loan Availability | Introduction of New Loan Types to Deal with the Crisis |
|---|---|---|---|---|---|---|
| Australia | x | x | x | | | |
| Denmark | x | | | | | |
| France | x | x | | x | | |
| Iceland | | | | | | |
| Ireland | x | x | x | | x | x |
| Netherlands | | x | x | | x | |
| Norway | x | | | | | |
| Poland | | | | x | | |
| Portugal | | | | | | x |
| Russia | x | x | x | x | | |
| Spain | x | | x | x | | |
| Sweden | x | x | | | Lower Maximum LTV | |
| U.K. | x | x | x | | x | |
| U.S. | x | x | x | | x | |

*Source:* Scanlon et. al. 2009.

The FSA in the U.K. has gone the furthest in Europe in contemplating tightened mortgage regulation. Their Mortgage Market Review of October 2009 lays out a number of proposals under consideration. In the area of product regulation, however, the FSA notes that LTV or debt-to-income (DTI) caps are not yet warranted by the evidence. They recommend restrictions on risk layering (prohibiting loans that are a mix of high-risk factors, for example, prohibiting high LTV loans to credit-impaired borrowers who have an unstable income or other similar "toxic" mixes) and requiring income verification on all mortgages. Requirements to fully document borrower income will result in the disappearance of "self-certification" mortgages. Affordability must be based on a repayment mortgage, rather than an interest-only one, while it must take account of future interest rate rises and be based on a 25-year mortgage term, even if the loan is being taken out over a longer period [CML 2010].

The FSA has promulgated suitability standards for mortgage lenders. Specifically, a product will be suitable if there are reasonable grounds to conclude that:

- The client can afford it over the repayment term.
- It is appropriate to the client's needs and circumstances.
- It is the most suitable of those available within the scope of service provided to the client.
- The lender cannot recommend the "least worst" product if it does not have access to a product that is appropriate to the client's needs and circumstances.

Australia also has suitability standards. The new National Consumer Bill requires licensees to assess each consumer's capacity to repay credit to ensure that the credit contract is not unsuitable for the consumer's objectives, needs and financial circumstances [ASIC 2010].

The EC [2009] is looking at additional mortgage regulation in response to the crisis.[31, 32] The EC has suggested restricting the use of teaser rates to "induce" borrowers to move to "higher repayment levels or different foreign currency exposures."

# Conclusions

This comparison of mortgage product offerings in developed countries has revealed significant differences in the dominant product offerings across countries. Countries differ in terms of the market share of adjustable versus fixed-rate mortgages, the use of pre-payment penalties, maximum term and the offering of features such as interest-only payments and assumability. Our findings suggest that the United States is internationally unusual in several respects:

- The United States has an unusually high proportion of long-term fixed-rate mortgages as well as an usually high use of securitization in the financing of housing. The dominance of the FRM and securitization is driven in part by the presence of government-backed secondary mortgage market institutions that lower the relative price of this type of mortgage.
- The United States is unusual in the banning or restriction of pre-payment penalties on fixed-rate mortgages. Most countries in the survey allow such penalties to compensate lenders for loss associated with the financing of mortgages. As a result, mortgage rates do not include a significant pre-payment option premium and other financing techniques, such as covered bonds, are more common.
- The only other country that utilizes the FRM is Denmark. The Danish system offers a superior alternative in the form of the POB that equates individual mortgages and bonds. This system allows borrowers to prepay their loans when rates fall, as in the United States, and allows them to buy back their bond when rates rise. This feature allows the borrower to benefit from interest rate increases and decreases and facilitates de-leveraging when rates rise, reducing the incidence of negative equity. Features that are restricted in the Dodd-Frank Bill such as longer terms, interest-only periods and flexible payment designs are quite common in other countries and do not appear to have been associated with higher rates of default.
- Mortgage default rates have been far lower in other countries than in the United States, despite the fact that several countries had greater house price volatility. The lack of subprime lending

(outside of the U.K.) and less use of limited or no documentation lending were major factors. Mortgage products did not play a role in mortgage default — in fact the dominance of ARMs in several countries was noted as a reason for lower default rates.

- Mortgage foreclosure and repossession regimes are varied, with some more efficient and some less efficient than those in the United States. However all other countries in the survey have recourse mortgages, and lenders routinely pursue deficiencies. Research in Europe and the United States has found that recourse reduces the incidence of default.
- Consumer protection regulation has advanced in a number of countries. The focus has been on borrower qualification and suitability standards, and for the most part has not constrained mortgage product design.

What are the likely effects of Dodd-Frank on mortgage product design? Prior to the crisis the United States had one of the richest sets of product offerings among the subject countries, offering a wide variety of ARMs, amortization choices and terms, along with long-term fixed-rate mortgages. As a result of the crisis the market has seen a decided shift to FRMs, driven in large part by historically low FRM rates. Rates are low in part because of low long-term Treasury rates, but their levels also reflect the impact of government policy in which almost all financing is from government-backed institutions, bolstered by unprecedented purchases of mortgage securities by the Federal Reserve.

Dodd-Frank is likely to perpetuate this trend. The market is likely to gravitate towards vanilla, qualified mortgages. Limiting or banning pre-payment penalties constrains the ability of lenders to match fund medium-term fixed-rate mortgages like the Canadian rollover. This provision will reduce the effectiveness of covered bonds as a financing technique for lenders. Qualifying ARM borrowers at a fully amortizing payment at the highest possible rate over a five-year period is likely to reduce ARM qualification and volume.

Is this state of the world sustainable or desirable? International experience suggests that comparable rates of homeownership and mortgage indebtedness can be achieved with different products and funding structures. While it is widely believed that the FRM is an ideal consumer mortgage instrument, its use does have significant drawbacks. In effect, the cost of the pre-payment option is socialized, with everyone paying a premium in the mortgage rate for the option. This contrasts with the European view that only borrowers who exercise the option for financial advantage should pay the cost (loss to the lender). As a result, European fixed-rate mortgages have lower spreads-to-benchmark rates. If the FRM is the instrument of choice, then the Danish option should be explored, as it provides benefits to borrowers throughout the interest rate cycle and reduces systemic risk that accompanies an interest rate increase.

Refinancing of FRMs creates significant volatility in the mortgage market as evidenced by the dramatic expansion and subsequent contraction in origination volume accompanying the 2003 refinance boom.

Such volatility has implications for operational costs and profitability of lenders (e.g., in hedging mortgage servicing rights). The pre-payment option has spawned an industry of traders in mortgage-backed securities (MBS). The turnover of MBS has little to do with the availability of housing or mortgage finance, but rather reflects speculation regarding the risky and uncertain embedded pre-payment option.

Transferring interest rate risk to borrowers through ARMs may not be good policy either. Excessive dependence on ARMs as in Australia, Spain and the U.K. runs the risk of significant credit deterioration when interest rates rise and may constrain monetary policy. Use of rolling short-term fixed-rate instruments, as in Canada and several countries in Europe, offers a trade off. Borrowers can adjust the fixed-rate term according to the level and expected direction of interest rates — shortening the term when rates are high and expected to fall, and lengthening when rates are low and expected to rise — allowing them to manage interest rate risk.

Legislative and regulatory restrictions on features like interest-only payments, low start rates and negative amortization will reduce credit availability for many households who need lower payments in the earlier years to afford a mortgage. The lack of such mortgages means there is less ability to offset the tilt effect of the FRM in which the real burden of the mortgage is higher in the early years.[33] Putting product restrictions and prohibitions into law will make it much more difficult to be flexible in underwriting borrowers in the future.

Mortgage products outside the United States do not appear to have had a role in the financial crisis. However, evidence suggests that it was the lack of underwriting and the mis-match between borrower ability to pay and loan characteristics that led to the mortgage meltdown, not the loan features in and of themselves. The predominance of ARMs in other countries may, in fact have reduced mortgage default rates. However, borrowers in these countries have significant vulnerability to rate increases that may cause problems in the years to come.

Finally, lower default rates in countries outside the United States, even in the presence of more volatile housing markets, may reflect stricter enforcement of lender rights. All countries in the survey have recourse lending, and anecdotal questioning by the author suggests it is enforced. Lenders with a greater certainty of recovering loan proceeds are more likely to extend credit and loan rates are likely to have lower credit risk premiums.

# Appendix: Details of Variable-Rate Mortgages

Adjustable-Rate Loan Characteristics: In most countries the dominant ARM is an indexed instrument (Table A-1). The index is typically a money market rate (LIBOR, CIBOR, EURIBOR). Canada and Japan use the prime rate and Korea uses either a CD or cost of funds index. The adjustment period is one year or less. Initial rate discounts are common but modest — typically no more than 1 percent.

**Table A-1**
**Variable-Rate Loan Characteristics**

| Country | Type | Caps | Margin | Period | Options | Discount |
|---|---|---|---|---|---|---|
| Denmark | Indexed CIBOR | Life of loan by contract (5%) | 0.5% | 6 months | 5 year max. | No |
| Germany | Reviewable | Rate of insurance policy available | N/A | Lender discretion | Mixed | |
| Spain | Indexed Euribor | Caps and floors ~30% of lenders | ~2% | 6–12 months | | Slight |
| France | Indexed Euribor | 2–3% | 1–3% | 3–12 months | Flex term; conversion; mixed | up to 1% |
| Netherlands | Indexed Euribor | | ~2.5% | 1–6 months | Conversion | 0.4% |
| U.K. | Reviewable; indexed (tracker) | Caps and collars available (tracker) | 0.5–1.5% to base rate | Monthly | | Up to 1% |
| Canada | Indexed; prime rate | Yes; term of mortgage | –0.5% | With prime change | Mixed; conversion | Yes |
| Australia | Reviewable | None | 1.2–2.2% average spread-to-cash rate | Lender discretion | | ~1% |
| U.S. | Indexed; hybrid | Yes; periodic, life of loan | 2.5% | 1 year; 3:1, 5:1 | Conversion | Yes |
| Korea | Indexed CD rate of COF | None | ~2% | 3 months | | |
| Switzerland | Indexed CHF Libor | Optional caps separate from mortgage | 0.5% | 3–6 months | Conversion; mixed fix/float | |
| Japan | Indexed; prime rate | Payment cap associated with flex term | | 6 months | Flex term; conversion; mixed | On rollover 1–2% |

# End Notes

1. The final "HOEPA Rule," amending Truth in Lending Rules, Regulation Z was adopted by the Federal Reserve on July 14, 2008. HOEPA rules restrict product characteristics and underwriting on high-cost loans.

2. See for example Bostic et. al., [2009]

3. We will not address the legal aspects of the mortgage in this study. Rather our focus is on the financial characteristics.

4. Rates on reviewable mortgages are typically adjusted after a change in the central bank target rate (base rate in U.K., cash rate in Australia).

5. See Table A-1 in Appendix 2 for details on indices.

6. Longer fixed rate periods are available in some countries (up to 10 years in Canada and the Netherlands and 15 years in Germany). Infinite life mortgages are common in Switzerland and are discussed below.

7. These loans are referred to as adjustable-rate loans in Denmark. They differ from variable-rate loans which are indexed to the Copenhagen interbank lending rate. Realkreditrådet [2010].

8. Mortgage contracts can contain a several options including assumability (the right of a new borrower to assume an existing mortgage on the same property) and portability (the right of a borrower to keep his mortgage when moving and have it secured by a new property). Mortgages in most European countries and Canada are assumable subject to lender review. Countries that allow assumability also restrict or penalize early repayment. Allowing assumption (subject to qualification) enables the lender to maintain an asset liability match that is required for covered bond financing. Only Ireland and the U.K. do not allow assumption and the Netherlands restricts it. Although portable mortgages exist in several countries (Australia, Canada, Germany, U.K.) there appears to be no data on their volume of use.

9. Typically the borrower takes out a new mortgage for the lower balance — pocketing the gain. For a more detailed description of the buyback option see Svenstrup and Willeman [2006].

10. Bullet bonds pay period interest with the principal repaid at maturity.

11. A number of European countries have theoretical usury limits but they are set much higher than recent historical mortgage rates. See [EMF 2007].

12. U.S. origination costs are higher than in many other countries. An EMF survey found average mortgage origination costs of 1.1 percent in Europe [EMF 2010]. U.S. loan origination fees are higher in part because they are a function of the loan amount. In many other countries, including Canada, origination charges are a flat typically low fee. Also most other countries do not have title insurance and the cost of title search is less than in the U.S. Some countries, including Denmark and Spain, have taxes on mortgage registration that raise their total costs to 2–2.5 percent.

13. Scanlon et. al [2009] report that the use of interest-only mortgages has fallen in several countries, including Ireland and the Netherlands, as both borrowers and lenders gravitate to less risky mortgages. 2005–2006 data from Scanlon et. al. 2009–2010 data from Scanlon 2009, Reserve Bank of Australia, Council of Mortgage Lenders, Korea Housing Finance Agency.

14. Korea interest is deductible if mortgage term is 10 years or more subject to maximum income limit.

15. In Germany, the lender can immediately cancel the loan if the borrower goes into negative equity, even if the borrower's payments are up to date, although the facility is little used in practice.

16. Interest-only mortgages in the Netherlands have a maximum 75 percent LTV. Amortizing mortgages can be as high as 100 percent LTV where value is defined as "foreclosure value," the likely proceeds from a foreclosure sale.

17. Another quirk that favored endowments over repayment mortgages was the fact that U.K. lenders charged interest on an annual basis. Thus the borrower with an amortizing loan did not get benefit of the principal reduction during the year, raising the effective interest rate. Life insurance premiums could be invested during the year, effectively lowering the amount of premiums necessary to repay the loan relative to the interest-only repayment loan. This practice was phased out in the 1990s.

18. For example on the Nationwide Building Society website a payment holiday of between three and twelve months can be taken if the mortgage for more than one year old and is less than 80% of the value of the home at the end of the payment holiday. The borrow back feature allows a drawdown of past overpayments subject to the LTV constraint.

19. The U.K. Homeowners Mortgage Support Program assists with mortgage payments for unemployed borrowers for up to two years, which may contribute to lower foreclosures. As in the U.S., lenders have been slow in repossessing houses — in part because house prices began rising at the end of 2009.

20. Subprime ARMS, balloons and interest-only mortgages have significantly higher default rates than prime fixed rates [Chomsisengphet and Pennington-Cross 2008]. However when controlling for other factors such as LTV, FICO score and geographic area, mortgage product variables appear less important. Demyanyk and Van Hemert [2008] find that ARM and hybrid loan variables were insignificant in explaining the probability of default. Loan margin and a pre-payment penalty were significant but had small effect.

21. There tends to less product variety in most countries as compared to the U.S. Thus there are no statistics relating product characteristics to default. Rather the focus is on underwriting variables such as LTV, adverse credit and low documentation.

22. Australian estimate from Genworth July 2010. Canadian estimate from CMHC and based on average loan size from Canequity.com.

23. Covered bonds are corporate obligations of the lender. Investors have priority rights to the pool of mortgages ("the cover" pledged to the bondholders). For detail on covered bond requirements see ECBC [2009].

24. Among the subject countries only Canada and Japan have government-supported secondary market institutions. The Canada Mortgage and Housing Corporation and Japan Housing Finance Agency play a similar role to Ginnie Mae in the U.S. See Lea [2010] for a more in-depth discussion.

25. Koijen et. al. [2009] find that the long-term bond risk premium is a more powerful determinant of mortgage choice than the simple spread.

26. Effective margins are less due to the widespread use of initial period discounts or "teaser rates."

27. Most recently in the European Commission White Paper [2008]. The European Mortgage Federation response [2008] recommends keeping the right of early repayment as a contractual option. They note

**"As a general rule, individual consumers should bear the consequences of the choice they make, i.e. borrowers not choosing an option to repay early should not pay for the costs of this option on an individual basis. The EMF considers that a cross-subsidisation/mutualisation model, under which all customers**

**would have to foot the bill for the pre-payment option whether they opt for it or not, is not a proportionate solution."**

28. For a survey of European national legislation regarding early repayment see EMF [2007].

29. French banks have a large pool of long-term funds dedicated to real estate through the l'Épargne Logement system of contract savings. This source of funds effects the pricing of mortgages (interest is tax exempt and thus lower than market rates on a pre-tax basis) as well as the ability to match fund longer-term FRMs. See Diamond and Lea [1992].

30. Scanlon et. al. (2009). Japan went the opposite direction by loosening underwriting in the crisis. The loan-to-cost ratio was allowed to increase to 100 percent from 90 percent Standard and Poors (2010).

31. The EC is looking into suitability standards for EC lenders [EC 2009]. They note: The requirement to assess the suitability of mortgage products to the personal circumstances of the consumer is set out in the national law of Austria, Belgium, Hungary, Ireland, Malta and the Netherlands. In the U.K. the requirement to assess the suitability of the product for the borrower is only relevant where advice is given.

32. DG MARKT (EC financial markets committee) is conducting a research study on interest rate restrictions in "consumer credit" — understood to include mortgage credit — in the EU. The study aims to identify the different types of interest rate restrictions, e.g. rate ceilings/caps, limits on interest rate variability, restrictions on the use of compound interest rates etc. and identify the Member States applying these and their reasons for doing so. The study also analyzes the economic, financial and social impacts of such restrictions on various stakeholders.

33. The tilt effect is created when markets incorporate inflationary expectations into nominal interest rates, increasing their level reducing affordability.

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Realkreditrådet (Denmark)

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