Mortgage Markets in Selected Developed Countries

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September 29, 2010

Congressional Research Service
7-....
www.crs.gov
R41432

CRS Report for Congress
Prepared for Members and Committees of Congress

Summary

The United States, Canada, Denmark, and Australia are advanced economies that share many features, but their approaches to financing homeownership have differed. As the U.S. Congress considers housing finance reform, the experiences of these other nations may suggest some potentially useful policy approaches.

In recent years, homeownership rates in the United States, Canada, and Australia have been similar: 66.9% in the United States, 68.4% in Canada, and 69.8% in Australia. Denmark's homeownership rate of 54.0% is low for this group of nations and for countries with developed economies.

- Of these four nations, only the United States and Denmark offer mortgages with payments that are fixed for 30 years. In Australia and Canada (and most of the world), mortgages adjust to current interest rates at intervals of one month to five years.
- Of the four nations, between 1991 and 2008, house prices increased the most in Australia and Denmark, but other countries including Ireland, the Netherlands, New Zealand, and Norway had still greater increases.
- Underwriting standards have been the most flexible in the United States and less flexible in Canada and Denmark. Some homeowners in the United States would not qualify for mortgages in Canada or Denmark.
- The United States and Australia have programs to encourage homeownership. Canada offers limited support for home purchases, and Denmark has no homeownership programs. Nevertheless, homeownership rates are similar in the United States, Australia, and Canada.
- U.S. and Canadian governments directly or indirectly guarantee most mortgages and assure lenders that mortgage payments will be made in a timely manner. Australia and Denmark have no such government guarantee.
- In Canada, Denmark, and Australia, borrowers who default remain responsible for any unpaid balances, but it is not clear how frequently this is pursued. In the United States, the ability of lenders to seek compensation beyond a foreclosure sale depends on state law and frequently this remedy is not invoked.
- Capital gains from the sale of one's main home are usually tax-exempt in all four nations; all but Canada allow taxpayers to deduct mortgage interest payments.
- Only the U.S. government has a maximum size on the mortgages that it will support. In the other nations, government support is offered to all mortgages.

This report will be updated as warranted.

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Introduction

This report discusses mortgage markets in selected nations[1] and identifies aspects of housing finance that may suggest interesting policy options as Congress debates housing finance reform in the United States. The report describes similarities and differences in a number of countries by comparing homeownership rates and changes in housing prices. It examines features of each country's primary mortgage market, which homebuyers directly experience when applying for and obtaining a mortgage; and it discusses the secondary mortgage market connections that link national mortgage markets and international financial markets. The report concludes by tentatively identifying what may explain why mortgage markets in three of the four countries examined appear to have more differences than similarities, yet have led to similar rates of homeownership.

This report concentrates on the United States, Canada, Denmark, and Australia, occasionally mentioning other nations to provide context. Canada was selected because of its proximity to the United States, similarity of its economy to that of the United Stages, and the distinctive attributes of its housing market. Homeownership rates in Canada and the United States are similar, but Canada has stricter mortgage qualifications (i.e., underwriting standards). Both nations have experienced home price increases over the past 10 years, but Canada has had neither the price level collapse nor the increase in foreclosure rates that the United States has had. Canada funds its mortgages mainly with bank deposits, whereas the United States depends on domestic and international financial markets. The homeowner in the United States typically has a 30-year fixed-rate mortgage (FRM), whereas the Canadian homeowner has a five-year adjustable-rate mortgage (ARM) that is renewed and is designed to be paid in full after 25-30 years. According to the Organization for Economic Cooperation and Development (OECD), Canadian home prices reached a maximum in 2007 that was 60% higher than in 1991, whereas another index developed by Teranet and the National Bank of Canada shows prices continuing to increase.[2] U.S. home prices reached a maximum in 2006 that was 61% greater than in 1991.

Denmark is included because it has very strict underwriting standards and has developed a type of covered mortgage bond with specific collateral to guarantee payment if the bond issuer fails. This is similar to covered bonds throughout much of the European Union (EU), including Germany. Homeowners in Denmark can prepay their mortgages by paying either the unpaid balance (as in the United States), or the market value of the mortgage. This market value will be less than the unpaid balance when interest rates have increased. Denmark and the United States are the only two nations where 30-year fixed-rate mortgages are common.[3] Danish house prices reached a maximum in 2007 that was 150% greater than the 1991 house price level.

Most Australian mortgages have adjustable interest rates. Australian homeowners can make extra payments on their mortgages; these prepayments can be withdrawn, sometimes by a special credit card. Between 1991 and 2009, home prices in Australia increased by 107%.

[1] The information in this report comes from national and international organizations, and from national housing experts in each of the countries examined. Published information was confirmed with these experts to ascertain that it is current at the time this report was written. Where multiple sources provided differing information, preference was given to the most authoritative and current information.

[2] The home price levels are discussed in more detail later in "House Price Changes." See also http://www.housepriceindex.ca.

[3] In most other nations, a long-term "fixed-rate" mortgage is fixed for only part of the mortgage's life.

Homeownership Rates

Broadly speaking, homeownership rates are determined by the relative costs of housing tenure options (renting versus owning) and the nonfinancial aspects of owning or renting a home. These factors can vary according to a household's income, savings, age, marital status including number of children, the tax system, anticipated house price changes, government regulations such as land use and zoning, building codes, immigrant status, and availability of desirable rental housing. Some factors including income, age, and family status can affect a person's decision to move out from their parents' home and to form an independent household. Because most homebuyers use a mortgage to finance their purchase, mortgage terms can affect homeownership rates.

Homeownership rates vary over time and within a country. For example, in the United States, the national seasonally adjusted homeownership rate reached a peak of 69.4% in the first quarter of 2005; since then, it has trended down with occasional, slight upticks.[4] As an example of regional variation in homeownership rates within the United States, in the second quarter of 2010, the Midwest had the highest rate (70.8%) of any census region, and the West had the lowest rate (61.4%).

As shown in **Table 1,** homeownership rates for selected developed countries in Europe, North America, Australia, and Asia range from approximately 35% to approximately 97%.[5] The European Union (EU) reports an average homeownership rate of 66.8% with national rates ranging from a low of 43.2% in Germany to a high of 97.0% in Lithuania and Romania. Germany's relatively low homeownership rate is frequently attributed to a policy emphasis on supplying subsidies to rental housing and the integration with the former German Democratic Republic (East Germany).[6] Outside the EU, Switzerland has long had a relatively low homeownership rate (34.6%) that is usually attributed to a high cost of ownership and strong protections for renters, including limits on rent increases. Lithuania and Romania, both EU members, had high homeownership rates following privatization initiatives after their transitions from communism in 1989 and presently lack alternative rental housing.[7] Australia reports a homeownership rate of 69.8%, whereas Japan's homeownership rate is usually estimated around 60%.

Figure 1 displays the homeownership rates, graphically sorted by the rate. A cautionary note: As a result of differences in the ways that countries collect and report data, international comparisons of homeownership rate statistics can be misleading. For example, in the United Kingdom, units with long-term rental contracts are considered to be owner occupied, and in Japan dwellings owned by an occupant's parents are listed as owner occupied.[8]

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[4] United States: U.S. Census Bureau, "Residential Vacancies and Homeownership in the Second Quarter 2010," press release, July 27, 2010, http://www.census.gov/hhes/www/housing/hvs/qtr210/files/q210press.pdf.

[5] Different nations collect and report this information on different schedules.

[6] Douglas B. Diamond, Jr. and Michael J. Lea, "Housing Finance in Developed Countries: An International Comparison of Efficiency, Chapter 4: Germany," *Journal of Housing Research*, 1992.

[7] Before gaining independence in 1991, Lithuania had been incorporated into the USSR. See Jose Palacin and Robert C. Shelburne, *The Private Housing Market in Eastern Europe and the CIS*, United Nations Economic Commission for Europe, Discussion Paper Series 2005.5, December 2005.

[8] Soula Proxenos, "Homeownership Rates: A Global Perspective," *Housing Finance International*, December 2002, pp. 3-7.

Table 1. Selected Homeownership Rates

(most recent year available)

Country	Year	Homeownership Rate
United States	Q2 2010	66.9%
Canada	2006	68.4%
Denmark	2008	54.0%
Australia	2006	69.8%
Austria	2003	57.0%
Belgium	2007	78.0%
Bulgaria	2002	96.5%
Cyprus	2006	68.0%
Czech	2007	58.7%
Estonia	2008	96.0%
Finland	2007	59.0%
France	2007	57.4%
Germany	2002	43.2%
Greece	2008	80.6%
Hungary	2003	92.0%
Iceland	2008	80-85.0%
Ireland	2008	74.5%
Italy	2002	80.0%
Japan	n/a	60.0%
Latvia	2007	87.0%
Lithuania	2008	97.0%
Luxembourg	2008	75.0%
Malta	2006	75.0%
Netherlands	2008	57.0%
Norway	2001	77.0%
Poland	2004	75.0%
Portugal	2007	76.0%
Romania	2007	97.0%
Russia	2003	63.8%
Serbia	2002	89.0%
Slovakia	2008	88.0%
Slovenia	2008	82.0%
Spain	2008	84.5%
Sweden	2007	52.0%

Country	Year	Homeownership Rate
Switzerland	2000	34.6%
United Kingdom	2008	59.0%

Sources: United States: U.S. Census Bureau, "Residential Vacancies and Homeownership in the Second Quarter 2010," press release, July 27, 2010, http://www.census.gov/hhes/www/housing/hvs/qtr210/files/q210press.pdf.

Canada: Statistics Canada, "2006 Census: Changing Patterns in Canadian Homeownership and Shelter Costs," press release, June 4, 2008, http://www.statcan.gc.ca/daily-quotidien/080604/dq080604a-eng.htm.

European Union: European Mortgage Federation, *Hypostat 2008, p. 62,* http://www.hypo.org/Objects/6/Files/Hypostat%202008%20-%20light%20version.pdf.

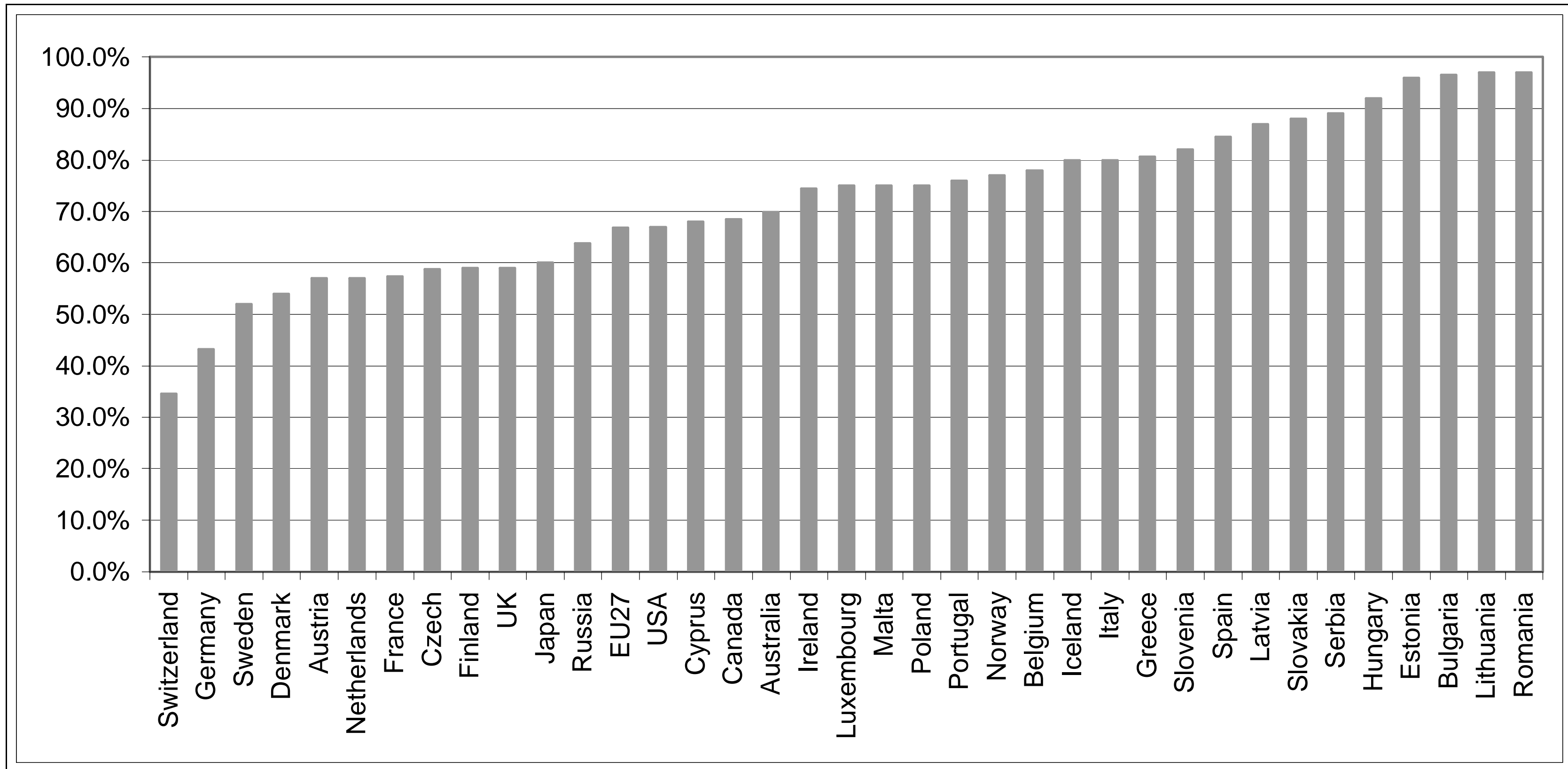
Switzerland: Swiss Federal Statistical Office, *Taux de logements occupes par leur proprietaire et logement en propriete, en 2000*,http://www.bfs.admin.ch/bfs/portal/en/index/regionen/thematische_karten/maps/bau-_und_wohnungswesen/wohnverhaeltnisse.parsys.0001.PhotogalleryDownloadFile1.tmp/k09.15s.pdf.

Australia: Australian Bureau of Statistics, "Year Book of Australia," press release, 2008, http://www.abs.gov.au/ausstats/abs@.nsf/bb8db737e2af84b8ca2571780015701e/37171EAC4F4F016ECA2573D20010F849?opendocument.

Japan: Miki Seco, "Transforming Housing Finance in Japan in the 21st Century," in Danny Ben-Shahar, Charles Ka Yui Leung, and Seow Eng Ong (eds.), Mortgage Markets Worldwide (Oxford, England: Blackwell Publishing), p. 75.

Note: In Japan housing is shared by unrelated individuals more frequently than in the other nations, making comparison of homeownership rates difficult. The range of estimates for Japan is from source cited above.

Figure 1. Homeownership Rates



Source: See sources for **Table 1**.

House Price Changes

In many countries, real (inflation adjusted) house prices were relatively stable from 1991 until approximately 2000. Between 2000 and 2008, prices increased in real terms, peaked, and declined. In this latter time period, most OECD-member countries experienced at least one year of rapid, real house price increases greater than 10%; the greatest price increase (28%) occurred in Ireland during 1998.[9] The United States' maximum annual price increase was 8.2% (2005), Canada's was 9.8% (2006), Denmark's was 19.3% (2006), and Australia's was 16.0% (2003). Between 1991 and 2008, U.S. house prices increased 50%. House prices in Canada increased 60%, Denmark 150%, and Australia 107%. Nations with the largest house price declines since reaching their maximum were Ireland (-0.53), the United States (-0.16), and Iceland (-0.13).

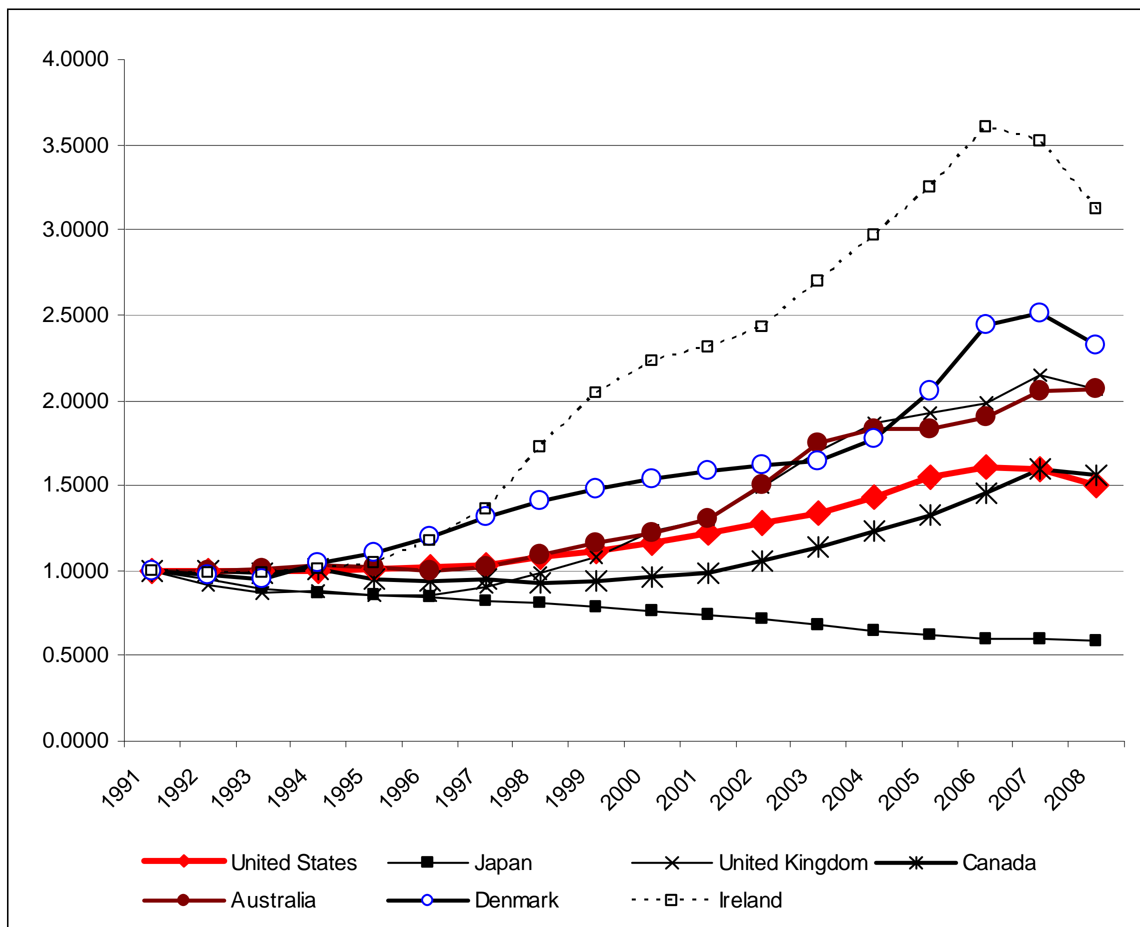
Real house prices do not always increase. Between 1991 and 2008, real house prices declined in Japan, Korea, and Switzerland.

Figure 2 graphs the price levels for the United States, Canada, Denmark, Australia, Japan, Ireland, and the United Kingdom. The graph emphasizes the point that many other nations had greater increases in housing prices than the United States did.

[9] Organization for Economic Cooperation and Development, "Annex Table 59. House Prices," *OECD Economic Outlook*, http://www.oecd.org/dataoecd/26/40/45801547.html.

Figure 2. House Price Levels

1991 = 1.00



Source: See sources for **Table 1**.

Notes: Each country's housing price level is set to 1.00 in 1991. The maximum is the greatest price level for the specified nation. For example, the U.S. maximum of 1.62 represents house prices in 2007 that were 1.62 times the level in 1991. Different price series will show somewhat different results. For example, another Canadian house price index (www.housepriceindex.ca) shows prices continuing to increase.

Factors Affecting Mortgage Interest Rates

This section discusses how the mortgage interest rate paid by a homeowner is determined in the United States, Canada, Denmark, and Australia. It begins by describing a widely used framework for explaining how mortgage interest rates are determined in the United States and then applies the same framework to the other nations.

United States

In a benchmark competitive economic model, the interest rate on a fixed-rate mortgage (FRM) depends on four sets of factors: (1) the interest rate for a riskless government bond with the same life; (2) adjustments to reflect borrower risk; (3) adjustments to reflect risks associated with the

characteristics of the property; and (4) adjustments to reflect the differences between the government bond and the mortgage.[10] The mortgage industry term for the sum of these adjustments to the base rate represented by the riskless government bond to adjust for risks and structural differences is *spread*.

In the United States, the rule of thumb is that a 30-year FRM is paid off in 7 to 10 years.[11] As a result of the 7-to-10-year life, most mortgage calculations are based on the interest rate on a 10-year Treasury bond. For example, a decrease in the interest rate on 10-year Treasuries will lead to lower mortgage interest rates and more prepayments as borrowers refinance their mortgages to take advantage of lower interest rates.

Adjustable-rate mortgages (ARMs) use one of a variety of interest rates plus a mark-up or spread instead of Treasury bonds as the basis for determining the interest rate paid by the borrower.[12] In many economic environments, lenders are willing to offer ARMs with lower interest rates than similar FRMs because the interest rate increases if the index rate or reference increases; this protects the lender against being locked into a loan that pays less than other loans. Borrowers can find ARMs attractive because of the potentially lower interest rates, the chance of future decreases in the mortgage rate, and limits (caps) on the increase in the interest rates. An ARM with a lower or "teaser" initial rate can be attractive to a homebuyer who plans to move before the teaser rate ends.

Borrower risk is typically assessed in terms of credit history (perhaps summarized by the borrower's FICO [formerly Fair Isaac Company] score), and debt-to-income ratio. The better an individual's credit history and the lower the debt-to-income ratio, the lower the spread that will be charged.

Property Characteristics

Property characteristics that influence risk assessments include the loan-to-value (LTV) ratio, and the type of property (owner occupied, investor, condominium, and manufactured housing). In general mortgages, with high LTVs, and mortgages on investor-owned property, on condominiums, and on manufactured housing properties are considered riskier and pay a higher interest rate. Sometimes lenders add a risk premium based on the location of a home.

Home Mortgages and Government Bonds

To a lender, a home mortgage loan is less valuable than a Treasury (or other government) bond of the same risk, maturity, and interest rate because the home mortgage comes with the option to

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[10] If there are only a few lenders, they could take advantage of market power to raise interest rates. These four factors would still determine differences in the rates paid by different borrowers.

[11] This can be because the homeowner refinances, moves, or decides to use other assets to eliminate the mortgage.

[12] These reference rates include the monthly weighted average cost of funds for 11th District savings institutions computed monthly by the Federal Home Loan Bank of San Francisco, the weekly average of secondary market interest rates on six-month negotiable certificates of deposit by the Board of Governors of the Federal Reserve System, the weekly average yield on United States Treasury Securities adjusted to a constant maturity of one year (as published by the Board of Governors of the Federal Reserve System), and the average of the London Interbank Offered Rates, also known as "LIBOR," for six-month U.S. dollar denominated deposits, as published in *The Wall Street Journal*.

prepay and risk of default.[13] To compensate for the relatively lower value, lenders seek higher interest rates on mortgages than on Treasury bonds. In the United States, the legal ability of lenders to seek full recourse from homeowners who have defaulted depends on state law, but until the recent recession, lenders frequently assumed that defaulters had few additional assets worth pursuing, regardless of state law.[14]

Some of the borrower and property characteristics such as FICO score and LTV jointly determine the mortgage interest rate that is charged.[15]

In the United States, lenders advertise mortgage rates on the internet and in newspapers; this rate is adjusted (usually increased) based on borrower and property characteristics.

Canada

Canadian banks post rates for various types of mortgages. Borrowers with good credit can negotiate appreciable discounts on one type of mortgage (five-year fixed rates, which are explained in the "House Price Changes" section). For example, in 2009, the Canadian Association of Accredited Mortgage Professionals (CAAMP) reported that the average advertised rate on one type of mortgage was 5.97%, but that the average mortgage rate actually paid was 4.74%.[16]

Denmark

In Denmark, mortgage interest rates are fixed at the time of the loan. The bonds financing the loan are pass-through bonds issued on the stock exchange, where the terms of the bonds exactly match the terms of the loan.[17] Thus, the borrowers pay the market interest rate at the time of the loan, and the rates are posted by the stock exchange.

Other European Countries

Recent European interest rates on mortgages with short-term initial fixed period rates have been in the range of 3.04% (Spain) to 4.77% (Netherlands); mortgages with long-term initial fixed

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[13] Financial analysts frequently consider default as an option. There is considerable research on this topic. For example, see Michael J. Brennan and Eduardo S. Schwartz, "Determinants of GNMA Mortgage Prices," *AREUEA Journal*, vol. 13, no. 3 (Fall 1985), pp. 209-228.

[14] Karen M. Pence, "Foreclosing on Opportunity: State Laws and Mortgage Credit," *Review of Economics and Statistics*, vol. 88 (February 2006), pp. 177-182. Also available as a working paper at http://www.federalreserve.gov/pubs/feds/2003/200316/200316pap.pdf. Hereafter cited as Pence, "Foreclosing on Opportunity."

[15] For more details on how one large company in the secondary mortgage market (Fannie Mae) adjusts interest rates on mortgages, see Fannie Mae, *Loan Level Pricing Adjustment*, https://www.efanniemae.com/sf/refmaterials/llpa/pdf/llpamatrix.pdf. This website works only with Internet Explorer. See, also, Freddie Mac, *Exhibit 19 – Postsettlement Delivery Fees*, http://www.freddiemac.com/singlefamily/pdf/ex19.pdf.

[16] Will Dunning, *Annual State of the Residential Mortgage Market in Canada*, Canadian Association of Accredited Mortgage Professionals, November 2009, p. 26, http://www.caamp.org/meloncms/media/Fall%20Report%20FINAL%20ENG.pdf.

[17] The servicer of a pass through bond collects payments and forwards them to the bondholders. There is only one class of bondholder.

period rates and 10-year or more maturities have ranged from 4.30% (Germany) to 5.22% (Netherlands).[18]

Features of Selected National Mortgage Markets: The Homebuyer's View

United States

In the United States, mortgages can be split into three general groups: conforming, government insured, and other.[19] Conforming mortgages are those that meet the government-sponsored enterprises' (GSEs) purchase standards and do not exceed the statutory maximum mortgage amounts known as the conforming loan limits.[20] Government-insured mortgages are those guaranteed by the Federal Housing Administration (FHA), the Department of Veterans Affairs (VA), or the U.S. Department of Agriculture's rural housing program.[21] The other group includes mortgages that do not qualify as conforming and are not government insured; this can happen if a mortgage exceeds the conforming loan limits (in which case the mortgage is known as a jumbo mortgage), if the borrower's credit quality is too low (in which case the mortgages are called subprime), or the mortgage application lacks full documentation about the borrower's income or assets (in which case the mortgage is called Alt-A, or alternative A).

At present, interest rates on FHA-insured and Veterans Affairs-guaranteed mortgages are not based on risk; every borrower pays approximately the same interest rate.[22] As discussed above, the interest rates for conforming mortgages and those in the "other" category are based on the risk associated with borrower, property, and lender characteristics.

Research at the Federal Reserve suggests that in normal times the GSEs mortgage market activity reduces the interest rate on mortgages by less 0.5% (50 basis points) compared to a world without GSEs.[23] There is no published research on the impact of the GSEs in the current economic

[18] European Mortgage Federation, *Quarterly Review of European Mortgage Markets*, 1st Quarter 2010, p. 8, http://www.hypo.org/Content/default.asp?PageID=422. The Federation did not list comparable rates for the United States, Canada, Denmark, or Australia.

[19] Some researchers also refer to mortgages without government insurance as "conventional" mortgages. Conforming mortgages are a subset of conventional mortgages.

[20] GSEs have congressional charters and are stockholder owned; but they are restricted to certain specified businesses such as purchasing existing mortgages. These charters give them advantages over purely privately owned companies including an implied federal guarantee. Fannie Mae and Freddie Mac, two housing GSEs, are currently in conservatorship and managed by the federal government. For more information see CRS Report RL34661, *Fannie Mae's and Freddie Mac's Financial Problems*, by (name redacted). The Federal Home Loan Bank System is the third housing GSE and is solvent. For more information see CRS Report RL32815, *Federal Home Loan Bank System: Policy Issues*, by (name redacted).

[21] Technically, FHA insures mortgages, and VA and USDA guarantee them. Mortgage insurance pays the balance of the mortgage if the borrower defaults. A mortgage guarantee is a promise for the government to make specified payments if the borrower defaults.

[22] CRS Report R40937, *The Federal Housing Administration (FHA) and Risky Lending*, by (name redacted).

[23] Wayne Passmore, Roger Sparks, and Jamie Ingpen, "GSEs, Mortgage Rates, and the Long-Run Effects of Mortgage," *Journal of Real Estate Finance and Economics*, vol. 2-3, no. 25 (2002), pp. 215-244.

environment, but in 2009 Fannie Mae and Freddie Mac issued 72% of all MBS suggesting that without the GSEs, mortgage availability would be lower and interest rates would be higher.[24]

Homeowners pay certain transaction costs that vary across (and sometimes within) nations. In the United States, borrowers frequently pay for real estate appraisals, land surveys, inspections, title insurance (which protects the lenders in case the sellers do not have a clear title to the properties being sold), origination fees (sometimes called *points*), lender services, and recording the new ownership and liens with state or local governments. Closing costs are lower in most other nations.

Loan Limits

In 2010, the conforming loan limit (the maximum mortgage that the GSEs can purchase) is $417,000 except for in high-cost areas in the contiguous 48 states where it varies to a maximum of $729,750. The conforming loan limit in Alaska, Hawaii, Guam, and the U.S. Virgin Islands is $625,500 (50% higher than the regular limit of $417,000), and the high cost maximum is $938,250. The conforming loan limit is reviewed annually.[25] FHA-insured mortgages are limited to $271,050, except for in high-cost areas where the limit varies to a maximum of $625,500. FHA loan limits are set specially in Alaska, Hawaii, Guam, and the U.S. Virgin Islands.[26]

The typical loan-to-value ratio in the United States on a new purchase or refinance money mortgage is 80%. Generally, borrowers who do not make at least a 20% downpayment must either purchase private mortgage insurance (PMI), or they obtain a government-insured mortgage.

Mortgage Payments

In the United States, home mortgages typically are for 30 years and have monthly payments that amortize the entire amount borrowed over the term of the loan. Biweekly mortgage payments, which pay off the loan more quickly, are not as common as they are in some other nations.

At times mortgages have been offered requiring only interest (or sometimes a fraction of the interest) to be paid for a period of time Such mortgages stopped being available at the start of the 2007-2009 recession.

In the United States, most prime mortgages can be prepaid without penalty. This is most commonly done to refinance a mortgage or when the homeowner moves. Many subprime mortgages with adjustable rates had low introductory rates and prepayment penalties to discourage borrowers from refinancing until after the higher rates became effective.

U.S. mortgages can be refinanced to take advantage of lower interest rates or to take equity out of the home. The amount of equity withdrawn increases the size of the mortgage, and it is paid to the homeowner when the refinancing is finalized or *closes*. Refinancing with an equity withdrawal is

[24] Federal Housing Finance Agency, *Conservator's Report on the Enterprises' Financial Performance*, Second Quarter 2010, p. 5, http://www.fhfa.gov/webfiles/16592/ConservatorsRpt82610.pdf. Hereafter cited as FHFA, *Conservator's Report.*

[25] CRS Report RS22172, *The Conforming Loan Limit*, by (name redacted) and (name redacted).

[26] Department of Housing and Urban Development, *FHA Mortgage* Limits, https://entp.hud.gov/idapp/html/hicostlook.cfm.

known as cash *out refinancing*. In a refinancing, most closing costs are incurred again. Prior to the current recession, cash out refinancing for more than the amount owed was common. Recently, Freddie Mac has reported that some homeowners have reduced the amount of the new mortgage by using cash to reduce the balance. On reason for a cash in refinancing is that the homeowner wanted to refinance, but needed more equity (money down) to qualify for the mortgage.

Assumptions

An assumable mortgage allows a new purchaser to take the place of the seller of a home in an existing mortgage. This option would be exercised by the new home purchaser only when it is to his advantage (e.g., can obtain a lower mortgage interest rate than otherwise), and consequently usually a disadvantage to the lender.

Most conforming mortgages are not assumable, although the housing GSEs say they will purchase these mortgages on a negotiated (as opposed to a standard) basis. Government-insured mortgages are assumable if the new borrower meets the current credit standards, and if the original borrower agrees to be responsible if the new borrower defaults. This liability makes assumption rare.

Foreclosure and Recourse

Foreclosure (the forced sale of a house because the borrower is delinquent in making mortgage payments) is governed by state law.[27] In addition to foreclosure and sale of the property to satisfy the debt, some states allow a lender to seek any unpaid balance through the courts (recourse). Even where recourse is permitted, most lenders have rarely exercised this option because most homeowners who default have few additional assets.

Taxation

Home mortgage interest is generally tax deductable for U.S. taxpayers who itemize deductions. There is a 100% capital gains exemption on a home that the owners have lived in for two of the last five years. For married couples filing jointly the maximum exemption is $500,000 and for taxpayers filing individually the exemption is $250,000.

Between April 9, 2008, and June 30, 2010, there were special tax credits ranging from $7,500 to $8,000 for qualifying homebuyers.[28]

Subprime

Subprime mortgages are those made to borrowers with less than prime credit histories. There is not a formal definition of the term. According to Federal Reserve Chairman Ben S. Bernanke, the

[27] Pence, "Foreclosing on Opportunity."

[28] CRS Report R40955, *An Economic Analysis of the Homebuyer Tax Credit*, by (name redacted).

annual size of the subprime market ranged from $35 billion (4.5% of the mortgage market) in 1994 to $600 billion (20%) in 2006.[29]

Low-Income Homeownership Efforts

In the United States, government policies to increase homeownership by low-income households have been the FHA-, VA-, and USDA-insured loan programs and involved the GSEs' affordable housing goals imposed by statute and regulation. There are also programs to provide downpayment assistance to low-income households and tax-free mortgage revenue bonds that municipalities can issue to reduce the mortgage interest rate paid by low- and moderate-income households.[30]

Other Nations

The only nations in the world offering long-term fixed-rate mortgages are the United States and Denmark[31]. In the other countries, mortgages are for shorter time periods and the interest rates adjust, sometimes monthly, sometimes every few years. This creates the risk that homeowners will not be able to afford the new payments. In Canada, this risk is eliminated by offering adjustable mortgages that extend or shorten the life of the mortgage to reflect the new interest rate.

Denmark and Canada place less emphasis than the United States and Australia on homeownership as an aspiration.[32] These other nations support low-income housing through a variety of programs and, in general, do not place as much emphasis on homeownership.

The amount of government intervention varies. Canada, Denmark, and Australia do not have anything similar to the GSEs in the United States. In Canada, government mortgage insurance (somewhat similar to the FHA's insurance) plays a major role for all borrowers regardless of income or the amount borrowed.

Canada, Denmark, and Australia have some tax support for owner-occupied housing. In Canada and Australia, much of the intervention in the housing markets is to support indigenous and immigrant populations.

Arguably, underwriting standards in Canada, Denmark, and Australia have been stricter than in the United States.

[29] Ben S. Bernanke, "Fostering Sustainable Homeownership," Speech to National Community Reinvestment Coalition Annual Meeting, Washington, DC, March 14, 2008, http://www.federalreserve.gov/newsevents/speech/bernanke20080314a.htm.

[30] CRS Report RS22934, *Treatment of Seller-Funded Downpayment Assistance in FHA-Insured Home Loans*, by (name redacted), and CRS Report RS22841,*Mortgage Revenue Bonds: Analysis of Sections 3021 and 3022 of the Housing and Economic Recovery Act of 2008*, by (name redacted) and (name redacted).

[31] Michael Lea, *International Comparison of Mortgage Product Offerings*, Research Institute for Housing America and Mortgage Bankers Association, Special Report, September 2010, p. 8, http://www.housingamerica.org/Publications/InternationalComparisonofMortgageProductOfferings.htm.

[32] Patricia Apps, "Home Ownership—The Australian Dream," *The Australian Quarterly*, vol. 48, no. 4 (December 1976), pp. 64-75, http://www.jstor.org/stable/pdfplus/20634876.pdf.

Canada

Key differences between U.S. and Canadian mortgages are as follows:

- Canadian mortgages are more likely to have adjustable rates, prepayment penalties, and are currently easier to obtain with high loan-to-value (LTV) ratios.
- Most Canadian mortgages with less than 20% down are 100% guaranteed under the National Housing Act (NHA) by a government corporation (the Canadian Home Mortgage Corporation or CHMC).[33] In contrast, most U.S. mortgages with less than 20% down are privately guaranteed for the difference between the downpayment and 20%.
- Canadian mortgages typically roll over every five years, even if they amortize over 30 years. If these mortgages are guaranteed by CHMC, the renewal is guaranteed and other banks can take them over. Closing costs are minimal or non-existent for rollovers.
- Canadian policy is to support programs that make rental and owner-occupied housing viable alternatives for all residents. Typically, various levels of government and nonprofits contribute to reduce the cost of low-income homeownership. In the United States, most government intervention has been to open homeownership to low- and moderate-income households.[34]
- Minimum downpayments in Canada have fluctuated in recent years from as little as 0% to 5% at the present time. The minimum downpayment in the United States on an FHA mortgage is presently 3.5%.
- Canadian mortgage payment schedules can be synchronized to one's pay schedule.

Canada supports housing options for low-income households through a variety of rental and ownership programs. Typically, various levels of government, CMHC, and nonprofits contribute to reduce the cost of low-income homeownership.[35]

Comparing mortgage costs in the United States and Canada is difficult, although one IMF study concluded that when interest rates, refinancing costs, and mortgage insurance costs are considered that similar prime borrowers pay similar amounts.[36]

CMHC is a government corporation that is partially supported through appropriations and partially self-funded. Appropriations cover assisted housing, implement other housing policy, and research. Mortgage insurance and securitization are commercially funded through fees, but the government provides the ultimate guarantee. CMHC pays the government for this guarantee.

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[33] Also known as Société canadienne d'hypothèques et de l'habitation (SCHL).

[34] Arguably, the GSEs have made homeownership more affordable to middle-income households, and the government-mandated GSE housing goals provided homeownership and rental support for low- and moderate-income households.

[35] Canada Mortgage and Housing Corporation, *Canadian Housing Observer 2009*, Chapter 2, pp. 15-35, http://www.cmhc-schl.gc.ca/en/corp/about/cahoob/upload/chapter_2_EN_2009.pdf.

[36] John Kiff, Canadian Residential Mortgage Markets: Boring but Effective, International Monetary Fund Working Paper WP/09/130, June 2009, http://www.imf.org/external/pubs/ft/wp/2009/wp09130.pdf.

The role of Canadian mortgage brokers has been growing in recent years. The provincial governments license brokers, and in some provinces brokers have a fiduciary responsibility to borrowers. Brokers are not paid yield spread premiums, which amount to extra payments for higher rate mortgages.

Loan Limits

Unlike the United States, there is no fixed dollar limit on a mortgage that can be securitized with government support. Nor are there any eligibility limits on government mortgage insurance.

In 2008 and 2009, the Canadian government enacted a number of mortgage requirements including limiting LTVs to 95%, prohibiting interest only loans, limiting the life of a mortgage to 35 years, and establishing other standards for government mortgages. The government also intervened in the secondary mortgage market by committing to purchase up to C$ 125 billion of insured mortgage pools. Approximately half that amount was spent.

In Canada, a conventional mortgage is one with an LTV of 80% or less.[37] Low downpayment mortgages are called high-ratio mortgages. By law, federally regulated depositories can hold a high-ratio mortgage only if there is mortgage insurance to protect against default.[38] This mortgage insurance can be provided by a government corporation, CMHC or a private company. CMHC guarantees 100% of the loan amount and private insurers guarantee 90%.[39] The typical new Canadian mortgage has an LTV of 75%.

Types of Mortgages

Interest rates on Canadian mortgages can be fixed for the life of the mortgage, or the interest rate can change. Mortgages with changeable interest rates can modify either the amount paid or the life of the mortgage.

Canadian mortgages that have adjustable rates are called variable rate mortgages and are tied to market rates. When the rate changes, the mortgage payment remains constant, and the amounts going for principal and interest are adjusted, that is, the amortization schedule and life of the mortgage are adjusted to reflect the new interest rate. Variable rate mortgages can have caps, but those with caps usually have higher interest rates.

Based on the length of the mortgage when it was initially taken out, the interest rates on most (62%) Canadian mortgages are fixed for four to five years, but interest rates were fixed for one year or less for 10% of mortgages, and only 12% of mortgages had fixed interest rates for more than five years.[40]

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[37] Canadian Mortgage and Housing Corporation, *Ready to Buy?*¸ http://www.cmhc-schl.gc.ca/en/co/buho/hostst/hostst_007.cfm.

[38] Canadian mortgage insurance covers the entire amount of the loan, whereas U.S. mortgage insurance covers only the amount above the 80% LTV level, i.e., it covers 20% of the mortgage.

[39] The Canadian government provides a backstop guarantee for private mortgage insurers. In the event a private mortgage insurer were to fail, the government would replace the company and guarantee 90% of loan. The fee structure is negotiated between the government and the insurer.

[40] CAAMP, p. 22.

Mortgage Payments

Canadian mortgage payments are frequently weekly, biweekly or monthly and synchronous with one's pay schedule. Canadian mortgages usually have a term from six months to 10 years, but payments are designed so that it will take 25 to 30 years to pay off the mortgage. The homeowner owes the balance of the loan at the end of the mortgage's term. Unless the homeowner opts to pay off the mortgage in whole or part, the outstanding balance is automatically rolled over into a new mortgage without additional fees. If the mortgage is insured, the homeowner has the option to negotiate a better arrangement with another lender and to transfer the mortgage. This refinancing could be problematic if the balance on the mortgage is more than the value of the home or if lenders reduce their lending.[41]

Canadian mortgages can have prepayment penalties (closed mortgages) or not (open mortgages). A closed mortgage prepayment penalty is incurred even if the homeowner moves, although this is frequently waived if the homeowner obtains a new mortgage from the current lender. For closed mortgages, there is a closed period, such as the first three years, during which a certain amount (typically 15%-20%) of the principal can be prepaid. Open mortgages, which are usually for one year, can be prepaid like a U.S. mortgage. If a homeowner moves, the mortgage can be transferred to the new home

Assumption

Some Canadian mortgages are assumable, which reduces the purchaser's appraisal and lawyer's fees. Some Canadian mortgages can be used to purchase a different home. Both these options reduce the burden of any prepayment penalties.

Foreclosure and Recourse

Canadian lenders can force delinquent borrowers into bankruptcy. After foreclosure, Canadian lenders can pursue borrowers for any unrecovered losses.

Taxation

Mortgage interest is not tax deductable in Canada. Capital gains on a principal residence are usually not taxed.

Subprime

Canada has a small Alt-A or "non-prime" mortgage market for borrowers who do not document their income. In 2006, Canadian non-prime mortgage originations were 5% compared with 14-20% in the United States.[42]

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[41] In the early 1980s, the rollovers and very large interest rate increases (due to high rates of inflation) caused some Canadian homeowners to default. See, John C. Given, "Loan Renewals Stun Canadian Homeowners," *Washington Post*, February 13, 1982, p. E6.

[42] Canada Mortgage and Housing Corporation, "Housing Finance," *Canadian Housing Observer 2009*, pp. 59-67.

Low-Income Homeownership

The federal and provincial governments have a number of affordable housing programs, which include rental and homeownership. Low-income homeownership programs frequently target indigenous populations.

Denmark

Denmark traces its current mortgage finance system to 1797. The Danish mortgage market is based on underwriting criteria established by law, matching mortgages' terms to bond terms (the balance principle), high securitization rates, and recourse lending which makes a borrower personally liable if foreclosure does not raise sufficient funds to cover the outstanding debt and costs of foreclosure.

Denmark and the United States offer 30-year mortgages with constant (fixed) interest rates. Mortgages in most other nations are fixed for a few years at most.

Mortgages in Denmark are made by specially authorized banks and subject to underwriting criteria established by law. For example, the maximum loan-to-value (LTV) ratio is currently 80% for owner-occupied homes; the maximum LTV on other homes (e.g., vacation) is lower regardless of borrower credit history. Mortgage interest rates are published, and there are no adjustments for borrower characteristics. To qualify for any kind of mortgage, the borrower will typically be required to qualify for a 30-year fixed-rate mortgage. This cost is generally higher than for adjustable-rate mortgages.

Recent legislation, including the Financial Business Act of 2009, allows banks to apply to join mortgage banks in issuing Danish mortgage bonds. Another recent change, based on EU requirements, is that collateral must be added to mortgage bonds when an individual mortgage's loan-to-value ratio exceeds 80%.

Key differences between the mortgage finance systems in the United States and Denmark are as follows:

- In Denmark, borrowers have two options to refinance: they can refinance as in the United States or they can purchase their mortgage at the current market price. When interests decrease, they will use the refinancing option. When interest rates increase, bond prices decrease, and Danish homeowners can buy back their mortgages out of the bonds. This second option is not available in the United States.
- The Danish system uses mortgage bonds. In the United States, Federal Deposit Insurance Corporation (FDIC) regulations protect the government's claim on the assets of an insolvent insured depository by limiting the use of mortgage bonds.[43]
- Danish mortgage bonds are issued at market rates, and, except for a small processing fee, the corresponding interest rate is passed directly on to the

[43] Federal Deposit Insurance Corporation, *FDIC Policy Statement on Covered Bonds*, Financial Institutions Letter FIL73-2008, August 24, 2008, http://www.fdic.gov/news/news/financial/2008/fil08073.html.

homeowners. All borrowers with the same kind of mortgage will pay the same interest rate.

- The Danish mortgage bond system does not have risk-based tranches with different repayment priorities. The United States' MBS issued by the GSEs commonly have risk-based tranches.
- Denmark has statutory underwriting standards that would disqualify some homeowners in the United States.
- Foreclosure and deficiency judgments in Denmark are based on national law and typically take six months. In the United States, foreclosure and deficiency judgments vary by state and generally provide greater protection for homeowners.

Danish mortgage banks retain credit (default) risk and pass onto investors prepayment and interest rate risk. In the United States, most mortgage originators pass on all risk to the secondary mortgage market. The housing GSEs and the federal government retain credit risk, but investment banks in the secondary mortgage market pass credit risk on to investors. Prepayment and interest rate risk is held by whoever purchases the MBS (sometimes the housing GSEs, and sometimes institutional investors).

Types of Mortgages

The Danish mortgage system offers three types of mortgages: fixed rate, adjustable rate and floating rate.

FRMs typically are for 30 years and have the same interest rate for the life of the mortgage. Interest rates are usually higher than the alternatives, but monthly mortgage payments are fixed.

The interest rate on ARMs changes at predetermined intervals of one, two, three, four, or five years. The amount of the change depends on the interest index rate on mortgage bonds. ARMs generally offer lower initial interest rates (and monthly payments), but future payments and interest rates are not known.

Floating-rate mortgages are similar to ARMs, but the interest rate adjusts at shorter intervals such as three to six months. Floating-rate mortgages are set based on a reference rate (not the bond rate) such as the Copenhagen Interbank Offer Rate (Cibor). Interest rate caps are available.

All three types of mortgages can have initial interest-only payments. Mortgages can be payable either in Kroner or Euro, but most are Kroner-denominated.[44]

Mortgage Payments

Most Danish mortgages are for 30 years and are fully amortized over the term of the mortgage.

[44] Denmark has not adopted the Euro and uses the Kroner, though the exchange rate is fixed.

Prepayment depends, in part, on the type of the mortgage, but all borrowers can prepay their mortgage by purchasing their bond in the market. Mortgage transaction costs (closing costs) are around 0.4% of the amount borrowed compared with 2% in the United States.[45]

Fixed-rate mortgages. FRMs can be prepaid by paying the balance owed. If interest rates decrease, which generally raises the price of a bond, the borrower can use this option. If interest rates increase, which generally lowers the price of the bond, the bond repurchase option is used.

Adjustable-rate mortgages. ARMs can be prepaid for the amount owed at any interest rate reset, or by purchasing the bond on the market.

Floating-rate mortgages. Floating-rate mortgages can be prepaid in three ways:

- first, for the unpaid balance at an interest rate reset, the same as an ARM;
- second, at a previously agreed price, typically 100% of the unpaid balance at any time; and
- third, by purchasing the underlying bonds.

Loan Limits

There are no absolute limits on the size of Danish mortgages, but there are limits on the LTV (80% for prime residences).

Foreclosure and Recourse

A typical residential foreclosure in Denmark takes six months from default to sale of the property. The homeowner is responsible if the proceeds of the sale do not cover the amount owed.[46] Further legal action is possible if no other arrangements have been made to repay the balance owed.

Assumption

Danish mortgages can be assumed by the purchaser of the house.

Taxation

Mortgage interest payments are partly tax-deductible. There is no tax on capital gains from the sale of one's primary residence.

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[45] European Mortgage Federation, *Study on the Cost of Housing in Europe*, Brussels, Belgium, 2010, p. 13, http://intranet.hypo.org/Common/GetFile.asp?DocID=3379&logonname=guest&mfd=off and Glenn Canner, Karen Dynan, and Wayne Passmore, "Mortgage Refinancing in 2001 and Early 2002," *Federal Reserve Bulletin*, December 2002, p. 476.

[46] International Monetary Fund, *Denmark: Financial Sector Assessment Program—Technical Note—The Danish Market—A Comparative Analysis*, IMF Country Report No. 07/123, March 2007, p. 7, http://www.imf.org/external/pubs/ft/scr/2007/cr07123.pdf.

Australia

The U.S. and Australian housing finance systems exhibit both similarities and differences.

Differences include the following:

- Australians appear to be more likely to select ARMs over FRMs. From July 2008 through February 2010 (the most recent available data), fewer than 10% of new mortgages have been "fixed rate," which in Australia means fixed for the first five years or less.[47] The reason for this might be that interest rates on ARMs have been much lower than on FRMs. Sometimes borrowers respond to price wars on a portion of the mortgage market. In contrast, in the United States, approximately 85% of mortgages outstanding are fixed rate.[48]
- Australians that have made extra payments on their mortgages can withdraw the prepaid funds. Some mortgages tie a credit card to the prepaid funds, but other mortgages charge a fee for redraws. This feature is not available in the United States, although U.S. lenders offer home equity lines of credit (HELOCs) that require a new loan application, approval and fees.
- The Australian government has no equivalent to the U.S. government's guaranteed mortgages.

Homeowners obtain mortgages from banks, credit unions and building societies (CUBS), and mortgage originators, which are similar to U.S. mortgage brokers and bankers.

Types of Mortgages and Features

The Australian mortgage finance system offers fixed- and adjustable-rate mortgages.

Fixed-Rate Mortgages. FRMs are generally limited to 15 years or less. Some FRMs convert after one to five years to ARMs for a total term of 25 years.

Adjustable-Rate Mortgages. ARMs (commonly called floating-rate mortgages in Australia) are more common than FRMs.

Most Australian mortgages are for 20-30 years, with the most typical maturity being 25 years. Monthly payments fully amortize the mortgage. Australian lenders charge most borrowers the same rate. There are, however, discretionary discounts offered to some borrowers, with sources indicating that this discount can be as much as 0.70% (70 basis points).

Low documentation loans are available, but they have higher interest rates. Self-employed borrowers frequently have difficulty providing independent verification and take out low-documentation loans even at this higher cost.

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[47] Australian Bureau of Statistics, "Housing Finance Australia," press release, February 2010, http://www.abs.gov.au/ausstats/meisubs.NSF/log?openagent&560909a.xls&5609.0&Time%20Series%20Spreadsheet&0F9F61B78B418B48CA2577000014BC50&0&Feb%202010&12.04.2010&Latest.

[48] Federal Housing Finance Agency, "Single-Family Mortgages Outstanding, 1990 - 2009Q1," press release, 2010, http://www.fhfa.gov/webfiles/14597/SFMOutstanding1990to2009Q1.xls.

ARMs usually do not contain any prepayment penalties. FRMs frequently have either a fixed penalty or a penalty based on the difference between fixed and adjustable interest rates. Some Australians pay their mortgages off early by making monthly payments in excess of the contractual amount. Some mortgages have "redraw" facilities that allow households to withdraw excess payments and provide tax advantages to the homeowner.

In Australia, the cost of refinancing averages about 1.4% of the mortgage amount.[49] Prepayment fees average over 40% of the refinancing cost.

Assumption

Australian mortgages cannot be assumed.

Mortgage Insurance

Unlike the United States, there is no government mortgage insurance in Australia. Authorized deposit-taking institutions (ADIs) making mortgage loans must meet requirements promulgated under Basel II by the Australian Prudential Regulation Authority (APRA).[50] Mortgages are classified as standard eligible or non-standard eligible. To be considered standard, income must be documented and verified, property offered as collateral must be appraised, and the property offered as collateral must be readily marketable. All other mortgages are non-standard. Capital to offset potential losses is reduced for low LTV mortgages, when there is lender insurance covering at least 40% of the mortgage, and for standard mortgages. In the United States, capital requirements are reduced for mortgages packaged by the GSEs into mortgage-backed securities and for government guaranteed mortgages.

In the United States, private mortgage insurance is usually required for mortgages with LTVs above 80%.

Loan Limits

In Australia, there are no loan limits.

Foreclosure and Recourse

In addition to foreclosing on delinquent borrowers, lenders can use the legal process of sequestration to force borrowers into bankruptcy if the proceeds of foreclosure do not satisfy the debt. In the United States, state law determines if a borrower's other assets can be seized.[51]

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[49] Australian Securities & Investment Commission, *Review of Mortgage Entry and Exit Fees*, Report 125, April 2008, p. 7, http://www.fido.gov.au/asic/pdflib.nsf/LookupByFileName/REP_125_Review_of_mortgage_entry_and_exit_fees.pdf/$file/REP_125_Review_of_mortgage_entry_and_exit_fees.pdf.

[50] Australian Prudential Regulation Authority, *Capital Adequacy: Standardised Approach to Credit Risk*, Prudential Standard APS 112, January 2008, pp. 19-22, http://www.apra.gov.au/ADI/upload/Final-APS-112-November-2007.pdf.

[51] Pence, "Foreclosing on Opportunity."

Taxation

Australia's tax system does not provide for any special treatment of mortgage interest. To the extent that a home is one's principal residence and not used to produce income, gains from selling the home are not taxed. When taxed, capital gains on a home are adjusted for inflation.

First Time Homebuyers

In July 2000, Australia adopted a First Home Owners Grant (FHOG) of AU$ 7,000 (approximately $5,600).[52] Since 2000, there have been a few first homeowners' assistance programs, augmenting the original AU $7,000. Most recently, this has included the "First Home Owners Boost Scheme" between October 2008 and December 2009. However, these temporary programs have expired and only the $7,000 FHOG remains.

Since October 2008, Australia has reduced the tax rate on savings dedicated to purchasing a first home.

Subprime

In the past, subprime (credit-impaired or non-conforming) borrowers have been able to obtain mortgages, but at a higher interest rate than prime borrowers. It is estimated that less than 1% of outstanding loans in 2009 were subprime.[53]

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[52] Federal Reserve Bank of New York, *Historical Foreign Exchange XML Data,* July 3, 2000, http://www.newyorkfed.org/xml/fx.html.

[53] Guy Debelle, Assistant Governor of the Reserve Bank of Australia, "The State of the Mortgage Market," Mortgage Innovation Conference, Sydney, March 30, 2010, p. 6, http://www.bis.org/review/r100401e.pdf?noframes=1.

Table 2. Selected Mortgage Characteristics

Country	Fixed Interest Rate	Adjustable Interest Rate	Pre-payment Allowed?	Owner Occupied Interest Tax Deduct-able?	Owner Occupied Capital Gains Taxation	Maximum Term
United States	Yes	Yes	Prime—yes, subprime—mostly no	Yes	Exempt if principal residence for two of last five years with maximum of $250-$500,000	30 years
Canada	Yes	Yes	Yes	No	Exempt	35 years
Denmark	Yes	Yes	Yes	Yes	Exempt	30 years
Australia	Limited duration	Yes	Fixed rate—yes, adjustable rate—during teaser (if any)	Yes	Exempt	30 years
Germany	Limited duration	Yes	With penalty	No	Exempt after 10 years	30 years
Italy	Limited duration	Yes		Yes	Exempt after five years	20 years (sometimes more)
Spain	Yes, but not common	Yes	Yes	Yes at 15% on a maximum of Euro 9,015	Exempt with age and holding requirements	60 years
Switzerland	No	Yes	Sometimes with penalty	Yes	Taxed mostly by cantons	Frequently non-amortizing
United Kingdom	Limited duration	Yes	Yes	No	Yes	30 years

Sources: Bank for International Settlements, *Housing Finance in the Global Financial Market,* Committee on the Global Financial System Paper 26, 2004, http://www.bis.org/publ/cgfs26.pdf; Royal Institution of Chartered Surveyors, *RICS European Housing Review 2009*; Martin Brown, *Country Note: Housing Finance in Switzerland*, Bank for International Settlements, 2005, http://www.bis.org/publ/wgpapers/cgfs26brown.pdf.

Secondary Mortgage Markets: Funding Mortgages

United States

Mortgages are designed to allow households to purchase homes that cost many times their annual incomes without waiting many years to accumulate sufficient savings to pay the full price. Funding long-term, fixed-rate mortgages, such as the 30-year mortgage, that is most common in the United States and Denmark challenges lenders because most funds directly available to financial intermediaries, such as banks, are for relatively short terms (less than five or 10 years), whereas mortgages are paid off over longer time periods. The United States and the rest of the world have developed different solutions to this mismatch of the duration of funding and mortgages.

The prevalence of 30-year self-amortizing, fixed-rate mortgages in the United States makes mortgage funding more difficult than in countries with shorter-term or adjustable mortgages. A bank can minimize its interest rate risk—the risk that its profit margins will be reduced because of rising interest rates—by matching the term of its mortgages to the term of its deposits. As a practical matter, the longest-term insured bank deposits (certificates of deposit) are for five years. When a bank makes a mortgage loan for more than five years, it knows that it will have to obtain new funds or persuade the depositor to roll over the funds when the deposit term expires.[54] The result is that while funding mortgages with federally insured deposits can be profitable, there are certain risks that lenders need to consider.

One solution to the long-term funding challenges is ARMs, which are more popular in many other countries, because they shift the lender's interest rate risk to the borrower. In the United States, ARMs have been popular only in times of high fixed interest rates, such as the 1970s.

In the United States, a secondary mortgage market has developed in which Fannie Mae, Freddie Mac, Ginnie Mae, and others purchase existing mortgages.[55] The mortgages are pooled into mortgage-backed securities (MBS), which are sold to institutional investors. MBS represent a claim on the monthly payments of the underlying mortgages. Fannie Mae, Freddie Mac, and Ginnie Mae add their guarantee of timely payment of principal and interest to the investor; other MBS issuers do not add any guarantee to the MBS that they create.[56] The MBS are normally liquid and can be resold later to other investors.

Between 2001 and 2009, the GSEs share of the MBS market ranged between a low of 40% (2006) and a high of 73% (2008). Since 2008, the GSEs and Ginnie Mae together have issued 95% or more of the MBS issued.

[54] Insured depositories can borrow money by selling bonds, but they pay a higher interest rate than they pay on insured deposits. This higher rate makes bonds a less profitable way to fund mortgages.

[55] Many lenders find it more profitable to keep ARMs as investments and to sell FRMs.

[56] Payments from MBS are frequently divided into tranches that give different investors different amounts of risk, interest, and different timing of payments. In one relatively simple approach to tranches, some investors receive the interest from the mortgages, and other investors receive the repayment of principal.

Table 3 reports covered bonds and MBS issues as a percentage of all residential mortgages outstanding. In the United States, new MBS volume was 10.1% of mortgages outstanding. In Canada, new MBS volume was 3.6%. In Denmark, new MBS were 0.1%, and new covered bonds were 58.5%. In Australia new MBS were 15.6%. New covered bond issues were negligible or zero in the United States, Canada, and Australia.

In many other nations, mortgage funds are frequently raised in financial markets using covered bonds. This financial product, uncommon in the United States, provides the issuer's legal commitment to pay interest and principal, and the pledge of specific mortgages as collateral to guarantee this payment.[57]

The mortgages used as cover remain on the issuer's balance sheet. Covered-bond issuers make the payments regardless of the borrower's actions. As required by law or contract, a mortgage in default must be replaced, and if the value of the mortgages declines, additional mortgages (or other specified high-quality assets) must be added to the collateral pool. Like MBS, mortgage bonds are normally liquid and can be resold. Unlike MBS, Danish mortgage bonds are usually not divided into tranches.[58]

Canada

As a practical matter, the only MBS in Canada are NHA loans pooled by and guaranteed by the government corporation, CMHC. Sometimes lenders will pay for CMHC insurance to allow the mortgages to be pooled. These MBS are pass throughs, have no risk-based tranches, and carry a Canadian government (CMHC) guarantee. In addition to the MBS, the government assumes prepayment and credit risk on Canadian Mortgage Bonds (CMBs). CMHC or a private insurer guarantees the underlying mortgages and CMHC guarantees timely payment of principal and interest on the MBS. This is similar to the roles played by the FHA and Ginnie Mae in the United States. Most non-NHA loans are held and serviced by the original lender.

In the CMB program, the Canada Housing Trust purchases NHA MBS and issues the mortgage bonds, which pay interest semi-annually and return the principal at maturity. These mortgage bonds have a payment stream similar to corporate and government bonds, which usually pay interest semi-annually or quarterly and return the principal at maturity. The bonds are issued in sizes as small as C$ 1,000 and can be issued for any term, but usually are for five years.

In Canada, depositories hold 69% of residential mortgage debt. Of this 69%, chartered banks, which are depositories, hold 56%.[59]

Denmark

To raise funds for mortgages, a Danish mortgage bank sells mortgage bonds to investors. By Danish law, the term and interest rate of the mortgages and bonds must match. This is called the

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[57] See CRS Report RS22925, *Covered Bonds: An Alternative to Securitization for Funding Mortgages*, by (name reda cted).

[58] Likewise, European covered bonds are not normally divided into tranches.

[59] John Kiff, *Canadian Residential Mortgage Markets: Boring but Effective?*, International Monetary Fund, IMF Working Paper WP/09/130, June 2009, http://www.imf.org/external/pubs/ft/wp/2009/wp09130.pdf.

"balance principle." The Danish bonds use "tap" funding, that is, mortgages are added to a bond for two or three years.

Bond rates are reported in Danish media. The interest rate on a specific mortgage depends on the specific bond used to fund it. Every qualifying applicant for a given mortgage type gets the same interest rate.

The mortgage bank passes through homeowner payments to the investor holding the bond funding the specific mortgage, and the bank charges a margin (typically 0.5% of the loan balance) for operating costs including any losses. Until it is paid off, the mortgage remains on the bank's books.

There are currently seven Danish mortgage banks and one other bank issuing Danish mortgage bonds.

Australia

Unlike in the United States, most Australian MBS have adjustable rates. Mortgage originators (brokers) largely sell their mortgages in MBS. The four largest Australian banks, which provide approximately 70% of the mortgage market, generally retain mortgages in portfolio. The CUBS (credit unions and building societies) securitize approximately 22% of their mortgages.

The Australian Prudential Regulatory Authority (APRA), which regulates all financial services firms in the country, prohibits covered bonds.

Table 3 reports the extent that various countries issue covered bonds and MBS.

Table 3. Covered Bonds and Mortgage-Backed Securities as a Percentage of Residential Loans Outstanding

(2008)

Country	Covered Bond Issues (Percentage of Residential Loans Outstanding)	Mortgage-Backed Security Issues (Percentage of Residential Loans Outstanding)
United States	—	20.1
Canada	—	3.6
Denmark	58.5	0.1
Australia	—	15.6
Austria	2.2	—
Belgium	—	1.9
Finland	2.6	—
France	1.6	1
Germany	3.6	0.2
Greece	—	6.2
Ireland	4	6.6

Country	Covered Bond Issues (Percentage of Residential Loans Outstanding)	Mortgage-Backed Security Issues (Percentage of Residential Loans Outstanding)
Italy	—	4.7
Japan	—	4.7
Netherlands	0.7	4.6
Norway	—	—
Spain	11.1	5.7
Sweden	10.1	0.9
United Kingdom	0.9	6.4

Source: International Monetary Fund, "Chapter 3. The Changing Housing Cycle and the Implications for Monetary Policy, "*World Economic Outlook* April 2008, http://www.imf.org/external/pubs/ft/weo/2008/01/pdf/c3.pdf.

Conclusion

The mortgage markets in all four nations—the United States, Canada, Denmark, and Australia—seem to have more differences than features in common. Yet except for Denmark, they have similar homeownership rates. Some possible reasons for this similar outcome are as follows:

- Demographic similarities could be more important than institutional details.
- Some differences in mortgage underwriting, such as minimum downpayment requirements, could delay homeownership on average for relatively short periods of time.
- Some features, such as the mortgage interest deduction and the treatment of capital gains on owner-occupied homes, could be built into the price of housing, reducing or eliminating the advantages given to homeownership.

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