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A COMPARISON OF INTERNATIONAL HOUSING FINANCE SYSTEMS

HEARING

BEFORE THE

SUBCOMMITTEE ON
SECURITY AND INTERNATIONAL TRADE AND FINANCE

OF THE

COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS UNITED STATES SENATE

ONE HUNDRED ELEVENTH CONGRESS

SECOND SESSION

ON

COMPARING THE INTERNATIONAL HOUSING FINANCE SYSTEMS

SEPTEMBER 29, 2010

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WEDNESDAY, SEPTEMBER 29, 2010

WITNESSES

A COMPARISON OF INTERNATIONAL HOUSING FINANCE SYSTEMS

WEDNESDAY, SEPTEMBER 29, 2010

U.S. SENATE,
SUBCOMMITTEE ON SECURITY AND INTERNATIONAL TRADE AND FINANCE,
COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS,
Washington, DC.

The Subcommittee met, pursuant to notice, at 2:36 p.m., in room SD–538, Dirksen Senate Office Building, Hon. Evan Bayh, Chairman of the Subcommittee, presiding.

OPENING STATEMENT OF CHAIRMAN EVAN BAYH

Chairman BAYH. If the Subcommittee would please come to order. Good afternoon. I am pleased to call to order this Subcommittee hearing entitled, "A Comparison of International Housing Finance Systems." I want to thank and welcome my colleague in attendance, Senator Corker, and I am happy to say that we have had an excellent working relationship, to show that Democrats and Republicans can cooperate together when the spirit so moves us. So, Robert, it is great to be with you once again. As a matter of fact, if I have to absent myself later, I have such trust and confidence in my colleague, I will hand him the gavel.

[Laughter.]

Chairman BAYH. Which does not happen much here on Capitol Hill, but it will be in good hands when it is in his. He was, in fact, the impetus behind holding this hearing and having this important discussion today.

To our three distinguished and learned witnesses that appear before us today, welcome and thank you for your testimony.

All three of the academics on our panel have extensive research and practical experience in the area of housing finance, with a particular expertise in the systems of developed nations abroad. I understand that two of our witnesses have traveled to be with us here today, and so I want to thank you for your time and consideration with regard to the Subcommittee's deliberations. Thank you for literally going the extra mile.

I look forward to our dialog today, but, unfortunately, due to some last-minute scheduling constraints, I may be unable to stay for the entirety of the hearing. I am confident, however, that given Senator Corker's keen interest in this issue and the appeal of the subject matter, we will still have a lively and informative discussion.

If the witnesses will indulge me, I may have a few written follow-up questions for you to be submitted for the record on certain topics that are not covered in the question-and-answer portion of today's hearing. I promise they will not be too voluminous.

Before we turn to the panel, I would like to give a few very brief remarks to provide some context for this hearing and what the Subcommittee would like to achieve today. And I invite Senator Corker to do the same when I am done.

Today we convene as a Subcommittee to gain insight into the legislative challenge facing Congress as it considers reforms to our housing finance system. This is a critical economic policy issue that affects virtually all of those involved in the housing market: homeowners, potential borrowers, financial institutions, investors, realtors, construction, and I could go on and on.

Many with an interest in reform are already hard at work. Last month, the Treasury Department held a conference on the future of housing finance. Some of our witnesses today participated in that conference, and it proved to be a worthwhile and substantive meeting.

Just last week, Assistant Secretary Barr reiterated the Treasury Department's intention to release a plan that will call for fundamental change by January 2011. This debate has the potential to become political and polarizing, but that should not prevent us from addressing such a consequential issue in a pragmatic fashion.

It is the responsibility of Congress to tackle how to build a more stable housing finance system, with an understanding of what went wrong with our current system and what we can do together, given the economic realities, to fix it.

To assist in that endeavor, we hold today's hearing to explore the housing finance models of other developed nations, including, but not limited to, Canada, Denmark, the United Kingdom, Australia, and Germany. We will hear from the witnesses on how the housing finance systems of these countries differ from the United States', the strengths and weaknesses of their product approach, and whether any lessons may be learned from their experiences prior to enduring the global economic crisis. More importantly, we hope to learn whether any aspects of their systems and policies or regulatory frameworks may be adapted to our system here in the United States.

As a lead-in to that discussion, I would note that some of the policy approaches of other nations are seemingly difficult to reconcile with the economic data. For instance, most developed countries experienced robust growth in their housing and mortgage markets during the first half of the decade. Some countries also experienced record levels of house price inflation, relaxed underwriting standards, and increased competition. Still, no other major developed nation has experienced the type of house price decline, the staggering default and foreclosure rates, and drastic change to their mortgage finance system that the U.S. went through. Why is that? What have they done differently?

At the same time, Australia, Ireland, Spain, Canada, and the U.K. all have higher or comparable rates of home ownership to the U.S., but these countries provide far less government support. In fact, the U.S. is unique in that it provides preferable tax treatment

for owner-occupied housing and it uses all three types of Government support: support of mortgage institutions or guarantee programs, mortgage insurance, mortgage guarantees, and Government-sponsored mortgage enterprises.

How did they achieve those rates of home ownership without the Government subsidies or the types of programs that we offer here in the U.S.?

In addition, some of those same jurisdictions have far stricter underwriting standards for loans and a limited number of mortgage products available to borrowers, with arguably less preferential terms, but still maintain high home ownership rates. How do we reconcile that paradox?

These are just a subset of the issues we seek to explore with our witnesses today as we learn more about our counterparts to the north and abroad and how they deal with housing finance and confront the challenges and asset bubbles.

I welcome our witnesses' insights and perspectives on this pressing issue and gathering what we can from other nations' experiences. Thank you all.

Senator Corker.

STATEMENT OF SENATOR BOB CORKER

Senator CORKER. Well, thank you, Mr. Chairman. I very much appreciate your working to cause this meeting to take place.

I want to thank our witnesses, who are outstanding. And, you know, the fact is that this year we are probably not going to do anything as it relates to housing finance, but next year we probably will, and I think understanding what has worked and what has not worked in other places will be helpful. I think a lot of times we have these myths or these built-in issues into the DNA here as it relates to housing finance, and sometimes looking in other places we can learn from that.

So I very much appreciate you being here today. I know that we are at the wind-down and there is not a lot of activity as far as people thinking about policy. But this will be very, very helpful to us as we move ahead this next year, and I thank all of you for coming, and I certainly look forward to the Chairman introducing you.

Chairman BAYH. Thank you, Senator Corker.

I am going to ask that the introductions of our three witnesses be included in their entirety in the record. You all have such great experience and so many credentials, I am not going to take your time by reading them all. I will just kind of hit the highlights starting from our perspective with you, Dr. Lea, and then moving to the rest of the panel.

Dr. Michael Lea is the director of the Corky McMillin Center for Real Estate at San Diego State University. I have already just mentioned that Dr. Lea is an international authority on housing and mortgage finance and has published over 75 articles and book chapters, including the editing and coauthoring of an influential World Bank publication on emerging market housing finance in 2009.

I am sure your book went higher on the Amazon scale than mine did, Doctor.

He has over 25 years of financial services industry experience, including more than 18 years of international advisory work in 28 countries spanning six continents. He has taught at Cornell University, San Diego State University, the University of California–San Diego, and the Wharton International Housing Finance Program at the University of Pennsylvania. Wharton is well represented here today. He receive his Ph.D. in economics from the University of North Carolina at Chapel Hill.

Welcome, Dr. Lea.

Next we have Dr. Susan Wachter—I hope I pronounced that correctly, Doctor—the Richard B. Worley Professor of Financial Management, Professor of Real Estate and Finance, codirector at the Institute for Urban Research, the Wharton School, University of Pennsylvania. Dr. Wachter is codirector and cofounder of the Penn Institute for Urban Research, has served as president of the American Real Estate and Urban Economics Association, and is coeditor of Real Estate Economics. She was appointed Assistant Secretary for Policy Development and Research at HUD and served from 1998 to 2001, where she was principal adviser to the Secretary, responsible for national housing and urban policy. Dr. Wachter received her B.A. from Harvard College, which in our part of the country, Doctor, we refer to as the Indiana University of the East.

[Laughter.]

Chairman BAYH. And her Ph.D. from Boston College. Welcome, Dr. Wachter.

Next we have Alex Pollock, Resident Fellow of the American Enterprise Institute. Mr. Pollock joined AEI in 2004 after 35 years in banking. He was president and chief executive officer of the Federal Home Loan Bank of Chicago from 1991 to 2004. He is also the author of numerous articles on financial systems and the organizer of the "Deflating Bubble" series of AEI conferences. He is a director of the Chicago Mercantile Exchange—you employ many people in my State, which we appreciate, Mr. Pollock—the Great Lakes Higher Education Corporation, the International Housing Union for Housing Finance, and the Chairman of the Board of the Great Books Foundation. Mr. Pollock is a graduate of Williams College, the University of Chicago, and Princeton University. Welcome, Mr. Pollock.

Dr. Lea, why don't we begin with you. Just as a rule of thumb—and I do not intend to enforce this strictly, but if you have got a lengthy statement, if you could kind of summarize it in 5 minutes or so, give or take, and then we could submit the rest to the record. And as I said, if you go over a little bit, that is not a big deal. But if you can kind of keep it in that ball park, that would be great. And then we will go to a round of questions after all three of you have finished your statements.

STATEMENT OF MICHAEL J. LEA, DIRECTOR, THE CORKY MCMILLIN CENTER FOR REAL ESTATE, SAN DIEGO STATE UNIVERSITY

Mr. LEA. Great. Thank you, Mr. Chairman and Ranking Member Corker and Members of the Subcommittee, who will see it in the record, I guess. As you said, I am Michael Lea, and I am the director of the Corky McMillin Center for Real Estate at San Diego

State, and as Mr. Chairman's introduction, I have had extensive experience in working and doing research in international mortgage markets now for more than 20 years.

I recently completed a comparative study of developed country housing finance systems that is going to be published by the Brookings Institution later this fall as well as a comparative study of mortgage instrument design which was released this week by the Research Institute for Housing America. And I would ask that both of these papers be entered into the record.

Chairman BAYH. Without objection.

Mr. LEA. Thank you.

I would like to start by looking at the U.S. owner-occupied mortgage markets in an international context. Our market is internationally unusual in several respects. First, the U.S. has a more extensive role of Government in our mortgage market than other countries. The U.S. Government backs over 50 percent of the stock of mortgage debt and over 95 percent of the new flow. Only Canada comes close, with approximately 50 percent of its loans directly or indirectly insured by the government, and about 25 percent of Canadian mortgage-backed securities have a government guarantee. Japan is the only other major developed market with a government security guarantee program, and the Netherlands is the only other market with a government-backed insurer. I did a study of about 11 or 12 major developed markets for this work.

No other developed market has a Government-sponsored enterprise, as you said earlier. No other market has quantitative housing goals or CRA-type legislation.

The U.S. is also unusual in the preponderance of the long-term fixed-rate mortgage and funding through securitization. Currently over 90 percent of U.S. new originations are fixed-rate mortgages, and in most years, they have a 70-percent market share. The only other countries with predominant market share in long-term fixed-rate mortgages are Denmark and France. The dominant instrument in other countries is either an adjustable-rate mortgage, such as Australia, Spain, or the U.K., or a short- to medium-term fixed-rate, sometimes called a rollover, mortgage with a longer amortization period, such as in Canada, Germany, and the Netherlands.

Over 60 percent of U.S. mortgages have been securitized and over 90 percent of current originations are funded through securitization. Internationally, Canada, Spain, and the U.K. have funded approximately 25 percent of the mortgages through securitization. In other countries, that markets share is quite less.

The predominance of fixed-rate mortgages and securitization in the U.S. is causally linked. Experience has shown that capital market financing is necessary to manage the risk of such mortgages. Their dominance is both a function of and a rational for Government involvement. The Government effectively subsidizes fixed-rate mortgages through the Government-sponsored enterprises and Ginnie Mae, the guarantees for which reduce the relative cost of this instrument. Investors in fixed-rate mortgages like Government guarantees so they do not have to worry about credit risk, only the underlying cash-flow risk caused by long amortization and frequent prepayment.

Thus, supporters of Government-sponsored enterprises argue that Government guarantees are needed to continue offering the fixed-rate mortgage. Without such guarantees, fixed-rate mortgages, in my opinion, would still exist but they would be more expensive and there would be a smaller market share.

What has been the result of these policies? The U.S. does not have a higher home ownership rate than in many other countries, as you indicated in your introduction. In my survey of 11 major developed markets, the U.S. was in the middle. The U.S. does not have a deeper mortgage market, either. A number of countries have higher ratios of mortgage debt outstanding to GDP. The U.S. market was unequivocally the worst-performing market during the crisis, with significantly higher rates of default and foreclosure.

There are many factors contributing to its poor performance, but the role of Government lending incentives and the crowding out of lower-risk lending by Government entities are significant contributors.

So what can we learn from the experience in other countries? The role of Government in fostering home ownership through tax incentives and lending programs has not resulted in higher rates of home ownership, rather contributed to a pronounced boom and bust that continues to plague the economy. International experience suggests that sustainable home ownership and mortgage indebtedness can be achieved without such a large role of the Government.

What can replace the Government-dominated funding model that now characterizes the U.S.? The Danish model offers several areas for improvement. The Principle of Balance results in a one-to-one correspondence between a mortgage loan and a bond that finances it. If mortgage rates fall, the borrower can refinance, as in the U.S. today. If interest rates rise, the borrower, through their mortgage lender, can repurchase the bond at a discount and cancel the mortgage. In this way the borrower can reduce debt and, therefore, the likelihood of negative equity in a rising interest rate environment.

This feature could also reduce the significant extension risk that mortgage-backed security investors face in the U.S. today. With rising rates, the effective maturity of mortgages is going to be rising over time.

The highly efficient Danish mortgage market is funded through corporate bonds in which the credit risk stays on the balance sheet of the lender, thus aligning incentives. The Danish model could be implemented initially by Fannie Mae and Freddie Mac, ultimately transitioning to a private model.

The Canadian–European combination of the rollover mortgage and covered bond financing has desirable characteristics as well. For example, a 5-year fixed-rate mortgages with a 30-year amortization provides significant, though not complete, insulation of the borrower from interest rate risk, particularly given the fact that the average homeowner moves every 5 to 7 years here in the U.S. A shorter fixed-rate period reduces the risk for the lender and investor and will result in lower relative mortgage rates.

A key characteristic of this model is the ability of lenders to charge prepayment penalties during the fixed-rate period. The penalties allow lenders to issue very simple bullet bonds or fund the

loans through swap deposits. While prepayment penalties got a bad reputation during the subprime lending crisis here, they do serve a valuable function and are common outside the U.S.

In conclusion, I believe there is much the U.S. could learn from international experience, and I look forward to your questions. Thank you.

Chairman BAYH. Thank you very much, Dr. Lea.

Dr. Wachter.

STATEMENT OF SUSAN M. WACHTER, RICHARD B. WORLEY PROFESSOR OF FINANCIAL MANAGEMENT, PROFESSOR OF REAL ESTATE, FINANCE, AND CITY AND REGIONAL PLANNING, THE WHARTON SCHOOL, UNIVERSITY OF PENNSYLVANIA

Ms. WACHTER. Chairman Bayh, Ranking Member Corker, thank you for the invitation to testify.

The United States belongs to a group of countries that suffered particularly severe recessions driven by sharp housing price crashes. Other countries in this category include the United Kingdom and Spain. On the other end of the spectrum are countries where home prices merely leveled from 2007 to the present, resulting in no or mild recessions. This category encompasses Canada, Australia, and Germany. Denmark lies somewhere in the middle, with a late bubble and current downturn. By comparing these two groups, we can investigate what causes and what prevents housing bubbles and financial crises. In a forthcoming paper with colleagues, cited in my written testimony, we conduct just such an investigation, and we find that two institutional differences separate these groups: the role of mortgage insurance and the strictness of regulations countering the market's tendency toward procyclical behavior.

No country better exemplifies this procyclicality in housing and mortgage markets than the United States. With economic growth and low interest rates coming out of the recession of 2000–2001, mortgage lenders and securitizers increased lending and competed for market share among borrowers. When the available market was satiated, they expanded the market by lowering their standards. Eventually, borrowers found themselves with too much debt to repay, and the downward spiral of foreclosures, defaults, and home price declines resulted in the crisis we have today.

While lending standards deteriorated, the extent to which this was occurring was unknown due to information opacity. I go through a short description of what happened in the United States to compare it to other countries.

Contrast this experience to that of Canada, where regulators mandate that all high loan-to-value mortgages must be covered by mortgage insurance. This practice has not inhibited Canada from achieving levels of home ownership on par with those of the U.S. at their peak in 2004. Canada and in this period Australia, which also shows a high rate of home ownership, relied on mortgage insurers as a "third-party regulator" with the result that mortgage lending standards did not deteriorate and housing prices did not collapse. Mortgages in Australia and Canada were and are typically short-term variable rate, or in the case of Canada, rollover,

and were originated and to a large extent held in portfolio by banks. Both countries avoided recessions, home ownership, as I said, has been maintained at high levels, and their banking systems have been able to continue lending as the crisis has caused financial systems in other countries to stop functioning.

The structure of the dominant mortgage product is also critical to preventing procyclicality. Most countries rely on adjustable-rate mortgages or rollover mortgages provided by banks and held in bank portfolios. The U.S., Denmark, and to a lesser extent Germany are the three notable exceptions, favoring fixed-rate mortgages or relatively long-term fixed-rate mortgages. ARMs place the interest rate risk on the borrower, who is not well suited to bear this risk. When interest rates rise, borrowers have difficulty making payments and may be forced to default. ARMs are also less conducive to systemic stability, as exhibited during the current economic crisis here and elsewhere. During the housing bubble, securitizers' appetite for market share drove them to underwrite riskier adjustable-rate mortgages from less creditworthy borrowers. The U.K. and Spain also relied on ARMs with deteriorating lending standards. All countries with ARMs saw their lending dry up during the credit crunch with borrowers not able to refinance even though it was assumed that refinancing would always be possible. With ARMs that need to be repaid or refinanced, the illiquidity of the system may be transformed as in these countries into a solvency or foreclosure crisis.

Building a system around the fixed-rate mortgage requires a secondary market. In my written testimony, I go into more detail as to why.

Unlike the private label securities of ARMs, securitization allows a fixed-rate mortgage that would otherwise not exist. In Germany, a secondary market exists in the former of covered bonds, identified as "Pfandbriefe," that are secured by standardized mortgage loans, which the quality of the standardized mortgage loans was not allowed to be undermined over time.

But without proper regulation, covered bonds can get a country into trouble. German regulators ensure that investors get periodic updates on the state of the collateral securing their covered bond, and they do not allow covered bonds to be secured by loans with an LTV ratio above 60 percent. Unlike in the U.S., these regulations were not eroded during the housing bubble. Denmark also relied on covered bonds and had similarly stringent regulations until recently. When Danish legislation moved the system toward interest-only mortgages, the market joined the housing mania and developed a late bubble that subsequently deflated, causing the current recession in Denmark. Similarly, Spain used covered bonds extensively, yet they did not have fixed-rate mortgages; they used covered bonds to finance adjustable-rate mortgages. The Spanish banks, the savings banks, *cajas,* securitized ARMs through *cedulas* in an effort to generate fees and gain market share, generating a bubble and crisis that is severe, with Spain now suffering 20 percent unemployment. In the face of rising prices, it is tempting to lower lending standards, as occurred in these countries, contributing to procyclicality.

Most countries do have significant involvement of governments in housing and mortgage markets. Now, Canada, as we have just heard, provides catastrophic mortgage insurance to most of its mortgage market. In other countries, when the housing market is in crisis, when the entire system is in danger, there is a rescue. The British rescue of Northern Rock preceded the American bailouts; the Spanish government has intervened to protect the *cajas* and their covered bonds. To prevent a foreclosure crisis from driving an economy into a severe recession or depression, governments will intervene; thus, it is necessary to regulate the housing market before it reaches the crisis stage. The taxpayer owns the tail risk. Rather than raise lending standards after the fact, we can prevent the problems of moral hazard, shrinking equity, and bailouts by maintaining standards and transparency.

In closing, the clearest difference between the U.S., the U.K., and Spain on the one side and Australia, Canada, and Germany on the other side is the stability of regulation. The first group allowed lending standards and capital requirements to decline, stoking the procyclical behavior that created a housing bubble and economic crisis, while the latter group maintained rules in the face of market pressure.

Thank you.

Senator CORKER [presiding]. Go ahead, Mr. Pollock.

STATEMENT OF ALEX J. POLLOCK, RESIDENT FELLOW, AMERICAN ENTERPRISE INSTITUTE

Mr. POLLOCK. Thank you, Mr. Chairman.

As you mentioned in your opening comment, it is without doubt the case that it is very useful to examine American housing finance in an international perspective. When we do, we discover one thing unique in the world about American housing finance, and that was the dominant and disproportionate role played by Government-sponsored enterprises—that is, Fannie Mae and Freddie Mac.

With Fannie and Freddie so prominent, many Americans, including Members of Congress, including the two gentlemen I had lunch with today, thought that America had the highest home ownership rate in the world. As you have pointed out, we did not and we do not.

In my written testimony, there is a table of comparative home ownership rates. Michael has 11; I have 26 advanced countries in my table, and I think it is about as up to date as it can be. The U.S. ranks 17th in this list among advanced countries, or about two-thirds of the way down the list, in home ownership. And as I say, that table is in my written testimony.

Many countries achieve home ownership levels as high or higher than ours with no GSEs. Various housing finance systems operate without tax deductions for the interest on home mortgages, without our highly unusual practice of making mortgages into nonrecourse debt, and without government CRA-like mandates to make riskier loans, without 30-year fixed-rate loans, and with prepayment fees on mortgages.

Of course, as bubbles and busts in these other countries show, you can also get in trouble with different systems. That is a gen-

eral rule, I take it, of finance. You can always get into trouble in finance.

The better credit performance of Canada and Canadian housing finance has been well known, and, indeed, Canada has mortgage delinquencies which are a small fraction of ours. Canadian mortgage lenders have full recourse to the borrower's other assets and income, in addition to the security interest in the house. The fact that there is no tax deduction for interest probably increases the incentive to pay down the debt over time. Most Canadian mortgage payments are made through automatic debit of the borrower's checking account and can be matched to the frequency and timing of the paycheck. It is a technical but I think very important point in terms of the behavior of borrowers.

With this relative credit conservatism, as has been pointed out, Canada's home ownership rate is 68 percent compared to 67 percent for us, and Canada does have a government body to promote housing finance, which has a very substantial role, as my colleagues on the panel have said, the Canada Mortgage and Housing Corporation, or CMHC. But at least CMHC's status, unlike the American GSEs, is completely clear and honest. It is a 100-percent government-controlled corporation. Its government guarantee is completely explicit. It provides housing subsidies which are on budget and have to be appropriated by the Parliament.

Canada in this respect, therefore, looks superior to the U.S. in candor, as well as credit performance. It has, however, had a big run-up in its house prices over the last decade, and this is shown in my written testimony. In response to this, Canadian regulators have taken actions to decrease the maximum loan-to-value ratios on some classes of mortgages, and such countercyclical movements in LTV limits, in my opinion, are an excellent idea and are, indeed, necessary to moderate the inevitable cycles in real estate credit.

As has been discussed, the most perfect housing finance solution in theory, which also functions very well in practice in an admittedly small country, is the housing finance system of Denmark, which has been admired by many observers. The interest rate and prepayment characteristics of long-term fixed-rate loans in the system are passed entirely on to investors in Danish mortgage bonds. But at the same time, there is a total "skin in the game" requirement for credit risk. The lending mortgage banks retain 100 percent of the credit risk of the loans. Deficiency judgments, if foreclosure on a house does not cover the mortgage debt, are actively pursued.

Some years ago, before the fall of Fannie and Freddie, I participated in an exchange with the Association of Danish Mortgage Banks. The idea was that they explained their bond-based and skin-in-the-game-based system to me, and I explained the American GSE-centric system to them.

When I had finished my presentation, the CEO of one of the leading Danish mortgage banks said this: "In Denmark we always say that we are the socialists and America is the land of free enterprise," he said. "Now I see that when it comes to mortgage finance, it is the opposite!" And, indeed, I think that is an insightful statement.

In my written testimony, I also discuss some other countries, including two ideas from Germany worth pursuing, one being covered bonds and the other being an emphasis on savings as part of housing finance, which has not been mentioned yet, Mr. Chairman. We need to rediscover the idea of savings as part of what we are doing in housing finance, as the old name savings and loan would indicate.

Well, America's GSE-centric housing finance system has collapsed, with massive taxpayer expense, as did the former thrift-based system which preceded it.

The international perspective suggests that there is every reason to think broadly about how to develop a better, post-GSE U.S. housing finance system for the future.

Senator CORKER. Thank you all for your testimony, and I think, to sort of shorten the chase here, if you will, Mr. Pollock, why do we not just start with that and have each of you, if you will, describe without the built-in DNA that exists around what we have in our own country, based on what each of you know about other countries and what you have seen here, if we were—because that, I think, is where we are going to try to go this next year—if we were going to design a housing finance system that worked in this country, taking into account the cultural aspects over the last 50 years that have developed around housing, what would it be?

Mr. POLLOCK. Do you want me to start, Mr. Chairman?

Senator CORKER. Yes.

Mr. POLLOCK. In my opinion, it would have a much bigger role for a truly private market. That is to say, the vast bulk of the residential market, which is the middle-class what we call conforming or prime mortgage market of the size that the vast bulk of the population borrows to buy houses that are in the middle of the distribution, would be a fully private market.

I have the notion that among the participants in this market would be the privatized parts of Fannie Mae and Freddie Mac in the future, when they leave behind their bankrupt old business. But that needs to be a private market, and I think on that basis it would work well and it would succeed in delivering a better resource allocation that is not warped and distorted by all kinds of government subsidies and guarantees.

For that part of the system which we would choose to subsidize or to do credits which a market would not do, I think that should be a purely and explicitly government activity, as it is in Canada, where the subsidies, instead of being hidden in GSEs and be able to allow those GSEs to exert significant political clout, those subsidies and nonmarket financings should all be explicitly in the government, have to be approved and appropriated by the U.S. Congress. So in that way, I think we would look more like other countries and we would have a superior economic model.

Just two other points. I think that it does make sense to think about covered bonds as an alternative financing. As my colleagues have pointed out, if you want to have fixed-rate mortgage loans, you have to have a bond market financing. You cannot finance long-term fixed-rate mortgage loans on a deposit basis, and in this country the banks are not big enough to finance the whole mortgage market anyway. And covered bonds, I think, make an alter-

native which should be explored. That alternative needs to have a statutory basis so the bond holders are truly given certainty about their collateral. And I agree with Dr. Wachter that the loans in such covered bonds should be conservatively underwritten loans.

And then finally, as I said, we need to rediscover savings and an emphasis on saving to enter into the housing market and paying down the mortgage as a source of long-term savings, so that in the very old fashioned but correct idea you actually end up owning the house as you get older.

Senator CORKER. What would the government subsidy that you are talking about that would be transparent, that subsidy would be directed at what?

Mr. POLLOCK. Well, Mr. Chairman, of course, it would be directed at whatever the Congress decided it would be directed at, but typically——

Senator CORKER. But you are developing this——

Mr. POLLOCK. ——but typically low-income households who are trying to enter into home ownership but still have a very good chance of performing successfully on the debt which they undertake. Certainly, this system has to have, or should have as part of what we do in the future, very clear, simple, and transparent information provided to borrowers about the credit commitments they are making so they really understand the commitments they are signing up for and they can underwrite themselves, as I like to say. It is much more important to underwrite yourself as a borrower, can I do this, than for somebody else to underwrite you.

And you, of course, never do anybody a favor by making them a loan they cannot afford, whether you are the government or whether you are a private factor, and we want to avoid that.

Senator CORKER. Generally speaking, do other countries—are there a lot of other countries around the world that have subsidies for——

Mr. POLLOCK. Yes.

Senator CORKER. ——for lower-income citizens?

Mr. POLLOCK. Yes, in advanced countries.

Senator CORKER. And they are interest rate subsidies, is that what you are talking about?

Mr. POLLOCK. I think they are typically—actually, Michael would know this better than I, but I think they are typically credit availability programs or—and there are often rental subsidies, as well. A lot of countries use these subsidies, including Canada, as a rental program, government program for low-income housing.

Senator CORKER. And for the middle- and upper-income citizens, would there still be—would you, if you could design it, still focus on long-term fixed-rate mortgages, or would you just let the market determine that——

Mr. POLLOCK. I would definitely have long-term fixed-rate mortgages in a system, because I think they would naturally evolve. But I think Dr. Lea is right. They would be a smaller part. They would probably be somewhat higher priced. And houses would be less expensive because you know that the most fundamental proposition in all economics is that not only lunches, but nothing is free, and all of the subsidies we put into housing finance merely go to

make houses more expensive. So the home buyers do not win in the end.

Senator CORKER. Dr. Wachter.

Ms. WACHTER. I agree with much of what Dr. Pollock has said. I do want to take a small exception to the last comment. While it is true that housing subsidies do raise prices some places in the United States, not all throughout the U.S. Housing is elastically supplied in much of the U.S., and in that case, it does not have that impact.

But I specifically do agree with the need for subsidies and the need for them to be explicit. I also, as you know from my comments, I do think it is extremely important, particularly at this time, for there to be the necessary institutions to support the long-term fixed-rate mortgage. We are at a point of historically low interest rates. If interest rates were to rise, let us say, 20 percent, 30 percent, in a world with an adjusted-rate mortgage, that would be equivalent to a 20, 30 percent rise in mortgage payments, which could create a crisis of similar dimensions of the crisis that we had if across the board mortgages went up that much, and perhaps in some cases doubled. If rates doubled, this would basically take people from, let us say, 30 percent of their income to 60 percent of the income. It is for this reason that countries that have reliance on adjusted-rate mortgage are attempting to create fixed-rate mortgage and move away from adjusted-rate mortgages.

Also, there is a problem that the U.K. has spoken of, and it is in the Miles report, of some hesitancy to use monetary policy when necessary because of the fear of rising interest rates and what it would do to destabilize not only individual homeowners, but indeed the entire economy.

So we are fortunate in having a fixed-rate mortgage. What we are not fortunate, obviously, what cratered our system was the deregulated private-label securitization that undermined lending standards. That happened nowhere else. In fact, Canada was considering a subprime mortgage market. They came to me, among others, to write a report to advise on that. This was in 2004. Many people submitted a report—I did—and advised against their moving to allowing a subprime mortgage market.

Canada, as we have heard, does have great involvement in the mortgage market. Specifically, it has also recourse mortgages. Recourse mortgages really could not work in the United States. Because of our bankruptcy law, that is not really an option for us.

And so we have for every reason, then, to be even more determined and careful in our regulation of our mortgage system so that we do not have crises which end up being taxpayer funded.

So let me go back to your question of what, then, would we take from other systems. Systems of both Denmark and Germany have much in them for us to model, particularly, as Dr. Pollack has said, they have in their securitized—and they use covered bonds, but, in fact, covered bonds when regulated well are not so dissimilar from mortgage-backed securitization that is regulated well. These securities that go into the covered bonds are, indeed, transparent. They are standardized. They are—information on them is maintained over time.

This is significantly monitored, and it is key if we are to have securitization that we monitor, from my perspective, what goes into the securitized entities for housing finance, because capital markets will always be subject to shocks. There is no way of stopping that. The shocks will then be transferred through the securitization to the housing market. If at the same time in a procyclical way the securitization standards are undermined, then we will, of course, have what we have today and it will be recurrent.

So to avoid both of these problems, I absolutely am in favor of a fixed-rate mortgage. By the way, if you just have adjusted-rate mortgages, you are basically reliant on your banking system and banking systems across the world have cratered, as we are well aware. Japan has had, through a kind of savings and loan crisis which got even larger, a basic real estate crisis beyond that, two decades of slow to no growth.

So a banking system mortgage-based finance does not prevent crises, either. In both cases, transparency, risk monitoring by the private sector as well as the public sector, is necessary.

Senator CORKER. So Mr. Pollock mentioned, I think, that the only involvement government had in his model would be on the subsidizing lower-income portion. As it relates to fixed-rate mortgages from your viewpoint, would that also—would you have government involvement, and middle- and upper-income loans also?

Ms. WACHTER. Absolutely, as there is in Canada. There would be, as in Canada, a provision of catastrophic mortgage insurance that would be priced. It would be explicitly priced.

Senator CORKER. And how does the insurance work in Canada?

Ms. WACHTER. I think perhaps Dr. Lea might be able to give us more details on how it works, but my understanding is that both the private insurers, of which there are two, do have a backstop of catastrophic insurance if there is a crisis, as well, of course, as the mortgages that are insured through CMHC.

Senator CORKER. And they are insuring the mortgage, but not the entity that actually——

Ms. WACHTER. And that is exactly where I would go. I would go to issuers of mortgages that are securitized that have a wrap on the mortgage-backed securities, but the first loss would be the private equity which would be at the risk and the companies themselves would be absolutely at risk.

It would seem to me you could also have, although you are never going to get away from the risk of catastrophic insurance, you would also potentially have companies which are issuing mortgages, securitized, without a wrap. But that would require, from my perspective, that the mortgages in these securities be well understood, well vetted, tracked real time for their potential risk.

Senator CORKER. Why do you not go ahead and jump in, Dr. Lea.

Mr. LEA. OK. Several comments and responses. In my view, an ideal housing finance system should have diversity in both instruments and in funding sources. I think a model that has almost all of its loans being fixed rate has problems and issues because of the risks associated with that to investors. I would also point out, in a rising interest rate environment, affordability problems are going to be exacerbated by the inflation premium that is built into long-term fixed-rate mortgages.

Likewise, as Dr. Wachter says, I do not think it is wise to have an entirely adjustable rate system where you have potentially significant payment shock for a wide part of the population. Rather, I would like to see some of both, where borrowers and lenders self-select with regard to the interest rate risk carrying capacities of the different borrowers.

For example, in Canada, they have this rollover mortgage. While the typical fixed-rate term is 5 years, so this would be a 30-year amortization mortgage but typically fixed for 5 years, the borrower can select between a 1-year, a 3-year, a 5-year, or in some cases even a 10-year fixed rate period. So that does allow the borrower to manage interest rate risk to a degree, because if they think rates are high and going to fall, then they can go into a shorter-term fixed rate. If they think rates are low and going to rise, they would pick a longer-term fixed rate.

I would also point out in the adjustable rate world, such as in the U.K., talking to the Council of Mortgage Lenders, for example, they credit the adjustable-rate mortgage for actually reducing defaults during the crisis because interest rates and payments have come down quite a bit. This is also the case of Australia. Though I fully agree with Dr. Wachter that we are now at historic lows and we are going to see significant increases going forward.

A couple other comments. With regard to subsidy, I just do not think it is generally a good idea to subsidize interest rates or to push the market toward particular products. I think from the subsidy kind of standpoint, what we should do is focus on affordability. I would note that both Australia and Canada have first-time homebuyer tax credit programs. They do not have the mortgage interest tax deduction. The mortgage interest tax deduction does very little to stimulate home ownership. In fact, most of its effect is as a regressive subsidy to higher-income people as well as being capitalized in the house prices.

And so if we are talking about an ideal world, I would gradually phaseout home mortgage interest deduction, but I would put in its place some form of first-time homebuyer tax credit which is targeted toward first-time buyers. It could also be targeted toward lower-income.

I also point out that other countries do subsidize rental housing more extensively than we do. In most countries that I looked at, the types of voucher programs that assist lower-income renters are entitlements. You qualify, you get it, as opposed to the U.S. where they are still effectively rationed and there is excess demand for those kinds of subsidies.

I agree with Dr. Wachter on the efficacy of the mortgage insurance. I think that using mortgage insurance initially through private mortgage insurers and having the government insurance backstop is a good idea. In Canada, the government provides a 90 percent backstop, catastrophic backstop, to private insurers. That was done primarily to try to level the playing field between the government insurer and the private insurers.

I would disagree with one thing with Dr. Wachter, though I have not looked at this from a legal standpoint, but the contention that recourse is impossible in the U.S. Recourse is practiced in a number of States in the U.S. Some lenders are more aggressively going

after deficiency judgments. And it is an important, I think, incentive mechanism for avoiding things like strategic default. And every other developed country has recourse mortgages and lenders do routinely go after deficiency judgments, and I think that also curbs over-indebtedness and speculative behavior on the part of borrowers. And so I would submit that in the future, we should not rule that out. I think that that is an important part of any legal system underlying the mortgage market.

Senator CORKER. What is it about the—and just 1 second, Mr. Pollock, but what is it about the bankruptcy laws that make the recourse issue not practical? I thought it was more the State Constitutions——

Ms. WACHTER. State Constitutions are actually the big——

Senator CORKER. So it is really not the bankruptcy laws?

Ms. WACHTER. Well, the biggest—yes, the bankruptcy adds to it in the sense that if the borrower has an option to go into bankruptcy, then repaying through income, for example, may not be viable. In Denmark, actually, wages are garnished, and I do not think that that would be viable if the borrower was in bankruptcy, at least in that period.

Senator CORKER. Mr. Pollock, you wanted to say something?

Mr. POLLOCK. Thank you, Mr. Chairman. I just wanted to add three quick things. I hope it was clear in my comments, but in my ideal mortgage system for the U.S. going forward, there would be no GSEs.

Senator CORKER. I kind of gathered that.

Mr. POLLOCK. I just wanted to make that explicit.

Senator CORKER. Yes.

Mr. POLLOCK. You would either be private or you would be the government, but you could never be both at the same time. I think that is an important principle.

A second comment is that there is also a risk for the borrower with fixed-rate mortgages, and that is you have a fixed-rate mortgage at some rate and rates go way down because we are having a recession, unemployment is high, and you cannot refinance for credit reasons, which is the situation of many people now. And the fixed-rate mortgage, in fact, puts you in a terrible place in that situation. So we need—there is nothing you can do that takes away all risks from everybody, and there are risks in that, as well.

Finally, just on the fact of how Canada works, one of the things I would not copy is the Canadian mortgage insurance. The overwhelming amount of Canadian mortgage insurance, and there is about 470 billion Canadian dollars of mortgages insured out of a total market of about 950 billion Canadian dollars or so, so that is half of the market, is provided directly by the Canada Mortgage and Housing Association, which is the government and it, in effect, guarantees 100 percent of the mortgage. There is no private capital there. There is just the taxpayer guaranteeing it. In my judgment, that is a bad idea. I would not do it.

There are Canadian critics who think that that pushing of credit, of mortgage credit, is contributing to the rise, which is quite dramatic if you have a chance to look at the graph in my testimony, in my written testimony, and they think that they may have a bubble. They say—some people in Canada say they have a bubble and

attribute this very heavy intervention as part of the cause. That is obviously debatable. But it is clear that in the Canadian system, for about half of the market, there is a direct taxpayer guarantee with no private equity in there, and the banks who then hold these insured mortgages get extremely low capital requirements for the mortgage. So the capital is not in the bank, either, when they are holding the mortgages. And, as I say, that is a part of what our Northern neighbors do that I would definitely not copy.

Senator CORKER. Dr. Lea, what is required in Canada to receive that insurance, meaning what type of oversight and standardization has to exist for those originating these loans to be able to secure this government insurance guarantee?

Mr. LEA. Well, first, if you are a bank or regulated lender, you have to have insurance if the loan is over 80 percent loan-to-value ratio. So that then brings a mortgage insurer, either government or private, into the picture and they will set the standards for what they will insure.

Senator CORKER. And in a collapse, I mean, one like we have had here in our country, very quickly, those entities would be out of business, is that correct? I mean, in a crisis like we have had. That is an interesting thing for episodic-type, just episodes of people failing, but when you have a systemic crisis like we have had, basically, those are wiped out pretty quickly, right?

Mr. LEA. Well, not necessarily. I would point to the fact that our private mortgage insurers still exist and they have basically survived. We have had one that has ceased writing new business, but they are still in business and several have raised new capital.

They, I think, benefited from the fact that a lot of the riskier mortgages, *A,* they did not insure them, did not meet their standards, and *B,* a lot of lenders tried to circumvent the insurance by creating the so-called "piggyback loans," 80/20 type of loans so that they could avoid charging borrowers mortgage insurance, and that also was where a lot of the riskier loans went.

And the third thing I would say is that if you had the universal, everything over 80 percent, then you are spreading your risk out, and one of the principles of insurance is to try to get more and more diversification. And absent a true systemic collapse—now, certainly you can come up with scenarios in which the insurance capital will not be sufficient, but insurance capital is different than banking capital in the sense that it is much more risk-based and you cannot pay out dividends as long as your risk ratios are at particular levels. So I think that, actually, from a capital adequacy standpoint, insurance models may be somewhat better than bank capital models.

Senator CORKER. So then back to this sort of standard issues, other than the mortgage insurance, what is it that happens in Canada to be able to get, if you will, that government insurance? What kind of standardization? What kind of oversight?

Mr. LEA. Well, again, the mortgage insurers are regulated——

Senator CORKER. So it is really the mortgage insurer that is making that determination.

Mr. LEA. Absolutely.

Senator CORKER. OK.

Mr. LEA. Absolutely. The bank——

Mr. POLLOCK. But Michael, you would have to say the overwhelmingly dominant mortgage insurer is the government of Canada——

Mr. LEA. Correct——

Mr. POLLOCK. ——through CMHC.

Ms. WACHTER. And two other companies——

Mr. POLLOCK. Yes, but they have——

Ms. WACHTER. ——smaller, I agree——

Mr. POLLOCK. ——they have a very minor share of the market. We are really talking about a government program.

Mr. LEA. So the government set the standards and——

Senator CORKER. And are those standards stringently enforced and——

Mr. LEA. As far as I know, yes.

Ms. WACHTER. Absolutely.

Mr. LEA. They started to relax them a little bit during the mid-2000s, kind of a boom period, and as they saw the markets starting to weaken, they lowered the maximum LTV. They also lowered the maximum term. They had been insuring out to 40 years. They moved that back to a maximum of 35. So they definitely tightened as they saw the downturn coming.

Senator CORKER. Dr. Wachter and Mr. Pollock, do you all agree that the interest rate deduction does not stimulate, as Dr. Lea has said, does not stimulate home ownership?

Ms. WACHTER. I agree. I would like to go back to the—but today, if you did withdraw the interest rate deduction, it would be a problem in the state of today's market.

Senator CORKER. Well, other than the rebellion that would take place, you are saying—but expand. Tell me, in your opinion, why it does not aid in home ownership or the desirability of home ownership.

Ms. WACHTER. The way we—at this stage, the way it is structured, because many people take the standard deduction, lower-income, middle-income households take a standard deduction, we only have——

Senator CORKER. So they never bump up against the actual——

Ms. WACHTER. They never bump—almost 49 percent do not pay taxes at all, so that you can see that the deduction is more important for higher-income households——

Senator CORKER. Mr. Pollock——

Ms. WACHTER. ——who would own, also, and——

Senator CORKER. And on that same note?

Mr. POLLOCK. Everything we do in housing finance, Mr. Chairman, you have to think about the interaction of finance and prices of the houses. Certainly, in an upper part of the market, upper half or so, the prices reflect the deduction, and I suspect if you took it away, you would not like the price reaction, and in a situation when a lot of people are underwater on their mortgages already, that gives you a real transition problem to work on if you wanted to get to a state of no interest deduction. We all know about politically how hard that is, but there is also a price problem especially now.

Senator CORKER. So, I mean, but from a standpoint of making that transition, is that something that if one were to make that

transition over a decade, would that be so distortive that it would hurt prices immediately?

Ms. WACHTER. Yes. This is not the decade to do it. Housing markets are too fragile. Perhaps 5 years from now, we could reconsider, or 2 or 3 years. But at this moment in time, housing markets are sufficiently fragile, they may start declining again and setting up a spiral of declining prices, increasing foreclosures, decreasing prices. We are not out of those woods yet.

Mr. LEA. I would point out that the U.K. did, over a decade time period, get rid of the mortgage interest deduction. They started as the market was coming out of the early 1990s downturn, which was a very severe downturn in the U.K. So I agree fully with Dr. Wachter that this is not the time to do it, but if we think 2, 3 years out of something like a decade-long policy, what they did in the U.K. was starting to lower the cap. We have a million-dollar loan cap now on deducting interest. You start lowering that. You also can lower the maximum marginal tax rate that you can take the deduction against, so you shrink the absolute size of the deduction then eventually have it go away. But it would have to be in a recovered market before you would want to start eliminating that.

Senator CORKER. How do the three of you feel about prepayment penalties?

Mr. LEA. How do what?

Senator CORKER. How do the three of you feel about prepayment penalties? In other words, in a normal, functioning commercial market, if you have a 10- or 15- or 20-year fixed-rate mortgage and you want to pay it off, you pay a penalty. That accounts for the losses that the investor would have because of the rate adjustment that would take place on the new mortgage they might have to replace it with. How would the prepayment penalty, should it come back, how would that affect the housing market and people's mentalities as it relates to longer-term mortgages?

Mr. LEA. Well, the countries where you have prepayment penalties, you would not have it for a full 20-, 30-year term. So typically, in countries like Canada and the Netherlands, it is predominately with a 5-year or shorter fixed-rate period. And so at the end of that period, then the loan rate is renegotiated and you are free to pay it off in entirety at that time. In Germany, you can go up to 10 years with a prepayment penalty, but the law caps it at that, even if the actual interest rate may be fixed for a longer time period. So it is not for 20- to 30-year type times.

The second thing, I think that the market is a place for both loans with and without prepayment penalties, and I think borrowers can self-select based on the pricing of the loans, because remember, if we do not have a prepayment penalty, as we have in the U.S., there is a fee that all borrowers pay. It is incorporated into the mortgage rate. There is an option premium for the option the borrower has to have early repayment that has mortgage rates to be higher than if you did not have that option. So everybody is, in effect, paying it, whereas the European view is that you benefit, you pay. So it is not a socialized type of model.

I think there is a market for both and that allows borrowers to self-select based on the initial rate in the mortgage, what their expectations are, both for interest rates and moving. And again, I

think more choice is better. We should not have a market that is all one or all of another.

Ms. WACHTER. I agree. I think there should be a choice in the prepayment penalty or not, and absolutely agree with Dr. Lea that it is priced in. If there is no prepayment penalty, then that is going to affect the payment.

I do also want to underline, however, that there is an advantage for the overall economic and systemic stability to having a preponderance of no prepayment penalty, and that goes just to the point of Dr. Pollock. Today, if we had a significant prepayment penalty, that would create an even more severe problem for those who wish to refinance out of fixed-rate mortgages into lower interest rate fixed-rate mortgages today, helping out the overall economy. That is, there is an automatic stabilizer in the ability to refinance when the economy declines and interest rates decline if there is an ability to refinance. Nonetheless, it should be priced. It is priced and there should be both options.

Mr. POLLOCK. There is an economist at the World Bank who has pointed out that in America, we have very high transaction fees for refinances which function in a way like a prepayment penalty. And another of the things we should think about in a future housing finance system is instruments that reduce those very high transaction costs as we churn fixed-rate mortgages. That is a very high cost to consumers.

I agree, in a private system, which I would favor, you would evolve mortgages with prepayment fees and mortgages without. The ones with prepayment fees would have lower interest, just like you have mortgages with up-front points you pay and mortgages that are no-point mortgages. If you pay points, you get a lower rate. It would work the same way and the market would work out the balance. We have to make sure only that the parties to the transaction understand what the deal really is and then the market will sort out the preferences of the various borrowers and lenders.

Senator CORKER. What has been your experience over the last 20 or 30 years looking at markets where most borrowers have a floating rate as opposed to a fixed rate? Over the course of time, has the amount of interest that they have paid, how does that compare to a fixed-rate market like the U.S.?

Ms. WACHTER. Well, the dramatic issue is that over the 20 years, interest rates have fallen across the world. They have fallen dramatically, seeing they were on average, in the study that we have done of 15 countries over 1980 through 2000, they fell from about 15 percent to 6, 7 percent. So in this scenario of declining interest rates, an adjustable-rate mortgage is perfectly safe. There have been very few countries that have had adjustable-rate mortgages a large share of their system that have faced a situation with rising interest rates. There is one exception to that that I know of, and that is the U.K. in the early 1990s.

Many, actually, developed housing markets have only, as Dr. Lea has extensively written about, have only developed since 1980. So we do not really have a huge experience of a well developed mortgage system, by that I mean a system where many—where the preponderance of people do have mortgages and have adjustable-rate

mortgages in a world where there is a sharp rise in interest rates. We simply have not seen that. As I said, there was this exception in the 1990s in the U.K. The U.K. did have a very well developed mortgage market and entirely adjustable-rate mortgages and their banking system was imperiled, as was the mortgage insurance system, at that point in time as interest rates rose coming out of 1990.

Senator CORKER. Any other comments here?

Mr. POLLOCK. I would comment on that, Mr. Chairman. There was a time in the 1990s when I was refinancing my loan once a year and it was much cheaper—U.S. specifically—how much interest you pay on an adjustable rate *versus* a fixed rate. That was much cheaper in that setting. And Chairman Greenspan at the time got himself in trouble once for talking about how much cheaper it would be for people to finance on adjustable rates. But there are times when it is cheaper. In a market where you have choices, it allows consumer borrowers to make a risk-reward choice. As in other normal financial markets, you have got purveyors of funds and takers of funds and they are negotiating where they think the risks and rewards are.

For a long time, starting off, let us say, around 1950 until 1980, interest rates were rising. People who had mortgages they took in the 1950s, if they were long-term mortgages, or 1960s, did very well relative to floating rates. Of course, the result of that was the failure of the entire savings and loan industry and the difference got to be paid by the taxpayers.

There is no way you can mechanically set up systems to assure that they will not fail and get you in trouble, but I think the more choices people can make in informed ways, the better overall it will function, including the question of trying to manage their total interest rate bill.

Ms. WACHTER. If I could just quickly follow up, the fact that we did have, of course, this major crisis, we were not the only country, and many countries had similar crises, which has led to the fact that banks do not make fixed-rate mortgages and hold them in their portfolio going forward.

Senator CORKER. In my previous life, I borrowed a lot of money and it was just part of what we did in business. I can tell you, there was no question a built-in mentality that if you had a floating-rate loan, especially one that was recourse, you know, most fixed-rate mortgages in the commercial sector are nonrecourse, but usually floating-rate loans are not. They are recourse. And so the mentality of having a recourse loan and also knowing that that rate could change caused you to pay that loan off as quickly as possible, and every cent, every dollar you had that was extra was used to pay down that mortgage. And so it is easy to see, certainly with the mortgage deduction component that goes with it, that—I mean, we basically incent people not to do that.

As you look at these other countries that have variable-rate mortgages mostly, that have not gotten into the kind of troubles we have, you know that part of the mentality in that household is that if there is an extra dollar or two that month, they are going to use it to pay the mortgage down because it, in effect, is savings, right? I mean, that is the same as savings and it is also deferring costs that are going to occur down the road due to interest payments.

Ms. WACHTER. I am certainly not disagreeing that in the commercial sector, in your experience of the commercial sector, but it is absolutely not the case that adjustable-rate mortgages have stopped borrowers from not taking on new debt. Of course, in the United States, the entire subprime market was an adjustable-rate market. So the increasing debt over time in this period from the late 1990s to 2006, at its height, was refinancing in the adjustable-rate product.

Senator CORKER. Yes?

Mr. LEA. In both Australia and the U.K., you did have very high LTV lending, where people took on a lot of debt even with the adjustable-rate mortgages. The one thing, though, that exists is people, as you suggest, do tend to pay down their debt more rapidly. I think that is in part due to the fact that interest, again, is not tax deductible, so it pays to essentially pay off that higher rate mortgage, for one thing.

The second thing is that, historically, both Australia and the U.K. have kind of an administered rate system, so unlike the U.S. adjustables, which are indexed to something like LIBOR or a money market rate or 1-year Treasury rate, you have what is called a discretionary ARM where the rate is set by the lender for all borrowers at the same time. Now, the positive of that is that lenders do tend to lag the interest rate changes, both on the up and the down cycle, which means that if rates do start sharply rising, it is not a guarantee that lenders are going to follow that up in lock step with whatever short-term index is going, but rather they have the discretion of spreading that out and lagging that, and statistically, that has been the case over the last couple of decades.

Senator CORKER. Yes, sir?

Mr. POLLOCK. An interesting difference between commercial credit markets, which you referenced, Mr. Chairman, and residential markets is commercial markets invariably have loan covenants, so with either private placement investors or banks or bond indentures, as a borrower, you are committing to maintaining certain levels of capitalization or earnings or inventory coverage or what not, whereas we do not have such things in residential loans.

I was in a discussion recently, and I think it is an idea worth thinking about, where there might not be covenants added, and these might develop if we really had a private market, to residential mortgages, for example, prohibiting the taking on of second lien borrowings without the agreement of the first lienholder so that you get a more commercial-like contract and you are not allowed as a borrower to run your leverage of the household up to foolish levels. It is something worth thinking about, anyway. But it is a clear, interesting distinction between the two markets.

Senator CORKER. And I might add, and I certainly look forward to hearing from you, but I might add that especially in an environment where basically the servicers of these first mortgages are usually the ones that have the locks on the second mortgage, so they are looking after their interest naturally more so than the prime lender is.

Dr. Wachter.

Ms. WACHTER. Yes, and this is an interesting idea, and other countries have other ways of getting to the same conclusion. For

example, in Canada, you cannot refinance your mortgage if it is over 80 percent without the mortgage insurance agreement to that.

Senator CORKER. So it sounds like, looking at the body language, all three of you would support loan covenants as a part of whatever we might propose. It is certainly on any kind of Government support system, is that correct?

[Panel nodding heads.]

Senator CORKER. Is there anything demographically about our country that is different than others as it relates to how our whole loan system has evolved and why it is so different than most other countries?

Mr. POLLOCK. Well, one reason we could say that Canada is an interesting comparison is that demographically we are both nations of immigrants and frontiers and pioneers and settlement, which gave us a land holding population. We still have heavy immigration, which we keep assimilating and trying to assimilate into home ownership, which is an interesting issue to think of. We would think about it generationally as cohorts of the family or of the generations of the family establish themselves in American society and move to home ownership that they could not afford in the beginning.

Ms. WACHTER. There are countries with serious problems of renters *versus* owners, where renters are have-nots in the sense that they cannot become renters [sic]. Their families do not have the wealth. Their families have not been owners. And with development and price rises, it is possible that these sectors will be out of home ownership entirely, leading to real stresses.

In our country, despite the fact that we have had these tremendous immigrants fueling our growth, we have also incorporated immigrants into home ownership so that they have a stake in our country. And as housing prices have risen, their wealth has risen with it, so that instead of being kept out of the potential of home ownership generation to generation, they have been able to buy into America's growth. I think this is extraordinarily important going forward.

Senator CORKER. Any comments?

Mr. LEA. You know, I do not really know that there is a major demographic argument for a lot of the characteristics of our system. As Dr. Wachter said, we have historically had a bias or penchant for home ownership for good reasons. But if you look at the legislation and language of a lot of other countries, they will also say that home ownership is really good, but they do not necessarily think it is good for everybody, and then the question becomes do you have the kind of support systems for lower-income people, for rental or people that are doing that in order to save and in order to own.

So I think that our system is actually—its characteristics are more defined by the very longstanding role that governments had, going all the way back to the 1930s, creation of FHA and Fannie Mae, prohibition of adjustable-rate mortgages until the early 1980s. That explains a lot more about why our system looks the way it does than any demographic feature.

Senator CORKER. And all three of you, I think, would support some type of legislation to deal with covered bonds but do not see

it as a panacea to our housing, is that correct? All three of you think that——

Mr. POLLOCK. Yes.

Ms. WACHTER. Yes.

Mr. LEA. Yes for me.

Ms. WACHTER. Yes for me, but I do actually think it is, in fact, going the other direction. Covered bonds are not only not a panacea, but they can be a source of systemic risk, as we see in Spain.

Senator CORKER. So they can add risk to the system if you do not properly balance——

Ms. WACHTER. Absolutely.

Senator CORKER. ——off what the FDIC's rights are against——

Ms. WACHTER. Exactly.

Senator CORKER. Yes. In closing, we have been here almost an hour and a half now, and are there any closing thoughts? I know you all had opening comments. I have asked a few questions. Are there any other comments or thoughts you would like to share with us before we adjourn?

Mr. POLLOCK. If I could, I would just repeat, Mr. Chairman, that looking at this in an international context where you see a lot of different evolved systems around the world is really a fruitful thing to do because we need to think anew about the way American housing finance, which is a huge market, hugely important economically and socially, but it needs to work quite a bit differently, in my judgment, than it has in the last generation, and, in fact, in the generation before that. So it is definitely time for these bigger, more open-ended thinking about what we might do.

Ms. WACHTER. I think it is also useful to look at the successes, but also to look at the failures, and the European regulators are looking at their failures at the same time. So cross-country examination and looking together at what works. We are not a nation alone. Our crisis helped bring down other markets. Other markets also affect us. I absolutely think it is important to have an international perspective and I do thank you for the opportunity to speak to it today.

Senator CORKER. Thank you.

Mr. LEA. And I would just add that there is no perfect system. We cannot say that one that is totally adjustable rate, bank deposit funded, or one that is totally fixed rate, security funded, is ideal. In act, both have their strengths and weaknesses, and I think what we can draw from the international experience is there is a diverse set of ways, both instrument and institution, that you can provide sufficient credit for housing and for home ownership, and I think we should look at, again, having a diverse menu of products, funding types with essentially the interplay of investors and borrowers determining what that mix looks like.

Senator CORKER. You know, we have just gone through, obviously, a huge financial regulation bill and some tangible decisions were made and then some, in many cases appropriately so, regulators are making decisions. In the area of housing finance, because of the involvement we have had, which has been, let us face it, 90 percent of the market today, we are going to have to make some tangible, hard decisions as it relates to housing finance going ahead. As a matter of fact, I think it is going to be in many ways

a far more difficult issue for us to come to terms with and solve because it affects so many people. And again, our involvement in it today is it is such a huge level—I am talking about our Government involvement.

So I thank you for coming today. I know that there will be people here, staffers and others that represent folks that will want to ask additional questions, and so we will leave the record open, I am sure, for a couple of days and we look forward to calling on you.

I know in our own office, we are trying to develop a sort of a thesis, if you will, about the direction that we think this ought to go. I know the New York Fed informally has come up with some ideas. I know others are doing the same. We thank you very much for traveling as far as many of you did today, for all of you being here, and look forward to your continued input. Thank you very much.

Ms. WACHTER. Thank you.

Mr. POLLOCK. Thank you.

Mr. LEA. Thank you.

Senator CORKER. The hearing is adjourned.

[Whereupon, at 3:58 p.m., the hearing was adjourned.]

[Prepared statements supplied for the record follow:]

PREPARED STATEMENT OF MICHAEL J. LEA

DIRECTOR, THE CORKY MCMILLIN CENTER FOR REAL ESTATE, SAN DIEGO STATE UNIVERSITY

SEPTEMBER 29, 2010

Mr. Chairman, Ranking Member Corker, and Members of the Subcommittee thank you for the opportunity to be here today. I am Michael Lea, Director of The Corky McMillin Center for Real Estate and Professor of Finance at San Diego State University. I have an extensive background in housing finance including senior executive positions at major mortgage lenders and as Chief Economist of Freddie Mac. I have been actively involved in the study of international housing finance systems for more than 20 years having done consulting and business development work in 30 countries and serving as Director of Research for the International Union of Housing Finance. I recently completed a comparative study of developed country mortgage markets that will be published by the Brookings Institution later this fall as well as a comparative study of mortgage instrument design released by the Research Institute for Housing America. I would request that both studies be entered in the record as they provide data support for the points I will make today. (*See,* Attachments 1 and 2 following this statement.)

In addressing the Subcommittee today you have asked me to compare the structure and performance of major developed housing finance systems with a focus on Australia, Canada, Denmark, Germany, and the United Kingdom. The three major issues you have asked me to emphasize are home ownership and affordability, the role of the Government in mortgage finance, and the dominant mortgage instrument, funding mechanism, and underwriting standards. I will address each in turn.

Home Ownership and Affordability

The United State has a relatively high home ownership rate of 67 percent. This rate puts the U.S. in the middle of a group of 11 countries. Australia, Canada, Ireland, Spain, and the U.K. have higher rates while Denmark, Germany, Japan, the Netherlands, and Switzerland have lower rates. Countries in Northern and Western Europe have lower rates of home ownership in part because of significant social rental programs. Such programs are less significant in Southern Europe with corresponding higher home ownership rates.

Although many countries extol the virtues of home ownership there is far less intervention to support affordable owner-occupied mortgage lending in other developed countries. No other developed country has "housing goals" or Community Reinvestment Act legislation. Only Canada and the Netherlands have government-owned mortgage insurance agencies and in neither case is the insurance targeted to affordable housing.

Many European countries provide greater rental housing assistance than the U.S. Subsidized social rental housing is a significant sector of the market in Western and Northern Europe and the U.K. The housing is owned by municipal governments or nonprofit groups. Subsidies take the form of rent assistance and financing assistance (*e.g.,* municipal guarantees, State loans). Generally the assistance is available to all households who qualify (income targeting) and in some countries (Denmark, Netherlands) it is available to homeowners as well as renters. Australia and Canada have more limited assistance programs. They provide targeted rental assistance but do not support social housing to a significant extent.

The recession has had limited impact on home ownership in other countries but a more significant effect on house prices. High house prices in some countries limited home ownership opportunity prior to the crisis. No other country has experienced the magnitude of mortgage defaults and foreclosures that force households out of home ownership. However, underwriting criteria have tightened worldwide which will ultimately have a negative influence on home ownership, particularly for first time homebuyers and self-employed borrowers.

House prices declined in all countries except Australia in 2008 and remained depressed in most countries in 2009. House prices increased significantly in Australia and Canada in late 2009 and 2010 and have risen in several other countries including the U.K. Only Ireland has experienced an extent of decline comparable to the U.S.

Extent of Government Involvement in Mortgage Finance

The U.S. is internationally unusual in the extent of government involvement to support owner-occupied mortgage finance. No other developed country has a government-sponsored enterprise similar to Fannie Mae and Freddie Mac. Only Canada and Japan have government mortgage security guarantee programs equivalent to Ginnie Mae. Only Canada and the Netherlands have government-owned mortgage

insurance companies. Australia sold its government mortgage insurer to the private sector in 1997.

For countries with government mortgage market support the market share of government-supported entities is far less than the current U.S. situation in which over 90 percent of mortgage credit is coming from Government-backed institutions. In Canada approximately 50 percent of mortgages have government-backed mortgage insurance which is required for all loans over 80 percent loan-to-value (LTV). Approximately 25 percent of mortgages have been securitized with guarantees from the Canada Housing and Mortgage Corporation. A similar proportion of mortgages have been securitized in Japan with guarantees from the Japan Housing Finance Agency. Governments do not support mortgage securitization in other countries.

A minority of countries allow a tax deduction of homeowner mortgage interest. Only the Netherlands and Switzerland have unlimited deductibility. Denmark, Ireland and Spain limit the deduction and interest is not tax deductible in the other countries including Australia, Canada, Germany, and the U.K. Households in these countries tend to pay down debt faster reducing mortgage risk. Tax-exempt bond financing programs for owner-occupied housing are also unique to the United States. Australia, Canada, and the U.K. have small first time homebuyer tax credit programs.

Mortgage regulation has been tightened in many countries as a result of the crisis. Canada and U.K. now require ARM qualification at higher than initial rates. Canada lowered the maximum LTV and term on bank originated mortgages. Both Australia and the U.K. have introduced suitability standards for mortgage lenders. Both the European Commission and individual country regulators are contemplating tighter underwriting parameters.

Mortgage Instruments, Funding, and Underwriting

The U.S. is internationally unusual in the market share of a long-term, fixed rate mortgage (FRM). Only two other countries have a dominance of this instrument: Denmark and France. Like the U.S. FRM, borrowers in Denmark can prepay their loan without penalty if mortgage rates fall. In France borrowers who refinance must pay a penalty and the typical term is shorter, 15 to 20 years. The Danish instrument adds a unique and valuable feature to its fixed rate mortgages. The Principle of Balance results in a one-to-one correspondence between a mortgage loan and a bond that finances it. If interest rates rise the borrower, through their mortgage lender, can repurchase the bond at a discount and cancel the mortgage. In this way the borrower can reduce debt and the likelihood of negative equity.

The dominant mortgage instruments in other countries correspond to one of two models—either adjustable rate mortgages (ARMs) or short to medium term fixed rate "rollover" mortgages. The dominant instrument in Australia, Spain and the U.K. is an adjustable rate mortgage. Reliance on this instrument has been credited with reducing the incidence of default during the crisis. However it is clear that there is significant credit risk in the system if and when rates rise.

The dominant instrument in Canada and many European countries is the rollover mortgage. With this instrument the loan rate is fixed for a period of 1 to 10 years (typically 1–5) with a longer amortization period (25–35 years). Borrowers are subject to a prepayment penalty for refinance during the time the rate is fixed. The rate is renegotiated at the end of the fixed rate period, adjusting to the market rate. Borrowers can manage interest rate risk by shortening or lengthening the fixed rate period at adjustment depending on the level and trend in rates.

The dominant mortgage instrument in individual countries reflects historical patterns, funding sources and government involvement. The U.S. is internationally unusual in its dependence on securitization for funding. Over 60 percent of the stock of mortgages has been securitized mostly through the government-backed entities. Today over 90 percent of U.S. mortgage funding comes through securitization. The highest proportion of loans securitized in other countries is approximately 25 percent in Canada, Spain, and the U.K. The dependence on securitization in the U.S. is driven by two factors; the predominance of the FRM and the involvement of the government agencies. GSE and Ginnie Mae securities primarily fund FRMs. Government backing lowers the relative price of that instrument leading to a larger market share. Lenders depend on securitization to fund such loans because of the high degree of interest rate risk they entail (as evidenced by the savings and loan failures in the 1980s).

Mortgage lending in adjustable-rate countries is dominated by commercial banks. They prefer this instrument because it minimizes interest rate risk for the bank—by passing it to the borrower. In Australia and the U.K. the rate is set for all borrowers at the discretion of the bank. Lenders typically lag the market in rate adjust-

ment. In times of rising rates banks cushion the interest rate shock with gradual rate increases.

Banks finance mortgage lending in rollover countries primarily through a combination of deposits and covered bonds. Covered bonds finance approximately 20 percent of mortgage lending in the European area. Outside of Denmark the bonds are bullet instruments of varying maturities. Mortgages have prepayment penalties that facilitate match funding by covered bonds or a combination of deposits and interest rate swaps.

Mortgage Performance and Underwriting

The default and foreclosure experience of the U.S. market has been far worse than in other countries. Serious default rates remain less than 3 percent in all other countries and less than 1 percent in Australia and Canada. Of the countries in this survey only Ireland, Spain, and the U.K. have seen a significant increase in mortgage default during the crisis.

There are several factors responsible for this result. First subprime lending was rare or nonexistent outside of the U.S. The only country with a significant subprime share was the U.K. (a peak of 8 percent of mortgages in 2006). Subprime accounted for 5 percent of mortgages in Canada, less than 2 percent in Australia and negligible proportions elsewhere.

Second while some countries including Australia, Canada and the U.K. relaxed documentation requirements there was far less "risk layering" or offering limited documentation loans to subprime borrowers with little or no down payment. There was little "no doc" lending.

Third, there has been less prevalence of negative equity in other countries. Although many countries allowed high LTV loans, the proportion of loans with little or no down payment was less than the U.S. and the decline in house prices in most countries was also less.

Fourth, loans in other developed countries are with recourse and lenders routinely do go after borrowers for deficiency judgments. Research in Europe and the U.S. has found that recourse reduces the incidence of default. With a much smaller proportion of loans that are securitized lenders are more apt to work with borrowers to restructure loans rather than go through a lengthy and costly foreclosure process.

Lenders have moved to tighten underwriting guidelines since the onset of the crisis. Down payment requirements have increased, loan-to-income criteria have been tightened, there are fewer interest only loans available and in some countries the maximum mortgage term has been reduced. In most cases this has been at the volition of lenders and not imposed by regulators. To date there have been few government mandated minimum underwriting standards or product restrictions such as those in the Dodd-Frank legislation.

Conclusions

There is no ideal housing finance system. Individual country arrangements reflect history, market structure and government policy. However, almost all developed country housing finance systems performed better during the crisis than that of the U.S. What can the U.S. learn from other countries?

First in no other country is there as much government involvement in the mortgage market. The combined effect of the various forms of government intervention undoubtedly contributed to the housing boom and bust in the U.S. Other countries have achieved comparable or higher rates of home ownership and well-developed, stable mortgage markets with much less government support.

Second, features of the Danish system offer the prospect of real improvement in the U.S. housing finance system. It retains the core fixed rate mortgage product but makes it more consumer and investor friendly by adding the option to repay the loan through the bond market if rates rise. This feature would have reduced some of the negative equity build up in the U.S. system during the crisis and the significant extension risk faced by mortgage security investors today. The Danish model could be adopted by the GSEs to facilitate its introduction with a transition to a nongovernment guaranteed bond market such as the one that exists in Denmark today.

Third, European style covered bonds can provide an alternative to funding through GSE securitization. The market is deep and liquid in Europe and has performed much better than the structured finance markets. The instruments are simple, bullet bond structures backed by a pool of conservatively underwritten mortgage assets and the capital of the issuer without government guarantees. Incentives are aligned as credit risk remains on the balance sheet of the issuer.

However, the fixed rate mortgages funded by covered bonds have prepayment penalties allowing issuers to meet strict asset-liability matching requirements. The re-

cently passed Dodd-Frank financial reform legislation reinforces long-standing restrictions on the use of prepayment penalties that will hamper the development of a European style covered bond market

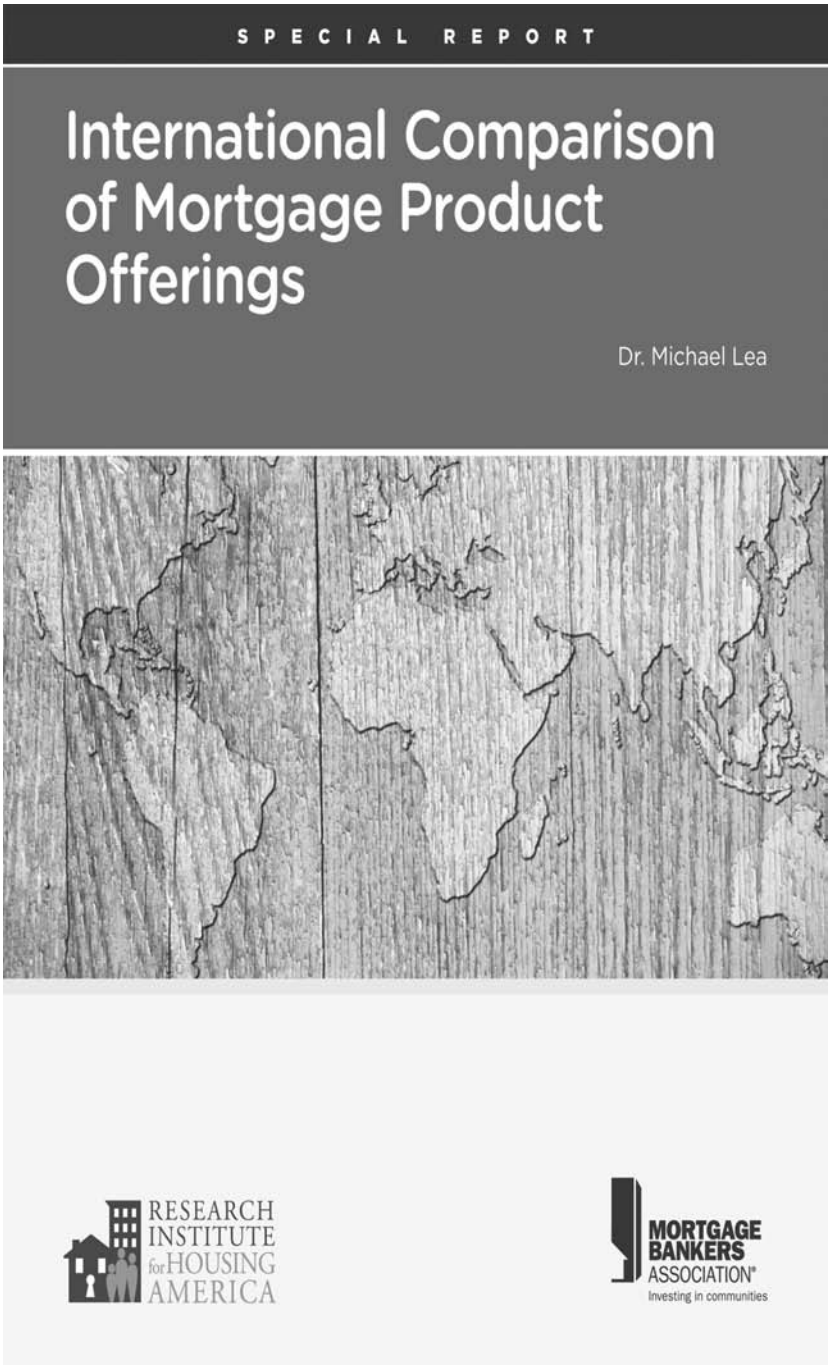
Fourth it should be recognized that the high proportion of FRMs funded through securitization in the U.S. is both the outcome of Government involvement and a justification for its continuation. The risks inherent in the FRM realistically require it to be funded in the capital markets. Investors require government guarantees against loan or issuer default to invest in mortgage-backed securities with volatile cash flows. Thus the argument is made that we need to continue Government support through the GSEs and/or Ginnie Mae to keep the mortgage market functioning. Their guarantees lower the relative cost of the FRM sustaining its dominance. The result is that the Government backs the majority of all mortgages in the U.S.

If Government guarantees for mortgage-backed securities were reduced or withdrawn over time the U.S. market would most likely achieve a more balanced mix of products and funding sources. Adjustable rate mortgages, medium term fixed rate mortgages and long term fixed rate mortgages all have a place in a robust mortgage market. Likewise, funding through deposits, bank bonds, covered bonds, and securitization allows lenders to tap a variety of funding sources and manage the risks of the various instrument designs.

The experience of other countries shows that high rates of home ownership and stable well-developed mortgage markets can be achieved without the degree of government intervention that exists in the U.S. today. In that respect the U.S. clearly can learn much for international housing finance systems.

Thank you for the opportunity to appear before this Subcommittee.

Attachment 1



International Comparison of Mortgage Product Offerings

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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 unique 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 adjust to 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 product design did not play a major 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.[3] 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 available 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.

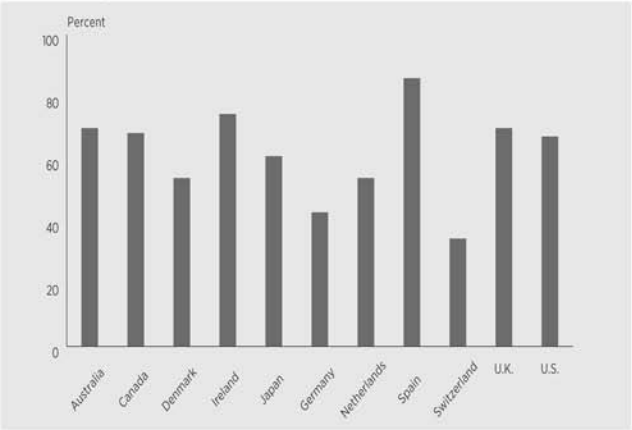
Is it a good idea to place restrictions on loan design? While many borrowers were offered inappropriate or highly risky products during the mortgage market boom, proposals to limit mortgage product offerings, either explicitly or implicitly, run the risk of eliminating valuable features from the mortgage 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

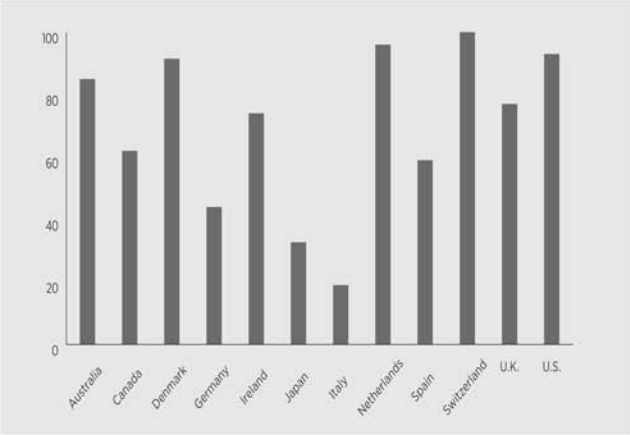
With the exception of Germany and Switzerland, the countries in this study have similar rates of homeownership (Figure 1). Australia, Ireland, Spain and the U.K. all have higher rates of homeownership and Canada's rate is comparable to that of the United States. This is noteworthy as these countries 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 housing and weaker support of social rental housing.

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.

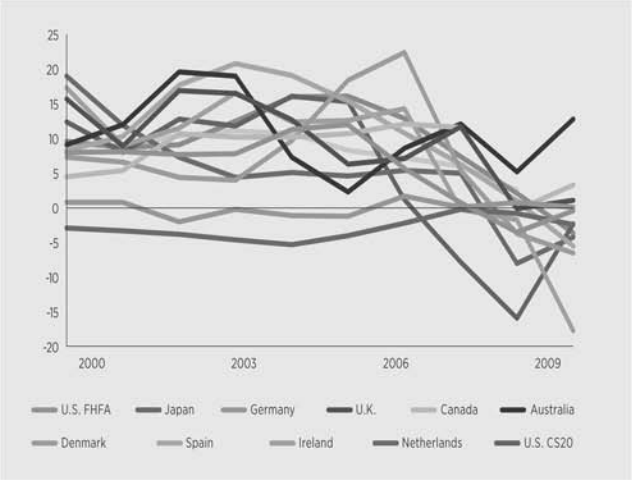
Mortgage indebtedness, as measured by mortgage debt outstanding relative to GDP, is also high in most countries — ranging from 38 percent in Japan to 100 percent in Switzerland (Figure 2). The ratios are low in Germany and Japan, reflecting more than a decade of stagnant house prices and mortgage lending. 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.

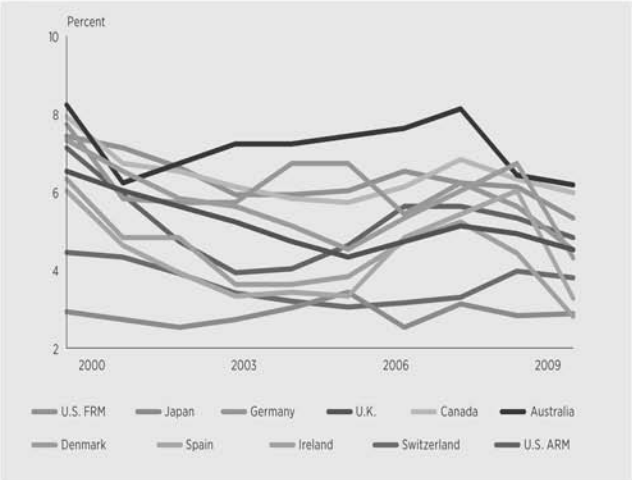
There are significant differences among countries in the presence of government-owned or -sponsored mortgage institutions. Table 1 compares select countries in this dimension. The United States is unusual in its use of all three types of government-supported mortgage institutions

Figure 3
House Price Change



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

Figure 4
Mortgage Interest Rates



Source: Central Banks, EMF, MBA.

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, Freddie 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's or the lender / investor's 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 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.

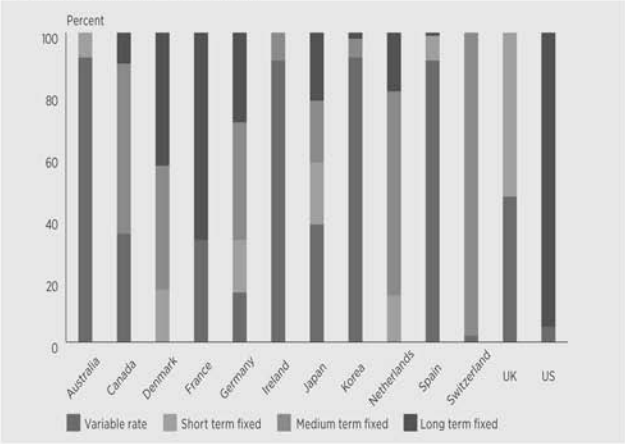
Interest Rate Determination: Fixed Versus Adjustable Rate

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: <1≤5 years 5≤10 years >10 years	*Rollover/Renegotiable* refers to a series of fixed rate terms *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	≤1 year	*Reviewable* — rate determined by the lender *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. Canada, 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 U.S. ARMs 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 has 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).

In summary, outside of the United States, Denmark, France and Germany, loans that allow frequent rate adjustments (ARMs or rollovers) are the standard product.

Pre-payment Penalties and Early Repayment

Other than Denmark, Japan and the United States, fixed-rate mortgages are typically subject to a pre-payment 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

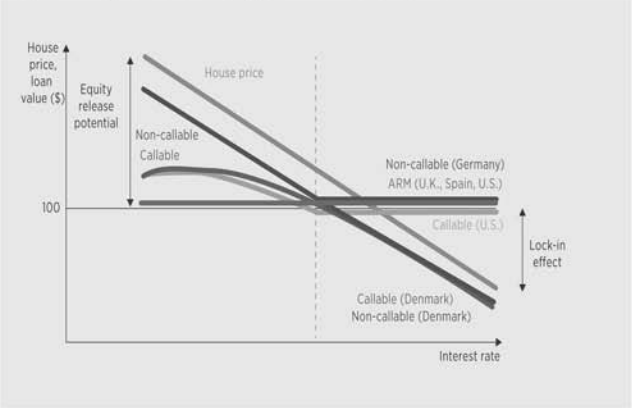
Table 3
Prepayment Penalties

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 a 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. This applies to both callable and non-callable mortgages.

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. However, even in states that allow them, 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 these loans have a very low market share. The maximum maturity granted is often linked to the retirement age. At an extreme, 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. Typically, 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 mortgages there 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.

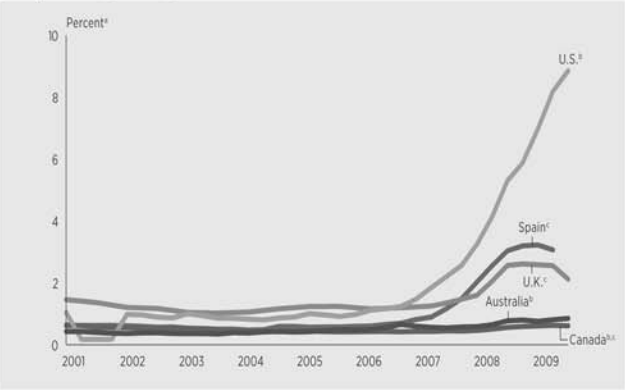
Loans with pre-programmed negative amortization (e.g., graduated payment mortgages or pay-option ARMs) are not common outside the United States. However, flexible mortgages have a maximum number of missed payments and LTV caps. Japanese loans have payments fixed for five years regardless of whether the 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) . 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.

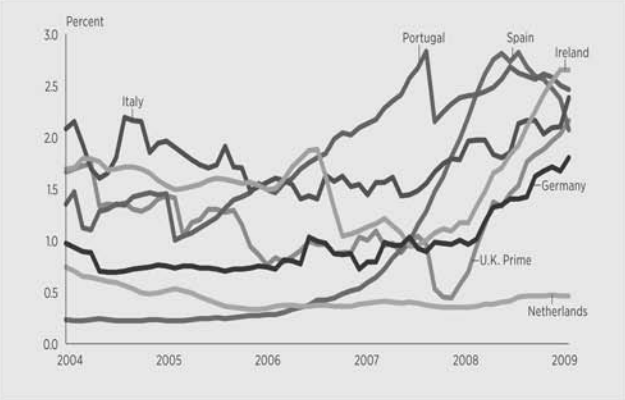
Delinquencies on European securitized loans have increased during the crisis but remain well below those in the United States (Figure 8). Default rates on Australian securitized loans are less than 1.5 percent and in Canada less than 1 percent. These results reflect the fact that subprime lending was 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

Figure 7
Non-performing Housing Loans



a. Percent of loans by value. Includes "impaired" loans unless otherwise stated. For Australia, only includes loans 90+ days in arrears prior to September 2003. **b.** Banks only. **c.** Per cent of loans by number that are 90+ days in arrears.
Sources: APRA; Bank of Spain; Canadian Bankers' Association; Council of Mortage Lenders; FDIC; RBA

Figure 8
European Mortgage Arrears Rates, 30 or more days

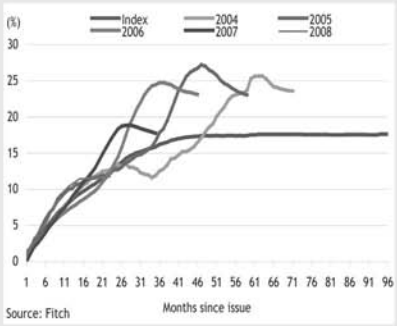


Source: Fitch Ratings 2010.

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.

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]

Figure 9
Three Months or more in Arrears, by Vintage



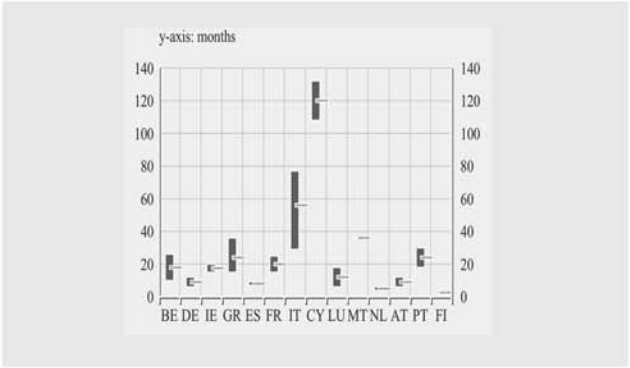
Source: Fitch Ratings 2010.

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 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

Figure 10
Typical Duration of a Foreclosure Procedure



Source: ECB.

have judicial foreclosure processes, which are procedural unless the borrower mounts a 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.

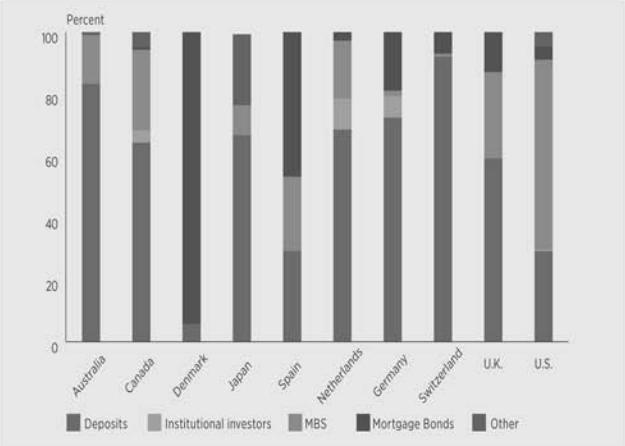
If the theoretical literature suggests that borrowers are better off with fixed-rate mortgages why do we see so many countries with ARMs as the dominant instrument and so few with long-term fixed-rate mortgages?

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 fixed-

Figure 11
Developed Country Mortgage Funding



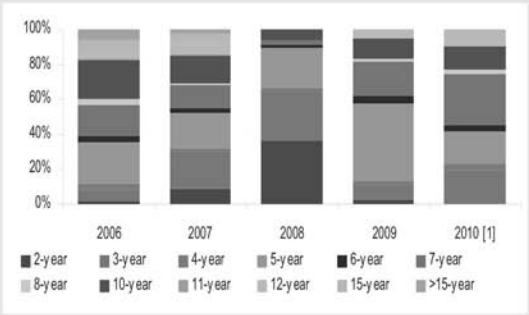
Source: ABS, CMHC, EMF, ESF, FRB, Merrill Lynch Europe, AU, CA, U.S. 2008, Japan 2006.

rate liabilities. Or it can use corporate or covered bond markets to issue medium-term fixed-rate debt. Figure 12 shows maturities of covered bond debt with a significant proportion of issuance in three- to five-year maturities. In early 2010, 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 per cent of all mortgage loans outstanding – allows pricing

Figure 12
Taking the Opportunity to Move Up Along the Curve



Source: Sabine Winkler Covered Bond Analyst and Alexander Batchvarov CFA International Strategy Financial Strategist Bank of America Merrill Lynch.

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 as 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.

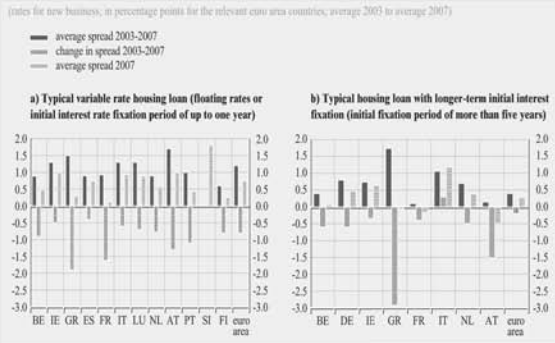
Pre-crisis mortgage spreads in Europe appear lower than those in the United States Figure 13 shows spreads on variable and fixed-rate mortgages relative to an index or benchmark rate. Spreads declined

in most countries between 2003 and 2007. Fixed-rate spreads are lower in Europe than in the United 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).

Figure 13
Spread of the Lending Rate for a Typical Housing Loan over the Opportunity Cost or Interest Indexation Rate



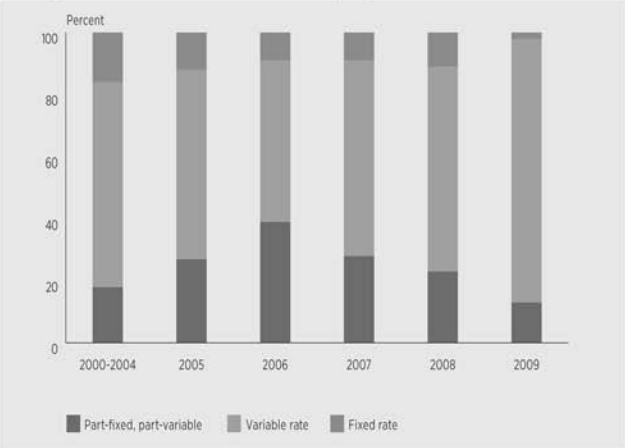
Sources: ECB and NCBs.
Notes: Chart a); See Table 2 for the selection of indexation rates: the three-month EURIBOR is used for the euro area. No data are available for CY and MT, and for SI prior to 2007. No figures are shown for DE due to the lacking relevance of variable rate housing loans.
Chart b); See Table 2 for the selection of the most typical rates. In addition, rates with initial fixation period of over one and up to five years are shown for AT, GR and IE; rates with initial rate fixation of over ten years are used for IT where variable rates are most typical. Rates with an initial rate fixation period of over ten years are used for the euro area. For the opportunity cost rates, swap rates corresponding to the interest rate fixation period were selected. There are no figures shown for CY and MT due to lacking data. No figures are shown for ES, FI, LU, PT and SI due to the lacking relevance of longer-term fixation housing loans.

Source: ECB and NCBs.

Rising rates of arrears have added to the costs of mortgage lending, putting pressure on margins. The implementation of the Basel 2 regime also has meant 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 bank 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, Retail Finance Intelligence (RFI).

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 unique 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 adjust to 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 could be explored, as it provides options 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 product design outside the United States does 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 the Appendix 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. The new loan has a higher rate on a lower balance. The loan can be refinanced to a lower rate if market rates subsequently fall. 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. United States 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]. United States 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 United States. 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. There are caps on deductibility in other countries (e.g. a maximum 33 percent rate in Denmark, a 15 percent rate in Spain and a 25 percent rate in Ireland).

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 percent 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 United States, 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 United States. 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 United States. 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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Korea Housing Finance Corporation (Korea)

Realkreditrådet (Denmark)

Australia Prudential Regulation Authority (Australia)

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Dr. Michael Lea is the Director of the Corky McMillin Center for Real Estate at San Diego State University. In that capacity he is responsible for improving real estate education, industry outreach and research. Dr. Lea is also a principal of Cardiff Economic Consulting, with a focus on the analysis of domestic and international mortgage markets and institutions. He has over 25 years of financial services industry experience, including more than 20 years of international advisory work in 30 countries spanning six continents. He has provided advice on a wide variety of mortgage and securitization topics as a consultant to international development agencies, government-sponsored enterprises, trade groups, regulatory agencies and major private and public sector financial institutions.

From 2000 through 2004, Dr. Lea served as Executive Vice President for Global Market Development at Countrywide Financial Corporation. He was responsible for developing global strategy, analyzing market opportunities and creating proposals and business plans for new international initiatives. Dr. Lea was also President of Countrywide International Consulting Services LLC, which conducted analysis of and provided technical assistance to primary and secondary mortgage market institutions worldwide. From 1991 through 1999, Dr. Lea was President of Cardiff Consulting Services, a firm specializing in the analysis of housing finance markets and institutions in the US and abroad.

Dr. Lea has a unique combination of research experience, senior operational responsibility in major financial institutions and high-level participation in public policy formulation. He was Senior Vice President of Finance and Capital Markets at the Imperial Corporation of America from 1987 to 1991. In this capacity he was responsible for the corporate finance, portfolio management and strategic planning functions of a $12 billion diversified financial institution and managed a staff of 40 professionals.

Dr. Lea was Chief Economist at the Federal Home Loan Mortgage Corporation (Freddie Mac) from 1983 to 1987 with responsibilities for primary and secondary mortgage market analysis and forecasting. He also served as a staff member for the President's Commission on Housing and was a Brookings Institution economic policy fellow at the U.S. Department of Housing and Urban Development in 1980 and 1981.

Dr. Lea is an internationally known authority on housing and mortgage finance. He has published over 75 articles and book chapters, organized several conferences and made numerous presentations to government agencies, legislative committees, multi-lateral institutions, corporate boards and management, trade groups and academic and professional organizations. He has taught at Cornell University, San Diego State University, the University of California, San Diego and the Wharton International Housing Finance Program at the University of Pennsylvania. He received his Ph.D. in economics from the University of North Carolina, Chapel Hill.

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Attachment 2

Alternative Forms of Mortgage Finance: What Can We Learn From Other Countries?

Dr. Michael Lea
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Paper prepared for
Harvard Joint Center for Housing Studies National Symposium

Moving Forward: The Future of Consumer Credit and Mortgage Finance

Harvard Business School

February 18, 2010
Revised August 3, 2010

Alternative Forms of Mortgage Finance: What Can We Learn From Other Countries?[1]

Introduction

The U.S. mortgage finance system has gone from the envy of the world to a case study of failure in 2 short years. As recently as the 2003-2005 period the system generated an enormous volume of originations (nearly $4 trillion) that contributed to a record level of homeownership (69.3 percent).[2] There were impressive gains in low income and minority rates of homeownership. The system was characterized by low mortgage interest rates, robust competition, particularly from non-bank lenders, buoyant house prices and low default rates. While the government role was significant, the major government supported institutions were losing market share. There were, however, ample warning signals that this rosy picture was about to end. Affordability was falling, concerns about predatory lending abounded, delinquencies in subprime lending were rising and numerous commentators warned of unsustainable house prices.

Fast forward to the 2007-2010 time period. Mortgage originations, while still relatively high by historical standards, are down significantly and only prime borrowers can obtain loans. The homeownership rate has fallen to 67.4 percent erasing all the gains since 2000. Conforming mortgage rates are relatively low but spreads to Treasury rates and non-conforming rates are much higher. There is reduced competition as most non-bank lenders have failed and the large banks dominate the market. House prices have been falling for three years and are off more than 30 percent nationwide. The country is experiencing record post-war default and foreclosure rates. The government role has expanded considerably – in fact the government backs nearly all mortgage lending. There is considerable uncertainty about when the recovery in the housing and mortgage markets will begin.

The economic recession that was sparked by the implosion of the U.S. subprime mortgage has been global in dimension. As such it has affected the housing and mortgage markets of many countries. Most developed countries had also experienced robust growth in their housing and mortgage markets during the first half of the decade. Many countries experienced record levels of house price inflation, increased competition and relaxed mortgage underwriting. But no major developed market has experienced the severity of the house price decline, rate of mortgage default and foreclosure and change in its mortgage finance system as the US. What have these countries done differently?

This paper will review the major characteristics and performance of a number of OECD country mortgage markets. The paper will compare and contrast the structure, principal features and performance of the primary and secondary market with that of the

[1] Helpful comments were received from Eric Belsky and Bertrand Renaud and several Symposium participants. Any errors are the author's responsibility.

[2] Harvard JCHS (2009)

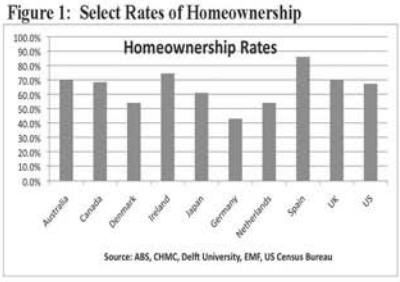
US. The comparison will include the types of lender and mortgage instruments in the primary market, institutions and instruments involved in the capital market funding of mortgages how loans are funded and how major mortgage risks (default and prepayment) are managed. The paper will compare and contrast the role of government in mortgage market regulation, consumer protection and in the backing of institutions and instruments through guarantees and ownership in the primary and secondary market. The goal of the paper is to extract ideas about how the US system can be reformed to improve performance and restore private capital market finance.

The paper is organized as follows. Section two provides international mortgage and select housing market comparisons. Section three provides comparisons of the role of government in the mortgage market. Section four details three alternative models of housing finance highlighting their strengths and weaknesses. The concluding section provides some thoughts as to what the U.S. can learn from the experience of other countries.

International Comparisons

The focus of this paper is the finance of owner-occupied housing. Figure 1 shows recent rates of homeownership among a number of OECD countries. The U.S. has a relatively high rate of homeownership but it is not the highest among major developed markets. In this comparison, Australia, Ireland, Span and the U.K. all have higher rates of homeownership and Canada's rate is comparable to that of the U.S. This is noteworthy for as we discuss below these countries provide far less government support for homeownership than the U.S. Most western European countries have lower rates of homeownership in part due to strong social rental systems. Southern European countries like Italy, Greece and Spain have higher rates of homeownership reflecting cultural values, discriminatory policies towards private rental housing and weaker support of social rental housing.

Figure 1: Select Rates of Homeownership

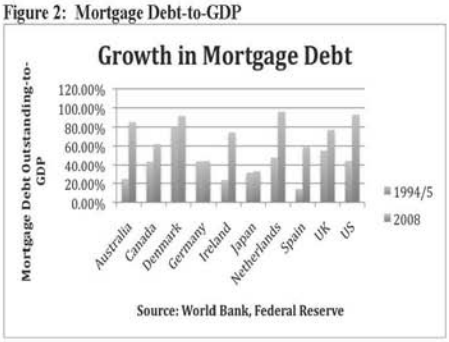


Homeownership rates in most countries were stable in the 1999-2008 time period. Canada had the largest increase from 64 to 68 percent. Spain, the UK and the US each grew 2 to3 percentage points.

The housing boom was characterized by increased rates of housing construction in many countries. Several countries, notably Australia, Canada, Ireland, and Spain had higher real residential investment to GDP in the 2002-2007 time period.[3] Ellis points out that a major difference between the US and other countries was that the increase in dwellings in the US was significantly greater than the increase in households or population, which created an excess supply of houses.[4]

Figure 2 shows the growth in residential mortgage debt outstanding-to-GDP between 1994/95 and 2008. The U.S. ratio grew from 44 percent to 93 percent, an impressive performance. But several other countries had a similar performance. Australia, Ireland and Spain had greater growth and the Netherlands has a higher ratio. All the countries except Germany and Japan had significant growth in their mortgage markets.

Figure 2: Mortgage Debt-to-GDP



Although the US 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 US. Australia and the U.S. were the first of the bubble countries in which house prices fell – the Australian housing market has since recovered. The magnitude of the US house price fall as measured by the S&P Case Shiller 20 metro area index has been greater than other countries. IMF research suggests that the US housing market is more elastic than other countries as evidenced by a higher share of real residential investment and real house price variation explained by housing demand shocks (e.g., lower interest rates).

[3] IMF (2009)
[4] Ellis (2008)

Figure 3: House Price Evolution

Mortgage interest rates in most countries declined during the decade except in Australia. 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 UK are predominately short-term variable rate markets. Their mortgage rates declined more sharply than those in other countries during the crisis.

Figure 4: Mortgage Interest Rates

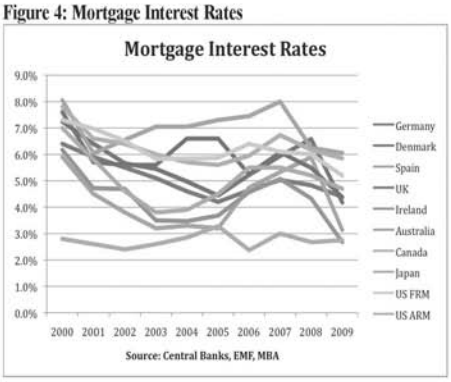


Figure 5 compares dominant mortgage product offerings by country in terms of interest rate variability. There is considerable difference in product types. Australia, Ireland, Spain and the UK are dominated by variable rate or short term (typically 1-3 year) fixed rate mortgages. ARM designs vary – in Australia and the UK the standard variable rate mortgage has a rate set by the lender at its discretion. Rates are changed for all borrowers at the same time. Spain and the US have indexed ARMs. Recently tracker mortgages which are indexed ARMs have become dominant in the UK. Initial fixed rate discounts are prevalent in Australia and the UK. The magnitudes of the discounts are less

than those in the US during the boom – typically around 100 basis points lasting 1-2 years.

The US is unusual in the high proportion of long term fixed rate mortgages. The ARM and short term fixed (hybrid) share in the US grew during the boom – accounting for 30—35 percent of loans in the 2004-2006 period but the market has reverted to the fixed rate mortgage in the crisis.[5] Long term fixed rate mortgages used to be the dominant product in Denmark but relatively low and falling short-term rates have led Danish borrowers to shift to medium term (1-5 year) fixed rate loans in recent years. Rollover mortgages are the dominant product in Canada, Germany and the Netherlands. These loans have a fixed rate for up to 5 years (10 years in Germany) with a 25-30 year amortization period (35 years in Canada). At the end of the fixed rate period the rate adjusts to the new market rate. There is a substantial (as high as yield maintenance) prepayment penalty during the fixed rate period. A high proportion of Dutch loans are interest only to maximize tax benefits. About one 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).[6] Japanese floating rate loans have fixed payments for 5 years with potential deferral and negative amortization. Some Spanish loans are part fixed and part variable rate.

Figure 5: Mortgage Products

Mortgage funding comparisons reveal interesting differences. As shown in Figure 6, deposit funding dominates in most countries. The US is unique in terms of the importance of securitization. Over 60 percent of US residential mortgages have been securitized – the next closest countries are Canada, Spain and the UK with 24 to 28 percent securitized. Covered bonds are a more common funding mechanism in Europe. Ninety four percent of Danish funding and forty seven percent of Spanish funding come

[5] Despite the fact that a 1 year ARM is 144 basis points lower than a 30 year fixed and a 3/1 ARM is 58 basis points lower as of 1/9/10 Wall Street Journal.

[6] For more detail on Japanese mortgages see Standard and Poors 2009

from this source. We will comment later on the role of covered bonds and the reason for their dominance in Denmark and significance in Europe.

Figure 6: Mortgage Funding

Mortgage lending tends to be dominated by banks and highly concentrated in most countries. The top five lenders have more than a 50 percent market share in Australia, Canada, Denmark, Netherlands and the UK. The top 5 are commercial banks except in Denmark where they are specialist mortgage companies (that are owned by or own commercial banks).[7] Banks are the largest lender class in Germany and Spain but the individual institution market shares is much smaller. Savings banks (owned by the state governments) are the largest lenders in these countries followed by commercial banks in Spain and mortgage banks in Germany. In Europe all mortgage lenders must have a bank charter (which can be commercial, savings, cooperative, mortgage etc.). The market in Japan is rather fragmented but large city banks have the largest market share. The other category in Japan is a legacy portfolio of GHLC loans being run off. As a result of the crisis the US mortgage market is beginning to look more like those in the other countries, dominated by large commercial banks.

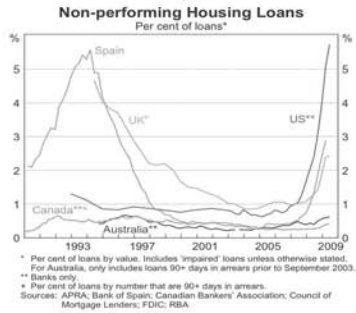
Mortgage brokers play a significant distribution role in many countries. Figure 7 shows the broker share of originations varies widely across countries – as high as 60-70 percent in Ireland and the UK and as low as 1 to 5 percent in Denmark and Japan. The US number does not reflect correspondent lending, which accounted for 31 percent of 2008 originations. Australia and the UK have a small amount of correspondent lending as well. The broker share has fallen in the US as a result of the crisis.

[7] The Nationwide building society is a top 5 lender in the UK.

Figure 7: Broker Share of Originations

The recession has taken its toll on all mortgage markets but more so in the US than anywhere else. Figure 8 shows comparative mortgage default rates for bank portfolios in several of the subject countries. Mortgage default rates have risen but remain low in other countries.[8] The U.S. has clearly had a worse bank mortgage portfolio performance than other countries.

Figure 8: Mortgage Performance Bank Loans



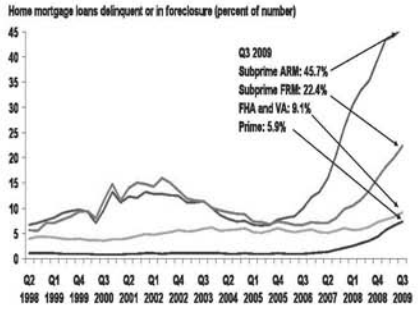
Source: Reserve Bank of Australia 2009

Mortgage performance has been worse for securitized mortgages in those countries with significant securitization. In large part this is due to the fact that subprime or non-conforming mortgages were the collateral for these securities. Figure 9 shows the performance of private label securitized loans in the US. Subprime loans have extraordinarily high default rates reflecting the decline in underwriting standards and risk

[8] Danish arrears (not shown) are less than 2 percent and foreclosures 0.4 percent in 2008 (Boyce 2009). German and Japanese default rates are also quite low. Serious default rates on loan held or guaranteed by Fannie Mae and Freddie Mac were over 5.5 percent in early 2010.

layering. The recent increase in prime defaults reflects rising unemployment and falling house prices.

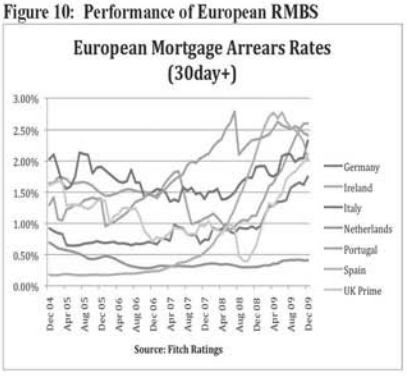
Figure 9: Performance of US Private Label Securitized Mortgage Loans



Source: Amherst Securities 2009

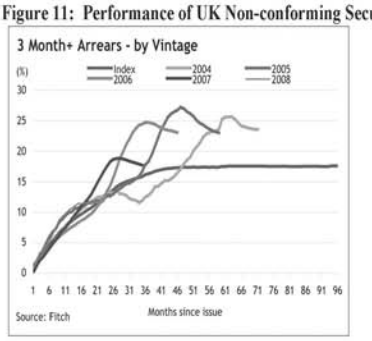
Figure 10 shows the performance of prime RMBS in Europe. Delinquencies on European securitized loans have increased during the crisis but remain well below those in the US. Default rates on Australian securitized loans are less than 1.5 percent and in Canada less than 1 percent. These results reflect the fact that sub-prime lending was rare or non-existent outside of the US. The only country with a significant subprime share was the UK (a peak of 8 percent of mortgages in 2006). Subprime accounted for 5 percent of mortgages in Canada, less than 2 percent in Australia and negligible proportions elsewhere. Subprime loans in Australia and Canada were more similar to US Alt A than true subprime loans.

Figure 10: Performance of European RMBS



The only comparable performance experience to the US is in UK non-conforming mortgages. UK lenders provided both loans to borrowers with adverse credit and with low documentation. UK non-conforming securitized loans have high delinquency rates (Figure 11) but foreclosure rate is far less than in the US.[9]

Figure 11: Performance of UK Non-conforming Securitized Loans



Role of Government

Tax Treatment of Homeownership

There are many ways government can provide incentives for owner-occupied housing. Perhaps the best known is favorable tax treatment. Figure 12 compares the tax treatment of owner-occupied housing for select OECD countries.

Figure 12: Tax Treatment of Owner-Occupied Housing

Tax Treatment of Owner-Occupation			
	Mortgage Interest	**Capital Gains**	**Other**
Denmark	Deductible at 33% max tax rate	exempt if primary residence of less than 1400 sq. m.	
Germany	non-deductible	exempt if held more than 10 yrs.	
Ireland	deduct for 7 yrs. At 25% max tax rate falling to 20%	exempt	
Netherlands	fully deductible	exempt	imputed income taxed
Spain	capped at € 9015 @ 15% rate	exempt if reinvested or sale after age 65	
UK	non-deductible	exempt	
Australia	non-deductible	taxable with indexed cost base	first time homebuyer tax credit
Canada	non-deductible	exempt	
Japan	non-deductible	tax at 30% if ≤5 yrs., 15% if >5 yrs	deduction of 1% of principal per year for 10 yrs.
US	dedutible limit $1 million	exemption of $250/$500k if principal residence 2 out of last 5 yrs.	temporary tax credit 2009-2010

Source: EMF, Global Property Guide

[9] The UK homeowners mortgage support program assists with mortgage payment for unemployed borrowers for up to 2 years, which may contribute to lower foreclosures. As in the US lenders have been slow in repossessing houses – in part because house prices began rising at the end of 2009.

The tax treatment of mortgage interest is varied. A majority of OECD countries do not allow a deduction and several that do cap it at low marginal tax rates. Denmark and the Netherlands have full or nearly full deductibility – however both countries tax imputed rent (albeit at low rates). Only the US allows nearly full deductibility without taxing imputed rent. In recent years those countries with deductibility have exhibited faster mortgage growth. Ireland and the Netherlands along with the US had the highest rates of growth in mortgage debt outstanding over the past 15 years and the Netherlands and the US have the highest levels. Note that countries that do not allow deductibility (Australia, Canada, UK) or cap it (Ireland, Spain) have equivalent or higher rates of homeownership than the US. Most countries exempt or reduce the tax on capital gains on owner-occupied housing. Ellis points out that interest deductibility combined with a lack of prepayment penalties in the US may have contributed to a growth in household leverage and mortgage indebtedness through cash out refinance and second mortgages.[10]

Mortgage Guarantees and Institutions

The differences among countries in the presence of government owned or sponsored mortgage institutions are more striking. Figure 13 compares select countries in this dimension. The US 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.[11] The market share of government-backed institutions in Canada and Japan is significantly less than that of the US.[12]

Figure 13: Government-Backed Mortgage Institutions

Government Mortgage Market Support			
	Govt. Mortgage Insurer	**Govt. security guarantees**	**Govt. Sponsored Enterprise**
Denmark	No	No	No
Germany	No	No	No
Ireland	No	No	No
Netherlands	**NHG**	No	No
Spain	No	No	No
UK	No	No	No
Australia	No	No	No
Canada	**CMHC**	**CMHC**	No
Japan	No	**JHF**	Possible
US	**FHA**	**GNMA**	**Fannie Mae, Freddie Mac, FHLBs**

[10] Second mortgages home equity lines of credit exist in other countries (e.g., Australia, Canada, UK) but in far less volume perhaps reflecting the lack of interest deductibility. The Netherlands has a relatively high incidence of second mortgages (13 percent of borrowers in 2002) reflecting full deductibility and high marginal tax rates.

[11] Australia had a government-owned mortgage insurer from 1965 – 1997. It was sold to Genworth in that year. For an analysis see Lea (2009).

[12] About 25% of Canadian mortgages are securitized through CMHC guarantees. JHF guarantees approximately 25% of Japanese mortgages.

The role of government in Canada is more similar to the US than any other country. The Canada Mortgage and Housing Corporation (CMHC) is 100 percent owned by the government and enjoys an explicit guarantee of the Canadian government.[13] It provides 100 percent mortgage default insurance through its National Housing Act program (similar to the FHA in the US).[14] CMHC also provides timely payment guarantees on securities backed by NHA loans (similar to Ginnie Mae in the US). CMHC administers the Canada Mortgage Bond Program, which is a trust set up to purchase CMHC-guaranteed mortgage securities funded by the issuance of mortgage bonds. The program eliminates the cash flow uncertainty caused by mortgage amortization and prepayment through cash flow swaps executed with investment banks. CMHC does not lend to primary mortgage institutions or invest in mortgages.

The Japan Housing Finance Agency (JHF) is a government incorporated administrative agency.[15] It operates in a manner similar to the guarantee functions of Fannie Mae and Freddie Mac, purchasing mortgages and issued mortgage-backed securities with its timely payment guarantee. It does not purchase loans for portfolio although it could do so within its charter. JHF replaced the former Government Housing Loan Corporation (GHLC) in 2007. The GHLC mainly provided loans to the public with funding from the Ministry of Finance. GHLC also securitized some of these loans. It ran into asset-liability mismatch problems that led to the creation of JHF.

The Netherlands has a government-owned mortgage insurer, the Homeownership Guarantee Fund (Dutch: Nationale Hypotheek Garantie (NHG)).[16] NHG provides 100 percent mortgage default insurance and a temporary mortgage payment facility. The fund is a private institution with fallback agreements with the national and municipal governments. These agreements form the basis for interest-free loans to the Fund from the national and municipal governments at times when its assets are no longer sufficient to meet claims. This means that the Fund is able to comply with its payment obligations at all times. As a result, the Netherlands Central Bank (Dutch De Nederlandsche Bank) considers the NHG as a government guarantee.

Unlike Fannie Mae and Freddie Mac, none of the international, government-backed institutions have experienced exceptional loss or required government capital injections. None of these institutions has a formal affordable housing policy mandate. Also none of these institutions takes on much interest rate risk as they have limited or no portfolio accumulation.

Regulation

Government is heavily involved in mortgage market regulation both through consumer protection and safety and soundness in all countries. A major difference

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[13] www.cmhc-schl.gc.ca/en

[14] The Canadian government also provides a 90% backstop guarantee for 2 private mortgage insurers – Genworth and United Guaranty.

[15] http://www.jhf.go.jp/english/about/pdf/main_1.pdf

[16] Ministry of Housing, Spatial Planning and the Environment, www.vrom.nl

between the US and other countries is the absence of specialized housing finance safety and soundness regulators outside the US.

Historically building societies in Australia, Ireland and the UK operated in a similar fashion to savings and loans in the US. These institutions had a specialist regulator. Regulatory reform led to the creation of a single financial regulator: the Australia Prudential Regulatory Authority (APRA) in Australia (1999), the Financial Services Authority (FSA) in the UK (2001) and the Financial Regulator in Ireland (2003). The building societies are regulated the same as banks in these countries. The mortgage credit institutions dominate housing finance in Denmark regulated by the Danish FSA. Mortgage banks are significant residential mortgage lenders in Germany. They too are regulated by the single financial regulatory agency, the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin). Commercial banks dominate mortgage finance in the other countries in this survey – thus mortgage lending is not subject to specialist regulation.[17] The US is unique in its fragmented regulatory structure with numerous specialized regulatory agencies.

The specialist mortgage guarantee and insurance institutions in this survey also do not have specialist regulators. The Ministry of Finance in their respective countries regulates CMHC and JHF. The Netherlands Ministry of Housing and the Association of Netherlands Municipalities supervise the NHG. An advantage to having a single financial sector regulator is the lower likelihood of regulatory capture or regulatory arbitrage but a disadvantage may be lack of sector specific expertise.

Consumer protection regulation is less clear-cut and in flux. There was significant product innovation and loosening of underwriting in most subject countries during the housing boom. Moderate versions of subprime lending appeared in Australia, Canada and the UK during the 2000-decade. Documentation requirements were relaxed in those countries as well creating a version of the Alt-A market. However, the extent of product innovation and underwriting relaxation did not approach the extent of the US. A study by the Australian Treasury Department in 2008 notes "The lax lending behaviour which gave rise to the sub-prime problem in the United States did not occur in Australia in part because the regulatory environment encourages a more cautious lending culture."

In the current market environment, both lenders and regulators are tightening guidelines contributing to a fall in new lending of 40-50 percent in many countries.[18] Lunde et. al. conducted a survey in early 2009 to assess the types of mortgage tightening taking place. As shown in Figure 14, underwriting criteria have tightened in 13 of the 14 countries surveyed.

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[17] The mortgage managers and centralized lenders are wholesale lenders funded by securitization in Australia and the UK respectively. They are not subject to bank safety and soundness regulation but are subject to consumer protection and business conduct regulation. Their market share has dropped significantly during the crisis.

[18] Lunde 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 S&P (2010).

Figure 14: Tightened Mortgage Underwriting

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			x
Russia	x	x	x	x		
Spain	x		x	x		
Sweden	x	x			lower max LTV	
UK	x	x	x		x	
US	x	x	x		x	
Source: Country expert's reports Lunde et.al.						

In light of falling house prices in most countries, lenders are requiring larger downpayments and 100 percent LTV loans, common in a number of countries before the crisis, have disappeared. Swedish maximum LTVs have declined from 95 percent to 85-90 percent and the average LTV in the UK has fallen from 80 to 75 percent. Lender surveys also reveal tightening – the Netherlands reported 80 percent of lenders tightening in early 2009 and the US reported 65 percent. Affordability criteria have been tightened and all loans are now fully documented.

Most of these changes appear to be at the volition of the lenders. According to the European Mortgage Federation, regulators in several countries are mooting restrictions on products and maximum LTVs. However none have been promulgated. There is no European wide mortgage regulation. The merits of a Mortgage Directive that would create minimum standards for all countries have been debated for a number of years. However the industry has steadfastly opposed this approach and developed an industry-wide code of conduct to police transactions.[19]

The FSA in the UK 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. Specifically they are contemplating increased capital requirements for lenders, new quantitative liquidity standards, increased regulation of non-bank ("high risk") lenders and product regulation. The FSA notes, however, that LTV or debt-to-income (DTI) caps are not yet warranted by the evidence. In particular they point out that LTV or DTI caps are ". . . a blunt approach to achieving the outcomes we want". They do 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

[19] http://www.hypo.org/Content/default.asp?PageID=449

income verification on all mortgages. It should be noted that mortgage brokers (intermediaries) are subject to FSA regulation.

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.
- 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. [www.fsa.gov.uk]

The FSA stresses that it expects a "common sense" approach. The lender or broker is expected to thoroughly document the research on and advice given to the client.

The FSA is looking into changing consumer disclosure requirements as well. Notably in their October discussion paper they state: "Our policy approach to date has been underpinned by a view that mortgage consumers will act rationally to protect their own interests. We believe that we need to change that approach, recognise the behavioural biases of consumers and be more interventionist to help protect consumers from themselves . . . . Overall, we think that our regulatory strategy needs to change to one that relies less on disclosure as a regulatory tool and looks to influence consumer behaviour in a more sophisticated way." The FSA is signaling that "for example, through banning products or prohibiting sales to those consumers exhibiting multiple high-risk characteristics or limiting the amount of equity that can be withdrawn" consumer protection can be improved.

The UK FSA is not alone in contemplating fundamental consumer protection reform. Australia is in the process of strengthening its consumer protections.[20] The Australian Uniform Consumer Credit Code (UCCC) has been in existence since the mid-1990s at the state level. The UCCC empowers the courts to set aside mortgage agreements where the lender could reasonably have known that the borrower would not be able to repay the loan without causing substantial hardship. There have been a number of cases that highlight the circumstances in which the courts have taken action to protect the interests of the borrower.

The National Consumer Protection Bill of 2009 was promulgated to create uniform nationwide legislation to replace existing (but varied) state legislation. The Australian Securities and Investment Commission (ASIC) was tapped to be the sole regulator of the new national credit framework with enhanced enforcement powers. The Code requires all providers of consumer credit and credit-related brokering services and advice to obtain a license from ASIC. It extended the scope of credit products covered by the UCCC to regulate the provision of consumer mortgages over residential

[20] http://www.treasury.gov.au/consumercredit/content/publications.asp

investment properties. The 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. There is a planned second phase in 2010 that will reform existing disclosures.

The Financial Consumer Agency of Canada (FCAC) is an independent regulatory body working to protect and inform consumers of financial services.[21] It was established in 2001 by the federal government to strengthen oversight of consumer issues and expand consumer education in the financial sector. As a federal regulatory agency, FCAC is responsible for:

- ensuring that federally regulated financial institutions comply with federal consumer protection laws and regulations;
- monitoring financial institutions' compliance with voluntary codes of conduct and their own public commitments;
- informing consumers about their rights and responsibilities when dealing with financial institutions; and
- providing timely and objective information and tools to help consumers understand, and shop around for, a variety of financial products and services.

Suitability standards are being introduced at the provincial level in Canada. The new Ontario Regulations requires lenders to take reasonable steps to ensure that a mortgage being offered to a borrower is suitable for the borrower "having regard to the needs and circumstances of the borrower". The consumer regulator in Ontario does not provide specific guidelines to determine suitability but stresses that "it would be prudent, in more difficult or unusual situations, to document the process used to arrive at the selected solution, and why it is the appropriate one."

What Can the US Learn From Other Countries

This brief survey has shown that mortgage finance systems differ significantly across countries in structure, funding, role of government and performance. The US is unique, however, in several respects. It has the highest level of government involvement, the greatest use of securitization, and its product mix is dominated by the long term fixed rate mortgage. These attributes are related. The long-term fixed rate mortgage has been the dominant instrument in the US since the Depression. Its dominance reflects consumer preferences, the ease of prepayment, past restrictions on ARMs and the emergence of the secondary mortgage market. However it results in the federal government absorbing most or all of the mortgage credit risk allowing investors to focus on management and pricing of the prepayment risk.

Despite the high level of government support, the US mortgage finance system has performed much worse those in other countries during the crisis. Furthermore it does not

[21] www.fcac-acfc.gc.ca/eng/about/default.asp

produce higher rates of homeownership or levels of mortgage indebtedness than many other countries. Thus it is fair to ask whether this unique system is sustainable and whether the US market would be more stable and effective in meeting the needs of borrowers and lenders with a different configuration.

There are four inter-related factors that should be considered in evaluating a housing finance system: the product, the underwriting, the funding and the role of government. These characteristics are so intertwined that it is difficult to evaluate them in isolation. Thus we will assess the merits of four different systems: the Danish Principal of Balance model, the European covered bond model, the Canadian/Japanese guarantee model and the Australian/UK depository model. Each of these systems has strengths and weaknesses and relevance for the US.

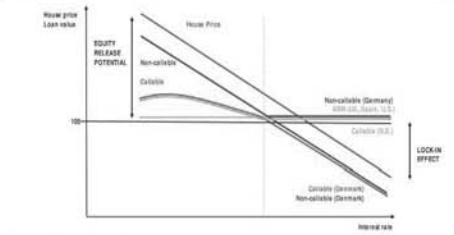
Danish Model

Denmark is the only country in the world other than the US in which the dominant product is the long-term FRM that can be prepaid without penalty. Like the US most its mortgage market is funded through the capital markets. The Danish system adds a couple of important attributes that are relevant for the US.

The Danish system is based on the Principle of Balance. 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. The Danish mortgage is cancelable at the lower of the market price or par. Like the US 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. It allows automatic deleveraging as rates rise and reduces the probability of negative equity. Figure 15 from Boyce (2010) demonstrates the difference between different mortgages as rates change.

Figure 15

Price/Yield Graph of Various Mortgage Risk Transfer Structures



Source: Boyce 2010

In the US, most mortgage loans can be called at par. However loans may not be redeemed at the market price when trading at a discount. This allows for equity release in the event of lower rates but subjects the borrower to a lock-in effect when rates rise. The Danish mortgage loan can be prepaid at par or redeemed by purchasing the bond at the market price thus eliminating the lock-in effect. For example, if the borrower has an outstanding balance of $200,000 and rates rise, the value of the bond may fall to $180,000.[22] The borrower can go to the bond market (through the MCI) and buy back the bond and cancel the loan. Thus the borrower saves $20,000 relative to the US case. Danish borrowers exercised this option in significant numbers in 2006 and 2007 when interest rates were rising, which may have reduced the likelihood of negative equity when house prices fell in 2008 and 2009.

The underwriting of Danish mortgages is more strict that of the US. The maximum LTV is 80 percent and borrower income is fully documented. Importantly Danish loans are recourse – in the event of a deficiency the lender has recourse to borrower income and other assets. Danish borrowers have in the past been able to get loans over 80 percent through a top up loan system whereby commercial banks provide unsecured loans for the amount over the mortgage.

The MCI in Denmark specialize in residential, commercial and agricultural mortgage lending. The market is highly concentrated with 4 MCI providing over 80 percent of the market. There is no explicit government backing of the MCI or the bonds they issue. The MCI bear all the credit risk of the mortgages they originate. However they bear no interest rate risk due to their unique funding structure (below). The MCI are required to maintain a minimum 8 percent capital-to-assets ratio. The combination of a low risk structure and Danish FSA and covered bond regulation result in low risk institutions.[23]

Danish mortgages are funded through the issuance of covered bonds. Individual loans are funded by selling the loan into a larger bond series. The direct link established between the borrower and the bond market facilitates redemption of the bond in the future. The MCI acts as a liability advisor to the borrower helping her obtain the lowest cost financing. Incentives are aligned in this system in that the borrower and lender have "skin in the game" and the lender serves the needs of the borrower. Prepayments are less cyclical as borrowers can exercise the option when rates rise or fall.

The Danish system has performed well throughout the crisis. Despite having a larger house price bubble (Figure 3) the Danish system has had far fewer defaults (Figure 16) and foreclosures (Figure 17). This can be attributed to less negative equity, absence of sub-prime lending, borrower recourse and strong regulation. The IMF notes that the Danish banking system including the mortgage credit institutions, have fared well despite

[22] Svenstrum and Willeman (2006)
[23] Realkreditradet (2009)

a housing boom. They attribute this to conservative investments and sound regulation – in particular tight credit risk managements standards and limited market risk.[24]

Figure 16: Danish and US Mortgage Delinquency

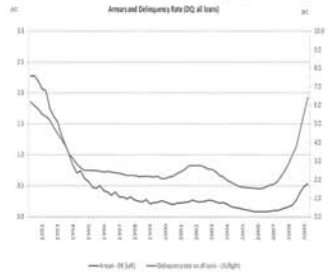
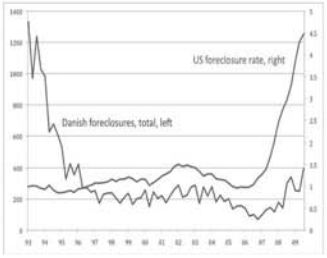


Figure 18: Danish and US Foreclosures



[24] IMF (2008)

Source: Boyce 2010

The Danish mortgage bond market has performed well. There has never been a mortgage bond default in its more than 200 year history and the market remained open without government assistance during the liquidity crisis of October 2008. The strengths of the Danish system are incentive compatibility, efficient risk allocation without government guarantees and the potential for automatic de-leveraging. The weaknesses are in the need for scale to ensure efficient execution – multi-lender issuers can create scale for smaller lenders.[25]

The European Covered Bond Model

Covered bonds in other European countries differ from those in the traditional Danish model. Mortgage covered bonds are full recourse debt obligations of the issuing financial institution, secured by a pool of performing eligible mortgage assets (the cover pool) that remain on the balance sheet of the issuer.[26] Covered bonds are dual recourse instruments. Investors have a priority claim on the cover pool assets in the event of an issuer default as well as a general claim on the assets of the institution. Thus the lender bears the credit risk of the mortgage. The main difference is the collateral. In the Danish model there is a one-to-one correspondence between the loan and the bond whereas in the European model a dynamic portfolio of mortgage loans backs the bonds.

Underwriting requirements are strict in the covered bond model. The maximum LTV varies by country but does not exceed 80 percent. There are no legislative documentation requirements or debt service restrictions. As noted earlier, default rates have been low in most covered bond issuance countries. Mortgage loans are recourse obligations in most covered bond countries.

In the European covered bond model borrowers bear potentially significant interest rate risk. Covered bonds can be backed by variable rate mortgages (Spain, UK) or rollover mortgages (Germany, Netherlands, Sweden). European rollover mortgages have prepayment penalties during the period the interest rate is fixed. For example a common form of rollover mortgage has a 25-30 year amortization with a 5 year fixed rate period. During the fixed rate period there is a substantial penalty (typically yield maintenance) for substantial or total prepayment. Thus the borrower can't release equity if rates fall and is locked in if rates rise (the German example in Figure 15)

Most countries allow a partial prepayment (e.g., 20 percent) without penalty. At the end of the fixed rate period the loan rate adjusts to the current market rate. The borrower can manage the interest rate risk to a degree by adjusting the term of the new fixed rate period (e.g., switching from a 5 year to a 1 year if rates are expected to fall).

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[25] Another weakness in all other models is the absence of forward rate locks and a TBA securities market that allows efficient management of pipeline risk.

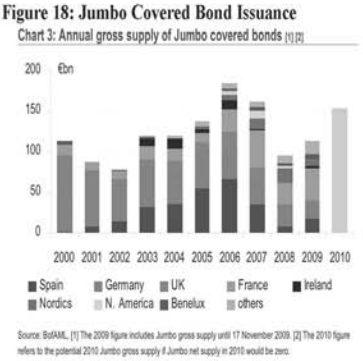
[26] See European Covered Bond Council (2009) for a detailed explanation of general and country specific frameworks.

Lenders are also exposed to portfolio interest rate risk in the European model, as outside Denmark there is not a 1:1 match. Covered bond legislation stipulates Asset-Liability Matching requirements such as nominal balance, yield and/or net present value matching. Most European covered bonds also require some over-collateralization. However these requirements have not stopped lender failure due to asset-liability mismatch. Realkreditradet notes that the Irish, German and Belgian governments had to step in and rescue covered bond issuers that suffered losses due to an interest rate mismatch between their mortgage loans and bonds.

By legislation covered bond issuers must be regulated banks – commercial, savings, cooperative or mortgage. There has been a decline in specialist mortgage banks and in most countries covered bond issuers are lenders with a diversified funding mix.

The European covered bond markets were stressed during the crisis. Issuance of jumbo covered bonds (min € 1 billion) dropped to near zero in the aftermath of the Lehman bankruptcy (Figure 18). It was only restarted in the first quarter of 2009 after the European Central Bank (ECB) announced a purchase program of up to € 65 billion. One reason for the decline in issuance has been the widespread government guarantees of bank debt that have crowded out covered bonds in most countries during the crisis.[27] Unlike the US Federal Reserve purchase program, which purchased more than the net new supply of agency MBS in 2009, the ECB program has been limited and private investors have returned to the market.

Figure 18: Jumbo Covered Bond Issuance



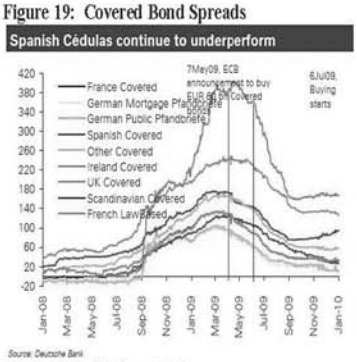
Source: Bank of America Merrill Lynch 2009

Secondary spreads widened dramatically during the crisis and are still well above recent historical averages (Figure 19). Investors differentiate among covered bond

[27] The RMBS market has been closed to new issuance with new issues retained by lenders and repo'd with central banks. Secondary spreads have decline but remain historically high – much higher than covered bonds.

countries. Those countries with weaker legislation and greater housing market turmoil (Ireland, Spain, UK) have seen much wider spreads.

Figure 19: Covered Bond Spreads



Source: Financial Times 2010

The strengths of the covered bond model are incentive alignment (for borrowers and lenders) and achieving capital market access without government guarantees. The weakness is in the allocation of interest rate risk. Borrowers have substantial interest rate risk as they face unlimited interest rate change at rollover and are locked in during the fixed rate term. The longest term is typically 10 years although there are 15 year fixed rate periods in France and Germany. Lenders have suffered losses from interest rate risk and legislative and regulatory asset-liability matching requirements have been tightened.

The AU/UK Depository Model

The dominant Australian and UK mortgage lenders are large diversified banks that fund with deposits and MBS issuance. In recent years UK lenders have also used covered bonds.

The dominant mortgage products in these countries are discretionary ARMs typically with a 1-2 year initial discounted fixed rate period. This product is ideal for depository lenders as they can match asset and liabilities effectively. Over time they have performed in a similar manner to US cost of funds indexed loans as lenders price mortgages at a margin over their average cost of funds. Basing interest rate change on lender cost of funds does shield the borrower from some interest rate risk (relative to ARMs indexed to short term government or money market rates) as the cost of funds is not as volatile as these rates. However lenders in the UK have been moving to indexed or tracker ARMs in recent years in part due to consumer complaints about the differential treatment of new vs. existing borrowers. Both countries are notable in the absence of medium to long term fixed rate mortgages (see Miles 2005).

Although borrowers bear interest risk in this model the use of ARMs has cushioned the downturn. Both the British Building Society Association and Council of Mortgage Lenders attribute low rates of mortgage default to the exceptionally low mortgage interest rates. The question will be how borrowers respond to the inevitable tightening of credit and increases in interest rates. Australia has some experience as it was the first major country to begin raising rates coming out of the crisis. House prices have been rising in Australia and default rates remain low.

Mortgage loans predominately remain on the balance sheet of lenders in this model. Although there is no government guarantee or insurance in this model pre-crisis securitization accounted for as much as 25 percent of mortgage debt outstanding. In Australia about one-third of mortgages have 100 percent default insurance from private mortgage insurers. Almost all Australian securitization transactions had credit enhancement (loan or pool) from a mortgage insurer. Private mortgage insurance is available but not widely used in the UK and credit enhancement primarily comes from structuring.

Underwriting of mortgages in Australia and the UK was more liberal than that of continental European lenders but more strict than the US. Non-conforming loans in Australia were low doc or high LTV loans—very little true sub-prime loans were granted. The UK lenders provided loans to borrowers with adverse credit as well as low doc and high LTV. As noted earlier default rates on non-conforming product were much higher than bank originated conforming loans.

The regulatory performance in these two countries has been mixed. APRA and the Reserve Bank of Australia were credited with cooling a house price boom in the mid-2000s. The UK FSA has been criticized for its oversight and resolution of mortgage lenders such as Northern Rock and HBOS.[28]

Both governments supported the market during the crisis with mortgage security purchase programs. In September 2008, the Australian government announced it would invest A$4bn, which was then increased to A$8bn in October via its asset management arm – the Australian Office of Financial Management (AOFM) – to purchase triple-A rated RMBS to shore up investor confidence in the sector and revive competition in the mortgage market.[29] The securitization market re-opened in September 2009 and more than A$ 6 billion is securities have been purchased by private investors since that time. The UK government has broadened the eligibility guidelines for central bank repo's to include most AAA mortgage securities. Four RMBS have been issued in late 2009 and early 2010 with wider margins, significantly greater credit enhancement and puts to the issuer.[30]

Although the Australian and (arguably) the UK mortgage markets have performed better than the US during the crisis, it is unlikely that US mortgage borrowers are going to

[28] House of Commons (2008)

[29] Bank of America Merrill Lynch (2009b)

[30] Bank of America Merrill Lynch (2010 a, b)

accept adjustable rate mortgages in high proportions. But the US market may move in this direction as large banks have increasing market share.

Canadian/Japanese Guarantee Model

The Canadian and Japanese mortgage markets have had less dislocation than most other developed countries. They have avoided the high rates of default, lender failures and large house price declines evident in other countries. Commentators attribute this performance to more conservative lending practices, tighter regulation and government guarantees.[31] Of course Japan has never truly recovered from the property boom and bust of the late 1980s and has had anemic economic performance since.

The Canadian model mixes attributes of the European and US models. The dominant instrument is the rollover mortgage – similar to that found in continental Europe. The maximum interest rate fixed period is five years although a few 10 year fixed terms were offered prior to the crisis. As in Europe there are significant penalties for early repayment. Thus most interest rate risk is borne by borrowers. Japanese borrowers have somewhat greater ability to manage interest rate risk with convertible mortgages.

Canadian borrowers have responded to falling and low short-term interest rates by switching to variable rate mortgages. Over 45 percent of new mortgages taken out in the first three quarters of 2008 were variable rate increasing the stock of such loans to 25 percent of the total.[32] The ability to switch between variable rate and medium term fixed rate loans affords Canadian borrowers some ability to manage interest rate risk. The Canadian government did offer interest rate insurance from 1984 to 1997 but it had a very low take up.

Lenders and the government hold credit risk in Canada. The government supports mortgage lending and funding through mortgage insurance and security guarantees, similar to FHA/GNMA in the US. Canada is unique in requiring mortgage insurance on all federally regulated lending institution originated mortgages with LTV >80 percent. Approximately 45 percent of all bank-owned mortgages are insured and almost all securitized loans are insured (either by NHA or a private mortgage insurer). Requiring mortgage insurance has two benefits: It provides an outside review of lender practices and ensures risk capital in the origination process. CMHC guarantees have kept the MBS market functioning during the crisis. CMHC has no affordable housing goals comparable to the US GSEs. The JHF in Japan retains credit risk on loans it purchases and securitizes (approximately 25% of the market).

Canadian lenders and insurers are relatively conservative in underwriting. Payment affordability criteria are similar to the US prime market. There is a small Alt A market aimed at self-employed borrowers with difficulty documenting income. The maximum

[31] See Kiff (2009) for a Canadian discussion.

[32] CMHC (2009)

LTV is 95 percent and all bank owned loans with LTV greater than 80 percent are required to have mortgage insurance. Mortgages are recourse obligations. Kiff notes the differences in the relative treatment of prepayment in Canada and the US. Although Canadian lenders impose prepayment penalties the origination (transactions) cost to the borrower is less. His calculations suggest that the cost to refinance (penalty plus transaction cost) is comparable between the two countries. Prepayment penalties are not common in Japan and borrowers frequently make partial prepayments.

The Canadian financial regulatory structure is widely credited with enhancing the stability of the system. The IMF commended the Canadians on their highly effective and nearly unified regulatory and supervisory framework.[33] Freeland notes that conservative mortgage market regulation, including the requirement that all loans over 80 percent LTV have mortgage insurance has contributed to its stable mortgage market.[34]

The government acted to support the MBS market during the crisis by committing to purchase C$125 billion of CMHC guaranteed securities in October 2008. Issuance of CMHC guarantee MBS and Canada Bonds increased sharply in 2008 and 2009 reflecting the value of the guarantee and the Bank of Canada purchase program.

Conclusions

There is no ideal housing finance system. Individual country arrangements reflect history, market structure and government policy. However, almost all country housing finance systems performed better during the crisis than that of the US. In examining the different systems we can make several observations about what worked and whether it is applicable to the US.

The Danish system offers the prospect of real improvement in the US system. It retains the core long term fixed rate mortgage product but makes it more consumer and investor friendly by adding the option to repay the loan through the bond market if rates rise. This feature would have reduced some of the negative equity build up in the US system during the crisis and the significant extension risk faced by mortgage security investors today. As discussed by Boyce the Danish system could be implemented through the GSE cash purchase programs that were significant during the 1980s before being largely phased out in favor of swaps and bulk purchases from individual lenders.

The Danish model is also better at aligning incentives as the credit risk remains on the balance sheet of the lender with substantial capital requirements. In theory a Danish style covered bond model could replace the GSE funding model. Although dropping government guarantees) at the current time would be unwise and infeasible, as the crisis dissipates the US could move to a hybrid model in which Danish style mortgage bonds

[33] IMF (2008b)
[34] Freeland (2010)

have a back up government guarantee (e.g., a GNMA wrap).[35] A model in which a private guarantor or issuer holds significant capital, combined with private mortgage insurance, would come close to achieving a similar allocation of credit risk as the Danish system. Restricting the government role to guarantees without portfolio accumulation of mortgages would reduce the systemic risk of the US housing finance system in line with the more targeted and stable Canadian system.

If the US wants to reduce the role of government in the funding of mortgages it could move towards a European style covered bond model. Although less desirable than the Danish model from an interest rate risk allocation perspective, it does align incentives and creates a liquid, simple and low risk security to fund housing. As noted above there is some flexibility for borrowers to manage interest rate risk and interest rate risk insurance products could be offered to further reduce borrower exposure. The rollover mortgage is a much simpler instrument than the US ARM, which lends itself to improved consumer disclosure and subjects the borrower to less short-term interest rate and payment volatility than a traditional US ARM.

An important feature of most developed country housing finance systems that would reduce credit risk for lenders, investors and the government is recourse. Research in Europe has found that the propensity to default in the face of an adverse income shock is closely related to the punishment incurred by doing so, which in turn depends on the legal framework.[36] Recent US research suggests that recourse decreases the probability of default when a borrower has negative home equity.[37]

Government policy supporting homeownership could be adjusted to focus less on mortgage debt and leverage. Many developed countries achieve similar or higher rates of homeownership than the US without a mortgage interest deduction or government subsidies for mortgage debt (GSE support). The tax system in the US has contributed to excessive borrower leverage and the high degree of negative equity. The current homeownership tax credit program could be expanded to replace the mortgage interest deduction.

It is clear that the decline in underwriting standards inherent in sub-prime lending was responsible for extending and accentuating the housing boom in the US, worsening the housing bust and creating the spark that triggered the financial crisis. No other country experienced a similar decline in standards. Several countries started down this road but none created a market with as poor quality loans as the US. Several factors appear to be responsible. First no other country had as significant a shadow banking system as the US. In all other countries there was greater regulatory oversight of mortgage lending which may have slowed the move to lower standards. Having one financial regulator with responsibility for non-bank as well as bank lenders is an important attribute of regulation. Second, mortgage lending in most markets is dominated by large

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[35] Jaffee (2009)

[36] Duygan and Grant (2006)

[37] Ghent and Kudylak (2009)

commercial banks. There is some evidence (e.g., in Australia) that large lenders avoided the excesses of non-conforming lending due to concerns about reputation risk. Third there was not as much government policy emphasis on homeownership in other countries – an emphasis that many commentators suggested was responsible for part of the subprime problem in the US. Finally requiring lenders to explicitly consider borrower affordability as is the case in many other countries would have reduced the prevalence of stated income loans and teaser ARMs.

Unlike most developed countries, the US is still mired in a housing and mortgage crisis. Continued and expanded government support of the mortgage market is essential to its current survival. But when the recovery begins, US policy makers should ask themselves whether it is desirable that most if not all of the US mortgage market is guaranteed by the taxpayer, whether it is necessary that a majority of US mortgages are securitized and whether homeownership should receive as much emphasis and policy support as it did before the crisis. Examination of the finance of housing from other developed countries suggests that alternative arrangements with far less support from the government can achieve outcomes that are more robust than that in the US.

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PREPARED STATEMENT OF SUSAN M. WACHTER

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Chairman Bayh, Ranking Member Corker, and other distinguished Members of the Committee, thank you for the invitation to testify at today's hearing on the "Comparison of International Housing Finance Systems." It is my honor to be here today to discuss the strengths and weaknesses of various models, how they differ from the United States system and any lessons or themes that may be learned from their experiences prior to, and during, the global economic crisis.

The United States belongs to a group of countries that suffered particularly severe recessions driven by sharp housing price crashes. Other countries in this category include the United Kingdom, Spain, and Ireland. On the other end of the spectrum are countries where home prices merely leveled from 2007 to the present, resulting in no or mild recessions. This category encompasses Canada, Australia, and Germany. (Denmark lies somewhere in the middle, with a late bubble and current downturn.) By comparing these two groups, we can investigate what causes and what prevents housing bubbles and financial crises. In a forthcoming paper with colleagues, we conduct just such an investigation and find that two institutional differences separate these groups: the role of mortgage insurance (MI) and the strictness of regulations countering the market's tendency toward procyclical behavior.

No country better exemplifies this procyclicality in housing and mortgage markets than the U.S. With economic growth and low interest rates coming out of the recession of 2000–2001, mortgage lenders and securitizers increased lending and competed for market share among borrowers. When the available market was satiated, they expanded the market by lowering their standards to include less creditworthy borrowers. An expanding economy thus drove lax lending standards, the increase in nonstandard mortgages, and the proliferation of private-label securitization (PLS). It also encouraged regulators and bankers to increase leverage (*i.e.,* lower capital requirements) to maximize profits. Eventually, borrowers found themselves with too much debt to repay, and the downward spiral of foreclosures, defaults, home price declines, and decreased aggregate demand ensued. Unfortunately, banks had too little capital—especially in liquid form—to cushion the blow, forcing them to curtail lending and even file for bankruptcy. The free market naturally motivates firms to lower lending standards and capital buffers in good times, thus adding momentum to the upswing, and to increase lending standards and capital buffers in bad times, thus reducing economic activity when the system needs it the most.

While lending standards deteriorated, the extent to which this was occurring was unknown due to information opacity, the underlying mortgages were complex and difficulty to track, the extent of fake equity, in which the rise in house prices was due to unsustainable product growth was unknown.

In the U.S., mortgage insurance and regulation declined as the housing bubble grew, thus magnifying this pro-cyclical behavior. Regulators who brought attention to declining lending standards, an increase in aggressive and predatory lending, and a rise in loan-to-value (LTV) ratios were ignored or overruled. Mortgage insurers could have served as a "third party control," as they must pay the remaining value of the mortgage if the homeowner defaults, but originators came to rely less and less on MI because they could pass on the default risk to investors via securitization. To deal with low down payments that would have triggered the need for mortgage insurance, piggy back loans were originated and these too were securitized. When Fannie Mae and Freddie Mac securitized mortgages, they bore the default risk, making them the "third party control." However, when Wall Street securitized mortgages, the default risk transferred to the buyers of the mortgage-backed securities (MBS). Because the mortgages and the MBS were becoming more complex and heterogeneous, investors could not assess the default risk, as evidenced by the fact that they were accepting lower interest rates (even in comparison to Treasuries) for riskier products.

Contrast this experience to that of Canada, where regulators mandate that all high-LTV mortgages must be covered by MI. This practice has not inhibited Canada from achieving levels of home ownership on par with those of the U.S. in 2004, at their peak. Canada and Australia in this time period as well relied on mortgage insurers as a "third party regulator" with the result that mortgage lending standards did not deteriorate and housing prices did not collapse. Mortgages in Australia and Canada were and are typically short term variable rate, or in the case of Canada, rollover, and were originated and to a large extent held in portfolio by banks. Both

countries avoided recessions, home ownership has been maintained at high levels, and their banking systems have been able to continue lending as the crisis has caused financial systems in other countries to stop functioning. Australia has a significant ARM share, but regulators prohibited lenders from issuing ARMs to borrowers who did not qualify for the highest projected rate over the life of the loan. Thus, Australia was spared the fate of the U.K., Denmark, and Spain.

A system reliant on MI can only work, however, if the insurers maintain enough capital to cover defaults during economic downturns. The U.S. is an example of what can happen when this principle is ignored. Credit default swaps (CDS) acted like insurance on MBS, but CDS issuers like AIG did not have enough capital to cover the defaults and were not required to reserve for the risk they were holding. Thus, MI is only one half of the equation, with strict countercyclical capital regulation being the other half. Canada is an excellent example of maintaining both ends of the equation. Their adjustable rates were regulated to prevent predatory behavior; for example, originators were not allowed to use low "teaser" rates.

The structure of the dominant mortgage product is also critical to preventing procyclicality. Most countries rely on adjustable-rate mortgages (ARMs). The U.S., Denmark, and Germany are the three notable exceptions, favoring fixed-rate mortgages (FRMs). ARMs place the interest rate risk on the borrower, who is not as well-suited to bear it as lenders and investors. When interest rates rise, borrowers may have difficulty making payments and may be forced to default. ARMs also subject the borrower to greater market risk because their interest rates may rise when defaults increase elsewhere in the economy. ARMs are less conducive to systemic stability, as exhibited during the recent economic crisis. During the housing bubble, securitizers' appetite for market share drove them to demand riskier mortgages from less creditworthy borrowers. Originators responded by favoring ARMs over FRMs, and it was these nonstandard mortgages that eventually exploded. The U.K. and Spain also relied on ARMs with similar consequences. All countries with ARMs saw their lending dry up during the credit crunch with borrowers unable to refinance at the high new rates. With ARMs that need to be repaid or refinanced the illiquidity of the system may be transformed as in these countries into a solvency or foreclosure crisis.

Building a system around the FRM requires a secondary market. Banks do not want to bear the interest rate risk of "borrowing short" from depositors and "lending long" to homeowners. When interest rates rise, they will have to pay more to depositors but will be receiving the same low payments from homeowners that were established when the contract was signed. This mismatch was directly responsible for the U.S. savings and loan crisis two decades ago and similar crises elsewhere. While in practice they can hedge this risk with derivatives, in practice no country has a banking system reliant on FRMs without secondary market institutions that bear some of that risk and/or increase their profitability. In the U.S., Fannie Mae and Freddie Mac serve that role by purchasing FRMs and securitizing them. Unlike PLS of ARMs, this securitization yields a product that would not otherwise exist. In Germany, banks issue "covered bonds" (instead of MBS) that are secured by standardized mortgage loans through Pfandbrief institutions. While the investor who purchases a covered bond receives the cash flows from the homeowner, the issuer who sold the covered bond retains the default risk. If the homeowner defaults, the issuer owes the remaining balance to the investor. Unfortunately, the stringent loan to value requirements of the system in Germany has resulted in one of the lowest home ownership rates in the industrialized world, relying on renting for over half its population.

But without the proper regulations, even covered bonds can get a country into trouble. German regulators ensure that investors get periodic updates on the state of the collateral securing their covered bond, and they do not allow covered bonds to be secured by loans with an LTV ratio above 60 percent. Unlike in the U.S., these regulations were not eroded during the housing bubble. Denmark also relies on covered bonds and had similarly stringent regulations until recently. When Danish legislation moved the system toward interest-only mortgages, the market joined the housing mania and developed a late bubble that subsequently deflated. Similarly, Spain used covered bonds extensively, yet they slid toward ARMs in recent years. The Spanish banks, *cajas,* securitized ARMs through *cedulas* in an effort to generate fees and gain market share, generating a bubble and crisis that is severe, with Spain suffering 20 percent unemployment. In the face of rising prices, it is very tempting to lower lending standards, contributing to procyclicality.

All industrialized nations have significant government involvement. When the housing market is in crisis, it endangers the entire system. The British rescue of Northern Rock preceded the American bailouts and the Spanish government has intervened to protect the *cajas* and their covered bonds. To prevent a foreclosure crisis

from driving an economy into a severe recession or depression, governments will intervene; thus it is necessary to regulate the housing finance market before it reaches the crisis stage. The taxpayer owns the tail risk. Rather than raise lending standards after the fact, we can prevent the problems of moral hazard, shrinking equity, and bailouts by maintaining standards and transparency.

The clearest difference between the U.S., the U.K., and Spain, on one side, and Australia, Canada, and Germany, on the other, is the stability of regulation. The first group allowed lending standards and capital requirements to decline, stoking the pro-cyclical behavior that created a housing bubble and economic crisis, while the latter group maintained rules in the face of market pressure.

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PREPARED STATEMENT OF ALEX J. POLLOCK

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SEPTEMBER 29, 2010

Mr. Chairman, Ranking Member Corker, and Members of the Subcommittee, thank you for the opportunity to be here today. I am Alex Pollock, a resident fellow at the American Enterprise Institute, and these are my personal views. Before joining AEI, I was the President and CEO of the Federal Home Loan Bank of Chicago from 1991 to 2004. From 1999 to 2001, I also served as President of the International Union for Housing Finance, a trade association devoted to the international exchange of housing finance ideas and practices, and continue to be a member of its Executive Committee.

A Middle of the Pack Home Ownership Rate, GSEs Notwithstanding

As we begin the last quarter of 2010, our housing finance system (as well as those of some other countries) is still struggling in the wake of the great housing bubble of 2000–06 and its collapse into the panic and serial crises of 2007–09.

Housing finance cannot be considered apart from its effects on house prices. When you push a lot of credit at an asset class, its price tends to rise. American housing finance practices and subsidies helped inflate house prices during the bubble. Then U.S. average house prices fell by more than 30 percent from peak to trough—something, we must remember, which was previously considered impossible. This brought them back to their long-term trend line and to the levels of 2003, with all of the losses and turmoil with which we are so familiar. A memorable decade! One of its lessons is to try to remember that things considered impossible can nonetheless happen.

As we develop other lessons for the next decade, there is no doubt that it is educational and useful to examine American housing finance in international perspective.

Comparing our housing finance system to other countries, we discover that one thing remarkable and indeed unique in the world about American housing finance was the dominant and disproportionate role played by Government-sponsored enterprises, namely Fannie Mae and Freddie Mac, wielding their "implied" Government guaranty. Based on this "implied" guaranty, massive amounts of their debt securities were sold around the world, so that foreign institutions could help inflate U.S. house prices without worrying about the risk and later be bailed out as creditors by American taxpayers. Of course the "implied" guaranty always was a real U.S. Government guaranty, as events have amply demonstrated, but it did not have to be accounted for as one.

In the days of Fannie and Freddie's pride, their representatives and political supporters used frequently to say, "American housing finance is the envy of the world!" It really wasn't, at least based on my discussions with housing finance colleagues from other countries. But many Americans—including members of Congress—

thought it was, just as they mistakenly thought and said that the U.S. had the highest home ownership rate in the world. We didn't and don't.

This is apparent from the table of Comparative Home Ownership Rates on page 3. The U.S. ranks 17th of 26 economically advanced countries, or about two-thirds of the way down the list.

I think we can agree that we would like our society to have a property-owning democratic citizenry, which includes widespread home ownership. But the international perspective makes it clear that many countries achieve home ownership levels as high or higher than ours with no GSEs. It turns out that these levels can be achieved without tax deductions for the interest paid on home mortgages, without our very unusual practice of making mortgages into nonrecourse debt, without Government mandates to make "creative" (that is, riskier) loans, without 30-year fixed-rate loans, and with prepayment fees on mortgages. Of course, as bubbles and busts in other countries show, you can also get in trouble with different systems.

At a minimum, we should never assume that the particular historical development so far of the U.S. housing finance system is definitive.

Canada

The better credit performance of Canadian housing finance over the last several years has become well known. The proportion of Canadian mortgage loans more than 90 days delinquent in the first quarter, 2010 was less than ½ percent. This is about one-tenth the ratio of U.S. mortgages over 90 days delinquent at that time, which was 4.9 percent. If we add to the U.S. number mortgage loans in foreclosure to look at serious delinquencies, it jumps to 9.5 percent. Quite a contrast, as many people have remarked.

Comparative Home Ownership Rates

Rank	Country	Ownership Rate	Date	Source
1	Singapore	89%	2009	Statistics Singapore
2	Spain	85%	2008	European Mortgage Federation
3	Iceland	83%	2005	Statistics Iceland (HES survey)
4	Belgium	78%	2007	European Mortgage Federation
5	Norway	77%	2001	UN Economic Commission for Europe
6	Portugal	76%	2007	European Mortgage Federation
7	Luxembourg	75%	2008	European Mortgage Federation
8	Ireland	75%	2009	European Mortgage Federation
9	Chile	73%	2002	UN Housing Policy
10	Italy	72%	2007	INSEE and Eurostat
11	Israel	71%	2004	UN Economic Commission for Europe
12	Australia	70%	2006	Australian Bureau of Statistics
13	England	68%	2010	Building Societies Association
14	Canada	68%	2006	Statistics Canada
15	Sweden	68%	2008	European Mortgage Federation
16	New Zealand	68%	2001	Statistics New Zealand
17	UNITED STATES	67%	2009	US Census Bureau
18	Japan	61%	2003	Japan Statistical Yearbook 2005
19	Finland	59%	2008	Statistics Finland
20	Czech Republic	59%	2007	European Mortgage Federation
21	France	57%	2007	European Mortgage Federation
22	Netherlands	57%	2008	European Mortgage Federation
23	Austria	56%	2009	Statistics Austria
24	Denmark	54%	2009	European Mortgage Federation
25	Germany	46%	2007	INSEE and Eurostat
26	Switzerland	35%	2000	Statistics Switzerland

Canada makes a pertinent comparison for the U.S. It is in population and economic size much smaller, of course—about one-tenth in both cases—but is in many ways very similar.

Both countries are rich, advanced, democratic, and stable, have sophisticated financial systems and pioneer histories, and stretch from Atlantic to Pacific. But Canada has no housing GSEs; mortgage loan interest is not tax deductible; it does not have 30-year fixed rate mortgages; it does have prepayment fees.

Mortgage lending is more conservative and creditor-friendly. Canadian mortgage lenders have full recourse to the borrower's other assets and income, in addition to the security interest in the house. This means there is less incentive for underwater borrowers to "walk away" from their house and mortgage. No tax deduction for interest probably increases the incentive to pay down debt. Most Canadian mortgage payments are made through automatic debit of the borrower's checking account and can be matched to paycheck frequency—a technical but important behavioral point. Canadian fixed rate mortgages typically are fixed for only up to 5 years. Subprime mortgages were a much smaller part of the market.

This relative conservatism has meant that Canadian banks, the principal mortgage lenders, while experiencing some pressure, have come through the international financial crisis in much better shape than their U.S. counterparts, with (as observed above) mortgage delinquencies so far well behaved.

There does not appear to have been a home ownership price to pay for this relative credit conservatism. Canada's home ownership rate is 68 percent *vs.* 67 per-

cent for the United States. Two very different housing finance systems, one, as it turned out, much riskier than the other, produced virtually the same home ownership rate.

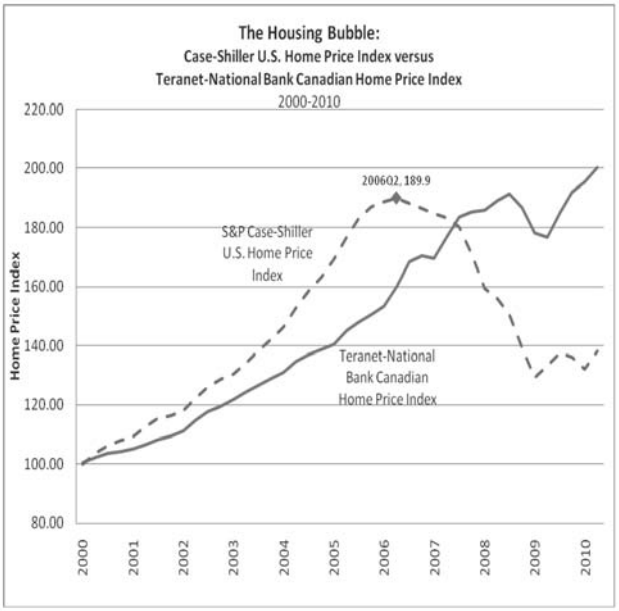
It is important to recognize that Canada does have an important government body to promote housing finance, which has a substantial role: the Canada Mortgage and Housing Corporation (CMHC). Among its principal activities is insuring (guaranteeing) mortgage loans, another is securitizing some of the insured loans. So you could think of it in one sense as a combination of FHA and Ginnie Mae. (Its mortgage insurance program was originally modeled on the FHA in 1954.)

CMHC's mortgage insurance is a major factor in the market, covering about C$470 billion out of total mortgage debt of about C$ 950 billion, or roughly half of Canadian mortgages. This is the same proportion as the combined Fannie and Freddie in the U.S. (over $5 trillion out of about $10 trillion).

Whether or not you like the idea of such a scale of government financing, you have to say that, in contrast to the American GSEs, at least CMHC's status is completely clear and honest. It is a 100 percent government-owned and controlled corporation. Its government guaranty is explicit, so it operates with the formal full faith and credit of the government of Canada. It also provides housing subsidies which are on budget and must be appropriated by Parliament.

Canada in this respect looks superior to the U.S. in candor, as well as credit performance.

However, CMHC does obviously represent a large government intervention in the housing finance market. Recalling our previous point about the interaction of housing finance and house prices, one Canadian criticism is that this intervention has caused excessive inflation in Canadian house prices. Indeed, Canadian house prices measured relative to a base of the year 2000, have now risen higher than U.S. relative house prices at the top of the bubble, as shown in the following graph.



A general rule is that as long as house prices are rising, mortgage loan performance will be good. Some Canadian commentators worry about whether their house prices are in a bubble. The Fraser Institute, a Canadian free-market think tank, has called the Canadian mortgage system "a high taxpayer-vulnerability model."

In response to these worries, Canadian regulators have taken important countercyclical actions to lower the maximum loan-to-value (LTV) ratios on some of the riskier classes of mortgage loans. In other words, they now require larger down payments and allow less leverage of the properties. Such countercyclical movement in

LTV limits, in my opinion, is an excellent idea and necessary to moderate the inevitable cycles in real estate credit. We should stay tuned to the highly interesting Canadian housing finance story.

Matching Mortgage Assets and Mortgage Funding

The traditional and still typical Canadian mortgage has a long-term amortization schedule (up to 35 years for CMHC-insured mortgages), but with an interest rate fixed for 5 years, after which the interest rate is reset for another 5 years, and so on. Shorter fixed periods are also common, but the debt service to income ratios are to be approved based on the prevailing 5-year rate.

About two-thirds of mortgages remain on the balance sheet of the lenders, which are dominated by five nationwide banks. The 5-year fixed rate mortgage loans are often funded by the issuance of 5-year fixed rate certificates of deposit, which gives a very good natural matching (that is, no derivatives required) of the banks' assets and liabilities. Obviously, such matching is also available for shorter fixed rate periods.

This is a straightforward answer to a fundamental problem of every housing finance system: how to match the nature of the mortgage asset with an appropriate funding source, so that you are not lending long and borrowing short. Different approaches distribute the risks among the parties involved, including lenders, investors, guarantors, borrowers and the government, in various ways. The classic example of not achieving the needed match is the infamous collapse of the American savings and loan industry in the 1980s.

There are clearly some basic variations:

- Variable rate mortgages funded with short-term deposits;
- Medium-term fixed rate mortgages funded with medium-term fixed rate deposits or bonds;
- Long-term fixed rate mortgages funded with long-term fixed rate bonds or mortgage-backed securities.

In general, variable rate mortgages put the risk of rising interest rates in the first place on the borrowers. To have long-term fixed rate mortgages requires funding by some form of access to the long-term bond market. Every housing finance system must address this fundamental asset-liability question; the answer results in a particular distribution of risks.

Denmark

The most perfect solution in theory, which also functions very well practically in its national setting in an admittedly small country, is that of the housing finance system of Denmark. It has been admired by many observers. Explicitly governed by what it calls the "matching principle," the interest rate and prepayment characteristics of the mortgage loans being funded, which include long-term fixed rate loans, are passed entirely on to the investor in Danish mortgage bonds.

At the same time, there is a total "skin in the game" requirement for retention of credit risk by the mortgage lenders. The mortgage banks retain 100 percent of the credit risk of the loans, in exchange for an annual fee, thus insuring alignment of incentives for credit performance. Deficiency judgments, if foreclosure on a house does not cover the mortgage debt, are actively pursued.

The fundamentals of the Danish mortgage system go back over 200 years. There are no GSEs or government housing banks. This is a private housing finance system built on what appear to be quite robust principles. It generates a home ownership rate of 54 percent, below that of Canada or the U.S.

Some years ago, when the proud hearts of Fannie and Freddie had not yet had their fall, I participated in an exchange with the Association of Danish Mortgage Banks. They explained their mortgage bond- and skin in the game-based system to me, then I explained the American GSE-centric mortgage system to them.

When I was done, the CEO of one of the leading Danish mortgage banks said this: "In Denmark we always say that we are the socialists and America is the land of free enterprise. Now I see that when it comes to mortgage finance, it is the opposite!"

England

England has a large economy, is financially very sophisticated, and has an entirely different housing finance structure. It also has no GSEs. The traditional and still typical English mortgage is a variable-rate loan financed by deposits in banks or mutual building societies. The interest rate on these loans can be changed up or down at the will of the lender, so everybody's rate changes at the same time. This

is a natural asset-liability matching for the depository institutions, but is risky for the borrowers.

England had a housing boom and bust in the 21st century cycle, as we did. Indeed, the first casualty of the financial panic was an English mortgage lender, Northern Rock, which was a well-known securitizer of mortgages. Northern Rock failed in 2007, long before Bear Stearns did, when the wholesale investing market refused to continue investing. This was followed by first a run on its retail deposits, then by the nationalization of the bank.

England also had a unified financial regulator, the Financial Services Authority, whose jurisdiction included mortgage lenders as well as all other financial intermediaries. This unified regulatory structure did not avoid the crisis.

Still, England has a home ownership rate of 68 percent, just ahead of the U.S.

Germany

Some German banks got into serious trouble in the housing bubble, but by investing in U.S. mortgage securities and other foreign mortgages, not in their domestic mortgage lending market, which is quite conservative. It generates a home ownership rate of 46 percent, which would not be politically acceptable in an American setting.

Nevertheless, there are two German housing finance ideas worthy of study. One is its mortgage covered bond *(Pfandbrief)*. With a statutory basis more than 100 years old (and it is claimed, a history going back to Frederick the Great of Prussia), the covered bond has provided a relatively stable source of bond-based mortgage financing.

Covered bonds allow a fixed rate funding for fixed rate mortgage loans, and keep the credit incentives of the lender intact, since the lender remains responsible for 100 percent of the credit risk and the loans stay on its balance sheet. But they provide access to the bond market, in addition to deposit-based funding, and are indeed a major component of the German bond market. The mortgage loans serve as collateral for the bonds, which are also senior obligations of the issuing mortgage lender.

Many people have proposed, and I agree, that the U.S. should introduce covered bonds as a mortgage funding alternative—one which does not involve a government guaranty. The German experience suggests these lessons:

- There needs to be a statutory basis for these bonds, not merely a regulatory one, to insure the bond holders' rights to the collateral are truly protected.
- The mortgage loans serving as collateral for them (the "cover pool") should be subject to conservative credit standards, to reduce the volatility and uncertainty of their credit behavior.

A second German housing finance idea for consideration is emphasizing (we should say, rediscovering the needed emphasis) on savings as part of sound housing finance. Thus, the German building and savings banks (*Bausparkassen*) continue to practice the traditional "savings contract," by which the borrower commits to a regular savings program as part of qualifying for a mortgage loan.

I am not recommending their specific program, but the general principle. We have completely lost the emphasis on savings as part of housing finance. We need to rediscover it.

Switzerland

Switzerland may just be mentioned as a case of the variety exhibited by housing finance in international perspective. It is a wealthy country with a very large and sophisticated financial sector. It has mortgage debt outstanding of about 100 percent of GDP, somewhat higher than in the U.S.

Yet Switzerland has a home ownership ratio of only 35 percent, the lowest on our list.

It is an unusual housing finance example. So is the American GSE-centric system, which has collapsed at heavy taxpayer expense, as did the American savings and loan system which preceded it.

Conclusion

The variety of international experience suggests that there is every reason to think broadly and openly about the possibilities for developing a better, post-GSE U.S. housing finance system for the future.

Thank you again for the opportunity to share these views.