Restructuring the U.S. Housing Market

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I. Introduction

Housing people is one of the most important businesses in the world. The value of global housing reached a record high of slightly more than $90 trillion in 2008.[1] In the United States, residential investment has averaged roughly 5 percent of GDP, while housing services have averaged between 12 percent and 13 percent, for a combined 17 percent to 18 percent of GDP.[2] In other big countries such as China and India, housing comprises 15 and 5 percent of GDP, respectively. Housing, moreover, is an important component of wealth for its owners. Indeed, in countries such as Finland, Germany, Italy, Sweden, and the United Kingdom, housing accounts for more than 60 percent of household wealth, while in other countries such as Spain it accounts for as much as 75 percent. In China and the United States the corresponding figures are 41 and 26 percent, respectively.[3] In the United States housing accounts for between 77 and 85 percent of tangible household assets. Changes in such a large portion of household wealth due to changing housing prices can potentially have significant effects on consumer spending and therefore overall economic activity.

In recent years, too much credit flowed into the housing market in many countries that contributed to housing price booms and busts. As a result, the housing markets in the United States and other countries suffered severely when housing prices collapsed. Among 39 countries surveyed, 26 recorded home price declines and 18 experienced accelerating rates of decline in recent years.[4] Given the importance of housing for the financial and real sectors in countries, this situation contributed to the global financial crisis and economic recession. The United States suffered a severe credit crunch and its worst recession since the Great Depression. In this regard, Robert Schiller has noted that "[r]esidential construction as a percentage of gross domestic product has had a prominent peak before almost every recession since 1950."[5]

In this paper, we look beyond the booms and inevitable busts of real estate markets to examine prospective ways to promote better-functioning housing finance systems to support homeownership. As always, though, before moving forward, we have to understand the past.

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* This paper is based upon our book, **Fixing the Housing Market**, Wharton School Publishing-Milken Institute, 2012.

[1] McKinsey & Company (2009).

[2] National Association of Home Builders (available on http://www.nahb.org/generic.aspx?genericContentID=66226).

[3] Peterson Institute for International Economics (2012).

[4] Global Property Guide (2011).

[5] Schiller (2007).

II. Some Early History

The first evidence of the existence of mortgages was *horoi*, or "mortgage stones," in ancient Athens. These were markers used to indicate that a property was mortgaged and to identify the creditors.[6] By the late 12th century, mortgages had reappeared in England in the form of common-law financial instruments to enable the purchase and sale of property. Real estate debts that were not paid could be recovered by lenders in property sales.

In the 18th century, early land developers designed financial contracts in which real estate investors would buy not an entire large tract, but a segment for development and resale accompanied by an option to purchase the adjacent segment. The pioneer in this effort was John Wood and his son, whose projects in Bath, England, used this method to integrate individual housing units and related commercial space to develop the city. Wood went beyond the city limits of Bath to an area unencumbered by regulations and leased land for 99 years, with each lease based on the performance of the development of the previous one. By utilizing options, he was able to circumvent land laws, raise debt and equity financing, and lease and manage related properties. This was the beginning of urban real estate development and residential housing finance as we know it today.[7]

III. Presidents Jefferson, Lincoln and promoting homeownership

Even as urbanization and residential development grew in the 18th and 19th centuries throughout Europe and the United States, agriculture remained the most important contributor to economic growth. Homeownership accompanied reform and expansion of landownership for farming. By 1890 in the United States, two-thirds of all farm housing was owner-occupied, increasingly so throughout the 1900s. At the same time, homeownership was less prevalent in urban areas. Over time, however, the overall homeownership rate increased from 45 percent at the beginning of the 1900s to 60 to 70 percent in 1960. As Figure 1 shows, it has remained at that level ever since.[8] The costs associated with homeownership represented an increasingly larger portion of consumer spending, especially since the turn of the 20th century as the homeownership rate increased, the size of homes expanded, and home prices trended upward. Possession of land and property, especially homes, reinforced some main drivers of nation-building—thrift, industriousness, geographical and occupational mobility, citizenship, and economic security.

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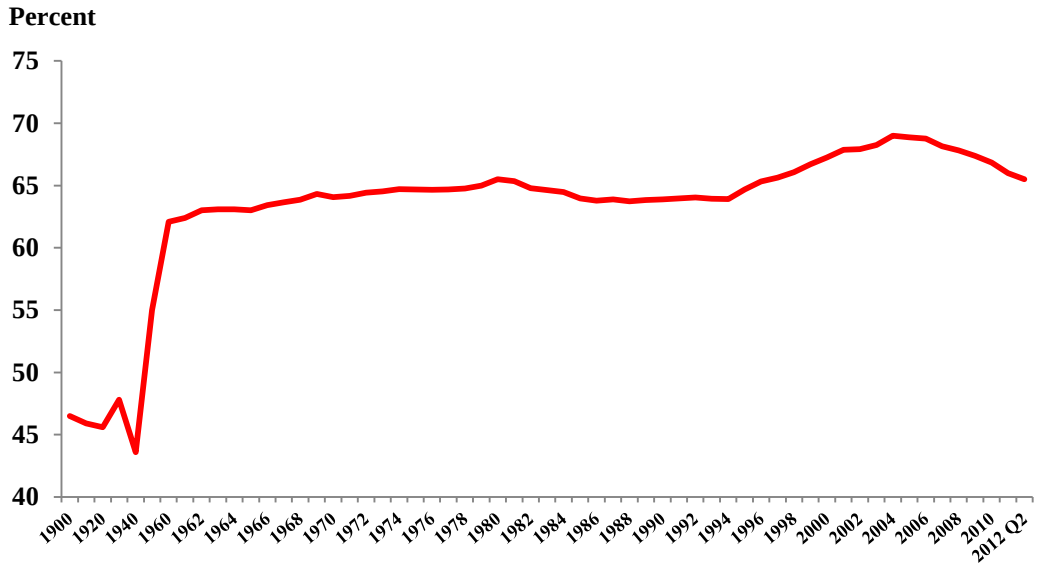
[6] Fine (1951).
[7] Rabinowitz (2002).
[8] According to Collins and Margo (1999), "in 1900, only 16 percent of all white male household heads held a mortgage and only 6 percent of blacks did, but by 1990, 57 percent of whites held a mortgage compared to 43 percent of blacks." It might also be noted that the rate of owner occupancy for African-Americans in 1870 was 8 percent, whereas it had increased to 54 percent in 2007 (see Collins and Margo (2011)).

Figure 1: U.S. homeownership rate, 1900-2012 Q2



Note: Data from 1910-1960 are for decades and annual data thereafter.
Source: U.S. Census Bureau.

There was a surge in the demand for housing brought about by increased commercial activities in cities and population growth and the westward expansion of settlements for 30 years after the American Revolution. Providing access to capital in the form of land for individual owners, opening markets globally for their products, committing funds to internal improvements, and opposing fiscal measures that hurt taxpayers were all part of Jefferson's policies. Limiting formal authority, deferring to individual freedom, and a commitment to growth through access to economic opportunity were the keys to economic and political democracy. These notions were the very definition of "Americanism"—a term coined by Jefferson and which he counter-posed to "aristocracy." He argued consistently against the dominance by a new elite group of wealth and privilege and gave high priority to laws that would prevent the concentration of landed wealth. It was in this context that land reform and home finance merged in public and financial policies and programs.

Focusing on land and homeownership, the Homestead Movement was geared to opening opportunities for would-be farmers in an age when this occupation was still considered the norm. Ever since the passage of the Land Ordinance of 1785 and the Land Act of 1796, the federal government provided assistance to settlers in the form of low-priced land. Other acts followed with regularity, such as the Preemption Act of 1841, which permitted would-be settlers to stake claims on most surveyed lands and to buy up to 160 acres for a minimum price of $1.25 per acre.

In 1862, Lincoln signed into law the Homestead Act. Under its terms any citizen or person intending to become a citizen who headed a family and was over the age of 21 could receive 160 acres of

land, clear title to which would be conveyed after five years and payment of a registration fee. As an alternative, after six months the land could be bought for $1.60 an acre. This established housing and landownership as common American goals.

On January 1, 1863, Daniel Freeman and 417 others filed homestead claims, and more pioneers followed. By 1934, over 1.6 million homestead applications had been filed, and more than 270 million acres representing 10 percent of the U.S. land mass passed to individuals in the largest capital distribution measure in public policy.[9] The ethos and purpose of this infused housing policy for years to come.

There were considerable restrictions on the ability to access capital and asset markets for agricultural and industrial workers throughout the 19th century. Aside from saving accounts and insurance policies, real estate in the form of houses and lots was a new investment objective of savers.

Without large-scale pension plans, homes were a major way to accumulate wealth and owner-occupied homes could also be a source of income through rentals and boarding. The choice of home tenure – between renting and owning – emerged in this social, political, and economic context as property markets grew in the 19th century with industrialization. Wealth accumulation became concentrated in real property as society became more urban and less rural, and with the associated increasing homeownership rate. These developments set the stage for the genesis of modern housing finance.

For many, homeownership is the "American Dream" as well as an indicator of status, position, and individual identity. But for most, the dream could not come true without taking advantage of lending practices that have evolved in the United States since pre-Civil War days, with the birth of the savings and loan industry.

IV. Modern housing finance takes shape in the United States

The financial system in a modern economy facilitates the transfer of resources from savers to borrowers. This allows the productive sectors to invest in capital necessary for growth. The financial system also allows consumers to adjust to variations in income over time so as to smooth consumption. Homeownership, of course, requires financing given the price of housing relative to the typical homeowners' income. The modern financing of housing largely began with the savings and loan industry in the United States.

Origin and development of savings and loan associations

The first American savings and loan institution was organized in 1831 to enable its member shareholders to pool their savings so that a subset of them could obtain financing to build or buy homes. Every member was to be afforded the opportunity, over time, of borrowing funds for this purpose, with

[9] U. S. National Archives and Records Administration (2010).

the association terminating after the last member was accommodated. Association membership was geographically restricted: no loans were made for homes located more than five miles from the institution.

This first savings and loan was organized as a mutual institution and therefore owned by its shareholder members. Shareholders were expected to remain with the institution throughout its life, but those wishing to withdraw their shares were allowed to do so if they gave a month's notice and paid a penalty of 5 percent of their withdrawal. The association's balance sheet consisted of mortgage loans as assets and ownership shares as liabilities, with relatively little net worth. These shares were the precursor of the savings deposits held today.

These institutions served the important role of consolidating the savings of a group of local individuals and rechanneling the funds to these same individuals in the form of mortgage loans. Thus, savings and loans filled a niche that was woefully underserviced by other financial institutions at the time. Only much later did borrowers and savers become separate and distinct customers of these institutions.

Originally, institutions of this type were called building societies because they bought land and built homes. When they began lending to members to build their own homes, they were referred to as building and loan associations. After the 1930s, they tended to be called savings and loan associations.

Perhaps it is not surprising that the need for financing for home purchases went largely unfulfilled by commercial and mutual savings banks.[10] These financial entities preceded the development of savings and loans, but neither catered to the housing market. Commercial banks issued liabilities consisting primarily of currency and demand deposits that were acceptable to their customers because they were meant to be backed by self-liquidating commercial loans. These banks catered to the short-term business loan market.

Mutual savings banks did not issue currency or accept demand deposits, but were involved with the savings of the general public. Unlike savings and loans, however, they were originally philanthropic. Their intent was to provide financial services for the small saver, which required that their deposits be more flexible in terms of amounts and maturities and correspondingly required a much more flexible asset portfolio than just mortgages. Each type of institution specialized in a particular market, and the specialization was reflected in the balance sheets of these financial firms.

After the organization of the first savings and loans, similar institutions spread throughout the United States—for example, entering New York in 1836, South Carolina in 1843, and what is now Oklahoma in 1890. As these associations spread throughout the country, innovations began to occur. For example, the self-terminating type of institution was replaced by a more permanent type, and the borrowers were separated from the savers. Thus, these firms began to operate with a long-term horizon in mind, and they began to accept shareholders who were not obliged to take out mortgage loans. This not

[10] Credit unions did not come into existence until the early 1900s.

only enlarged the pool of potential shareholders but also emphasized the savings aspect of membership in an association. So the link between borrower and saver began to dissipate despite the mutual form of organization under which these firms usually operated. These institutions still generally did not take deposits per se; in many states, in fact, they were precluded by law from doing so. It was not until the advent of federal deposit insurance for savings and loans in the 1930s that the taking of deposits as such became widespread.[11]

Over time, competition from commercial banks was beginning to develop. In the early 1900s, national banks were informed that they were not prohibited from accepting savings deposits. Moreover, Federal Reserve member banks were given an incentive to use this source of funds when a lower reserve requirement was placed on savings accounts than on demand deposits.

On the asset side, competition for residential mortgages was also beginning to develop between savings and loans and banks, albeit to a much lower degree. Without active secondary markets and with still somewhat restrictive regulations, the two types of depository institutions found that comparative advantages in information collection and processing, as well as the favorable tax treatment afforded savings and loans, still led to fairly identifiable balance sheet differences.

Thus, as the economic boom of the 1920s began, the banks and savings and loans maintained different balance sheets, competed only indirectly, and were regulated to a different degree and by different levels of government. The federal regulators were most interested in commercial banks and the payments mechanism, and the state governments were most directly involved with savings and loans and their role in facilitating homeownership.

Savings and loan associations and the Great Depression

There appear to have been only two periods in the first 150 years of savings and loan history in which they have suffered large-scale failures. The first was the Great Depression of the 1930s, and the second was the severe economic downturn of the 1980s.

During the Depression, savings and loans did not accept demand deposits and therefore did not suffer the runs that reportedly plagued commercial banks. Nevertheless, their members had to draw upon their savings to maintain consumption. Savings and loans were hard-pressed to cope with these withdrawals because their assets were almost entirely mortgages, and they prided themselves on maintaining low liquidity levels. Moreover, reserves for losses were relatively low because "many state laws…discouraged the accumulation of reserves and some supervisory authorities practically forced the

[11] Bodfish (1931, p. 95-96).

distribution of all earnings."[12] As withdrawals mounted and assets declined in value due to delinquencies and defaults, savings and loans failed. These failures severely limited the flow of funds to housing.[13]

This disruption in the housing market finally changed the role of the federal government in the regulation of the savings and loan industry.

First, on July 22, 1932, the Federal Home Loan Bank Act was signed by President Hoover. This act set up the Federal Home Loan Bank System, consisting of 12 regional Federal Home Loan (FHL) Banks under the supervision of the Federal Home Loan Bank Board in Washington. The main purpose of the system was to financially strengthen member savings and loan associations by providing them with an alternative and steady source of funds to promote homeownership. The system was designed so that the FHL Banks could issue bonds in the capital markets and thus be able to provide advances to healthy and reasonably safe institutions.

Secondly, the Home Owners' Loan Act was signed on June 13, 1933. Although the main purpose of the act was to facilitate the refinancing of mortgages in distress cases, many borrowers seeking the more favorable interest rate and other terms offered by the government were also able to obtain loans. This led many borrowers deliberately to default on their existing loans, thus exacerbating the problems of savings and loans.[14] Another purpose of the 1933 act was to allow the Federal Home Loan Bank Board to charter federal savings and loans. The aim was to establish savings and loans in places where the state institutions were providing insufficient service.

Finally, the National Housing Act, enacted June 27, 1934, created the Federal Savings and Loan Insurance Corporation (FSLIC) to provide deposit insurance for savings deposits at savings and loans. Membership in the FSLIC was made compulsory for federal associations and optional for state-chartered associations. With the establishment of the FSLIC, the savings and loans were placed on an equal footing with commercial banks, which were insured by the Federal Deposit Insurance Corporation. Eventually, the FDIC would become the administrator of federal deposit insurance for savings and loans as well.

Postwar growth and diversification in the savings and loan industry

Following the Great Depression and World War II, savings and loans experienced tremendous growth for close to four decades. They surpassed mutual savings banks in terms of total assets for the first time in 1954 and grew to half the size of the commercial banking industry by the end of 1980. This expansion was spread throughout the entire industry, with large and small institutions participating.

[12] Bodfish (1931, p. 7).
[13] According to Bodfish (1935, p. 22), "One-half of the counties in the United States as a result of the Great Depression now had no mortgage loan institutions or facilities."
[14] Bodfish (1935, p. 21).

The magnitude of the redistribution is remarkable. Private financial assets in 1945 totaled $247 billion. Of this amount, savings and loan associations held a meager 3 percent, compared to 65 percent for commercial banks. By 1975, however, savings and loans had increased their share of the total to 16 percent, while the share for commercial banks had dropped to 37 percent. Mutual savings banks and life insurance companies also lost considerable ground during this period. Moreover, although the share of total financial assets accounted for by all of the depository financial services firms declined to 51 percent from 76 percent, the share of savings and loans quintupled.

Tax law in the savings and loan industry came into play in 1951. Before the Revenue Act of 1951, savings and loans were exempt from federal income taxes. Although this act terminated their tax-exempt status, savings and loans nonetheless were able to avoid paying taxes because they were permitted essentially to deduct up to 100 percent of taxable income through a bad-debt reserve.

In 1962, however, another revenue act was passed that reduced the bad-debt deduction to 60 percent of taxable income, subject to a qualifying asset restriction. This restriction stated that for a savings and loan to be eligible for the maximum deduction, 82 percent or more of its assets had to consist of cash, U.S. government securities, and passbook loans, plus one-to-four family residential property loans. The deduction was zero if these assets fell below 60 percent.

The Tax Equity and Fiscal Responsibility Act of 1982 further reduced the bad-debt deduction to 34 percent in 1982 and then to 32 percent in 1984. The Tax Reform Act of 1986 reduced the bad-debt deduction as a percent of taxable income to 8 percent in 1987. Thus, over time, the tax laws have provided a large but diminishing incentive to invest in eligible mortgage-related assets.

In addition to the tax laws, there were regulations pertaining to FHLBB-member associations, FSLIC-insured associations, federal associations, and state associations.

The Interest Rate Control Act of 1966, for example, gave the FHLBB the authority to set rate ceilings, which until then had been nonexistent, on the savings deposits of member associations. This ceiling was set initially at one-half of 1 percent but later was reduced to one-fourth of 1 percent above the ceiling rate that commercial banks were permitted to pay on savings deposits. The ceiling represented an attempt to provide a competitive edge to savings and loans to garner funds for the residential housing sector. This differential was abolished in January 1984, and all rate ceilings for depository institutions were eliminated in March 1986.

The regulations for federal associations were initially quite direct in their intention to limit lending to local home-mortgage loans, which meant loans secured by houses within 50 miles of the association’s home office.

In 1964, federal associations were permitted to make unsecured, personal loans for college or educational expenses—the first time they had been allowed to make loans for any purpose other than acquiring real estate.

In the same year, the geographical limit for mortgage loans was extended to 100 miles. Later, Congress extended this limit to encompass the association's home state—and beyond that for the largest savings and loans. Then, in 1983, the FHLBB permitted federal associations to make loans nationwide. Unless prohibited by state law, state associations with FSLIC insurance were permitted to do the same.

Federal associations were also permitted in 1964 to issue mortgages and buy property in urban renewal areas and to buy securities issued by federal, state, and municipal governments. And then in 1968, these associations were allowed to make loans for mobile homes, second or vacation homes, and housing fixtures. Thus began the entry by savings and loans into business areas long viewed as the exclusive domain of commercial banks.

Turbulent 1980s for the savings and loan industry

As interest rates rose unexpectedly and fluctuated widely in the late 1970s and the early 1980s, it became very clear that many savings and loans were ill equipped to handle the new financial environment. Their newly authorized market-rate deposits were rapidly escalating the institutions' cost of funds, while the largely fixed-rate mortgage portfolios were painfully slow to turn over.

The result was rapidly deteriorating profits and a significant increase in failures. The problems persisted -- even as interest rates declined in 1982 and the maturity-mismatch problem lessened—due to a growing deterioration in the quality of assets held by many associations.

The savings and loan industry's ratio of net worth to total assets fell from over 5 percent at the end of 1979 to 3.4 percent at the end of 1985. Over this same period, more than 500 savings and loans failed and an additional 400 or so were left with negative net worth. By the end of the decade, approximately 500 more associations had failed, and the government had bailed out the industry. The insurance fund for savings and loans was a few years later merged into the insurance fund for commercial banks.

The turbulence of the early 1980s, however, did more than reduce the number of institutions. It permanently affected the way savings and loans were to do business. Instead of just savings and time deposits, these institutions began to offer transaction accounts, large certificates of deposit, and consumer repurchase agreements—virtually as wide a selection as that of any commercial bank. On the asset side, these institutions went beyond mortgages to hold consumer loans, commercial loans, mortgage-backed securities, and a wide variety of direct investments. As such, savings and loans were from then on to

differ from commercial banks more as a matter of degree than of kind. The distinctions among the depository financial services firms became forever blurred.

It is important to note that variable-rate mortgages, which existed in the early 1970s in some states such as Wisconsin and California, were rejected by Congress on a national basis in 1974. Although federally chartered savings and loans were allowed to issue variable-rate mortgages in states where state-chartered institutions were permitted to do so, it was not until January 1, 1979, that all federally chartered savings and loans were allowed to offer variable-rate, graduated-payment, and reverse-annuity mortgages on a national basis.

V. Sources of funding for home purchases and homeownership rates

Sources of funding

In addition to savings and loans, non-institutional sources were major providers of home finance before World War II. Frederiksen (1894) reported that in the late 1800s about 55 percent of mortgages in the country were held by local investors who made the loans or sold the property themselves, and about 18 percent by non-resident investors. "So that in America," he wrote, "the making of a mortgage loan is essentially a local transaction."

Frederiksen further noted that "it is entirely satisfactory only when the investor is personally familiar with the property mortgaged, and the insurance is kept up, and when, furthermore, he is able at any time to take steps to protect himself in case of default."

Frederiksen's study indicates that the mortgages averaged less than one-half of the value of the security, and that less than one-half of the property in America was under mortgage.[15] Interestingly enough, when local investors were replaced increasingly by more formal and more regulated sources after World War II, two major real estate crises occurred, one in the 1980s and the other in the late 2000s, with the most recent one more widespread and costly than the earlier crisis.

As may be seen in table 1, savings and loans were a major provider of funding for housing until 1980. Afterward, commercial banks became more important than savings and loans. But in recent decades government-sponsored enterprises (GSEs) have dominated the field.

[15] Frederiksen (1894).

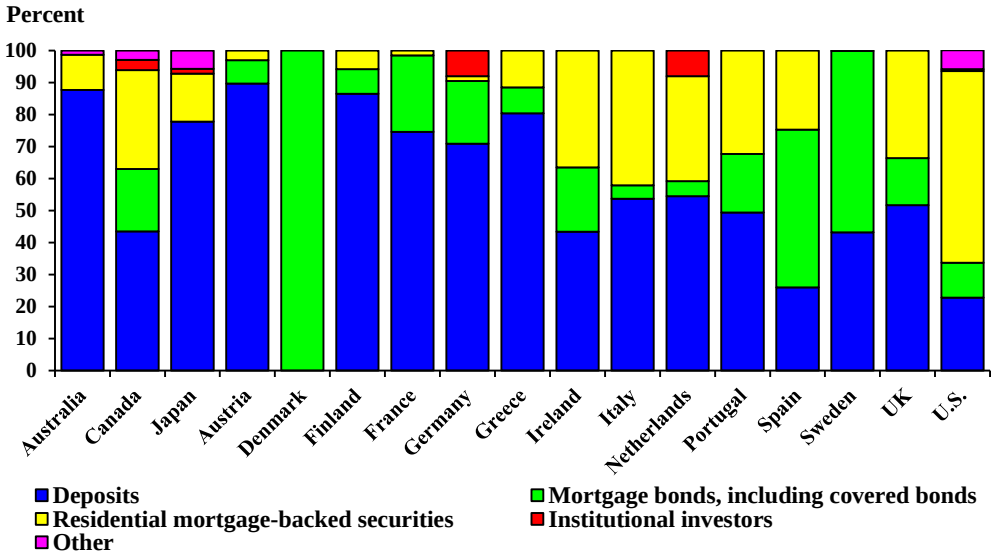
Table 1: Nonfarm residential mortgage holdings by type of institution [a], 1900–2012 Q2

Year	Total holdings (US$ billions)	Percentage of total holdings				
		CBs	S&Ls[b]	LICs	GSEs[c]	Other
1900	2.92	5.42	34.38	6.27	0.00	53.93
1905	3.52	8.32	36.08	7.22	0.00	48.38
1910	4.43	10.05	40.69	9.11	0.00	40.15
1915	6.01	9.41	41.82	8.68	0.00	40.09
1920	9.12	8.77	39.93	6.12	0.00	45.18
1925	17.23	10.78	40.80	8.17	0.00	40.24
1930	27.65	10.29	38.11	10.41	0.00	41.19
1935	22.21	10.02	32.80	9.91	0.00	47.28
1940	23.81	12.59	33.54	12.13	0.75	41.00
1945	24.64	13.78	34.69	14.74	0.03	36.77
1950	54.36	19.19	37.08	20.30	2.44	20.99
1960	162.11	12.56	49.77	17.73	1.79	18.14
1970	352.25	12.96	52.71	12.12	5.24	16.97
1975	574.64	14.43	53.62	6.48	11.11	14.35
1980	1,100.40	15.61	48.41	3.40	16.14	16.44
1985	1,732.10	13.60	37.58	1.94	28.15	18.74
1990	2,893.73	16.19	23.91	1.52	39.83	18.55
1995	3,719.23	18.63	14.64	1.05	48.35	17.34
2000	5,508.59	19.02	11.90	0.75	49.49	18.85
2005	10,049.21	19.21	10.47	0.50	40.74	29.08
2010	11,386.53	21.11	4.32	0.46	53.77	20.33
2011	10,034.36	21.22	4.09	0.06	58.16	16.47
2012 Q2	9,844.03	21.93	3.52	0.07	59.14	15.34

[a] Commercial banks (CBs), savings and loans (S&Ls), life insurance companies (LICs), government-sponsored enterprises (GSEs), and "other", which includes state and local government employee retirement funds, private issuers of asset-backed securities, finance companies, real estate investment trusts, and credit unions.
[b] Include mutual savings banks (MSBs).
[c] This number includes all government-sponsored institutions participating in the mortgage market (government-sponsored enterprises and agency- and GSE-backed mortgage pools) both on-balance sheet holdings and securitized mortgages.
Sources: U.S. Federal Reserve Flow of Funds and Bureau of the Census (Statistical Abstract Supplement, Historical Statistics of the United States, 1961).

As shown in figure 2, financing of homeownership differs substantially across countries. In the U.S., securitization has clearly become very important, while in Denmark covered bonds dominate. In other countries like Australia, Japan, Austria, Finland, France, Germany, and Greece, homeownership has been financed largely through the use of deposits at financial institutions.

Figure 2: Sources of funding for home mortgages in selected countries, 2009



Note: Based on the latest available data from sources below.
Sources: Author's calculation. U.S. Federal Reserve Flow of Funds (2009) for the United States; Hypostat (2009) for EU countries; Odaira and Takado (2008) and Japan's Government Housing Loan Corporation; and Australian Bureau of Statistics.

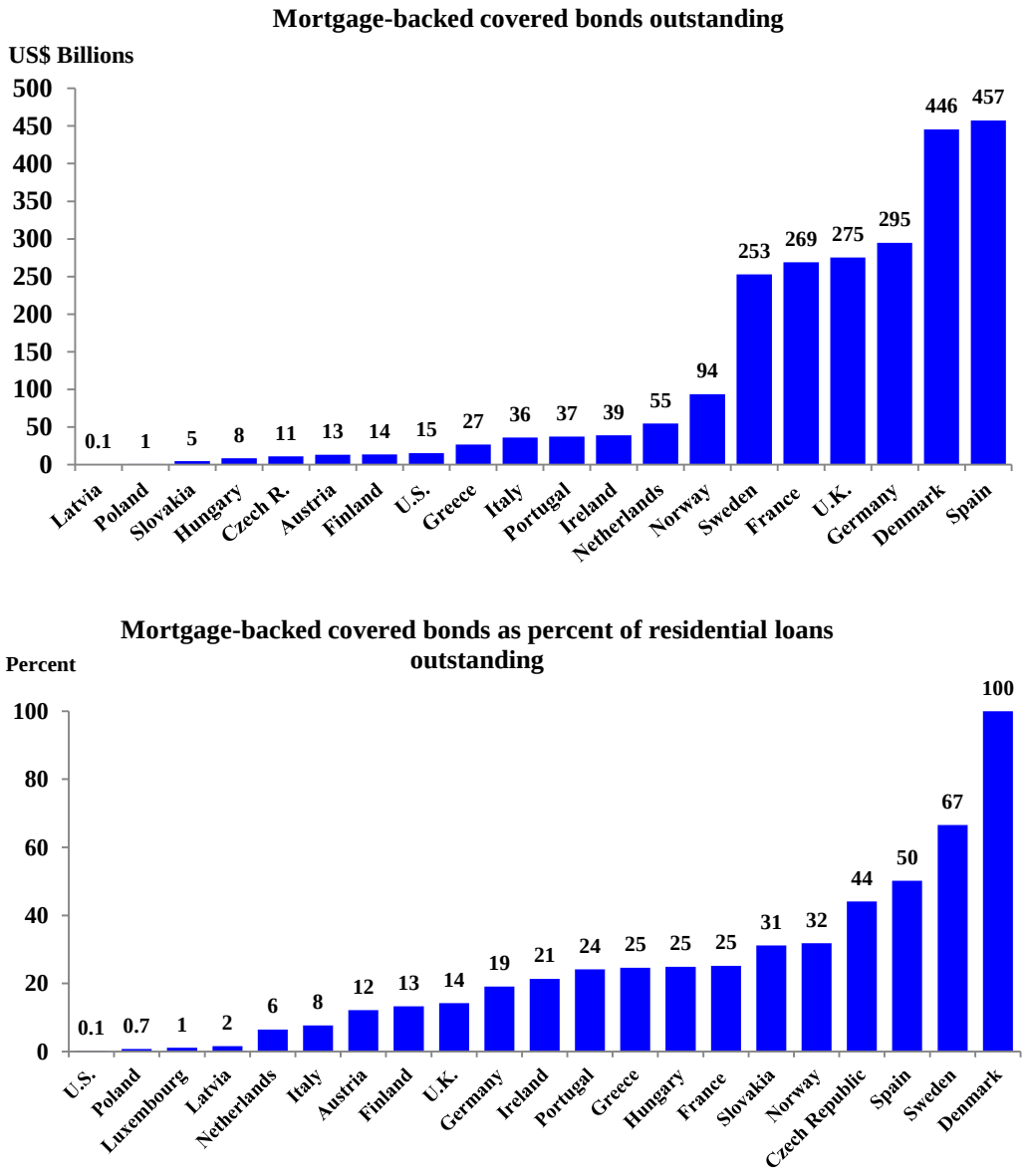
It should be noted that, in 1769, Frederick the Great of Prussia structured the first covered bonds in the aftermath of the Seven Years' War to ease the credit shortage in agriculture. These bonds were later extended to provide funding for residential and commercial real estate. Issued by banks and secured by a pool of mortgages, covered bonds resemble mortgage-backed securities, with the exception that bondholders have recourse to the underlying collateral of those bonds because the mortgages stay on the balance sheets of issuing banks.[16]

The use of covered bonds has been largely restricted to European countries, with the spread to Canada and the United States being a recent development. These bonds are the primary source of mortgage funding for European banks. As compared to the securitization used by banks in the United States, covered bonds have a cost disadvantage due to greater capital requirements.[17]

Figure 3 shows the extent to which the mortgage-backed covered bonds play a role in financing homeownership in 2010. Denmark is notable, with covered bonds accounting for 100 percent of residential loans outstanding. In the United States, covered bonds are a new development and thus still relatively unimportant in financing homeownership.

[16] Allen and Yago (2010) and Paulson (2008).
[17] For further discussion, see Bernanke (2009).

Figure 3: Covered bonds in selected countries, 2010



Source: Hypostat (2010).

Homeownership rates

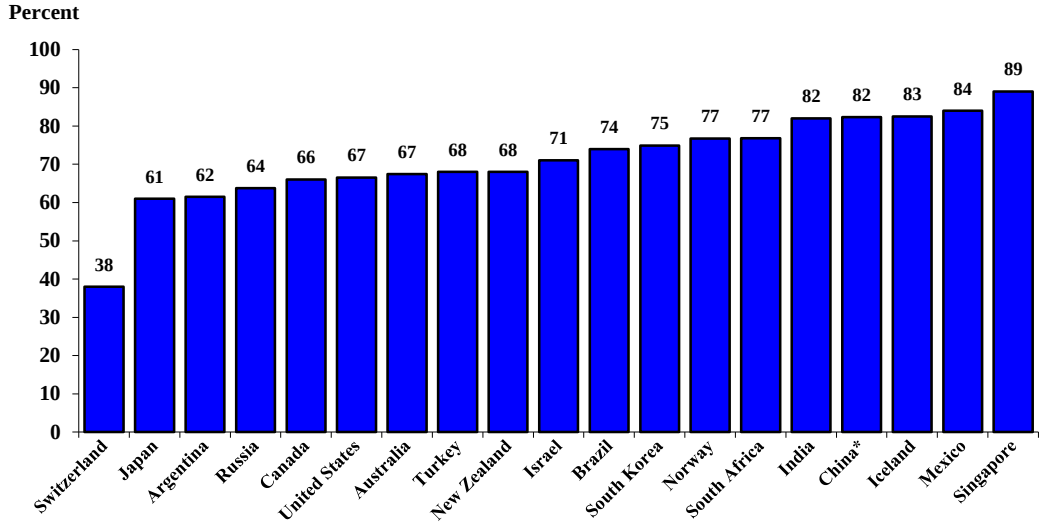
How does America stack up against other nations in terms of homeownership? The answer to that question has varied over time. In 1890, the U.S. homeownership rate was at 17.9 percent compared to 6.7 percent for Europeans. By the middle of the 20th century, that rate had risen above 61 percent in the United States, but European countries were gaining as well. Their rates were 50 percent for Belgium, 33

percent for France, 13 percent for Germany, 26 percent for Sweden, and 43 percent for the United Kingdom.[18]

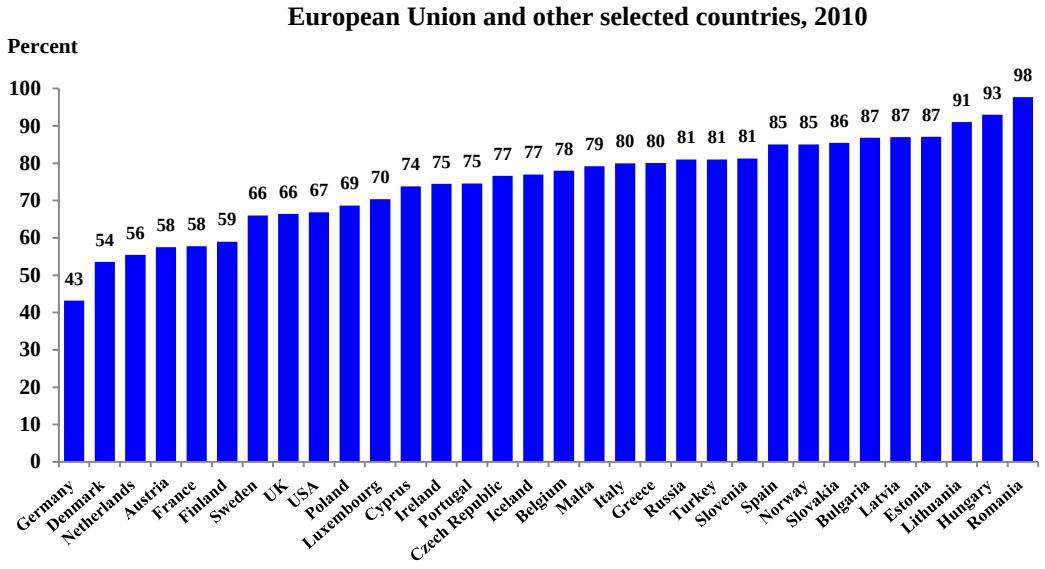
Figure 4 shows more recent data, with homeownership rates varying from a low of 38 percent in Switzerland to a high of 98 percent in Romania. Of the 47 countries in the figure, only Switzerland and Germany (43 percent) fall below 50 percent. These low rates have been attributed to cultural factors, very low rents, and conservative mortgage lending.[19] Italy, Greece, and Spain have much higher rates of homeownership, reflecting cultural values, discriminatory policies toward private rental housing, and weaker support of "social" rental housing (low-cost public housing owned and managed by government or nonprofit organizations).[20] Fisher and Jaffe have found that, even though there are several partial factors associated with high or low rates of homeownership, no single explanation can account for all global patterns. In their words, "any explanation of worldwide homeownership rates must be limited from a generalizable proposition to an anecdotal explanation with limited empirical content."[21]

Figure 4: Homeownership rates in various countries around the world

Selected countries, 2009



[18] Haines and Goodman (1991).
[19] Bricks and Slaughter, A Special Report on Property (2011).
[20] Lea (2010).
[21] Fisher and Jaffe (2003).



* Homeownership rate only for households that have hukou. (Hukou are people with official registration at cities of residence.)
Note: Based on the latest available data from sources listed below. In countries like Brazil where there are favelas it is not clear exactly how these are treated in terms of the homeownership rate that is provided. Also, it is not clear in another country like South Africa what is included or excluded in the homeownership rate. The sources listed do not always provide sufficient detail to elaborate on these issues.
Sources: EMF Hypostat (2010) for EU countries and Iceland, Russia, Norway, Turkey; Whitehead (2010) for Australia and Canada; Pollock (2010) for Japan, Israel, New Zealand, and Singapore; U.S. Census Bureau for the United States; Euroconstruct (2008) for Switzerland; Gao (2010) for China; and United Nations (2001) for Argentina, Brazil, South Korea, South Africa; Soula Proxenos (2002) for India.

Figure 5 provides information on the ratio of home mortgage debt to GDP to accompany the homeownership rates just discussed. As may be seen, Switzerland has the highest ratio at 130 percent in 2009, even though it has the lowest homeownership rate among the countries in the figure. This reflects a high cost of housing due to substantial increases in housing prices over the past decade and a sizable group of wealthy domestic and foreign-born (often transient) individuals who can afford more expensive homes. Germany has a mortgage-debt-to-GDP ratio that is relatively low at 47 percent in 2010, reflecting its low rate of homeownership. Overall, the ratio for the 27 European Union countries was 52.4 percent in 2010 as compared to a U.S. ratio of 76.5 percent in the same year.

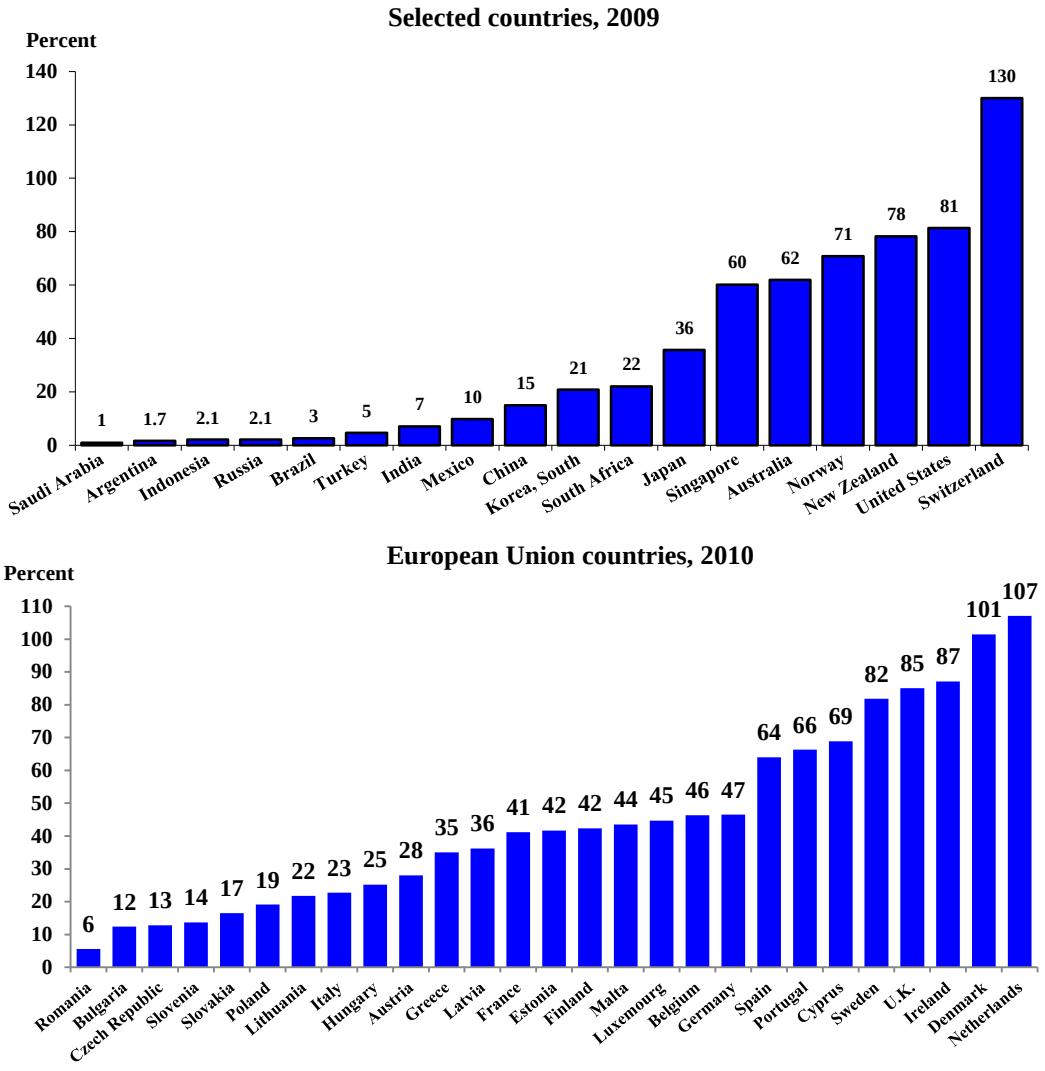
According to Bardhan and Edelstein, "The large differences in the national mortgage markets reflect the fact that mortgage markets retain strong national characteristics … as a result of the differences in the historical, demographic, political and regulatory environments in which mortgage lenders operate."[22] In some countries, like France, mortgage interest is not subsidized, while the rental market is

[22] Bardhan and Edelstein (2009) and Lea (2010a).

subsidized and heavily regulated. This policy contributes to lower homeownership rates, which in turn leads to lower mortgage-debt-to-GDP ratios.[23]

More generally, as urban property values increase and more developed mortgage capital markets emerge in cities, a higher proportion of homes can be financed by mortgages in areas of rapid urbanization and industrialization. In this way, homes become not only secure shelter, but also provide potential income (through rentals and boarding) and serve as collateral for borrowing.

Figure 5: Home mortgage debt to GDP in various countries around the world



Note: Based on the latest available data. EMF Hypostat (2009) provides the latest data as of 2009, and Warnock and Warnock (2008) for the average data from 2001-05.
Sources: EMF Hypostat (2010) for EU countries and Iceland, Russia, Norway, Turkey, and the United States; Warnock and Warnock (2008) for the other countries.

[23] Green and Wachter (2005).

VI. Federal government involvement in mortgage markets

Since the 1930s, the federal government has played an increasingly important role in the allocation of mortgage credit. Instruments of federal policy used for this purpose include or have included loans insured and guaranteed by the Federal Housing Administration and Veterans Administration; secondary mortgage transactions by the Federal National Mortgage Association (Fannie Mae), Federal Home Loan Mortgage Corporation (Freddie Mac), and the Government National Mortgage Association (Ginnie Mae); interest rate subsidies; tax expenditures; and direct loans. Federal regulations have been enacted to affect the behavior of mortgage lenders in the pursuit of social objectives. These regulations include the Fair Housing Act (Title VIII), the Equal Credit Opportunity Act, the Home Mortgage Disclosure Act, and the Community Reinvestment Act.

Housing policies are clearly a part of the stabilization, allocation, and distribution activities of the federal government. The first major federal housing initiatives, enacted in the National Housing Act of 1934, as mentioned earlier, were part of an economic recovery program implemented during the Great Depression. Though stabilization of economic activity has always remained an important objective, allocation and distribution objectives have become increasingly important. Indeed, such aims were explicitly acknowledged in the 1949 Housing Act, which proposed a "goal of a decent home and a suitable living environment for every American family."

An implicit but important goal of federal housing policies has been to encourage the acceptance of greater risk in mortgage markets. Encouraging greater risk-taking may be socially desirable for reasons of economic efficiency and distributional equity. Attitudes toward risk by private lenders and federal, state, and local financial regulatory agencies, however, may prevent mortgage transactions that would be profitable for borrowers and lenders. In such cases, appropriately designed federal mortgage insurance programs may enhance the efficiency of mortgage markets. Low-income applicants for mortgages are likely, for numerous reasons, to be more risky. Improving the access of such individuals or groups to mortgage credit through government actions can be a means of achieving greater distributional equity.

Table 2 shows that the United States is one of relatively few countries among those listed in which the government provides support to residential mortgage markets.[24] As a result of the recent mortgage market meltdown in the United States, the role of the government in mortgage markets is being reconsidered. However, as of the writing of this paper, no legislative action had been taken to make any major changes, particularly as regards government-sponsored enterprises.

[24] According to Ergungor (2011), the fiscal year 2010 budget indicates that "…the U.S. government will spend $780 billion in tax expenditures over the next five years to subsidize housing through mortgage interest and property tax deduction…."

Table 2: Government support for mortgage markets

Country	Government mortgage insurance	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
United Kingdom	No	No	No
Australia	No	No	No
Canada	Canada Mortgage Housing Corporation	Canada Mortgage Housing Corporation	No
Japan	No	Japan Housing Finance Agency	Possible
South Korea	No	No	Korean Housing Finance Corporation
Switzerland	No	No	No
United States	FHA	GNMA	Fannie Mae, Freddie Mac, FHLBs

Source: Michael Lea, "International Comparison of Mortgage Product Offerings." *Special Report*, Research Institute for Housing America, Mortgage Banker Association, September 2010.

It should also be noted that the Canada Mortgage and Housing Corporation, which is a 100 percent government-owned and -controlled corporation, insures (guarantees) mortgage loans and securitizes some of the insured loans. Pollock points out that CMHC is "in one sense…a combination of FHA and Ginnie Mae." He adds that it insures roughly half of Canadian mortgages, which is the same proportion as the combined Fannie Mae and Freddie Mac in the United States.[25] Homeownership rates are nearly identical in the two countries, as shown in figure 2. Furthermore, despite all the U.S. government support for homeownership, Australia, Ireland, Spain, and the United Kingdom all have higher homeownership rates with far less government support.

New mortgage products and mortgage insurance

During the 1920s, the U.S. mortgage market relied heavily on mutual savings banks, savings and loan associations, insurance companies, and commercial banks. These four types of institutions accounted for 74.4 percent of the total new mortgage loans made on one- to four-family housing from 1925 to 1930. The typical mortgage terms on loans made by these institutions during this period were quite different from those prevailing in subsequent periods, including the present. During the 1920s, mortgages were written with term to maturities not exceeding 12 years and with loan-to-value ratios close to 50 percent. In the 1930s and 1940s, however, these mortgage terms were significantly loosened. By 1947 the term to

[25] Pollock (2010).

maturity approached 20 years and the loan-to-value ratio was roughly 70 percent. In more recent years, both of these factors were further liberalized.

During the 1930s, the housing and banking industries virtually collapsed. Between 1930 and 1933, more than 8,800 banks failed. In 1933 alone, 3,891 banks suspended operations. Total housing starts fell 70 percent, from 2,383,000 in 1926-1930 to 728,000 in 1931-1935. It is estimated that only 150,000 persons were employed in on-site construction in 1933. At the same time, approximately half of all home mortgages were in default, and foreclosures were occurring at the phenomenal rate of over 1,000 per day. Nonfarm real estate foreclosures reached a maximum of 252,000 in 1933.

Among the responses of the federal government to these events were the establishment of the Home Owner's Loan Corporation (HOLC) in 1933 and the passage of the National Housing Act of 1934, which created the FHA mortgage insurance programs. HOLC was established to buy mortgages in default and threatened with foreclosure. It was therefore directly concerned with mortgage debt and only indirectly, if at all, with the availability of new mortgage credit. At its peak in 1935, the HOLC held more than 15 percent of all U.S. residential mortgage debt. By contrast, the National Housing Act of 1934 was designed to increase the availability of new mortgage credit and thereby encourage the revival of the housing industry. The principal instrument was Section 203(b) of the National Housing Act.

Mortgages insured under Section 203 (b) were secured by the Mutual Mortgage Insurance Fund (MMIF). The creation of the Federal National Mortgage Association (FNMA, also known as Fannie Mae), in 1938 provided additional impetus to 203(b) mortgage activity since FNMA was authorized to buy such mortgages. FNMA therefore made FHA mortgages extremely liquid by providing a ready secondary market for the longer-term type of mortgages offered under Section 203(b).

The main feature of Section 203(b) was the provision of mortgage insurance to all borrowers at a uniform premium. Each 203(b) loan was to be evaluated on the basis of economic soundness to ensure the solvency of the MMIF. Though no formal definition of economic soundness was provided in the legislation, limits were placed on the maximum mortgage amount and the maximum loan-to-value ratio. There is, however, a general consensus in the literature that FHA implemented Section 203(b) mortgage insurance by imposing minimum values on neighborhood quality, property quality, and borrowers' creditworthiness. These criteria were implemented by conducting a property inspection, and maximum permissible values were established for monthly payment-to-income ratios.

High levels of mortgage insurance activity experienced under Section 203(b) during the 1930s, 1940s, and 1950s, along with sizable surpluses in the MMIF, indicate that, during this period, the bulk of FHA-insured mortgage loans were profitable. Indeed, as early as 1938, the maximum loan amount and the maximum loan-to-value ratio were increased based upon favorable loss experience. Subsequently, these maximums were further increased. Government insurance transactions generally met or exceeded the

criterion of actuarial or economic soundness. Note, however, that it is possible for the average transaction to earn a profit even though the marginal loan transaction, at the highest loan-to-value ratio, may suffer a loss.

Congress has traditionally set the maximum mortgage amount that can be insured under FHA programs. In 2008, under the basic Section 203(b) single-family mortgage insurance program, the limit was $362,790. Thirty years earlier in 1978, the limit was $60,000, which was in force since 1977. Before then, the cap was $45,000, a limit introduced by the Housing and Community Development Act of 1974. Until the passage of this act, the mortgage limit was $33,000.

If housing prices rise more rapidly than these congressionally determined mortgage limits, the maximum permissible loan-to-value ratios must necessarily fall. This reduction in the real value of mortgage limits in inflationary periods induces borrowers to shift to conventional mortgage loans.

The first private mortgage insurance company was established in 1887. The 1950s also saw the revival of the private mortgage insurance (PMI) industry, which began to offer insurance for conventional mortgage loans for the first time since the 1930s. The industry had collapsed during the Great Depression.

As the result of legislation passed in 1956 in Wisconsin, the Mortgage Guarantee Insurance Corporation began operating in 1957. Subsequently, more and more PMIs were permitted to operate as additional states passed enabling legislation.

The PMIs became increasingly important thereafter. The standard mortgage insurance policy indemnifies the beneficiary against losses in the event of default, with the amount indemnified depending on the special coverage chosen.

An increase in the demand for conventional loans, of course, also results in an increase in the demand for PMI. When the U.S. housing market collapsed in 2007 and 2008, mortgage insurers paid $15 billion in claims.

PMI competes with FHA insurance by offering lower premiums for safer mortgages. FHA generally sets an insurance premium of 0.5 percent of the outstanding mortgage amount, collected over the life of the loan on a current basis, on all its loans. In contrast, PMI premiums vary according to the loan-to-value ratio of the mortgage, the percentage of the mortgage amount insured, and the choice of prepayment option with fixed length of coverage. Of course, these premiums are set lower than the FHA premium because the PMI companies only insure relatively low-risk mortgage loans, a practice known as "cream-skimming." FHA is left with the rest. Increased PMI activity decreases the volume of Section 203(b) insurance activity and raises the loss rate, thereby reducing the surplus in the MMIF. Both of these outcomes have been observed.

The FHA has made a number of important contributions. Among these are assisting in the popularization and standardization of the fully amortized, fixed interest, level payment mortgage;

assisting in the lengthening of the term of the mortgage; assisting in the increasing of the loan-to-value ratios on residential mortgages; assisting in the development of minimum property standards, standardized appraisals, and the standardization of the mortgage contract; and assisting in the provision of information on risks of default that was then available to private mortgage lenders and insurers. All of these factors, of course, have contributed to the development of a truly national mortgage market.

The introduction of PMI encouraged lenders to make larger loans because with insurance conventional loans could be sold to such institutions as FNMA and FHLMC (discussed in the next section). Until these institutions were created or were permitted to buy conventional insured mortgages, however, lenders were undoubtedly reluctant to relax their loan terms, particularly when faced with usury laws or "soundness" requirements imposed by federal or state regulatory agencies.

Government-sponsored enterprises (GSEs)

The United States established three government-sponsored institutions to support the housing sector. First, as noted earlier, the Federal Home Loan Bank Act set up the Federal Home Loan Bank System in 1932, consisting of 12 regional Federal Home Loan Banks, to strengthen savings and loans by providing them with an alternative and steady source of funds to promote homeownership. It now provides such funding to all depository institutions. Second, the FNMA was established in 1938 to buy home mortgages and thereby created a secondary market for such mortgages. Third, the Federal Home Loan Mortgage Corporation (FHLMC, also known as Freddie Mac) was established in 1970 to increase the availability of residential mortgage credit by contributing to the development and maintenance of the secondary market for residential mortgages.

Since FHLMC primarily buys conventional mortgages and then issues securities backed by those mortgages, a process known as securitization, its creation increased the liquidity of this type of mortgage loan. More important, however, is the FHLMC policy (required by its enabling legislation) of limiting its purchases of conventional mortgages to those in which the borrower has at least a 20 percent equity in the property or in which a lower borrower equity is accompanied by private mortgage insurance, so that the effective exposure risk is reduced to 80 percent of the loan amount. Clearly, this policy increased the demand for PMI. About the same time that the FHLMC was created, the Emergency Home Loan Financing Act of 1970 authorized FNMA to buy conventional mortgages and securitize home mortgages.

The Federal Housing Enterprises Financial Safety and Soundness Act of 1992 established goals for Fannie Mae and Freddie Mac for financing affordable housing and housing in inner cities and rural and other underserved markets. In 1996, the affordable housing goal was increased from 40 percent to 42 percent of their financing to go to borrowers with low and moderate incomes for each year from 1997 through 2000. This goal was boosted to 50 percent for the years 2001 to 2004 and raised still higher in

some subsequent years as shown in table 3. The table also shows that revisions were made for 2010 and 2011 to include four separate goals and one sub-goal for purchases of single-family mortgages and one goal and one sub-goal for purchases of multifamily mortgages.

There are also goals for underserved areas (low-income and/or high-minority census tracts and rural counties) and special affordable housing (very low-income families and low-income families living in low-income areas). The low-income areas housing goal targets the purchases of mortgages in specified geographic areas in the revisions made in 2010 and 2011 in a manner similar to the previous underserved areas goal.

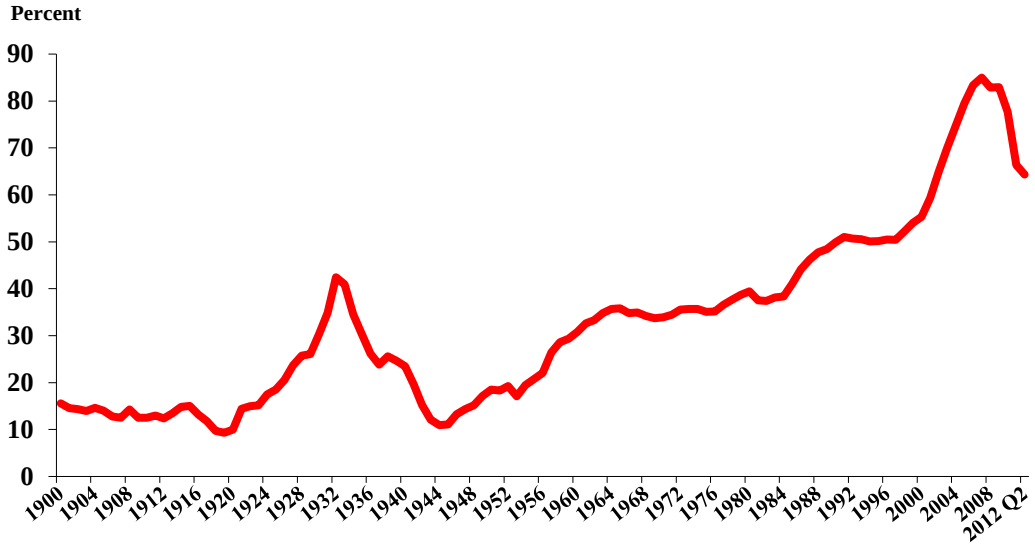
Table 3: Housing goals set for Fannie Mae and Freddie Mac

	1997-2000 housing goals	2001-2004 housing goals	2005-2008 housing goals				2009 housing goals	2010 redefined benchmarks	2010-2011 housing goals	2012-2014 housing goals
			2005	2006	2007	2008				
Low and moderate income families	42	50	52	53	55	56	43	**Low-income families**	27	20
Underserved areas	24	31	37	38	38	39	32	**Very low-income families**	8	7
Special affordable	14	20	22	23	25	27	27	**Low-income areas**	13	11
								Refinancing Mortgages	21	21

Sources: Federal Register, Milken Institute.

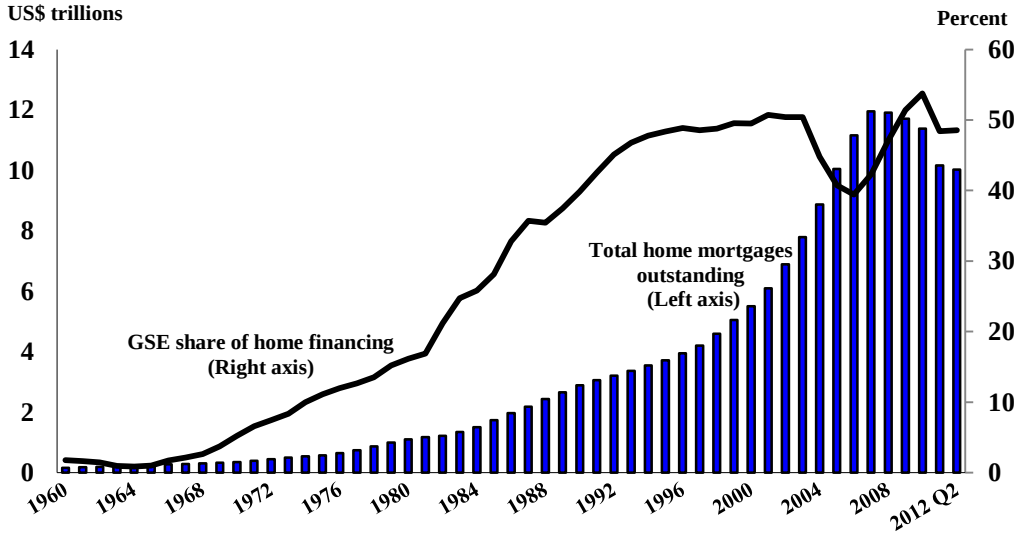
Figure 6a shows the ratio of total mortgages outstanding to GDP over the past century, while figure 6b shows the growing importance of financial institutions like FHLMC and FNMA in financing homeownership over the past three decades. (As a result of the recent mortgage market meltdown, however, their future remains uncertain as of the writing of this paper.) Like FHLMC, FNMA can only buy high loan-to-value ratio conventional loans if these loans have private mortgage insurance. FNMA's activities and policies therefore also increased the demand for PMI. In the early 1970s, regulations were also promulgated permitting thrift institutions to originate mortgages at 95 percent of value when the individual loans are insured.

Figure 6a: Total mortgages outstanding as percentage of GDP



Sources: U.S. Federal Reserve Flow of Funds, Bureau of the Census (Statistical Abstract Supplement, Historical Statistics of the United States, 1961), and Bureau of Economic Analysis.

Figure 6b: Total home mortgages outstanding and share of home financing provided by government-sponsored enterprises



Sources: U.S. Federal Reserve Flow of Funds, Bureau of the Census (Statistical Abstract Supplement, Historical Statistics of the United States, 1961), and Bureau of Economic Analysis.

The securitization of residential mortgages has clearly spread beyond the United States during the past 30 years, as shown in table 4. Other developments have also facilitated the financing of homeownership, such as covered bonds in Denmark and Pfandbrief in Germany. Clearly, however, the use of securitization and covered bonds to fund home purchases is found in more mature economies due to their more complex legal and financial issues.

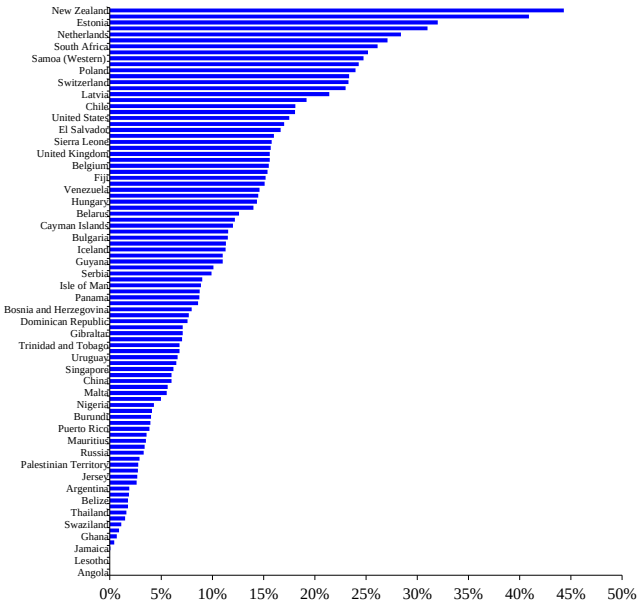
Table 4: Date of first mortgage-backed securitization

Year	Country
1970	United States
1984	Australia and Canada
1985	United Kingdom
1988	France
1989	South Africa
1991	Spain
1995	Germany and Ireland
1996	Argentina
1999	Brazil, Japan, Italy and South Korea
2000	India
2003	Mexico
2004	Malaysia
2005	China
2006	Russia and Saudi Arabia

Source: Milken Institute, Capital Access Index 2005.

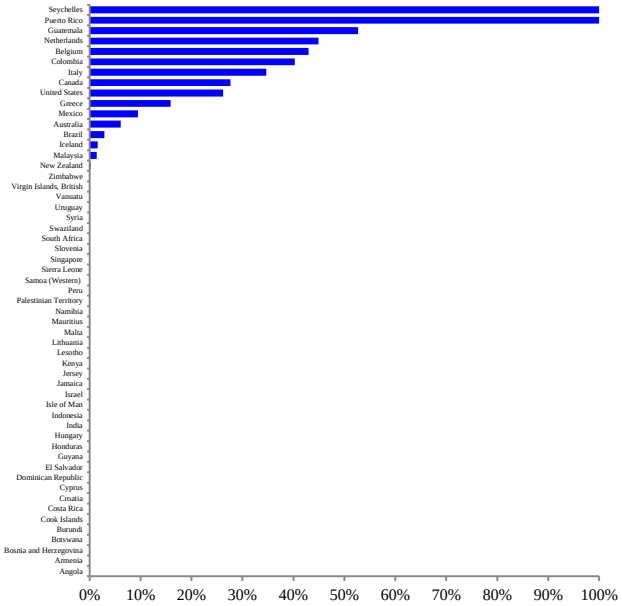
To show the limited role of securitization in housing markets in countries around the world, we rely upon data in the World Bank Survey IV released in September 2012. Figure 7 shows the percentage of bank assets in residential real estate loans in various mature and emerging market economies for 2010, while figure 8 shows the percentage of the loans that have been securitized. Comparing these two figures, it is clear that almost all the banks in the countries do indeed hold residential real estate loans on their balance sheets. However, in only a relatively few countries are such loans securitized. The vast majority of the countries in which no real estate loans are securitized are developing countries.

Figure 7: Percentage of bank assets in residential real estate loans (2010)



Source: World Bank Survey IV, September 2012.

Figure 8: Percentage of securitized residential real estate loans (2010)



Source: World Bank Survey IV, September 2012.

Federal policies to address special housing problems in inner cities

In the 1950s and 1960s, federal housing policy focused increasingly on inner cities. This represented a basic shift from the primary emphasis placed in the 1930s and 1940s on increasing the supply of adequate housing. This change was initially reflected in the Omnibus Housing Act of 1954, which attempted to expand housing credit and production in urban renewal areas, and provided mortgage insurance to families displaced by urban renewal.

In addition, the Federal National Mortgage Charter Act of 1954 established the first special assistance functions (which require governmental financial support) to be carried out by FNMA. These new programs were established with their own statutory provisions and insurance funds to permit them to function almost independently of FHA. This was done to insulate the original FHA mortgage insurance fund, supporting programs such as Section 203 single-family home mortgage insurance, from the effects of the relatively permissive underwriting terms of each new program.

Relaxation of mortgage terms relative to those in effect for the regular government mortgage insurance programs was a major feature of the 1954 Housing Act and the 1954 Mortgage Charter Act. The trend toward liberalization continued with generous insurance terms on housing for the elderly and loans at subsidized interest rates to developers of private housing for the elderly. The 1961 Housing Act further relaxed the terms of government mortgage insurance and broadened the coverage of insurance to include low- and moderate-income families. The Act enabled such families to acquire housing at low down payments. It provided for subsidized, below-market-interest rate mortgage insurance. The Housing and Urban Development Act of 1968 designated troubled urban areas as worthy of special consideration, including waiver of statutory limitations concerning loan-to-value ratio, size of unit, or maximum mortgage amount. The terms of the mortgages insured under this provision were to be designed with consideration for the needs of "families of low and moderate income in such areas."

Government regulation of conventional mortgage lenders

The expansion of FHA mortgage insurance and housing subsidies during the 1960s and 1970s was perceived as less than completely successful in achieving social objectives. Several explanations were offered. Racial discrimination was cited as one barrier to the efficient and equitable functioning of urban housing markets. Concern about discrimination in housing markets was manifested in the Fair Housing Act in 1968 and Equal Credit Opportunity Act in 1974. Both regulations define criteria that creditors may and may not use in their lending decisions. In general, both acts prohibit lenders from denying or limiting credit solely on the basis of race, sex, creed, or national origin. In addition, the Fair Housing Act permits lenders to take some neighborhood characteristics into account, but not others.

The Home Mortgage Disclosure Act of 1975 and the Community Reinvestment Act of 1977 are aimed at increasing the volume of conventional loans in redlined areas. HMDA requires lenders to disclose the location of their loans, though interestingly enough, not deposits. CRA represents an increased effort to prod lenders to expand mortgage lending in older and moderate-income areas in which they have offices.

VI. **Turmoil in global housing markets: Implications for the future of housing finance**

In the wake of the global financial crisis of 2007 to 2009, it is important to understand the implications of this economic tsunami for the future of housing finance, not just in the United States but in other countries around the world. We begin with the collapse of the housing and mortgage markets in the United States.

The U.S. Housing Crisis

The residential mortgage market in the United States has worked extremely well over the past two centuries, enabling millions to achieve the dream of homeownership. The homeownership rate reached a record high of 69.2 percent in the second quarter of 2004 before declining to 65.5 percent at the end of the second quarter in 2012 (see figure 1), with all segments of society participating during the rate-increasing period.

To be sure, housing markets have experienced previous periods of turmoil. After the Great Depression, the first major episode was the collapse of the savings and loan industry in the early 1980s. This led to significant changes in mortgage markets.

When the Federal Reserve changed its policy to combat inflationary pressures in the late 1970s, short-term interest rates rose rapidly, and the yield curve inverted, with short-term rates exceeding longer-term rates. At the time savings and loans were heavily involved in the mortgage market, holding about half of all mortgage loans in portfolio. The vast majority of these loans were traditional fixed-rate, 30-year mortgages. The inverted yield curve meant nearly all savings and loans were insolvent if their mortgage portfolios had been marked to market because the interest rates on their outstanding mortgage loans were lower than the rates on Treasury securities of comparable maturity as well as newly issued mortgage loans. The nearly 4,000 savings and loans in existence at the time were estimated to be insolvent on this basis by roughly $150 billion (or $417 billion in 2011 dollars).

The reason for this dire situation was that the savings and loan institutions were largely prohibited from offering adjustable-rate mortgages or hedging their interest-rate risk through the use of derivatives. Congress responded to the crisis by broadening the powers of savings and loans so they could operate more like commercial banks, which largely avoided the same plight. Furthermore, savings and loans were also allowed to offer adjustable-rate mortgages.

This financial innovation enabled savings and loans to shift some of the interest-rate risk to borrowers. While adjustable-rate mortgages accounted for less than 5 percent of originations in 1980, that share had increased to 64 percent in 2006, before declining to 37 percent in 2010 as a result of the financial crisis.[26]

The broader powers of savings and loans also meant a blurring of distinctions among different types of depository institutions. The share of home mortgages held by savings institutions dropped from 50 percent in 1980 to 8 percent in 2006 to less than 3.5 percent in the second quarter of 2012, while commercial banks saw their share rise from 16 percent to 22 percent over the same period.

The percentage increase for commercial banks may seem relatively small, but the total assets of commercial banks in the second quarter of 2012 were $13 trillion, compared to the $1 trillion in assets for savings institutions. These figures indicate commercial banks are now more important for financing housing than saving institutions.

The second episode of disruption emerged in the summer of 2007, triggered by the "subprime mortgage market meltdown." The 1980s savings and loan crisis was more regional in nature, while the subprime damage was truly national in scope. Millions of households with subprime loans (loans made to less creditworthy individuals) became delinquent on their mortgages, and many lost their homes to foreclosure. Many of these homebuyers took out "hybrid" mortgage loans, which featured low introductory interest rates for two or three years but a higher rate thereafter. This financial innovation was fine as long as home prices continued to rise. With increases in home prices, borrowers could refinance their mortgages at lower interest rates as equity was being built up. Such individuals had the opportunity to improve their credit ratings at the same time.

Unfortunately, home prices fell—and fell dramatically. This led to a surge in foreclosures and a tightening of credit standards by lenders that triggered the housing market meltdown, and contributed to a more general financial crisis and deep recession. As of the writing of this paper, housing prices have appeared to bottom out and even increased in some parts of the country, which has helped improve the overall residential real estate sector. This underscores the importance of promoting well-functioning housing markets in countries around the globe.

Changes in U.S. mortgage markets over the past three decades contributed to the most recent crisis. Before 1980, as already noted, the vast majority of mortgage loans were made by savings and loans. These institutions originated, serviced, and held these loans in their portfolios. But as early as 1970, the combining of these three functions by a single institution began to change, as mortgage loans were increasingly securitized.

In subsequent years, Ginnie Mae, Fannie Mae, and Freddie Mac became the primary securitizers of home mortgages. These three entities securitized only 5.2 percent of all outstanding mortgages in 1970, but their share

[26] Office of Thrift Supervision (2011).

rose to a high of 49.5 percent in 2000 before declining to 40.7 percent in 2005, and then subsequently increasing to 59.1 percent in second quarter of 2012 (see table 1).

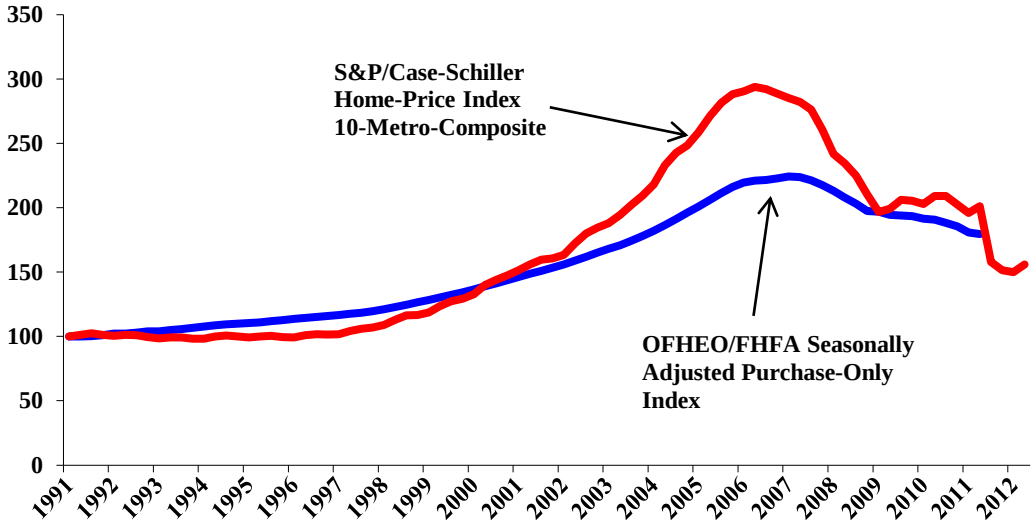
Furthermore, financial institutions themselves began to securitize mortgages, which are referred to as private-label-backed mortgage pools, which was an innovation. Their share of home mortgages was less than 1 percent in 1984 and then increased to a high of 21 percent in 2006, before declining to 14 percent in 2009. The private-label-backed mortgage pools increased significantly before the financial crisis and then declined abruptly during and after the crisis. As of mid-2012, nearly all securitization of mortgages was being done by Ginnie Mae, Fannie Mae and Freddie Mac. The role of private-label securitizers in financing housing had become virtually nonexistent.

Beginning in the second half of the 1990s, subprime mortgage loans grew rapidly in importance. The subprime share of total originations was less than 5 percent in 1994, increased to 13 percent in 2000, and then grew to more than 20 percent in 2005 and 2006, before declining to 0.3 percent in 2010 and at the end of second quarter of 2011. Furthermore, the share of subprime originations packaged into mortgage-backed securities (MBSs) more than doubled over the same period, from 31.6 percent to 80.5 percent, before declining to zero in 2010 and at the end of second quarter of 2011. The subprime mortgage market essentially shut down in 2009 and thereafter. But this was not all that was happening. MBSs were put into pools and new securities were issued, referred to as collateralized debt obligations (CDOs). The issuers of CDOs were the major buyers of the low-rated classes of subprime MBSs in 2006. CDOs were also put into pools and still newer securities issued, known as "CDOs-squared."

Lending institutions and investors seeking higher yields in the earlier years of the decade found the subprime market attractive but apparently underestimated the risks. At the same time, the prospect of subprime loans coupled with rising home prices undoubtedly enticed borrowers in many parts of the country.

Home prices jumped nationally at an average annual rate of nearly 9 percent from 2000 to 2006, after rising an average of slightly less than 3 percent per year in the 1990s (see figure 9). Stated another way, a home worth $150,000 in 2000 was worth $251,565 in 2006. This environment undoubtedly fueled optimism on the part of lenders, borrowers, and investors.

Figure 9: Home prices peak in 2006 and subsequently decline
(1991 Q1 – 2012 Q2; Index, 1991 Q1=100)



Source: S&P/Case-Schiller (Bloomberg) and OFHEO/FHFA.

In the summer of 2007, several subprime lenders filed for bankruptcy, and other financial firms suffered heavy losses on subprime securities. The rate of foreclosures on subprime loans increased and by some estimates nearly doubled from 2000 to 2006. For loans made in 2006, the foreclosure rate was 5.5 percent after just six months from origination. This exceeded the corresponding rates for all previous years. As of November 2007, there was one foreclosure for every 617 households, according to RealtyTrac.

This situation led to many condemnations of subprime mortgages, particularly hybrid loans or loans with interest rate resets. The process of securitizing loans was questioned. Some critics argued that subprime borrowers should not have been offered many of the innovative financial products that became available before the housing market collapse. It is important to remember, however, that the growth in this market reflected a combination of factors, including the increase in first-time homeownership attributable to less-rigorous screening of loan seekers. Subprime loans also let some borrowers improve their credit scores and then qualify as prime borrowers. Furthermore, most of the same types of mortgage products offered to subprime borrowers were also offered to prime borrowers. And the securitization of these products was important in enhancing the liquidity of mortgage loans and increasing the supply of funds for such loans. Most importantly, the factors that cause individuals to enter foreclosure are generally not linked to the type of product they receive, but rather the financial straits they find themselves in after they obtain mortgage loans. These difficulties include unemployment, divorce, health problems and, especially, a decline in housing prices that leaves homes worth less than their outstanding mortgage balances.

By recognizing the key role these factors play, it becomes clear that additional legislation and regulations cannot—and should not try to—prevent subprime lending (or innovation in the mortgage markets more generally), because that will simply shut off credit to less-creditworthy individuals who want to become homeowners. Instead, efforts should focus on better educating consumers about complex loan products and simplifying the documents necessary for informed decision-making. Consumers must be allowed to choose mortgage products, even if some expose borrowers to interest-rate risk. Also, investors, domestic and foreign, in securities backed by subprime loans—particularly in the more exotic types—must more fully appreciate the fact that the marketplace is sometimes quite harsh in punishing those who seek ever-higher returns without taking into account the correspondingly greater risk.

Lastly, in view of the fundamental determinants of foreclosures, more thought should be given to what foreclosure rate is acceptable on subprime mortgage loans. Surely it would be unreasonable to implement regulations based on the premise that the socially desirable foreclosure rate is zero. If that were the case, hardly anyone would qualify for a mortgage.

Just as it is difficult to distinguish between prime and subprime borrowers on the basis of FICO scores, it is also difficult to distinguish between them on the basis of the mortgage products they use. Over the past decade, most—if not all—of the products offered to subprime borrowers have also been offered to prime borrowers. In fact, from January 1999 through July 2007, prime borrowers obtained 31 of the 32 types of mortgage products—fixed-rate, adjustable-rate, and hybrid mortgages, including those with balloon payments—obtained by subprime borrowers.

If the loan product itself were the problem in the subprime market, one might expect all borrowers using that product to be facing foreclosure. But this is not the case. Foreclosure rates were rising, as already noted, but the rates differ widely by type of product and borrower. Most important, the foreclosure rates on all mortgage products still fell far short of 100 percent, which means many borrowers were benefiting from them.

To argue that the product is the source of the problem is to ignore a fundamental truth: the ability or willingness to repay loans depends on financial factors. The marketplace and a borrower's financial circumstances may deteriorate, leading to serious problems, including foreclosure. In some parts of the country, for example, real estate prices fell so far that houses were worth less than the balances owed on them.

In addition, borrowers lost jobs, or suffered divorce or serious illness, or otherwise faced severe financial straits. These factors, more than anything else, contributed to increases in foreclosures, regardless of the mortgage product.

Some products, however, did become associated with relatively high and rising foreclosure rates, especially among subprime borrowers. But both prime and subprime borrowers experienced foreclosures for 29 of the mortgage products, indicating that virtually every mortgage product—whether prime or subprime—is a candidate for foreclosure.

Of course, foreclosure rates on subprime mortgages are typically higher than those for prime mortgages, regardless of product type. Subprime borrowers are by definition riskier. Furthermore, the loan-to-value ratio may be a more important determinant of mortgage loan risk than the borrower's FICO score. In particular, subprime borrowers received a larger proportion of loans with loan-to-value ratios greater than 80 percent as compared to prime borrowers.

So what does one conclude? Product innovation is beneficial, and attempts to curtail such innovation in the mortgage market could deny credit for borrowers who would not otherwise qualify for loans. Legislative or regulatory actions that are too sweeping and severe could limit the availability of mortgage products, denying borrowers a wider menu from which to choose the product that best suits their needs.

Of course, innovative new products require education on the part of lenders and borrowers. To the extent that problems arise for lenders, they will make adjustments in the products they offer. Borrowers, too, must educate themselves about which products are most suitable for their current and expected financial status.

The process by which lenders and borrowers decide on specific mortgage products is imperfect and can at times create difficulties for both, resulting in re-negotiations of mortgage terms and the curtailment or discontinuation of some products, as was seen in the recent market turmoil. And regulatory authorities should be vigilant against fraudulent activity.

Rising foreclosure rates are a serious issue. But as Lawrence Summers of Harvard University stated in September 2007, "... we need to ask ourselves the question, and I don't think the question has been put in a direct way and people have developed an answer; what is the optimal rate of foreclosures? How much are we prepared to accept?"[27]

The same type of argument applies to securitization. Securitization per se is not a problem; it is the quality of the products that are securitized, and the credit-worthiness of the borrowers, that can present problems. For example, to the extent that subprime loans created problems, then so would securities backed by such loans.

In the first part of 2000s, foreclosures were mainly a problem of the prime mortgage market. In recent years they became chiefly a problem in the subprime mortgage market. In response to the worsening problems associated with the subprime loans, lenders greatly reduced the origination of such products, particularly those with reset features. However, many subprime borrowers benefited from the product diversity that provided access to credit and homeownership. It is, once again, important that any legislative or regulatory action not unduly curtail subprime mortgage loans.

A final note: Many subprime borrowers got financing on extremely generous terms. Lenders in many cases extended credit without requiring a down payment. Borrowers were able to take out loans on the basis of the equity that had been built up over time in their homes, especially during the period of rapidly increasing home

[27] Summers (2007).

prices. Of course, when home prices declined, many of these owners found that they owed more on their homes, including the first and second lien mortgages, than their homes were worth. This provided an incentive to stop making payments and allow homes to go into foreclosure. Again, it is the ability and willingness to repay loans that matters, not the method of financing home purchases.

Housing Problems in Other Countries

The United States was not the only country to endure problems in its housing sector in recent years. As table 5 shows, 10 of the 19 countries experienced significant increases in housing prices during the past decade before prices declined. The three countries that experienced biggest declines in prices were Ireland (-25.3 percent), the United States (-22.6 percent) and Spain (-20.8 percent). The experiences of seven of the countries, moreover, were similar to that of the United States.

Table 5: Average house price changes in selected countries
(Rankings of countries in parentheses)

Country	Boom (1998:Q1-2006-Q2)	Bust (2006:Q2-2011:Q3)	Overall (1998:Q1-2011:Q3)	Similar to the United States?
United States	49.9 (15)	-22.6 (2)	16.0 (16)	-
Australia	78.5 (7)	17.7 (17)	110.1 (3)	No
Belgium	55.2 (11)	12.4 (14)	74.4 (7)	No
Canada	53.3 (13)	28.5 (19)	96.9 (4)	No
Denmark	79.5 (6)	-19.5 (4)	44.6 (13)	Yes
Finland	68.4 (8)	2.7 (11)	72.9 (8)	No
France	102.2 (4)	5.1 (12)	112.6 (2)	No
Germany	-11.4 (18)	-5.7 (9)	-16.5 (18)	No
Ireland	131.4 (1)	-25.3 (1)	72.9 (9)	Yes
Italy	53.4 (12)	-7.9 (6)	41.2 (14)	Yes
Japan	-25.6 (19)	-8.3 (5)	-31.8 (19)	No
Netherlands	61.0 (10)	-6.9 (8)	49.8 (12)	Yes
New Zealand	64.2 (9)	-1.7 (10)	61.4 (11)	Yes
Norway	53.0 (14)	24.3 (18)	90.2 (6)	No
South Korea	4.4 (17)	6.5 (13)	11.1 (17)	No
Spain	108.6 (3)	-20.8 (3)	65.3 (10)	Yes
Sweden	83.4 (5)	16.0 (16)	112.9 (1)	No
Switzerland	10.7 (16)	14.2 (15)	26.4 (15)	No
United Kingdom	112.2 (2)	-7.3 (7)	96.6 (5)	Yes

Source: Jeffrey P. Cohen, Cletus C. Coughlin, and David A. Lopez, "The Boom and Bust of U.S. Housing Prices from Various Geographic Perspectives," *Federal Reserve Bank of St. Louis Review*, September/October 2012.

The question now becomes, "Why, despite the fact that some countries experienced bigger increases in home prices than the United States, did the U.S. housing market suffer far worse than the markets in these other countries?"

For one thing, riskier borrowers were granted an increasingly larger share of mortgage loans, and lending standards were far more lenient in the United States. According to Lea (2010), "First subprime lending was rare or nonexistent outside of the United States. 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."

In the United States borrowers with little or no documentation regarding their income or net worth were able to obtain mortgage loans. Interest-only and negative amortization loans were also made available to many borrowers. Lastly, loan-to-value ratios in some cases exceeded 100 percent. Although some of these practices existed in other countries, they were far less prevalent than in the United States.[28] In Germany, moreover, the maximum loan-to-value ratio was 80 percent.

One might think that the country with the highest level of mortgage debt relative to GDP would also be the country with the worst-performing mortgage market. Figure 5 would indicate that this country is the Netherlands. However, as table 5 shows, home prices in the Netherlands rose higher than those in the United States before the crisis, but the corresponding decline was far lower during the period of bust. The fact that Dutch home prices did not collapse as they did in the United States spared the Netherlands problems in its housing market.

In addition, although the Netherlands did extend high loan-to-value mortgages to borrowers, they remained a small minority of total mortgages. The tax subsidy extended to borrowers, moreover, was less in the Netherlands as compared to the United States.[29]

In contrast to the Netherlands, Ireland had the biggest increase in home prices before the crisis and the biggest collapse in home prices during the bust, as shown in table 5. Figure 5 also shows that Ireland had the third-highest mortgage-debt-to-GDP ratio at 87 percent in the European Union. Its housing market also suffered severely in recent years.

Another difference between the housing markets in the United States and other countries is that only the United States has government-sponsored enterprises like Freddie Mac and Fannie Mae. These two financial institutions were chartered by the U.S. government and were expected to not only maximize profits for their shareholders but also to provide mortgage credit to make housing finance more affordable to moderate- and low-income households. Unfortunately, this dual mandate led to the insolvency of both of these giant mortgage

[28] See Lea (2010b) and Ellis (2008).
[29] See Ellis (2008).

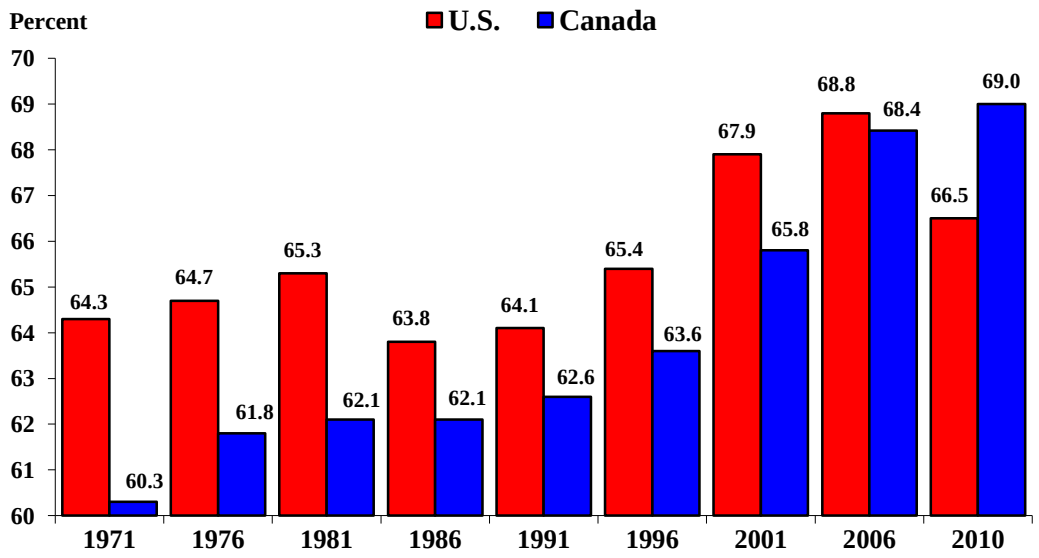
institutions, which were placed into conservatorship in September 2008 by the U.S. government. The actions of these institutions worsened the performance of the housing market in the United States.[30]

Lastly, it might be noted that in Denmark covered bonds are the dominant source of housing finance. This form of financing is an alternative to securitization of mortgages, which has been so important in the United States. The advantage of covered bonds is that the bonds remain on the balance sheets of financial institutions and are collateralized with home mortgages that also remain on the balance sheets. Other European countries use covered bonds, though to a far lesser degree. During the past decade, Denmark saw greater fluctuations in housing prices than the United States, yet avoided the housing problems that afflicted the United States. Covered bonds may therefore be a good complement, if not substitute, for securitization.

Housing Problems in the United States versus Canada

It is instructive to compare the performance of the housing markets in Canada and the United States. As figure 10 shows, these two countries have similar homeownership rates, and both of these rates had tended to trend upward until the global financial crisis struck. At the same time, home prices in Canada and the United States closely tracked one another until 2003, when U.S. prices rose faster and then declined more abruptly and further than those in Canada. Home prices in both countries rose from their lows in 2009 and were increasing in 2010 (see figure 11).

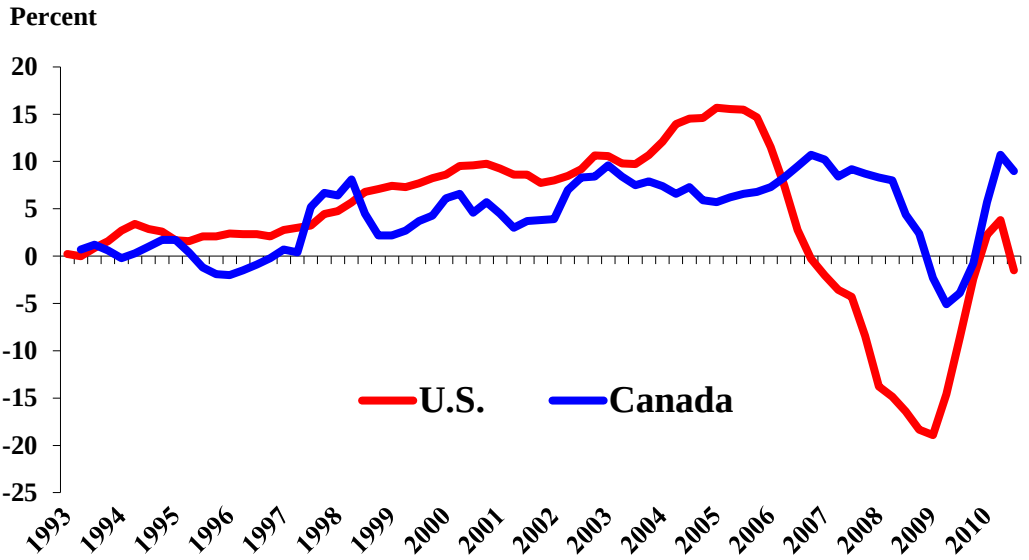
Figure 10: Homeownership rates in Canada and the United States



Note: The rate for Canada in 2010 is an estimate from Scotia Economics.
Sources: Statistics Canada, U.S. Census Bureau.

[30] Barth, et al. (2009).

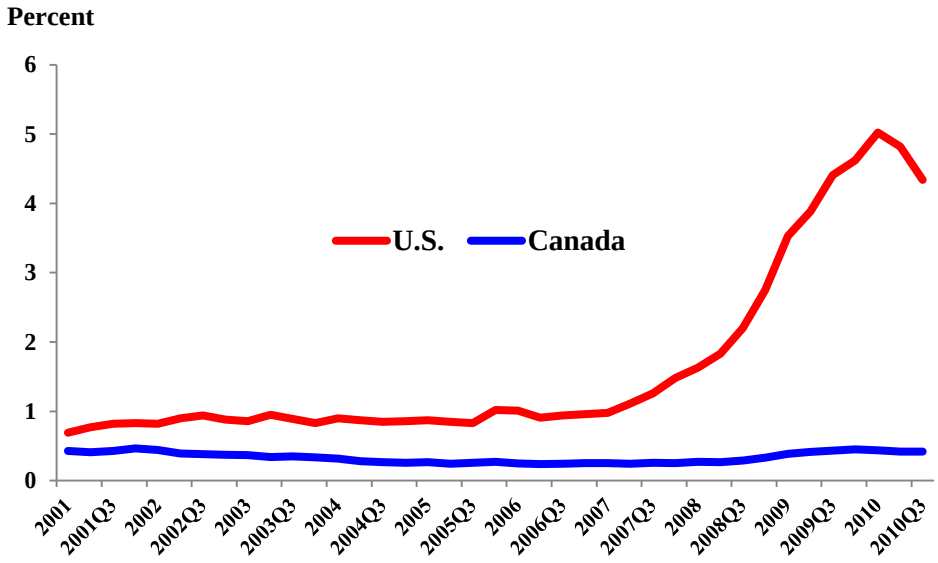
Figure 11: Canada and U.S. home prices (year-over-year percentage change)



Sources: S&P Case-Shiller/Fiserv, Bank of Canada, Royal LePage, 2010 Q3.

In terms of residential delinquency rates, figure 12 shows that the United States performed far worse than Canada during the global financial crisis. Indeed, the delinquency rate for Canada has remained relatively flat over the entire past decade. This is in sharp contrast to the tremendous rise in the delinquency rate beginning in 2007 in the United States. The question is why the Canadian housing market did not perform in the same troublesome way as the U.S. market, given that both countries have the same general pattern in homeownership rates.

Figure 12: Canada and U.S. residential delinquency rates



Sources: Canadian Bankers Association, Mortgage Bankers Association, 2010 Q3.

One important distinction between Canada and the United States is the extent of government involvement in the housing market. The U.S. government plays a far greater role in supporting the financing of housing than does the Canadian government. Financing and mortgage insurance support in the United States is provided by Freddie Mac and Fannie Mae—both of which have specific housing goals set by the U.S. Department of Housing and Urban Development—and Ginnie Mae.[31] These three institutions provided nearly 60 percent of the funding for home mortgages in 2006. All three have a mandate to support housing in a way that is not strictly comparable to the approach that would be taken by a firm focusing on risk-return tradeoffs to maximize shareholder value. Canada does have a government-owned mortgage insurance agency, the Canada Housing and Mortgage Corporation, but the insurance is not targeted to affordable housing.[32] Canada does not have any entities similar to Freddie Mac and Fannie Mae. Furthermore, in contrast to the United States, securitization in Canada provided slightly less than 20 percent of the funding for mortgages in 2006. Banks and credit unions, on the other hand, provided slightly more than 70 percent of funding in that year.

Canada does not have legislation similar to the Community Reinvestment Act enacted in 1977 to encourage depository institutions to help meet the credit needs of the communities in which they operate, including low- and moderate-income neighborhoods. These differences contributed to greater problems in the housing market in the United States than in Canada.

Table 6 shows more differences in mortgage finance between Canada and the United States. Americans benefit from a mortgage interest deduction from their taxes, but not Canadians. Also, Canadians who become delinquent on their mortgage loans and eventually end up in foreclosure are subject to recourse by lenders. This is not the case in the United States, where borrowers have a greater incentive to default on their mortgages, especially when they owe more than their homes are worth.

Table 6: Key differences in mortgage finance: Canada vs. the United States

Country	Mortgage interest deduction	Main product	Recourse	Pre-payment penalty	Funding model	2006 Peak subprime % outstanding
Canada	No	5-year FRM	Yes	Yes	On-balance-sheet	*Less than 5%
U.S.	Yes	30-year FRM	No	No	Originate-to-distribute	20%

Note: FRM refers to fixed-rate mortgages.
*Subprime mortgages in Canada are mainly near-prime/Alt-A and are much more conservative than those in the United States.
Source: Virginie Traclet, 2010, "An Overview of the Canadian Housing Finance System," *Housing Finance International*, Autumn.

[31] Barth, et al. (2009).
[32] Lea (2010b).

Note further that in 2006 the subprime share of total outstanding mortgages was less than 5 percent in Canada, while in the United States the share was 20 percent. In addition, Canada relies to a far greater degree on on-balance-sheet funding than the United States, which relies more on securitization. As noted earlier, with a greater degree of subprime mortgages and with a large fraction of them securitized, the result was a worse performance of the housing market in the United States.

Lastly, Canada relies on mortgages with a fixed rate—typically for five years but sometimes as short as one year or as long as 10 years. The rate is then renegotiated at the end of this period and adjusted to the current market rate. This enables borrowers to better manage their interest rate risk by changing the length of the fixed-rate period depending on the level and trend of interest rates.

Yet another difference between the two countries is that 80 percent of Canadian homeowners with mortgages had equity that was 20 percent or more of the value of their homes in 2010. Only 2 percent of mortgage holders in Canada had negative equity. In contrast, about 25 percent of mortgage holders in the United States had negative equity.

Canada, moreover, had more-conservative lending policies than the United States during the past decade, with the proportion of loans with little or no down payment being far less than in the United States. As Lea (2010) points out, while Canada "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."[33]

One final comment regarding housing price bubbles and their bursting: Regulators in developed countries have increased focus on home prices as a source of systemic risk in banking. Of 143 countries, 49 now consider housing prices in assessing systemic risk in the banking sector, while 94 do not (see table 7). However, most of the countries that do consider housing prices are developed countries, while the other countries that do not are mostly developing countries. If regulators are successful in focusing more directly on housing prices to prevent banking crises in the developing countries, which account for a very large share of world GDP, the likelihood and severity of another global financial crisis may be significantly diminished.

[33] Lea (2010b).

Table 7: Are housing prices considered in assessing systemic risk in the banking sector?

Yes (49)		No (94)			
Armenia	Mauritius	Angola	Estonia	Kyrgyz Republic	Senegal
Australia	Morocco	Argentina	Ethiopia	Lesotho	Seychelles
Austria	Netherlands	Bangladesh	France	Madagascar	Sierra Leone
Bahrain	New Zealand	Belarus	Gambia	Malaysia	Slovenia
Belgium	Norway	Belize	Germany	Mali	South Africa
Bulgaria	Oman	Benin	Ghana	Malta	Suriname
Chile	Palestinian Territory	Bhutan	Guatemala	Mexico	Swaziland
Cyprus	Philippines	Bosnia and Herzegovina	Guinea-Bissau	Moldova	Syria
Fiji	Portugal	Botswana	Guyana	Montenegro	Taiwan
Finland	Romania	Brazil	Honduras	Mozambique	Tajikistan
Gibraltar	Russia	Burkina Faso	Hong Kong, China	Myanmar	Tanzania
Greece	Serbia	Burundi	Hungary	Namibia	Togo
Guernsey	Singapore	Cayman Islands	Indonesia	Nepal	Trinidad and Tobago
Iceland	Slovakia	China	Iraq	Nicaragua	Tunisia
India	Spain	Colombia	Ireland	Niger	Turkey
Italy	Sri Lanka	Cook Islands	Isle of Man	Nigeria	Uganda
Jamaica	Switzerland	Costa Rica	Israel	Pakistan	Ukraine
Latvia	Thailand	Côte d'Ivoire	Jersey	Panama	Uruguay
Lebanon	Tonga	Croatia	Jordan	Paraguay	Vanuatu
Liechtenstein	United Arab Emirates	Denmark	Kazakhstan	Peru	Venezuela
Lithuania	United Kingdom	Dominican Republic	Kenya	Poland	Virgin Islands, British
Luxembourg	United States	Ecuador	Korea, Rep.	Puerto Rico	Yemen
Macao, China	Zimbabwe	Egypt	Kosovo	Qatar	
Malawi	Canada	El Salvador	Kuwait	Samoa (Western)	
Maldives					

Source: World Bank Survey IV, September 2012.

VII. Future Innovations in Housing Finance

In this section, we examine ways to improve the functioning of housing finance systems to facilitate homeownership in the wake of the severe problems in housing markets in the United States and other countries, the structural shifts in demand that will drive housing finance innovation in the future, and current supply constraints and attempts to overcome them. It is important to realize that many of the financial innovations for housing are similar for both developed and emerging markets. These are as follows:

- Diversifying sources of capital (debt *and* equity)
- Structuring financial products that will promote private capital investment to support residential real estate construction, maintenance, and sustainable improvement
- Diversifying types of housing products (single/multiple family)
- Higher density, sustainable buildings that increase housing consumers' cash flow and ability to service long-term debt
- Pooling savings and risk-management products

- Credit enhancement
- Using information technology to monitor and improve efficiency in housing finance.

The record-breaking foreclosures and defaults, decline of homeownership, and surge of "underwater" mortgages overwhelmed aspiring and existing homeowners in recent years. Home prices fell more than 40 percent since their peak in 2006, but have recently appeared to stabilize and even increased somewhat in parts of the countries. At the end of 2011, 23 percent of all residential properties with a mortgage were in negative equity, according to CoreLogic. This is an improvement from a few years ago when one in seven households with mortgages faced foreclosure or default, and nearly 40 percent of the 48.4 million homes with mortgages were "underwater." Furthermore, sharp falls in property prices contribute to problems for neighborhoods and local and state governments that depend upon property taxes to support critical services.

Post-Crisis Housing Markets

Effectively, most of the costs of housing finance risk have been nationalized due to the recent crisis. As of September 2012, the residential finance system is nearly completely supported by the federal government—a situation that cannot be indefinitely sustained without seriously damaging the prospects for a return to long-term growth. While the management of the financial crisis led the government to recapitalize large financial institutions, the challenges to revitalize the housing finance system for the long run remain largely unaddressed.

The private sector played a major role in funding residential real estate until the recent financial crisis in the United States. Today, the way that mortgages are originated and sold to the capital markets will have to be reformed before private capital returns to a more normal level. Most lending institutions held mortgages on their balance sheets, and many investors—domestic and international—bought securities backed by those mortgages. Access to housing finance had grown dramatically and steadily over the preceding decade, and homeownership reached historic highs.

While the financing of the housing sector still needs repair, the demographic drivers that will require the return of financial innovation to support homeownership continue unabated. The developed world and emerging markets continue to serve as laboratories for new financial products. At present, many lending institutions still curtail credit to the real estate sector as they recapitalize their balance sheets due to the financial crisis, and investors cut back on purchases of mortgage-backed securities. The securitization of mortgages by private firms, moreover, collapsed along with private-investor participation. Most of the funding for home purchases now goes only to the most creditworthy individuals.

This dramatic decline in funding by the private sector poses a major problem that has yet to be addressed: a growing gap in the availability of credit to residential real estate markets in both mature and emerging markets. In the United States, the government has recently focused on stemming the tide of home foreclosures through loan

modification efforts, while also providing its own credit to the housing sector. But this crisis management is not designed to get real estate markets functioning normally again.

Governmental resources are much smaller than those of the global capital markets that must ultimately return to channel investment into the housing sector. This means that the current reliance on the Federal Reserve System and GSEs (or similar housing finance agencies overseas) to stimulate housing markets is insufficient to promote greater national economic growth and stability. One saying in economics in that trends that can't go on forever won't. This is one of them.

Structural Shifts in Housing Demand

It's important to step back and examine what conditions are likely to drive the next wave of financial innovation—structural shifts in the demand for capital in housing. By 2011, a major transition occurred as the majority of the world's population came to live in cities—more than 51.4 percent or 3.6 billion people now reside in urban areas. Most future population growth will also occur in urban areas.[34] Indeed, by 2030 nearly 60 percent of the world's population will be urban and more than half living in slums. In the developing world, an average 5 million new residents are absorbed in cities each month. This contributes to housing shortages and increasingly high rates of the depletion of housing stock. Historically, economic growth is always accompanied by decreases in family size, resulting in additional demand for new housing units.

In the United States, as in many developed countries, most population growth is driven by immigration. While currently representing 13 percent of the population in the United States, immigrants will account for 70 percent of population growth and thus future demand for housing. Their needs, preferences in housing, and choices of location will be important drivers of housing demand.

Meanwhile, additional age structure and household formation dynamics complicate the demand for capital in housing and the need for financing a mix of housing types (single or multifamily), forms (ownership and rental), and styles (high/low density) emerging in the market.

Younger people face declining income prospects, with real median household incomes in all age groups under 55 not having increased since 2000. For the youngest working cohorts (25-34), incomes are continuing to fall as they have for the past decade. This trend suppresses household formation due to high unemployment and thereby reduces current housing demand, but accelerates it later as the cohort ages.[35]

With stagnant incomes, lost equity in homes, and a declining group of upwardly mobile buyers, housing finance will need to be reinvented. New entrants in the housing market will require a greater variety of housing options and innovations in finance, construction, and sustainability.

[34] 2011 Revision of World Urbanization Prospects (2012).
[35] 2009 State of Nation's Housing (2010).

Financial innovation in housing: What works? What doesn't?

Common to all the innovations to be examined are answers to some underlying policy questions: What is the structure or preference of tax or other subsidies? What works best—people- or place-based subsidies and incentives? What are the regulatory supply-side constraints in the provision of land and space for development and associated development rights? How can future construction rights be transferred and ultimately financed? What is the role of information technology in bridging gaps in information about housing credit analysis and risk? How can technology reduce transaction costs and clear the path from savings to investment in housing?

People versus place-based subsidies: Policy successes and failures in innovating housing finance

Before we examine new waves of financial innovation in housing, it's important to consider some general principles of the incentives that support housing access and affordability. Tax subsidies, regulatory constraints on property supply through zoning and land-use planning, and technological advances that can bridge information asymmetries in assessing risk should all be considered as elements in the process.

The mortgage-interest-rate deduction has been by far the most prominent feature of the tax subsidy for homeownership. From a distributional perspective, the mortgage deduction (like all deductions) disproportionately favors the wealthy. While the ownership subsidy has significantly risen over the past 40 years, the rate of homeownership has remained relatively stable. This suggests that the deduction alone has exhausted its ability to increase ownership much further.

While the subsidy has contributed to greater demand for larger dwellings (to maximize tax deductibility), it has done little to increase the total housing stock and its affordability. Incentives to maximize deductions through increased leverage and housing size undermine housing sustainability, financially and environmentally.

However, there is growing evidence that targeted innovations in public policy and financial innovation can increase housing stock and access. Subsidized housing for lower-income residents in many circumstances complements and does not crowd out private investment. Government finance has the potential to increase the total number of units, even with some displacement of privately generated housing. In more populous markets, there is less crowding out.

In terms of innovations, those programs that have greatest effect target individual mobility, rather than improvement in specific locations. Subsidizing brick-and-mortar building through tax preferences rather than the individuals' ability to exercise their own housing preferences leads to outcomes opposite the intended effect of maximizing housing quantity, quality, and choice.[36] Project-based programs are least effective at subsidizing housing for those who need it. Tenant-based programs that provide certificates and vouchers maximizing choice are most effective in increasing housing stock.

[36] Rybczynski (2010).

Supply-Side Housing Innovations

An increasing amount of evidence suggests that zoning and other land-use controls work against affordability in housing. Zoning restrictions, which decrease the amount of land available for development, are associated with higher prices. This suggests that such forms of regulation contribute to higher housing costs.

Reducing implied land-use taxes on new construction has had considerable impact on housing prices when included in policy innovations. In England, for example, the use of supply-side finance policy demonstrated support for housing affordability through land-use planning.

One key element in nearly all programs is the use of transfer of development rights. These programs increase housing supply by enabling owners to sell development rights, while encouraging denser residential development in city centers. New development can make an important contribution to housing affordability. The creation and financing of transfer of development rights has been demonstrated in many developing and transitional markets such as India to Russia.

Technology and Financial Innovation

The nexus between information technology and financial product innovation is a pivotal factor in any housing finance system. The increasing sophistication of risk estimates, assuming data accuracy and the absence of fraud, enables innovation. The ability to evaluate creditworthiness and prepayment risk are examples of quantitative pricing, credit scoring, and risk-management systems that are applied to home finance. With lower information processing and communications costs, the activities of back-office mortgage servicers have decreased as service providers extend their geographic scope.

Credit analysis, with data based on debt payments relative to income, enables more-precise measurement in pricing of risk. The ability to assign credit scores and automate centralization of credit information can increase the access to credit and ability to monitor payments and cash flows at a consumer level. All of this enables greater standardization of documentation and financial structures, which again lowers housing costs.[37]

Financing Housing: Back to the Future

The long-established principles that worked in expanding capital access to the housing industry are the basis of the reinvention of home finance for the future:

- Aligning interests of private capital funders with policy incentives
- Create a diversified housing stock by eliminating the bias against subsidies for renters
- Pooling savings to create investment vehicles
- Using credit enhancement and guarantees to manage real estate risks
- Creating flexible capital structures for residential developments through structured finance
- Regulating land use to limit supply constraints.

[37] Committee on the Global Financial System (2006).

The restoration of the historical partnership of governments with private investors will be central to overcoming housing scarcity. Because government resources are increasingly limited, bringing back private investment is vital to the return of a vibrant housing finance system. However, entrenched biases will have to be overcome. One is the overwhelming preference of subsidies to ownership over rental housing. This has led to rising homeownership accompanied by decreasing affordability. This situation predictably proved untenable. One hundred percent loan-to-value ratios and negative amortization mortgages were never a sustainable innovation. Along with non-recourse mortgages and lax regulation, these practices boosted housing demand while unintentionally creating hidden incentives to default when prices declined.

Currently, spending programs and tax expenditures (subsidies transferred to consumers or investors through tax reductions) amount to $300 billion annually. The biggest share of these funds supports homeownership (about $230 billion) as compared to rental affordability (about $60 billion).[38] As a result, homeownership increased to 68 percent of all households, while the number of households spending more than 30 percent of their income on housing increased steadily during the past decade.[39] To improve the housing sector, the gap between shelter and affordability must be bridged. Favorable tax policies and subsidies are needed for rental housing as well as homeownership to promote flexibility and choice in housing markets.

Closing the credit gap and moving beyond crisis management are the only ways to restore international investors' confidence in mortgage products in residential single and multifamily housing. This will require public *and* private capital. The federal government's current dominant role in the real estate markets must be phased out to free up its resources for other national priorities. Innovations need to focus upon:

- Restoring the role of private investors (domestic and international) as drivers of homeownership and financing.
- Restoring confidence in securitization through mortgage-backed securities and covered bonds.

This will require some resolution as to what to do about Fannie Mae and Freddie Mac.

Rebooting Structured Finance in Housing

Securitizations or structured finance products aimed at spreading risk must return to basics. Important factors in this regard are disclosure transparency, the alignment of interests between mortgage sellers and capital market investors, improvement in collateral quality, and regulatory protections.

A number of measures are being discussed that could contribute to solutions. Financial reform after the crisis created a number of challenges to the resurgence of the mortgage securitization market, including the 5 percent retention of risk by originating financial institutions. A number of smaller, private placement mortgage-

[38] Congressional Budget Office (2009).
[39] McIlwain (2010) and Barth, et al. (2009).

backed securitizations have begun to appear recently, including one backed by the Federal Deposit Insurance Corporation that included the performing loans of 12 failed banks and federal credit enhancement.[40]

More recent transactions have shown that private-sector financing can be done with rates that are within 0.5 percent of the rates on mortgages financed through government-sponsored enterprises.[41] Nonetheless, the seemingly unlimited extension of the umbrella of Fannie Mae and Freddie Mac crowds out the private market, given the government's access to a lower cost of funds.

The major debate that emerges as to how and when private securitization can re-emerge revolves around the degree of guarantee provided by the government. One proposal has suggested the creation of government-chartered issuers of mortgage-backed securities. These issuers would sell some home loans through government-guaranteed securities. The government-chartered firms would have regulated profitability and fees to cover government guarantees on affordable mortgages and rental housing. This would be an alternative to the almost complete dependency upon government-sponsored enterprises.[42]

Alternatively, others recommend eliminating government guarantees and restricting securitization only to the highest-quality mortgages.[43] Issues of affordable housing could then be addressed directly through on-budget social policies, rather than the overextension of off-budget guarantees (that eventually find their way back to the federal budget).

Other alternatives or additions to securitization include covered bonds, which are debt securities backed by the cash flows of mortgages that remain on the balance sheet of the issuing financial institutions. These have been effective in Europe and elsewhere but, to date, lack a statutory framework in the United States. Similar to securitization, the covered bond system creates tradable instruments that increase liquidity.

One feature of the Danish model of covered bonds could be helpful in other countries. The capital structure of these bonds enables borrowers to manage risks and mortgage balances as interest rates change. In this model, when a lender issues a mortgage, it is obligated to sell an equivalent bond with a maturity and cash flow that exactly match the underlying home loan. The issuer of the mortgage bond remains responsible for all payments on the bond, but the mortgage holder can buy back the bond in the market and use it to redeem their mortgage and deleverage household balance sheets when interest rates rise and home prices fall.[44] This ability to manage interest-rate and credit risks reduced defaults and foreclosures in other countries and could help do so in the United State as well.

[40] Rebooting the Private MBS Market (2010).
[41] IFR-Sequoia deal bolsters case for RMBS Revival (2011).
[42] A Responsible Market for Housing Finance: A Progressive Plan to Reform the U. S. Secondary Market for Residential Mortgages (2011).
[43] Wallison, et al. (2011).
[44] Allen and Yago (2010).

From Crisis to Innovation: Working out the foreclosure crisis

Usually, as has been the case historically, innovation emerges from new necessities created by crises and scarcity. A good way to see the beginnings of the next wave of financial innovation is working through the problems created by the overhang of foreclosed properties arising from the mortgage meltdown.[45]

Until recently, the United States averaged more than 70,000 home repossessions per month due to the housing finance meltdown. The crisis created a demand for ways to buy and rehabilitate properties that had entered foreclosure, failed to sell at auction, and was owned by mortgage lenders. This real-estate-owned inventory expanded during the crisis from government-sponsored enterprises as well.

These properties, which remained vacant as supply outstripped demand, represented a resale inventory glut of 13.9 million homes by 2009, roughly 11 percent of all housing units and considerably more than housing vacancies in previous recessions. Housing markets and neighborhoods would benefit if investors were able to buy and rehabilitate these properties and turn them into long-term affordable housing or rental units.

Financing will be needed to address such challenges. The structural demand for capital includes: 1) short-term capital to acquire property; 2) mid-term needs to rehabilitate or demolish homes; and 3) exit financing to transfer property to a buyer.

At the same time, operational capacity to handle any surge in foreclosed and defaulted properties is reduced. This demands innovative pricing models that can aggregate capital sources to clear the logjam of foreclosed properties while maintaining ways to make these residences affordable. Let's consider these various dimensions of financial innovation in turn.

Innovative Pricing Models

In markets where house values are fluctuating, it is important to find ways to arrive at a fair, affordable price. Two innovative models have emerged from the crisis:

- **Top-down approach**. The National Community Stabilization Trust (NCST) starts with a market price under normal conditions and then derives a current value. It calculates a "net realizable value" by taking the estimated market value and subtracting holding, insurance, and other market-specific costs. Key to this approach is that the final sale price reflects local market conditions and predictions about future home prices.
- **Bottom-up approach**. The Community Asset Preservation Corporation (CAPC) of New Jersey buys pools of non-performing mortgages and REO properties in low- and moderate-income communities. CAPC then employs a variety of strategies to return these properties to productive use. Its pricing model starts with an estimate of current value and adds the costs necessary to bring the property to market. In March 2009, CAPC was the first nonprofit to complete a bulk purchase of foreclosed properties.

[45] This discussion is largely based on a financial innovations lab conducted for the Ford Foundation in 2009. REO Financial Innovations Lab, Milken Institute, February 2009.

In both of these cases, the focus is on underwriting a borrower (rather than the property) into an affordable mortgage and thereby forcing a write-down of property value to the point where negative equity would be eliminated. By working with private funds that buy marked-down mortgages, the ability to create realistic values emerges.

Clearing the Property Logjam

Another important innovation has been setting up intermediaries between REO servicers and local housing organizations, nonprofits, or governmental agencies seeking to stabilize neighborhoods and alleviate collapsing values. For example, in 2008, some of the country's largest community development organizations—Enterprise Community Partners, Housing Partnership Network, Local Initiatives Support Corporation, and NeighborWorks America—came together to form NCST. Today, the National Urban League is also part of the effort.

The nonprofit's goal is to act as a bridge between state and local housing providers and the REO departments within financial institutions, which are typically not accustomed to working together. NCST facilitates the transfer of foreclosed properties to local and community development organizations.

In addition, NCST provides flexible capital to help communities leverage their Neighborhood Stabilization Program funds and finance state and local acquisition efforts. The trust also builds local capacity through organizing and facilitating collaboration and engagement with the trust's partners, and acts as an industry voice for neighborhood stabilization.

Aggregating Capital

After the financial crisis, the Neighborhood Stabilization Program, part of the Housing and Economic Recovery Act, provided down-payment assistance and credit enhancement to leverage private capital by allocating $3.92 billion to state and local governments and nonprofits focused on housing. This amount could obviously only address a small portion of REO properties.

Until housing markets recover more fully, public subsidies and philanthropic capital must leverage private capital in order to have a widespread impact. Creative financing is necessary at each stage, from the acquisition of the properties to disposition.

Some strategies for aggregating capital might include:

- **Use program-related investments (PRIs).** PRIs, below-market investments, could be used more widely to subsidize returns for private capital. With public subsidies and dollars from socially motivated investors, PRIs could take the form of subordinated debt as an external credit enhancement.
- **Credit-enhance housing funds**. Government dollars could also be used for credit enhancement. Protecting private-sector investments from the downside would encourage investors.

- **Create a publicly traded investment vehicle**. A publicly traded tax-advantaged vehicle for foreclosure acquisitions would be able to raise large amounts of private capital to stabilize communities.
- **Allow specialized asset managers**. New mortgage and securitization paradigms are essential. Creating safe harbors for specialized asset managers would allow them to make decisions on loan modification without fearing litigation from investors and have a greater authority in administrating the pool of loans. New investors could be brought in to meet stronger underwriting regulatory standards.
- **Increase access to takeout financing to retire short-term or long-term debt on terms that are more favorable**. Access to responsible takeout financing is essential to put individuals in homes they can afford by retiring and refinancing older mortgages on more favorable and sustainable terms. One example is the model successfully used by Neighborhood Assistance Corporation of America in low- and moderate-income communities. NACA developed and uses online software that features a user-friendly application process and stores a borrower's documents. This greatly facilitates the underwriting of mortgages and enables NACA to offer a 30-year fixed-rate product at a slightly below market rate with no down payment and no closing costs. Only 0.0023 percent of homeowners who bought this product defaulted on their mortgages. In addition, NACA holds free events around the country to restructure unaffordable mortgages.[46]

Preserve Affordability

Innovative financial products can help low- to moderate-income households achieve the dream of homeownership more safely than the mortgage products that failed in recent years. Excessive leverage without equity sponsorship or equity support created capital structures and financial products that were likely to fail.

Negative equity, non-recourse loans and declining markets combine to create an incentive for borrowers to default. The most promising remedy to the problems of inadequate equity is not more but different equity. Financial options have emerged such as lease-purchase mortgages and shared-equity mortgages that provide a middle ground between rental and ownership. They are especially attractive for households that cannot initially qualify for standard mortgages, but could be candidates for homeownership several years down the road. Some different options are as follows.

- **Shared-equity ownership**. Models of shared equity, such as deed-restricted housing, community land trusts, and limited-equity cooperatives, are time-tested in the U.S. and Europe. A government or nonprofit invests in a property alongside the homebuyer. Shared equity enables borrowers to trade some potential upside of a purchase for financing. Hundreds of these programs now operate in the United States.
- **Lease-to-purchase mortgages**. Self-Help is piloting this more experimental solution. The nonprofit buys and rehabilitates properties in Charlotte, N.C., then leases the homes to "tenant purchasers"—renters likely to be able to assume Self-Help's lease-purchase mortgages in one to five years. During the rental period, Self-Help provides credit and homeownership counseling, as well as property management services, to the tenant purchasers. When the tenant qualifies, he or she assumes the lease-purchase mortgage from Self-Help.

[46] For other interesting financing models, see Boyce, et al. (2011) and Shiller, et al. (2011).

Rental Housing

Federal housing policy has largely ignored rented residences. As noted above, rental housing represents less than a third of the tax subsidies and expenditures provided for homeownership.[47] This is especially true as it relates to low-income rental housing, where the amount spent on assistance declined both as a percentage of non-defense discretionary spending and as a share of GDP. Until recently, rental vacancy rates hovered at their highest levels (8 percent) since 1980, and multifamily starts were down two-thirds from their peak two years ago.

The demand for new rental housing is increasing due to high levels of immigration, lower incomes, and the delayed entry of younger consumers into the workforce and housing markets. At the same time, aside from homeless assistance, all categories of low-income housing assistance for renters have declined in recent years, including Section 8 rental assistance through public-private partnerships, housing-choice vouchers that encouraged tenant mobility, and public housing. Clearly, structured finance products that address this growing demand for rental housing and developers will emerge.

Housing in Developing Countries

Housing loans make up a very small amount of total credit in low-income countries. According to the World Bank, only 3 percent of outstanding credit is in housing in low-income countries as opposed to 27 percent in high-income countries. The developing world has among the lowest outstanding mortgage debt as a percentage of GDP—3 percent in Bangladesh, 7 percent in India, 15 percent in China, and 17 percent in Thailand, compared to 42 percent in the European Union. [48] The overwhelming majority of the population in developing nations does not qualify for mortgage finance.[49]

Most countries face accumulating housing shortages through increased demand driven by rapid urbanization. The formal housing sector provides only a minority of the housing stock. The urban housing backlog is 25 million units in India and 3 million units in Pakistan. High percentages of the housing stock require replacement and additions in Afghanistan, Egypt, and throughout the developing world. From 60 percent to 80 percent of all housing stock is provided by the informal sector.[50]

Underlying all issues is the proper functioning of property markets and property rights to facilitate housing finance. As Hernando DeSoto has shown, the problem is "dead capital" that cannot be monetized in the market. He has shown that the value of savings in land is huge multiples of the amount received in foreign direct

[47] Rice and Sard (2009).
[48] Davies and Chen (2009).
[49] UN-Habitat (2004).
[50] Landaeta (2004).

investment, yet the ability to finance those assets lags because of the absence of effective private property rights and markets.[51]

The length of time it takes to obtain authorization or register land creates overwhelmingly high transaction costs that block the use of land and housing property as collateral to access credit for development. Poor information systems are also a hindrance. Associated with these limitations is the absence of long-term credit, meaning that property assets, which are long-term, are mismatched to the assets they must finance. Short maturities, high transaction costs, ineffective legal and judicial systems, and the reluctance of the formal sector to enter poor markets limit the ability to solve housing problems in the developing world.[52]

Several patterns are common to all the emerging models of housing finance innovation. The attempt to build and maintain lower-price points for housing access requires public-private partnerships, which have been more successful than public housing agencies that had limited term and capacity.[53] Leveraging funds through public-private partnerships has made programs more sustainable. Purely public programs were more open to corruption and abuse. Linkages to large-scale builders, building associations, and conventional commercial banks under conditional, performance-based terms have improved delivery of housing finance. Transparency and restrictions on sales for specific terms have prevented speculation. Encouraging ownership, joint guarantees (additional security through microfinance structures to ensure repayment), and cross-subsidy models have increased the flow of housing credit.[54]

Savings Models

In most rapidly growing Asian economies, some of the most promising models seek to encourage and leverage consumer savings to sustain housing finance. Compulsory and contractual savings schemes to provide a capital base for housing investment have proliferated. In China and Singapore, successful housing finance models included mandatory "housing provident" funds. Employers and employees contribute a matching percentage of salary for housing-related expenses, including down payments, monthly payments, and building repairs. Borrowings from the housing provident funds can be advanced for homeownership and leverage additional bank loans. Funds not used for housing are returned at retirement. China allows for a 5 percent contribution from employees and employers to build the housing fund.[55] In Singapore, the provident fund embeds lifetime earnings for retirement and channels money toward housing by allowing a household to borrow up to 20 percent of their retirement fund. Appreciation can accrue toward repayment of those loans on a deferred basis upon realization.[56]

[51] Soto (2000).
[52] Housing for All: The Challenges of Affordability, Accessibility and Sustainability: A Synthesis Report (2008).
[53] Davies and Chen (2009, p. 43-46).
[54] Rizvi (2010).
[55] Li and Yi (2007).
[56] Housing Finance Policy in Emerging Markets (2009).

Australia also has innovative mechanisms matching access to retirement funds for households with permanent jobs to long-term housing assets. Pension funds can provide additional cash that low- and moderate-income families can apply to down payments and mortgages. The use of pension-fund savings can lower carrying costs substantially and increase the capacity of homeowners to support mortgage debt.[57]

Land Trusts

Renewable, long-term leaseholds are made available through land trusts that are held by nonprofit housing corporations or cooperatives for development. These land trusts or land banks enable nonprofits or governments to acquire, preserve, convert, and manage foreclosed and other vacant and abandoned properties. By permitting the relevant agency (public or nonprofit) to aggregate and obtain title to these properties, a usable asset is created to reduce blight, generate revenue, and facilitate affordable housing by lowering land acquisition costs and aggregating parcels for development.[58]

Organizational Innovations

Although housing has occupied a relatively small niche of microfinance, some microfinance institutions have expanded into the sector. In South Asia and Latin America, nonprofit microfinance institutions have joined government and private for-profit and nonprofit organizations as co-investors. By linking banks, housing agencies, and individual consumers, intermediaries can provide loans for housing rehabilitation, new homes, resettlement, and infrastructure.[59]

Microfinance institutions (Grameen, Banco Sol, MiBanco), nongovernmental organizations (Accion, FINCA), cooperatives, mutual savings associations, municipalities, government housing programs, and commercial banks have joined together to downscale lending, create new securities and guarantees, mobilize data technology for tracking credits, and mobilize credit enhancement to reduce lending risks.[60]

Housing Bonds

Mortgage banks have used long-term bonds to finance housing. If the bonds are tax-exempt, banks can lower their cost of capital by issuing bonds at below-market interest rates. Housing agencies have issued bonds for mortgages on apartment rentals and owner-occupied housing. The agencies issuing the bonds fund private-lending institutions that provide mortgages at a lower cost.[61]

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[57] Ge (2009).
[58] Financial Innovations for Housing: After the Meltdown (2009).
[59] Housing for All: The Challenges of Affordability, Accessibility and Sustainability: A Synthesis Report (2008, p. 13-15).
[60] Escobar and Merrill (2004).
[61] Gyntelberg and Remolona (2006).

Revolving Loan Funds

Revolving loan funds operate through a variety of organizational forms (government, NGOs, and public-private partnerships in conjunction with commercial banks or non-bank lenders). The purpose of these funds is to provide long-term, self-sustainable sources of finance to build and upgrade housing based upon initial capitalization of the funds (through government and nonprofit foundation funds) and driven by interest and repayment revenues. Under these funds, deficits are covered by drawdowns from accounts and interest charges. Loans can be disbursed by stages of construction and performance. In many cases, they are available for construction and home improvement and offer flexible conditions and options for repayment.[62]

Credit Enhancement

Credit enhancement, or the ability to cushion or protect against loan losses, has a long history and an important future in housing finance. By spreading risk of loss, either through internal measures provided by the borrower or by government, philanthropic, or other outside entities, these measures can expand credit access.

Credit enhancement provides a form of insurance that reduces the risk of loss based upon detailed credit analysis. Internal credit enhancement is provided by the mortgage originator within subordinated layers of the capital structure and structure of loan payments. Reserve accounts to insure against default risk are funded by excess interest rate spread payments (larger than the amount needed for debt servicing), over-collateralization (holding assets of greater value than the debt issued), and additional debt coverage. External measures can be provided by outside parties, bank letters of credit, private or public insurance, additional guarantees or collateral pledged, or subordinated loans from other parties.[63]

In all these cases, loan losses are cushioned by enhancement pools covering a certain portion of the outstanding debt, thereby ensuring extension of additional credit risk. The adaptation of these measures by governments, multilateral organizations, philanthropies, and financial institutions has been increasingly widespread.

Sustainable Housing, Sustainable Financial Innovation

The rising demand and costs of housing will drive innovation that is environmentally and financially sustainable. As several recent studies have demonstrated, any money saved by buying housing in the suburbs is being drained by unsustainable costs in transportation and energy.[64] As prices decline in the peripheral areas of major metropolitan centers, many new or displaced homeowners will continue to leave behind the communities in

[62] National Development Council (2008).
[63] A full discussion of all these measures can be found in The Handbook of European Structure Financial Products (2004).
[64] Beltway Burden: The Combined Cost of Housing and Transportation in the Washington, D.C. Metropolitan Area (2009) and Priced Out: Persistence of Workforce Housing Gaps in the Boston Metropolitan Area (2010).

which they work and commute farther. As John McIlwain as pointed out, the outer suburbs "will have the least expensive housing, but the cost in time and money of long commutes will eliminate any savings."[65]

The importance of financing infrastructure and housing in transportation-oriented development will increase in response to pressures to improve workforce productivity and avoid the productivity losses caused by congestion. New modes of development favor increasing population densities and re-urbanization in order to create market mechanisms that respond to challenges of sustainable energy and transportation costs and environmental sensitivity.[66] New studies show that in over half of the U.S. metropolitan areas, new residential building permits, density, and revitalization have dramatically increased. Infill development that uses land within built-up areas becomes more significant.

Residential and commercial buildings account for almost 40 percent of the greenhouse gas emissions in the U.S. With Americans spending approximately 90 percent of their time indoors, it is clear that green building is the direct path to a cleaner and healthier future. Increasing energy efficiency while decreasing the catastrophic effects of the burning of fossil fuels, green building also represents an opportunity to generate new jobs and economic growth. A 2008 study by the Lawrence Berkeley National Laboratory of Science estimates that a reasonable level of nationwide energy-efficiency upgrades, costing $22 billion per year, would result in nearly $170 billion in annual savings.[67] Given the political shift toward "going green," now more than ever, there is real momentum to overhaul construction in this country.

Before the current economic crisis, the green building growth rate had been about 50 percent to 75 percent per year, representing about 5 percent of new construction. Around the country, there are 5,000 LEED- and ENERGY STAR-certified commercial buildings, with 800,000 ENERGY STAR homes, and approximately 2,000 Green-point rated homes. However, significant capital is needed to scale the retrofitting of residential, commercial, industrial, and retail properties. And while preliminary financing models have seen relative success with individual pilot projects, long-term, large-scale innovations need to be refined to create sustainable sources of funding. From the municipal bond market to green building securities, leveraging investment from the capital markets will ensure a more effective use of public and private resources.

A broad array of green building and other sustainable finance products is beginning to appear including:

- Direct mortgage, construction, and rehabilitation loans for residential properties
- Structured finance products that monetize cash flows from energy efficiency and environmental savings
- Pooled green real estate debt and equity funds and investments
- Insurance and asset-management products and services for green buildings to monitor and capitalize energy efficiencies[68]

[65] McIlwain (2010, p. 2).
[66] Thomas (2009).
[67] Brown, et al. (2008).
[68] Capital Markets Briefing Paper: Business Case for Commercializing Sustainable Investment (2009).

The objective of these measures would be to reduce risk and create higher-valued collateral, create a cheaper cost of capital and enhanced liquidity for environmental efficiencies in homes, and provide underwriting standards for assets to be financed in this growing market.

Financing Energy and Environmental Efficiencies[69]

It has long been known that energy efficiency in the cheapest source of power. But implementation of solutions has been hindered by high upfront costs and uncertainty about benefits. A number of innovative financing models have emerged in recent years that will certainly expand in the future.

There are currently 130 million homes in the United States—and their combined energy demand accounts for 20 percent of the nation's greenhouse gas emissions. Studies have consistently found that nationwide energy-efficiency upgrades would significantly reduce emissions, create green jobs, and pay for themselves. According to "Recovery through Retrofit," a recently released White House report that lays the groundwork for building a sustainable home-retrofit industry, existing techniques and technologies can reduce energy consumption by up to 40 percent, potentially saving $21 billion annually in home energy bills.[70]

Greening older buildings has become a top priority for the U.S. Department of Energy and the White House. The availability of multibillion-dollar funding from the federal stimulus package (the American Recovery and Reinvestment Act of 2009, or ARRA) has paved the way for programs aimed at improving residential energy efficiency.

The DOE has issued a request for proposals for a new Retrofit Ramp-Up initiative, specifically seeking "game-changing" programs. It has encouraged state and local governments to create financing mechanisms that can leverage public money to encourage the broader adoption of retrofits. President Obama has also proposed the HOMESTAR program, which would help households pay for retrofit projects, reducing their high initial costs.[71]

Stimulus funding represents the largest injection of federal dollars for energy efficiency in the U.S. history. But given the cost of retrofitting millions of homes, even these record sums are insufficient. It is therefore crucial to use these public funds in a way that gives private investors an incentive to deploy their capital as well.

Residential energy-efficiency financing programs have operated for years in states and municipalities—but so far, none has caught on widely enough to attract private capital. Taking a retrofitting program to scale requires improvement in several areas: marketing of products and services to likely customers; a trained workforce capable of extensive, quality field implementation; financing offers that are replicable; and the ability to sell loan pools into a national secondary market, allowing for a more rapid and systematic recycling of funding

[69] Much of this discussion is summarized from our "Financing the Residential Retrofit Revolution" (2010).
[70] "Recovery Through Retrofit" (2009).
[71] See Financial Assistance Funding Opportunity Announcement (2009).

back into loan programs. Furthermore, there is an inherent tension in the need to tailor programs to local conditions and preferences—thus yielding multiple, relatively small loan programs—and the need for large, homogenous pools of securities that can capture the transaction efficiencies of modern financial markets. State and local governments, the administrators of most of the energy-efficiency financing programs, design programs to meet their region's needs but look to access to broader pools of private capital.

Market growth depends on successfully integrating program design and financial product design. Program rules shape the risk/return trade-off that drives the financial products. Consumers respond to program features such as ease of billing or attractive payment terms, but these details vary considerably across smaller, locally focused programs. Broad standardization is needed for national loan pools and securitization (which would lower costs).

Energy-efficiency mortgages

The financial logic of these "green mortgages" is clear: potential borrowers add the cost of the energy-efficient home improvements to the new mortgage, and the energy savings boost their disposable income, creating higher borrowing capacity. Energy-efficient mortgages (EEMs) are based on the principle that energy savings create disposable income—and thus, the ability for a homeowner to carry a larger mortgage to finance these capital improvements. Because the homeowner is presumed to have higher credit quality than otherwise, in theory, the mortgage carries a lower default risk and can be issued at a lower interest rate. EEMs allow homeowners to pay for the cost of energy-efficiency upgrades with tax-advantaged mortgage interest rates, while avoiding large upfront out-of-pocket costs and aligning payments with the long periods it may take for some of the energy-efficiency upgrades to pay off.

Only 1,066 FHA-insured EEMs were originated in the United States in 2007. The numbers in previous years were even lower. Three challenges have emerged. First, the link between energy savings and lower default rates has not been proven, so it is unclear if the energy savings are sufficient to make it worthwhile for lenders to reprise the loans. Second, the loans are more difficult to sell into the secondary markets, increasing lender risk. Finally, because EEMs are more-complicated loans, they are more difficult to make, but lenders have little incentive to offer EEMs because they get no additional compensation for the extra work.

The marketing of EEMs should be easy because homeowners know how to obtain a mortgage and refinance, so the lender can simply introduce energy efficiency into the transaction. Further, the mortgage market infrastructure is huge and efficient, with very low transaction costs. The EEM has been available in all 50 states for more than a decade. EEMs are sponsored by the FHA, Fannie Mae, the Department of Veterans Affairs, the Agriculture Department, and state housing finance agencies.

Several solutions to the product's design flaws are based on lessons learned. Key provisions include creating an inexpensive, nationally available audit tool to reduce customer costs; qualifying borrowers based on

credit risk rather than projected savings; and reducing the cost to the customer and to the lender by using federal and state programs to drive down the interest rate.

Given the potential energy savings, a federal, state, or Fannie Mae/Freddie Mac subsidy to reduce costs in the early years while performance data are gathered would make sense. Pilot programs currently offer ENERGY STAR-branded mortgages. If EEMs reach sufficient volume, performance will be demonstrated, and loans can be priced for the secondary market.

Any lender can use the ENERGY STAR mortgage as long as the product meets two conditions. First, it must produce at least a 20 percent improvement in the whole home's energy efficiency. Second, because the ENERGY STAR brand helps lenders with marketing, lenders must provide consumers with some additional benefit, such as covering the cost of the audit or the appraisal, or reducing the interest rate. The pilot programs will demonstrate if these features increase consumer adoption.

Unsecured home improvement loans

When heating and cooling systems fail and must be replaced, homeowners can often obtain unsecured home improvement loans through their contractor. If contractors could refer them to loans offered by different financial institutions (with more choices and made cheaper through subsidies), the consumers' replacement decisions would be more likely to tip toward energy-efficient systems. Capital to support unsecured home improvement loans for greater energy efficiency comes from public and private sources (including Fannie Mae, state and local budgets, and banks). Several examples include:

- **Public loan programs**: Widely available through partnerships with utilities and local banks, the Fannie Mae Energy Loan is the largest public source of unsecured loans. After originating a loan, the Fannie Mae-approved lender transfers loan obligations to Fannie Mae but continues to service the loan. It is one of very few loan programs with a functioning secondary market at this time. However it will be challenging to expand, as the interest rate is high (currently between 12 percent and 15 percent).
- **Pennsylvania's Keystone Home Energy Loan Program (HELP):** Homeowners receive loans for energy-efficient home improvements at attractive terms in a program provided and subsidized by the state. The state administers the program and acts as a secondary market, buying loans from lenders through its pension funds. By acting as a ready buyer, the state secures the availability of residential home improvement lending and lowers the interest rate offered to borrowers.

While it might be expected that delinquencies and defaults would be a key challenge for these programs, loan-loss rates have been very low and have only risen slightly during the recession. The reason is self-selection by borrowers, who are largely homeowners with no plans to move, great credit scores, and high home-equity values. EnerBank reports a 10-year loss rate of only 0.8 percent, with a small but manageable rise in 2008 and 2009. There is little need for a secondary market partner as so many loans are paid off in the first year.

While funds for unsecured loans are constrained by the current credit crisis, a large and efficient infrastructure for processing and securitization already exists. Contractors sell the loans as part of their offerings,

banks originate the loans, and the secondary markets securitize them as part of ABS financings. Infrastructure for origination and distribution of these loans and a strong base of expertise are already in place. A tiered interest rate to attract proactive buyers, with the best rates reserved for comprehensive home performance loans, appears to have a good track record. With access to a broader secondary market, these programs could grow.

Property tax–based financing

Municipalities have long used property assessments and taxes to finance public projects. Property tax-based financings could also provide homeowners with funding for energy-efficient improvements and solar installations. The homeowner repays the loan through a voluntary increase in his or her property tax bill. Funds are provided by a local bond mechanism (similar to a municipal bond issued for a specific purpose, but taxable at the federal level). Repayment terms are long (10 to 20 years), and since repayment is tied to the tax bill and carries the same seniority over the mortgage, default rates should be generally low. Any property assessments in arrears have a senior lien to mortgage payment in the event of default, which led to a Federal Housing Finance Agency directive not to underwrite mortgages for properties with an energy-related assessment. Current litigation and proposed legislation seek to overcome these concerns through Department of Energy and other certifications to ensure savings could be supported and would serve the interests of building owners, municipalities, and mortgage lenders.

Because basic efficiency measures can cut energy costs by up to 35 percent annually, energy savings are believed to exceed the cost of related tax assessment, thereby overcoming the upfront-cost barrier by financing over a longer term and improving cash flow for owners.[72] Once regulatory and legal issues are addressed, similar options will most certainly materialize to address the needs of this financing and overcome the objections of federal regulators. The loan obligation moves to the next owner if the home is sold. In theory, the energy savings would be greater than the increase in property tax, generating a positive cash flow to the homeowner.

The pool of loans is not tax-exempt at the federal level, so it cannot be sold into the tax-free municipal bond market. This decreases liquidity significantly, as the tax-free segment of the overall market totals $600 billion per year, while the taxable segment is $6 billion per year. Additionally, the lack of an active securitization market limits liquidity. Once the secondary markets do open, government agencies and philanthropic funds could provide credit enhancement to pools of loans, enabling purchase at lower risk.

As a voluntary property tax increase, this type of financing is designed to take seniority over an existing mortgage. New mortgages can be issued with this seniority clearly spelled out, but seniority status for existing mortgages has been challenged. It is not a matter of simply getting the mortgage lender to agree to a change in status. Most mortgages are not held by the original lender, but have been placed in securitized loan pools held by

[72] Property Assessed Clean Energy Policy Brief, 2010.

a large number of investors. Financial institutions holding large mortgage pools are concerned about losing their senior position. Legal opinions vary on this, and the issue has not been resolved.

Sixteen states have passed legislation for these property-tax-based programs, allowing municipalities to create financing districts. Pilots have been launched in California (Sonoma County, Berkeley, and Palm Desert); Babylon, N.Y.; and Boulder, Colo. In these programs, home loans have been financed out of general obligation funds, so the market's acceptance of these new financial products has not been tested. Homeowner acceptance has been good, but project scale to date has been small in each locale. The White House included property-based finance as a major component of the Recovery through Retrofit plan. The California Energy Commission has funded expansion of PACE throughout California with its allocation of the ARRA funds for energy efficiency.

Whether programs are administered by local government or by an outsourced administrative partner (such as the startup company Renewable Funding), the key bottleneck is transfer of loans from the originator to the secondary markets. An early aggregator and buyer of bonds would resolve a key risk. Credit enhancement by the federal government, or possibly state and local government, is needed for property-backed bonds to be placed in the secondary market. Private markets are not in a position to provide this insurance, but such bonds may have strong appeal to new lenders since they are secured by tax liens and have seniority to mortgage debt, pending expected legislative resolution of the issues surrounding these innovations. In any case, the attempt to link long-term asset development to improved energy/environmental efficiency will continue.

One large investment required by the Oregon program was a unified software platform for loan origination and processing. This platform works for three utilities. It is hoped that access to loan payment history, the best predictor of default risk, will help with underwriting and servicing. The platform is intended to become a regional demonstration project.

V.III Lessons learned: Back to the future

Financial innovation is an imperative for promoting well-functioning housing markets. Changes in the increasing structural demand for capital in housing are demographically driven and shape market structure and performance. Urbanization and household formation have fueled financial innovation in housing markets throughout history—from the very first mortgages to covered bonds, guarantees, insurance, tax credits and subsidies, and secondary market development. Regardless of geography, using cash alone to buy or build housing has long proven unfeasible for the vast majority of people. In earlier historical periods, specialized lenders charged relatively high interest rates that limited capital access and impeded entry of new participants, such as developers, consumers, and financial intermediaries. Financial innovations, however, enabled private investors to enter the market, fund development, and create long-term, low-cost sources of capital. All of these innovations required reporting, regulation, and oversight.

Securitization contributed to the housing bubble. Originators ignored credit risk, underwriting standards were excessively loosened, and investors in such securities failed to exercise proper diligence. However, securitization—directly and through covered bonds and other structured products—lowered funding costs, created sources of capital for borrowers, and expanded opportunities for institutional investors around the world. Innovative loan products can reduce costs to creditworthy borrowers (either homeowners or rental-housing developers), while other products enable financial institutions to manage risk and free up capital that can be used to fund housing.[73]

From the Homestead Act and other 19th century land reforms, to the emergence of secondary mortgage markets and securitization, innovation has been a vital element of housing finance. Market-based finance emerged over the past century and became important throughout the world. It has varied widely in form, mix of instruments, government support, market structure, and types of housing. There is no "one size fits all" version.

Highly regulated and noncompetitive financial systems have been curtailed as the importance of property rights became more widely recognized through land reform, land registries, and collateralization.

With greater access to capital, the cost of financing has fallen, making homeownership and rental housing more affordable over the past century. The increased availability and range of mortgage products for homebuyers and developers, combined with structured finance, has created greater liquidity in real estate markets and thus drove trillions of dollars of investment into this sector. Moreover, mortgage-equity withdrawals have contributed greatly to credit availability and hence aggregate consumption.[74]

During the recent housing bubble, however, home prices went far above what average families could afford. Public and business policies that eased lending requirements and led to laxer and less transparent underwriting standards seriously slanted debt-to-equity ratios. As ever more mortgage defaults and foreclosures ensued, liquidity constraints in markets collapsed when the housing-price bubble bust. As credit markets froze and contagion spread throughout the financial sector, the macroeconomic conditions that had encouraged growth and shelter-access disappeared.

Housing markets, structured finance, and mortgage-backed securities function properly when transparent information, independent analysis, and standardized reporting are available. But, as transparency is replaced by conformity and opaque reporting—and as mortgage originators became detached from the consequences of excessive lending due to perverse incentives—problems arise. The wisdom of crowds is replaced by the madness of mobs in the mortgage marketplace and, as investors flee, markets spiral downward.

In all the banking and financial crises we have studied, periods of initial financial liberalization and prosperity in real estate markets have driven demand to peaks that led to regulatory failures, overpricing, and

[73] Phelps and Tilman (2010).
[74] Ducka, et al. (2011).

shoddy risk analysis.[75] Our review of the long sweep of housing finance history yields the following lessons, which are consistent across time in developed and emerging markets alike.

Lesson 1: Don't compromise on credit analysis

As demand for mortgage-backed securities outstripped supply and inflated home values, guidelines designed to ease credit failed. Lenders neglected fundamental analysis, thereby increasing information asymmetries between all parties in the housing market (largely through principal-agent conflicts that drive moral hazard and adverse selection).

Nearly $20 trillion in mortgages originated during the period of easy credit from 2003 to 2008. Before 2007, when housing prices began to decline, residential real estate was estimated at $60 trillion. By 2011, it had declined to $50 trillion with a lot of wealth destroyed in Spain, Ireland, and other European countries, as well as the United States.

Whether attempting to fund new housing in emerging countries or understand the complexities of CDOs, clear and reliable information is essential. Investors need to know about titles, financial accounts, deeds, and contracts. This information makes it possible to determine values, assess risks, and track performance. As Hernando de Soto states, "Without standardization, the values of assets and relationships are so variable that they can't be used to guarantee credit, to generate mortgages and bundle them into securities, to represent them in shares to raise capital."[76]

Clear property rights are vital in order to expand access to affordable housing—whether owned or rented—in emerging or developed markets. Property rights facilitate housing credit by establishing clear collateral and legal claims. Transparent real estate laws are also critical for effective credit analysis and allocation.

Weakly underwritten instruments and private securitizations (which were later replaced by government agencies during the crisis) increased borrowers' incentives to default due to their limited equity at stake and lack of adequate recourse by lenders. The proliferation of new and flexible mortgage products alone was not the primary cause of the market failure. Instead the abbreviated loan process and abandonment of long-proven underwriting standards led many of those products to fail.

Underwriters ignored transaction costs (such as escrow taxes and insurance), enabled loan-to-value ratios above historically proven safe limits, and allowed automated and unverified valuation models. The resulting layering of risk—based on deceptive credit terms, financial illiteracy, or fraud by borrowers—led to a flood of credit on inappropriate terms.

[75] Barth, et al. (2003).
[76] Soto (2011).

These failings led to the explosion of moral hazard, which ultimately pushed the costs of excessive risk onto taxpayers. Foreclosures, delinquencies, and negative equity left an unprecedented number of vacant homes, increasing downward pressure on values in struggling neighborhoods.

Lesson 2: Flexible capital structure matters

Financially sustainable capital structures for the housing market require a balance of debt *and* equity. Early innovations in funding for housing, such as savings and loans, developed a method for collectively accumulating equity to support long-term lending. These pioneering principles were later embedded in government entities, nonprofit organizations, formal financial institutions, and home-savings products. Lessons from these earliest models of peer-to-peer lending could be applied to recent problems in developed economies and help satisfy the growing demand in emerging and frontier markets. New investment vehicles can arise from old innovations.[77]

Since the Great Depression, long-term (20-30 years), fixed-rate mortgages have financed homeownership and enabled developers to provide affordable rental housing. This innovation sprang from the failure of earlier capital structures in housing and the absence of long-term, low-cost loans. After the saturation of the housing market in the United States in 1925, lending standards were loosened as property values rose. Homes were bought with short-term loans (three to five years) requiring 50 percent equity payments. Many buyers would take out secondary loans to pay for the primary loan and purchase price. The classic mistake of financing long-term housing assets with short-term loans, coupled with inadequate equity, led to massive defaults and delinquencies as values declined.

When the housing market collapsed in the Great Depression, the federal government offered refinancing through the creation of the Home Owners Loan Corporation. Later the Federal Housing Administration provided broader mortgage insurance, which enabled the absorption of excess inventory and restored the flow of credit. Extended loan maturities became the new standard in real estate markets in the United States and abroad.

With proper underwriting, the 30-year, fixed-rate mortgage increased the supply of sustainable credit. The alignment of interests between homebuyers, developers, and lenders continued under conditions that enabled liquidity, standardization, and transparency. Rebooting securitization with retained-interest transactions by originators, introducing covered bonds, and dealing with other gaps in the market's capital structure are vital to reinventing housing finance. Loan modification programs, debt-for-equity swaps that allow rent-to-own as an alternative to foreclosure, and encouragement of investor finance could also be helpful.[78] All of these measures could improve liquidity over the longer run.

[77] Tufano and Schneider (2007) and Tufano and Schneider (2008).
[78] Ranieri, et al. (2011).

New policies and programs that enable shared equity, flexibility in mortgage refinancing, and lower transaction costs in finance for homeownership and rental housing can overcome the frictions in that have hampered monetary policy, inflated foreclosures, and slowed economic recovery.[79]

Lesson 3: Size matters

Supersized mortgages and houses contributed to much of the overleveraging and sprawling developments that made housing unaffordable. According to the Census Bureau, the average new home sold in the U.S. ballooned in size over the last three decades from 1,700 square feet to 2,422. That's a 42 percent increase, with the trend intensifying since the late 1990s. "McMansions" had nothing to do with making room for more kids. (The average size of the American household fell from 2.76 people in 1980 to 2.57 in 2009.) Instead, rising home prices lured some consumers into an over-reliance on housing as an investment—building homes that were larger than needed and harder to maintain, with the anticipation that they could serve as a giant savings account, with the added benefit of appreciation.[80] Taste may also have been a factor in the shift to larger homes.

What if houses shrank back to the size expected by the typical U.S. homebuyer 30 years ago? The average new home would have been 722 square feet smaller in 2009. If you consider the average cost per square foot, returning to the expectations of our parents' generation would have produced a savings of $80,000 per home in 2009 alone. America's total expenditures on all new homes sold over the past 30 years would have been $1.2 trillion less in today's dollars, and that savings would continue to accrue in the future. That's before taking into account the cost of furnishing, heating, cooling, and cleaning all that extra space.

Today, Americans devote 34 percent of their household expenditures to their homes. But if Americans are willing to rethink their assumptions about what size their houses should be, they could radically improve the lives of those who live in those homes.

The relationship between housing size, suburbanization, and exurbanization, and the demand of increased energy inputs have created costs that should be factored into 21st century credit analysis. Factors such as neighborhood compactness, access to public transit, and rates of vehicle ownership affect mortgage performance. There is a direct, statistically significant link between longer, costlier commuting and a higher risk of default.[81] Transportation and energy costs take a growing toll on disposable income as urban settlement patterns are increasingly dispersed. Since roughly 17 percent of an average U.S. household income goes to transportation costs, mortgage underwriting procedures should consider this factor as it relates to financial risk.

Mixed use and diversification that accompany location efficiency are also key factors in stabilizing housing markets. Diversification by income levels, use (retail and residential), and tenure (rental and ownership)

[79] Milkes and Pillonca (2008).
[80] Barth, et al. (2010).
[81] Rauterkus, et al. (2010).

attract different elements of demand that result in more sustainable communities. Reduced isolation, labor market access, and other elements that strengthen social capital in communities appear to bolster financial and environmental sustainability as well.[82]

Lesson 4: Structured products and secondary markets work

If lenders and investors monitor credit quality and if timely, adequate information is provided, securitization works well. Beyond the product, market, and regulatory failures previously noted, the ability to securitize (with proper risk-retention by originators to align interests) is central to housing finance. The linkage of risk management and capital access for housing has been historically demonstrated.

Secondary markets expand liquidity and help to balance the broader costs and risks of housing finance. They provide access to capital across market segments (including low- and moderate-income borrowers), types (owner-occupied and rental housing), geographies (urban and rural), and originators (including credit unions, micro lenders in developing countries, and community-based lenders). By providing a wide range of product choices to borrowers, the linkage between housing finance and macroeconomic growth policy can be achieved.

As information technology, data reporting, and regulatory transparency become more widespread, the transitions to recovering secondary markets and securitization will succeed without sacrificing stability.

For housing to be affordable and sustainable, securitization, covered bonds, and other hybrid products are required. Long-term, fixed-rate mortgages require liquidity in real estate financing. Capital markets have proven fundamental to this process insofar as they enable the diversification of risk for investors while avoiding its re-concentration on financial institution balance sheets as occurred in the most recent crisis.

Regulatory measures, when successful, ensure benefits to renters, owners, and developers in single-family and multifamily housing. Government guarantees and subsidies could enable sustainable financial innovation by private, non-profit, and public investors. New products and delivery modes for housing construction, access, and retrofitting are important.

Final Remarks

Beyond the economic characteristics of housing as a physical structure providing shelter and investment value to consumers lays the broader meaning of homes and the hopes and dreams tied to them. As the housing crisis in the developing world and the major disruptions in developed markets prove, there are no quick fixes or applications that can be cut and pasted into vastly different demographics, economic environments, and capital markets. Nonetheless, the principles of housing finance remain consistent, achievable, and available to guide the creation of affordable homes and sustainable communities to better serve society's interests.

[82] Lees (2008).

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