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The Future of the Government-Sponsored Enterprises
The Role for Government in the US Mortgage Market

Dwight Jaffee and John M. Quigley

8.1 Introduction

The two large government-sponsored housing enterprises (GSEs),[1] the Federal National Mortgage Association ("Fannie Mae") and the Federal Home Loan Mortgage Corporation ("Freddie Mac"), evolved over three-quarters of a century from a single small government agency, to a large and powerful duopoly, and ultimately to insolvent institutions protected from bankruptcy only by the full faith and credit of the US government. From the beginning of 2008 to the end of 2011, the two GSEs lost capital of $266 billion, requiring draws of $188 billion under the Treasured Preferred Stock Purchase Agreements to remain in operation; see Federal Housing Finance Agency (2011). This downfall of the two GSEs was primarily a question of "when," not "if," given that their structure as a public/private

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We are grateful to the Fisher Center for Real Estate and Urban Economics at the University of California, Berkeley, for financial support and to Sandley Chou for research assistance. We thank Stuart Gabriel of UCLA, Mark Willis of NYU, and Karen Dynan of the Brookings Institution, as well as the book editors, Ed Glaeser and Todd Sinai, together with all the participants in the two NBER conferences, for helpful comments. Dwight Jaffee adds, with great sadness, that John Quigley, friend, colleague, and coauthor, passed away on May 12, 2012. The chapter was essentially complete by that date, and the further changes are minor and made to prepare it for publication. For acknowledgments, sources of research support, and disclosure of the authors' material financial relationships, if any, please see http://www.nber.org/chapters/c12625.ack.

1. A third, much smaller, Government Sponsored Housing Enterprise is the Federal Home Loan Bank System (FHLBS). The issues for reforming the FHLBS are similar to many of the issues raised in this chapter for Fannie Mae and Freddie Mac, although we have not analyzed separately the FHLBS or other nonhousing government enterprises.

partnership provided a strong incentive for excessive risk taking. The failing mortgage market conditions in 2008 then determined the "when." This chapter traces the transformation of the GSEs from privately held institutions with powerful direction and political influence to their current status as vassals reporting to an administrative agency in the Department of Housing and Urban Development (the Federal Housing Finance Agency, FHFA).

Within the next few years, the GSEs will have to be restructured. Proposals for reform include recapitalizing them in some form as GSEs, reconstituting them as agencies of the federal government with more narrowly-specified missions, or privatizing the organizations. There are also proposals to replace the GSEs with a variety of new government mortgage guarantee/insurance programs. The GSE reform and mortgage guarantee proposals are both nested within the larger question of what are the likely consequences of alternative roles for government in the US housing and mortgage markets. This chapter is intended to help in the deliberations of "what to do" about these costly failures. We briefly review the history of the housing enterprises and their performance, including the recent housing crisis. We document the contributions of Freddie and Fannie to the operation of US housing markets, and we analyze the role of the agencies in the recent housing crisis. We search for evidence on the importance of Freddie and Fannie in achieving other important housing goals. We compare US policies with those adopted in other developed countries.

This is not the first time we have provided some analysis of the reform options in housing finance, either individually (Jaffee 2010a, 2010b, 2011; Quigley 2006) or jointly (Jaffee and Quigley 2007, 2010). However, it is our first attempt to relate the full history and to consider all of the options.

In section 8.2 we discuss the background and origin of the GSEs, the evolution of their structure as a public/private partnership, and the federal role in supplying housing credit. Section 8.3 provides a brief summary of home ownership and government policy. Section 8.4 describes the broader objectives and goals of the GSE institutions and analyzes the most recent failures of the credit market and the secondary housing market. Section 8.5 describes the likely consequences of a series of plans concerning the restructuring of the GSEs and alternative mechanisms for government support of the US mortgage market. It also provides a brief summary of the GSEs under their government conservatorship since September 2008.

8.2 Background

With the public sale of its stock and its conversion into a government-sponsored enterprise in 1968, the Federal National Mortgage Association (FNMA) emerged from obscurity as an agent in the market for home mortgage credit. The FNMA had been established in 1938, based on provisions

in the 1934 National Housing Act, after the collapse of the housing market during the Great Depression. The 1934 act had established the Federal Housing Administration (FHA) to oversee a program of home mortgage insurance against default. Insurance was funded by the proceeds of a fixed-premium charged on unpaid loan balances. These revenues were deposited in Treasury securities and managed as a mutual insurance fund. Significantly, default insurance was offered on "economically sound" self-amortizing mortgages with terms as long as twenty years and with loan-to-value ratios up to 80 percent.

Diffusion of the new FHA product across the country required national standardization of underwriting procedures. Appraisals were required, and borrowers' credit histories and financial capacities were reported and evaluated systematically. The Mutual Mortgage Insurance Fund, established to manage the reserve of FHA premiums, was required to be actuarially sound. This was generally understood to allow very small redistributions from high income to low income FHA mortgagees. By its original design, the FHA was clearly intended to serve the vast majority of home owners.

In the 1934 act, Congress had also sought to encourage private establishment of National Mortgage Associations that would buy and sell the new and unfamiliar insured mortgages of the Federal Housing Administration. By creating a secondary market for these assets, the associations sought to increase the willingness of primary lenders to make these loans. No private associations were formed, however. When further liberalization of the terms under which associations could be organized was still unsuccessful, the Federal National Mortgage Association was chartered in 1938 by the Federal Housing Administrator following the request of the President of the United States. Federal action was precipitated particularly by concern over the acceptability of new FHA 90 percent twenty-five-year loans authorized that year.

At first, the association operated on a small scale, but its willingness to buy FHA mortgages encouraged lenders to make them. A 1948 authorization to purchase mortgages guaranteed by the Veterans Administration (VA) led the association to make purchases, commitments, loans, and investments that soon approached the congressionally authorized limit of $2.5 billion. Since the maximum interest rate on VA mortgages was below the market rate, FNMA's advance commitments to buy VA-guaranteed mortgages at par assured windfall gains to private borrowers or lenders. The 1954 Housing Act reorganized Fannie Mae as a mixed-ownership corporation with eligible shareholders being the federal government and lenders that sold mortgages to Fannie Mae. The FNMA was then able to finance its operations through sale of its preferred stock to the US Treasury, through sale of its common stock to lenders whose mortgages it bought, and by the sale of bonds to the public.

The Housing and Urban Development Act of 1968 transferred FNMA's special assistance program and the management and liquidation of part of its portfolio to the newly constituted Government National Mortgage Association. Its secondary market operations remained with FNMA, now owned entirely by private stockholders. Commercial banks were the primary beneficiaries of FNMA's secondary market activities in FHA and VA mortgages, since the banks specialized in originating the government-guaranteed mortgages. In contrast, the mortgages originated by Savings and Loan Associations (S&Ls) and Mutual Savings Banks were primarily "conventional" mortgages, meaning they received no government guarantee. The thrift institutions (covering savings and loan associations, mutual savings banks, and credit unions) lobbied for equal treatment, and were rewarded in 1970 with the establishment of the Federal Home Loan Mortgage Corporation ("Freddie Mac") under the regulatory control of the Federal Home Loan Bank System, the S&L regulator. Freddie Mac stock first became publicly available in 1989, although shares owned by Freddie Mac's financial partners had been traded on the New York Stock Exchange starting in 1984.

The structure of Fannie Mae and Freddie Mac as government-sponsored enterprises was established by the 1968 and 1970 legislation that created the two firms in their current form. They are private entities in the sense that they are shareholder owned with stock that traded on the New York Stock Exchange, were increasingly managed to maximize profits, and were not part of the federal government budget. They were also public entities in the sense that they were chartered by Congress (which could therefore change their charter), some members of the boards of directors are selected by the president, and they were regulated by the government to enhance a variety of public policy goals. They were aptly described as public/private partnerships.

This "partnership" left open the question whether the government would be liable for the debt instruments issued by the GSEs if the enterprises were to fail. While their charters indicated no formal guarantee, the GSEs immediately suggested there was an "implicit government guarantee," and market investors generally believed this was the case. Indeed, this expectation was fulfilled in 2008 when the government did guarantee all the GSE debt instruments as part of the Conservatorship. The implicit guarantee provided the GSEs with a strong incentive to carry out high yielding but risky investments, since the gains would go to the GSE shareholders, while serious losses would be the responsibility of the government. Starting in about 1990, it became increasingly clear that the GSEs were following this strategy, first by taking on significant amounts of interest rate risk, and later taking on significant amounts of credit risk in the midst of the subprime mortgage boom. Once the government acquiesced in allowing the concept of an implicit government guarantee to gain traction, it was inevitable that the combination of GSE risk taking and a market crash would cause the firms to fail.

8.3 Home Ownership and Government Policy

According to de Tocqueville (1835), Americans have long been obsessed with owner-occupied housing. Richard Green (2011) sees this as a political issue, as societies are less disposed to make revolution when personal and real property is augmented and distributed among the population. Other recent work emphasizes the external benefits of owner-occupied housing, and a large social science literature has developed exploring the connection between higher levels of home ownership and the economic and social outcomes of households. Table 8A.1 in the appendix reports some of the findings linking home ownership to social outcomes. Two other papers (Dietz and Haurin 2003; Haurin, Dietz, and Weinberg 2002) provide an exhaustive comparison of the economic and social consequences for those living in owner-occupied and rental housing.

Most of the research supports the conclusion that home ownership has some positive effects upon the social outcomes for individuals and households. But the research does not conclude that the effect is very large. And even if the effect were large, nothing supports the conclusion that home ownership should be supported by the institution of the GSEs or their policy choices. In particular, the primary impact of instruments that focus on lowering the cost or expanding the availability of mortgages will be larger mortgages, which makes those instruments ineffective and costly relative to direct subsidies for home ownership. This is important since, as noted later, many of the popular arguments in support of subsidies for the GSEs are based upon the promotion of home ownership in the economy.

8.4 Policy Objectives for the GSEs

8.4.1 Primary Objectives

The GSE charters state the goals and responsibilities of the enterprises, and do so without direct reference to home ownership goals. Instead, they seek to:

1. Provide stability in the secondary market for residential mortgages.
2. Respond appropriately to the private capital market.
3. Provide ongoing assistance to the secondary market for residential mortgages (including activities relating to mortgages on housing for low- and moderate-income families involving a reasonable economic return that may be less than the return earned on other activities) by increasing the liquidity of mortgage investments and improving the distribution of investment capital available for residential mortgage financing.
4. Promote access to mortgage credit throughout the nation (including

central cities, rural areas, and underserved areas) by increasing the liquidity of mortgage investments and improving the distribution of investment capital available for residential mortgage financing.

5. Manage and liquidate federally owned mortgage portfolios in an orderly manner, with a minimum of adverse effect upon the residential mortgage market and minimum loss to the Federal Government.

This section reviews the key activities of the GSEs with respect to providing stability, assistance, and liquidity to the secondary market for residential mortgages. The specific objectives of the secondary market activities have varied over time, including operations to reinforce or offset fiscal and monetary policy, to increase residential construction, to make a market in federally underwritten mortgages, to reduce regional yield differentials, and to act as a mortgage lender of last resort. (See Guttentag [1963] for an extensive discussion of these key activities.)

Quantitative Impact of the GSEs on the US Home Mortgage Market

Table 8.1 reviews the quantitative role of the GSEs in the US mortgage market over the recent past. The top panel reports the outstanding amounts of whole home mortgages at the end of each decade from 1950 through 2010. Through 1960, all whole home mortgages were held directly in portfolios, and even by 1970 the only exception was $3 billion of whole mortgages backing the first mortgage-backed securities (MBS) issued by the newly established Government National Mortgage Association (GNMA). The largest portfolio investor has always been the depository institutions (commercial banks and thrift institutions). The "market investor" portfolio category includes capital market entities such as pension funds, mutual funds, and insurance companies. The GSE category covers the Fannie Mae on-balance-sheet portfolio through 1970 and the sum of the Fannie Mae and Freddie Mac portfolios thereafter.

Figure 8.1 shows the percentage of whole mortgages held directly in portfolios for each of the three investor classes. The depository institutions have always been the predominant holder of whole mortgages. At year-end 2010, for example, the depository institutions held 76 percent (= /$2,959/$3,918) of all whole mortgages that were directly held in portfolios, with the market investors and the GSEs each holding a 12 percent share. Starting in 1980, however, the portfolio holdings of whole home mortgages were increasingly transferred to MBS pools. The top panel of table 8.1 shows the three main categories of MBS pools: pools issued by the GSEs, by GNMA, and by private label securitizers (PLS).

The middle panel of table 8.1 shows each of the categories for whole home mortgage holdings as a percentage of the total amount outstanding. One major trend is that the portfolio holdings declined steadily from 100

Table 8.1 Outstanding whole home mortgages

	Year						
	1950	1960	1970	1980	1990	2000	2010
A. Billions of dollars							
Portfolio holdings	$45	$141	$289	$851	$1,496	$2,297	$3,918
Depository institutions	27	95	207	642	1,066	1,669	2,959
Market investors	17	40	65	146	316	441	478
GSE portfolios	1	6	17	62	114	187	481
Mortgage pools	0	0	3	107	1,111	2,811	6,614
GSE pools	0	0	0	13	652	1814	4,311
GNMA pools	0	0	3	94	404	612	1,038
PLS pools	0	0	0	0	55	386	1,265
Total	$45	$141	$292	$958	$2,606	$5,108	$10,531
B. Percentage of total							
Portfolio holdings	100%	100%	99%	89%	57%	45%	37%
Depository institutions	60	67	71	67	41	33	28
Market investors	38	29	22	15	12	5	5
GSE portfolios	2	4	6	7	4	8	5
Mortgage pools	0	0	1	11	43	55	63
GSE pools	0	0	0	1	25	36	41
GNMA pools	0	0	1	10	15	12	10
PLS pools	0	0	0	0	2	8	12
Total	100%	100%	100%	100%	100%	100%	100%
C. GSE whole loans held + MBS issued							
	3%	4%	6%	8%	29%	44%	46%

Source: See data appendix.

percent of the total in 1960 to 37 percent of the total by 2010. Among the portfolio investors, both depository institution and market investor holdings declined steadily starting in 1970. The GSE portfolio holdings of whole home mortgages, 5 percent of the total in 2010, remained a small percentage of the total throughout the history, with fluctuations within the narrow band of 3 percent to 8 percent of the total.

The corresponding major trend reported in the middle panel of table 8.1 is the steady rise in mortgage pools as a percentage of the total, starting at 1 percent in 1970 and reaching 63 percent of the total by 2010. The GSE pools show the most rapid rise, reaching 41 percent of total outstanding home mortgages by 2010. The PLS pools also grew steadily, reaching 12 percent of the total by 2010. The GNMA pool share of total outstanding mortgages,

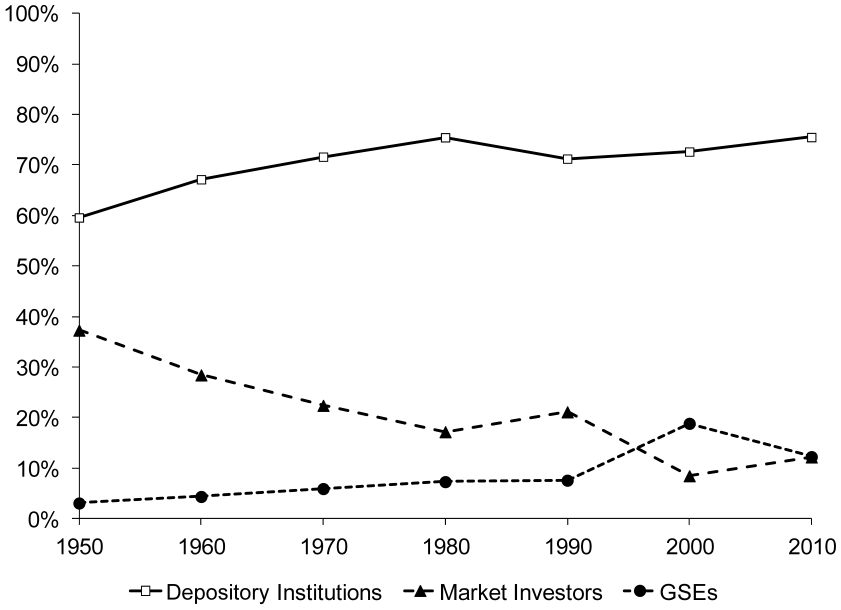

Fig. 8.1 Share of whole mortgages held directly, by holder class
Source: See data appendix.

10 percent at year-end 2010, fluctuated in a narrow range between 10 percent and 15 percent of the total from 1980 to the present.

The bottom panel of table 8.1 shows the direct GSE share of the home mortgage market, computed as the sum of whole mortgages held in the GSE portfolios and their outstanding MBS. While this GSE share rose steadily from 1950, the primary increase started in 1990, with the share reaching 46 percent of all outstanding home mortgages in 2010. This direct share does not include MBS from other issuers that were held in the GSE portfolios, a topic to which we turn later.[2]

While table 8.1 accounts for all outstanding home mortgages, it does not distinguish among the investor groups holding the MBS instruments created by the mortgage pools. This issue is addressed in table 8.2, in which ownership of the MBS pools has been allocated among the various investor classes. These values are then combined with the portfolio holdings of whole mortgages to determine the ownership structure of all home mortgages, whether held as whole mortgages or as investment in MBS pools.[3] It is apparent from

2. Quantitatively, including the GSE holdings of other MBS would raise the total GSE share to 47 percent and 48 percent for 2000 and 2010, respectively. This ratio actually peaked in 2003, reaching 50 percent.

3. As far as we are aware, this integration of whole mortgage portfolio holdings and MBS pools by investor has not been available previously.

Table 8.2 Holdings of whole home mortgages and MBS by investor class

	1950	1960	1970	1980	1990	2000	2010
	Billions of dollars						
Depository institutions							
Whole mortgages	$27	$95	$207	$642	$1,066	$1,669	$2,959
MBS	0	0	0	41	385	604	1,368
Total	27	95	207	683	1,450	2,272	4,326
Market investors							
Whole mortgages	17	40	65	146	316	195	478
MBS	0	0	3	66	714	1,446	4,444
Total	17	40	68	212	1,030	1,641	4,923
GSEs							
Whole mortgages	1	6	17	62	114	433	481
MBS	0	0	0	0	12	762	802
Total	1	6	17	62	126	1,195	1,283
Total home mortgages	$45	$141	$292	$958	$2,606	$5,107	$10,531

Source: See data appendix.

table 8.2 that, starting in 1980, market investors were expanding relative to the depository institutions and the GSEs, and that by 2010 the market investors were the largest investor class for the sum of whole mortgages and mortgage securities.

Figure 8.2 reports the percentage of outstanding MBS for the three holder classes.[4] It is apparent that the market investors have always been dominant in holding MBS positions. At year-end 2010, market investors were holding 67 percent (= $4,444/$6,614) of the outstanding MBS, with depository institutions holding 21 percent and the GSEs 12 percent.

Figure 8.3 combines the results for figures 8.1 and 8.2, reporting the share for each holder class of their combined positions in whole mortgages and MBS. By 2010, the market investors had the largest position, representing 47 percent of all home mortgages, with depository institutions in the second position, holding 41 percent of all home mortgages. At the same time, the GSEs were holding 12 percent of all home mortgages (as either whole mortgages or MBS) a share just below their average over the last three decades.

Figure 8.3 indicates that the GSE combined holdings of whole mortgages and MBS has always represented a relatively small share of total US home mortgages outstanding. In this sense, closing the GSEs now, in an orderly way, would have a minor impact on the US mortgage market. That is, the 12 percent GSE share could be readily replaced by a combination of market investors and depository institutions (who between them are already holding

4. The graphs start in 1970, since there were no outstanding MBS before that year.

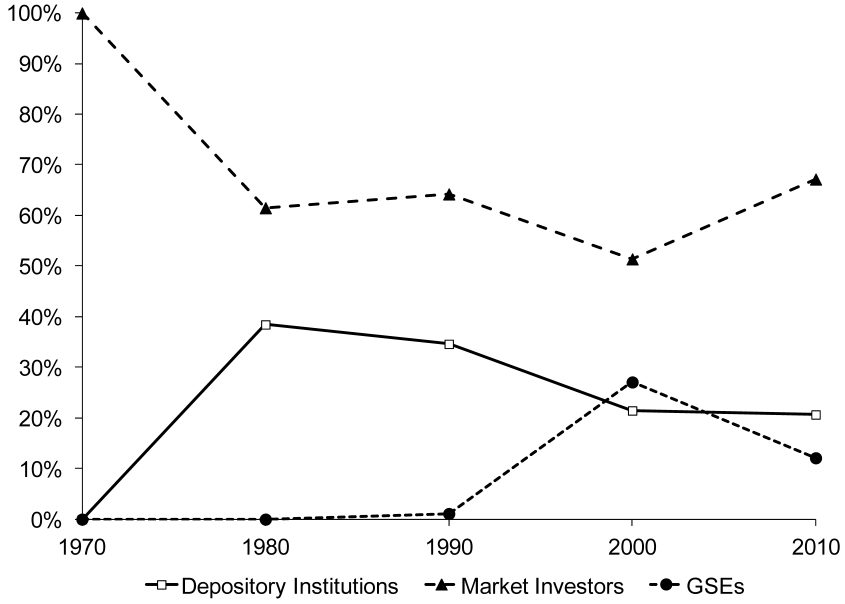

Fig. 8.2 Share of MBS outstanding, by holder class
Source: See data appendix.

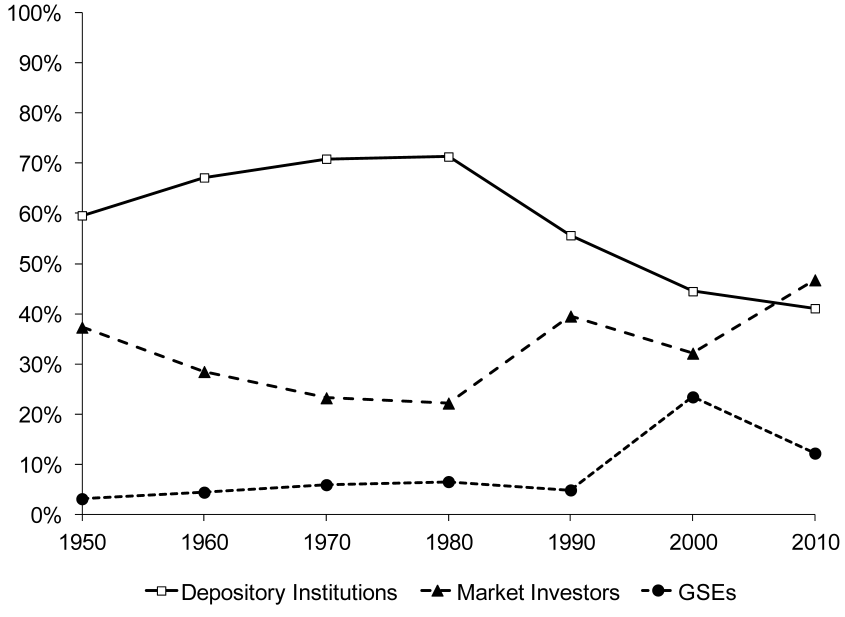

Fig. 8.3 Share of whole mortgages and MBS, by holder class
Source: See data appendix.

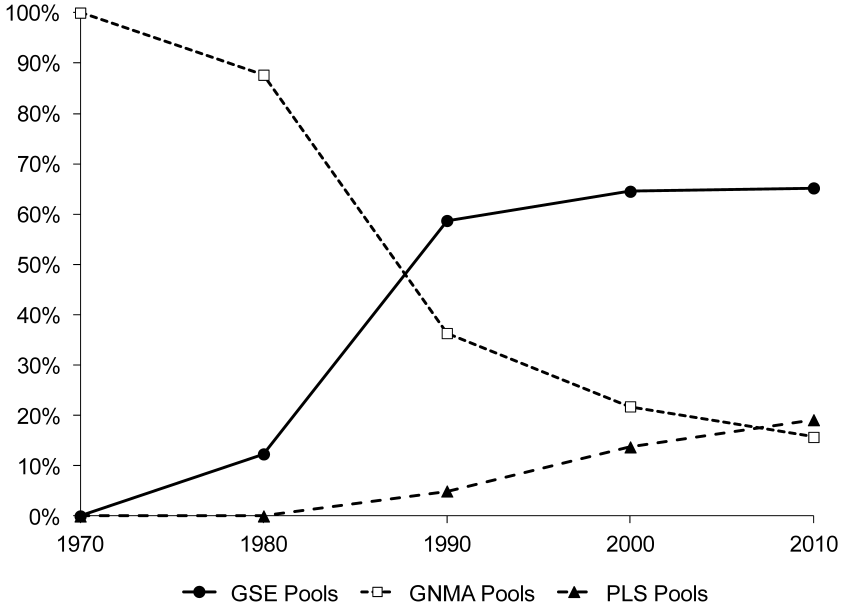

Fig. 8.4 Share of MBS outstanding, by MBS issuer
Source: See data appendix.

88 percent of US home mortgages). There are, however, two other measures of potential GSE benefits with regard to outstanding whole mortgages and MBS: (1) the contribution of MBS issued by the GSEs, and (2) stabilization of the US home mortgage market through countercyclical activities by the GSEs. We now consider these in turn.

The Role of GSE-Issued MBS

Figure 8.4 shows the relative shares of outstanding home mortgage MBS by issuer class. The GSE share has been dominant since 1990, representing 65 percent of all outstanding MBS in 2010. The share of private label securitizers (PLS) has been steadily rising, but still represented only 19 percent of outstanding MBS at year-end 2010. The GNMA share has been steadily declining, reaching a 16 percent market share by year-end 2010.

The dominant historical position of GSE MBS in the current US home mortgage is sometimes used to justify a future role for the GSEs in the market. But, at its core, the GSE dominance of the MBS market for home mortgages has been largely derived from the assumption of market investors—reinforced by GSE marketing—that the GSE MBS had an implicit government guarantee. In this sense, the dominant GSE MBS position is just an example of *crowding out,* whereby any asset with a low-cost government guarantee against loss will likely replace private activity in the same

market. If the government guarantee were eliminated, there is every reason to expect that private market activity would simply replace the activity of the government entity.

A brief review of the history of US MBS development is valuable for understanding the limited contribution of the GSEs to MBS innovations.[5]

- 1968: GNMA creates first modern MBS by securitizing FHA/VA mortgages.
- 1970s: GSEs expand MBS market based on their implicit government guarantee.[6]
- 1980s: Salomon Bros. securitizes multiclass, nonguaranteed, MBS instruments.[7]
- 1990s: Multiclass (structured finance) mechanism is first applied to wide range. of asset-backed securities, including auto, credit card, and commercial mortgage loans.
- 2000s: Subprime lending rapidly expands by applying structured MBS methods.

Credit for the modern innovation of single-class MBS belongs to the government itself with the creation of the GNMA MBS. The GNMA was, and remains, an agency within the Department of Housing and Urban Development. Likewise, credit for the innovation of the multiclass MBS belongs to the private sector with the development of structured MBS by Salomon Bros. in the 1980s. In fact, the GSEs have always been followers, not innovators, in the MBS market. The success of the GSEs in establishing the market for their own MBS depended entirely on the perception of capital market investors as facing no credit risk as the result of the implicit federal guarantee. Absent this government guarantee, the single-class GSE MBS would have simply lost out in the marketplace to the multiclass, private-label, MBS.

The GSE proponents often argue that the GSEs reduced securitization costs and mortgage interest rates. Here, too, the reality is that the GSEs provide no benefit other than the implicit guarantee. A case in point is the TBA ("to be announced") forward market for GSE and GNMA MBS. While this market arguably expands the liquidity of the traded MBS, the

5. The US mortgage securitization probably actually began soon after the founding of the republic. Following the War of 1812, the US federal government was desperate for revenue and extended loans to homesteaders for property on the Western frontiers. Without the resources to make and hold these loans, the government pooled and sold these loans to investors. By the 1920s, securitization was already a well-accepted format for selling loans to investors. These mortgage-backed securities failed during the real estate crisis of the 1930s, and it was decades before US securitization was reactivated in 1968. See Quinn (2010) for a new history of US housing policy and the origins of securitization.

6. The GSEs could point to their $2.25 billion line of credit at the US Treasury as backing for their guarantee, a significant factor only in the early years when their scale of operations was relatively small. It also helped the GSE case that the US government never firmly and officially rejected the notion of an implicit guarantee.

7. The colorful development of private-label MBS under Lewis Ranieri at Solomon Brothers is wonderfully chronicled in *Liars Poker* by Lewis (1990).

benefit depends completely on the market's perception that the guarantees—explicit for GNMA and implicit for the GSE MBS—make credit risk irrelevant in the pricing and trading of the securities. It is equally noteworthy that the markets for *asset-backed securitization,* for the securitization of credit card, auto, and commercial mortgage loans, and other loan classes as well, expanded rapidly starting in the early 1990s without any contribution from the GSEs. Indeed, as with the original GNMA MBS, the GSEs benefited from the innovation by others, creating their own structured finance offerings once the market demand for such securities had been expanded through private market innovation.[8]

Finally, the claim is sometimes made that the GSE MBS activity is critical for the survival of the thirty-year, fixed-rate, residential mortgage. This claim is unwarranted. In fact, two features of the GSE MBS instrument directly deter the expansion of the long-term, fixed-rate, mortgage:

First, the GSE MBS transfer the entire interest rate risk imbedded in the fixed-rate mortgages to the market investors who purchased the instruments. The GSEs took no action to mitigate this risk.

Second, the GSE MBS generally disallowed prepayment penalties on all the mortgages they securitized. While borrowers may have felt they benefitted from this "free" call option, it greatly magnified the interest rate risk imposed on investors in the GSE MBS, and led to higher interest rates on the fixed-rate mortgages.

Finally, a number of Western European countries successfully use long-term, fixed rate mortgages, but have no entity comparable to the GSEs; Denmark is the most conspicuous example. The use of covered bonds also allows European banks to hold long-term mortgages on their balance sheets, while passing a substantial part of the interest-rate risk to capital market investors. We further discuss the experience of Western European countries in the section on mortgage markets without GSEs.

The Limited GSE Contributions to Mortgage Market Stability

The GSEs claim credit for taking actions to stabilize the US mortgage markets. The US Government Accountability Office (2009), however, finds little evidence of such benefits:

> [T]he extent to which the enterprises have been able to support a stable and liquid secondary mortgage market during periods of economic stress, which are key charter and statutory obligations, is not clear. In 1996, we attempted to determine the extent to which the enterprises' activities would support mortgage finance during stressful economic periods by analyzing Fannie Mae's mortgage activities in some states, including oil producing states such as Texas and Louisiana, beginning in the 1980s.

8. See Downing, Jaffee, and Wallace (2009) for a discussion of how the GSEs profited by restructuring their simple pass-through MBS into more complex multitranche securitizations.

> Specifically, we analyzed state-level data on Fannie Mae's market shares and housing price indexes for the years 1980–1994. We did not find sufficient evidence that Fannie Mae provided an economic cushion to mortgage markets in those states during the period analyzed.

Reports by the Congressional Budget Office (1996, 2010) come to similar conclusions. The academic literature also generally concludes that the GSE contribution to US mortgage market stability has been modest at best. This view is stated in early studies by Jaffee and Rosen (1978, 1979) and more recent studies by Frame and White (2005) and Lehnert, Passmore, and Sherlund (2008). In contrast, Naranjo and Toevs (2002), a study funded by Fannie Mae, found evidence of effective stabilization by the GSEs, as did other studies carried out internally by the GSEs. Unlike the previous studies, Peek and Wilcox (2003) focused on the flow of mortgage funds, and not on mortgage interest rates, and found the GSE contribution to be countercyclical. Of course, this research was all conducted before the subprime housing bubble and its collapse. As we now document, the GSE participation in the subprime housing bubble was decidedly destabilizing.

The GSE Role in the Subprime Mortgage Boom and Crash

The losses reported by the GSEs starting in 2008 leave no doubt that the GSEs acquired a significant volume of risky mortgages during the subprime boom. However, the extent, timing, and significance of these acquisitions is debated. For example, Jaffee (2010b) describes the GSE role as "expanding" the subprime boom, especially in 2007, whereas Wallison (2011, 2) concludes that GSE activity, based on their housing goals, was a primary "source" of the crisis. In this section, we evaluate the role played by the GSEs in the subprime mortgage boom and crash.

A quantitative evaluation of the GSE role in the subprime crisis faces a number of significant data issues:

1. Definitions for *subprime* and *Alt-A* mortgages differ across data sets, and certain high-risk mortgages are not included under either label.
2. Defining *high-risk mortgages* (including subprime and Alt-A instruments) is necessarily complex because mortgage default risk arises from numerous factors including borrower and property attributes (FICO scores, loan-to-value ratios, etc.), special amortization options (interest only, negative amortization, etc.), and fixed-rate versus adjustable-rate loans.
3. The GSEs could not acquire any mortgages with an initial loan amount above the conforming loan limit (so-called jumbo mortgages).

Our analysis starts by reviewing a newly compiled mortgage origination data set from the GSE regulator, the Federal Housing Finance Agency (2010a).[9] These data compare the risk characteristics of all mortgages

9. We thank Robin Seiler of the Federal Housing Finance Agency for providing us with a road map for the intricacies of these data.

acquired by the GSEs (whether securitized or held in retained portfolios) with the risk characteristics of all conforming, conventional, mortgages that were included in private label securitizations (PLS), tabulated by year of mortgage origination. Because the data set has nearly complete coverage and is restricted to conforming mortgages, it provides the best available direct—"apples to apples"—comparison of the GSE acquired mortgages relative to the comparable market. Nevertheless, there are two limitations. First, while the FHFA data include all the conforming mortgages that collateralized PLS MBS instruments, the GSE holdings of PLS tranches are not so identified. We do not expect a significant bias in the comparisons from this source, however, because the GSE PLS holdings were almost entirely AAA tranches with little ex ante credit risk.[10] Second, the FHFA data exclude conforming mortgages that were not securitized (i.e., they were retained in lender portfolios). To the extent that lenders did retain conforming mortgages with high-risk attributes, the FHFA data set will undercount the high-risk dimensions of the overall conforming origination pools, and will therefore overstate the GSE share of all high-risk originations. Here too, we do not expect a significant bias in our comparisons, because most subprime and Alt-A mortgages were securitized, and the securitization rate was even higher among those high-risk loans that were also conforming mortgages.[11]

Panel A of table 8.3 shows the dollar amount of the conforming mortgages by origination year and various risk attributes. Rows 1 to 3 report on loans with one of the identified high-risk factors: high loan-to-value (LTV) ratios, low FICO scores, and adjustable-rate mortgages (ARMs), respectively. However, there is some double counting since some loans have more than one of these attributes. The aggregate high-risk originations shown in row 4 nets out all double counting.[12] Row 6 shows the percentage of high-risk mortgages as a share of total conforming mortgages (in row 5). This

10. See Thomas and Van Order (2011) for further discussion. The PLS tranches as a share of total GSE acquisitions reached its high point at 22.9 percent in 2005, but had fallen to 7.4 percent by 2007. Furthermore, actual cash flow losses on GSE PLS positions have been modest to date, although the GSEs have recognized significant mark to market valuation losses on these positions.

11. For example, 2007 data from *Inside Mortgage Finance* indicate that only $33 billion (or 7 percent) of the subprime/Alt-A mortgages originated that year were not securitized. Even if these were all conforming mortgages, their share of total conforming originations that year would be less than 3 percent. Furthermore, *Inside Mortgage Finance* indicates that over 31 percent of subprime MBS and 9 percent of Alt-A MBS in 2007 were "GSE eligible"—that is, conforming mortgages eligible for GSE purchase—further reducing the incentive of portfolio lenders to hold these mortgages in unsecuritized form. It is also noteworthy that while there is no consensus conclusion from the expanding literature on whether securitization created lax underwriting standards—see, for example, the contrast between Bubb and Kaufman (2009) and Keys et al. (2010)—there is no finding that portfolio lenders were systematically retaining high-risk mortgages.

12. For example, for the fixed-rate mortgage originations in 2007, 2.2 percent had LTV $>$ 90 percent and FICO score $<$ 620. For adjustable rate mortgages in 2007, 19.2 percent had either LTV $>$ 90 percent or FICO score $<$ 620. Overall, in 2007 4.7 percent of the originated mortgages had more than one of the high-risk attributes.

Table 8.3 **Conforming mortgage originations by origination year, characteristics, and GSE market share**

	2001	2002	2003	2004	2005	2006	2007
A. Conforming originations, billions of dollars[a]							
(1) Loan-to-value ratio > 90%	108	121	154	130	112	115	169
(2) FICO score < 620	94	126	164	194	211	162	92
(3) ARMs	83	200	332	516	579	447	165
(4) High risk originations[b]	241	367	536	664	719	597	374
(5) Total conforming originations	1,064	1,451	2,074	1,331	1,454	1,307	1,117
(6) High risk as % of total conforming	22.6%	25.3%	25.9%	49.9%	49.5%	45.7%	33.5%
B. GSE Share of risk attributes							
(7) Loan-to-value ratio > 90%	92.2%	86.4%	76.0%	59.6%	58.4%	66.8%	93.1%
(8) FICO score < 620	63.9	56.7	47.0	25.1	22.4	32.5	76.8
(9) ARMs	50.7	60.5	56.5	36.8	29.0	33.1	62.6
(10) High risk originations	77.2	72.7	65.3	43.5	36.3	42.5	79.9
(11) GSE share total conforming loans	93.7	91.6	88.7	67.5	61.9	67.1	90.7
C. Relative Intensity (1.0 = "market portfolio")[c]							
(12) Loan-to-value ratio > 90%	0.98	0.94	0.86	0.88	0.94	1.00	1.03
(13) FICO score < 620	0.68	0.62	0.53	0.37	0.36	0.49	0.85
(14) ARMs	0.54	0.66	0.64	0.55	0.47	0.49	0.69
(15) High risk originations	0.82	0.79	0.74	0.64	0.59	0.63	0.88
(16) GSE total conforming loans	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Source: All data are from Federal Housing Finance Agency (2010a).

[a]Conforming mortgage originations exclude originations retained in lender portfolios.

[b]Line (4) = (1) + (2) + (3) – adjustment for mortgages with multiple factors.

[c]Relative intensity = GSE share of risk attribute/GSE share conforming loans (row 11).

high-risk share of total conforming originations rose steadily through 2004 and then declined steadily thereafter.

Panel B of table 8.3 computes the share of the conforming mortgages acquired by the GSEs—whether as backing for their MBS or to hold on their balance sheets—for each risk attribute. For example, in 2001, the GSEs acquired about 92.2 percent of all conforming mortgages with LTV ratios above 90 percent. For all three of the risk attributes, the GSE share fell steadily through 2005 and then expanded rapidly through 2007. By 2007, the

GSEs were acquiring 79.9 percent of the high-risk, conforming mortgage originations. In interpreting these numbers, however, it must be recognized that, as shown in row 11, the GSEs represent a large share of the overall conforming mortgage market; as their overall conforming market share approaches 100 percent, their share of each risk attribute would necessarily do the same.

Panel C corrects for the large GSE share of the conforming market by computing a "relative intensity," dividing the GSE market share for each risk attribute in panel B by the overall GSE market share in row 11. A coefficient of 1 indicates the GSEs are holding the "market portfolio," whereas coefficients below 1 indicate they are avoiding risky mortgages, and coefficients above 1 indicate the GSEs are actively acquiring risky mortgages. The pattern for each of the three risk attributes shows the relative intensity rising steadily starting in 2005. In each case, the high point of the seven-year history was reached in 2007. Since the relative intensities over the full time span are generally less than one, it would appear the GSEs were not leading the market for high-risk lending as the subprime boom took off.[13] But the jump in relative intensity in 2007 for most of the indicators suggest that the GSEs then rapidly expanded their participation in the subprime boom. This is one key basis for our conclusion that the GSEs were a destabilizing influence on the conforming mortgage market as the subprime boom headed to its peak in 2007.

The analysis has so far focused on the GSE acquisition of high-risk mortgages as a share of the overall conforming mortgage market. We now consider the GSE acquisition of high-risk mortgages as a share of their total acquisitions. Table 8.4 reports the three attributes—high LTV ratios, low FICO scores, and ARMs—reported in table 8.3, as well as interest only, condo/coop, and investor loans. The time pattern is again distinctive, with the share of the GSEs' new business dedicated to mortgages with these high-risk attributes generally peaking in 2007, the only exceptions being the declining share of Fannie Mae ARM acquisitions and Freddie Mac interest-only loan acquisitions. These data thus present a second independent basis for our conclusion that the GSEs were a decidedly destabilizing influence on the conforming mortgage market as the subprime boom headed to its peak in 2007.

Mortgage Markets without GSEs

The abovementioned evidence indicates that the GSEs definitively expanded their share of high-risk US mortgages during the later stages of the subprime boom, but there is a further question of how the US mortgage markets would function without the GSEs. To help answer this, in this

13. Thomas and Van Order (2011), although using different data sets, come to the same conclusion.

Table 8.4 **Conventional single-family business volume by attribute and year**

	2001	2002	2003	2004	2005	2006	2007
Fannie Mae							
LTV > 90%	11%	8%	7%	10%	9%	10%	16%
FICO < 620	6	6	4	6	5	6	6
ARMs	6	9	10	22%	21	17	10
Interest only	n/a	1	1	5	10	15	16
Condo/coop	n/a	7	7	9	10	11	11
Investor	4	5	6	4	5	6	5
Freddie Mac							
LTV > 90%	11%	7%	5%	7%	6%	6%	11%
FICO < 620	4	3	3	4	4	5	6
ARMs	8	12	13	17	18	16	20
Interest only	n/a	n/a	n/a	3	1	0	0
Condo/coop	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Investor	2	2	4	4	4	5	6

Source: Fannie Mae and Freddie Mac Annual Reports.

Note: Loans may have more than one of the characteristics. n/a = not available.

section we consider evidence from two sources: (a) how the US mortgage market performed without GSEs, and (b) the performance of the mortgage markets in Western European countries.

The evidence that private mortgage markets have operated effectively in the US economy can be summarized with three comments on the historical role of private markets within the US mortgage market. First, private markets have always originated 100 percent of US mortgages, and closing the GSEs would not affect this. Second, the GSEs have never held a significant share of the outstanding US home mortgages, this share being, for example, 12 percent at year-end 2010. Third, the GSE MBS share of total home mortgages first exceeded 30 percent only in 2007. This confirms that the private markets—depository institutions and capital market investors—are capable of holding or securitizing the large majority of US mortgages. It is also noteworthy that the market for jumbo mortgages—mortgages that exceed the conforming loan limit—has generally functioned quite satisfactorily.

Turning to the European evidence, the European economies and housing markets are sufficiently similar to the United States to provide a potentially interesting comparison, while they have the key distinction that government intervention in these housing and mortgage markets is far less than for the United States; in particular, none of these countries has entities with any significant resemblance to the US GSEs.[14] This conclusion is stated very clearly by Coles and Hardt (2000, 778):[15]

14. See European Central Bank (2009) for an extensive review of housing finance in the European Union countries.

15. Hardt was the Secretary General of the European Mortgage Federation at the time.

> There is no national or European government agency to help lenders fund their loans. Mortgage loans have to be funded on the basis of the financial strength of banks or the intrinsic quality of the securities. EU Law (Article 87 and 88 of the EC treaty) outlaws state aid in the form of guarantees as there may be an element of competitive distortion.

Table 8.5 compares the US and Western European mortgage markets for a range of quantitative attributes from 1998 to 2010 based on a comprehensive database of housing and mortgage data for fifteen European countries from the European Mortgage Federation (2010). Column (1) compares the most recent owner occupancy rates for the United States and European countries. The US value is 66.9 percent, which is just below its peak subprime boom value. It is frequently suggested that the high rate of home ownership is the result of the large US government support of the mortgage market, including the GSEs. It is thus highly revealing that the US rate is just at the median—seven of the European countries have higher owner occupancy rates—and slightly below the average value for the European countries. Furthermore, the lower owner occupancy rates in some of the countries (Germany, for example) appear to be the result of cultural preferences rather than government inaction. A full analysis of the determinants of owner occupancy rates across countries should also control for the age distribution of the population, since younger households, and possibly the oldest households, may have lower ownership rates in all countries. Chiuri and Jappelli (2003) provide a start in this direction, showing that lower down payment rates are a significant factor encouraging owner occupancy after controlling for the population age structure in a sample of fourteen Organization for Economic Cooperation and Development (OCED) countries. The United States has also generally benefitted from very low down payment rates, but it still has an average ownership rate, reinforcing the conclusion that the government interventions have been largely ineffective in raising the US home ownership rate relative to its peers.

Column (2) measures the volatility of housing construction activity from 1998 to 2010 based on the coefficient of variation of housing starts as a measure of relative volatility. The US relative volatility is third highest out of the sixteen countries, implying that the government interventions have failed to reduce US housing cycles relative to those in Western Europe. Column (3) measures the volatility of house price changes based on the standard deviation of the annual house price appreciation from 1998 through 2010. Here the United States stands fifth, meaning the country has faced a relatively high rate of house price volatility. This negative result is all the more significant because the United States is far larger than any of the individual European countries, and thus the benefits of regional diversification should have lowered the observed US volatility.

Column (4) compares the level of mortgage interest rates in Western Europe and the United States, using "representative variable mortgage

Table 8.5 **The Performance of European mortgage markets in comparison with the United States**

	Rate of owner occupancy latest year (1) (%)	Coefficient of covariation of housing starts[a] (2) (%)	Standard deviation of house price inflation (3) (%)	Mortgage adjustable rate average level (4) (%)	Mortgage interest rate average spread[b] (5) (%)	Mortgage To GDP ratio 2010 (6) (%)
Western Europe						
Austria	57.5	7.2	2.7	4.83	1.79	28.0
Belgium	78.0	15.2	7.4	5.61	2.58	46.3
Denmark	53.6	56.1	8.5	5.80	2.58	101.4
Finland	59.0	11.9	3.8	4.13	1.09	42.3
France	57.8	17.4	6.2	4.83	1.80	41.2
Germany	43.2	29.0	1.7	5.07	2.05	46.5
Ireland	74.5	99.2	14.2	4.32	1.15	87.1
Italy	80.0	25.7	3.4	4.70	1.56	22.7
Luxembourg	70.4	17.9	4.7	4.08	1.05	44.7
Netherlands	55.5	14.5	6.5	5.08	2.06	107.1
Norway	85.0	24.6	5.0	6.11	1.44	70.3
Portugal	74.6	35.5	2.9	4.43	1.35	66.3
Spain	85.0	93.0	8.1	4.16	1.08	64.0
Sweden	66.0	45.5	2.9	3.75	0.91	81.8
United Kingdom	66.4	25.0	6.8	5.12	0.93	85.0
EU average	67.1	34.5	5.6	4.80	1.56	62.3
US	66.9	45.5	7.3	5.07	2.26	76.5
US rank	8th of 16	3rd of 16	5th of 16	6th of 16	3rd of 16	6th of 16

Notes: Statistical measures computed with annual data by country for the years 1998 to 2010. Unless noted otherwise, the data are all from European Mortgage Federation (2010), an annual fact book that contains comprehensive mortgage and housing market data for the years 1998 to 2010 for fifteen Western European countries and the United States.

[a]Computations based on housing starts where available; all other countries use housing permits.

[b]The mortgage interest rate spread is based on the three-month Treasury Bill rate from the OECD Economic Outlook Database.

rates" for Europe and the Freddie Mac one-year ARM commitment rate for the United States. The column shows that the United States has the sixth highest average mortgage interest rate from 1998 to 2010, and exceeds the Western European average by 27 basis points. Since overall interest rates also vary across countries, as a further test, column (5) shows the average spread between the mortgage rate and the Treasury bill rate for each country. The United States ranks third highest based on the spread and exceeds the Western European average by 70 basis points. Of course, numerous factors determine these mortgage rates and spreads, including the precise terms of the variable rate mortgages, other contract features such as down payment requirements, and the generally greater credit risk of US mortgages. Nevertheless, the fact remains that despite the government subsidies and other interventions in the US residential mortgage markets, US mortgage rates have remained among the highest levels compared with the countries of Western Europe.

Finally, column (6) shows the 2010 ratio of home mortgages outstanding to each country's annual GDP, a standard measure of the depth of a country's mortgage market. The US ratio is 76.5 percent, which puts it sixth within this group of sixteen developed economies. A relatively high US result would be expected, given the large mortgage subsidies provided through the GSEs and other channels. It is noteworthy, therefore, that five Western European countries achieved even higher ratios without substantial government interventions in their mortgage markets.

The overall conclusion has to be that Western European mortgage and housing markets have outperformed the US markets over the full range of available measures. Although data are not provided here, a similar conclusion would hold for the Australian and Canadian mortgage markets (see Lea 2010). There are, of course, a wide range of possible explanations for the superior performance of the European mortgage markets.[16] The key point for present purposes is simply that the superior performance of the European mortgage markets is *not* explained by greater government intervention. In the absence of GSEs, almost all Western European mortgage lending is carried out privately by banks, primarily funded by bank deposits or covered bonds. Other indirect forms of government support, such as the tax deductibility of mortgage interest and property taxes, are also notably absent in most European countries.

8.4.2 Other Justifications for GSE Subsidies

The activities of the GSEs may be justified by the particular benefits accruing to specific classes of borrowers, or more specifically, to all home

16. As just one example, housing policies in some European countries—France seems a particular example—have had particularly adverse impacts on rental markets, thus providing an implicit incentive to home ownership; see Ellickson (2010).

purchasers and home owners from the activities supported by these institutions. As noted earlier, benefits in the stabilization of the mortgage supply and corresponding reductions in the volatility of housing construction and home sales seem not to be verified. But there are at least three other classes of potential benefits arising from the GSE:

1. Increases in the extent of mortgage credit accruing to income and demographic groups that policymakers appear to have deemed particularly deserving—credit that augments that supplied by the private marketplace.
2. Increases in the lending support provided to builders, owners, or residents of specific types of housing (e.g., multifamily rental housing) that would otherwise not be provided in the market.
3. Subsidies accruing more broadly to housing market participants; for example, to all home purchasers in the form of lower interest costs arising from the increased liquidity afforded by the GSEs and the implicit guarantee of repayment provided by those institutions.

This section reviews the evidence on the extent and distribution of these benefits.

Increased Credit to Targeted Groups and Geographical Areas

The original charter establishing Fannie Mae as a GSE in 1968 recognized a "national goal of providing adequate housing for low and moderate income households," and it authorized the Secretary of the Department of Housing and Urban Development (HUD) to require that a reasonable portion of Fannie Mae's purchases of home mortgages be related to this goal. Although regulations requiring the GSEs to allocate a fixed percentage of mortgage purchases to lower-income households were advanced in the 1970s, mandatory rules were not proposed in Congress until after the passage of the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) of 1989. Ultimately, the Federal Housing Enterprises Financial Safety and Soundness Act of 1992 modified and made more explicit the "housing goals" to be promoted by the GSEs. The act directed the HUD secretary to establish quantitative goals for mortgages to "low- and moderate-income" households and for mortgages originated in "underserved areas." It also imposed a "special affordable housing goal" for mortgages for low-income housing in low-income areas. The 1992 legislation stipulated two-year transition goals, but after that period, the HUD secretary was empowered to promulgate more detailed regulations.

Under the HUD regulations, finalized in December 1995, the first goal ("low- and moderate-income housing") directs that a specified fraction of new loans purchased each year by the GSEs be originated by households with incomes below the area median. The second goal ("underserved areas") requires that a specified fraction of mortgages be originated in census tracts with median incomes less than 90 percent of the area median, or else in

census tracts with a minority population of at least 30 percent and with a tract median income of less than 120 percent of area median income. The third goal ("special affordable housing") targets mortgages originated in tracts with family incomes less than 60 percent of the area median; or else mortgages in tracts with incomes less than 80 percent of area median and also located in specific low-income areas. Any single mortgage can "count" toward more than one of these goals. (For example, any loan that meets the "special affordable housing" goal also counts toward the "low- and moderate-income" goal.)

The numerical goals originally set by HUD for 1996 were modest—requiring, for example, that 40 percent of the GSEs' mortgage purchases be loans made to households with incomes below the area median. Over time, the goals for new business set by HUD have been increased.[17] The goal for mortgages to low- and moderate-income households has been increased from 40 percent in 1996 to 56 percent by 2008. Until 2007, mortgage originations by both Fannie Mae and Freddie Mac had reached their primary goals every year. The HUD goal for "underserved areas" was increased from 21 percent in 1996 to 39 percent in 2008. Originations by the larger GSE, Fannie Mae, exceeded this goal in every year; originations by Freddie Mac exceeded the goal in each year until 2008. The "special affordable" housing goal was increased by HUD from 12 percent in 1996 to 27 percent in 2008. Both GSEs surpassed this goal in loan originations each year until 2008.

Figures 8.5, 8.6, and 8.7 report the HUD goals and GSE progress in achieving those goals from their publication in 1995 to the federal takeover of the GSEs in 2008. In this view, it might appear the goals were successful in expanding the GSE lending.

Figures 8.8, 8.9, and 8.10, however, provide another perspective on the magnitude of the goals set by HUD for the GSEs. They report each of the three goals as well as an estimate of the share of all newly-issued mortgages in each of the categories. For example, in 2000 the HUD-specified "low- and moderate-income goal" was to reach 42 percent of new purchases for the GSEs. However, in 2000 low- and moderate-income mortgages, according to the same definition, constituted about 59 percent of all new mortgages. At that time, the "underserved areas" goal was 21 percent of GSE mortgages, while these mortgages constituted more than a 30 percent market share of new mortgages. In virtually all cases, the goals imposed were a good bit lower than the share of mortgage loans of that type originated in the economy. There is no evidence that the goals were set so that the GSEs would "lead the market" in servicing these groups of households.

17. Note, however, that at the time that the 1992 act was debated in Congress, only 36 percent of Fannie Mae's single-family deliveries were for housing whose value was below the area median. (See FHFA 2010b).

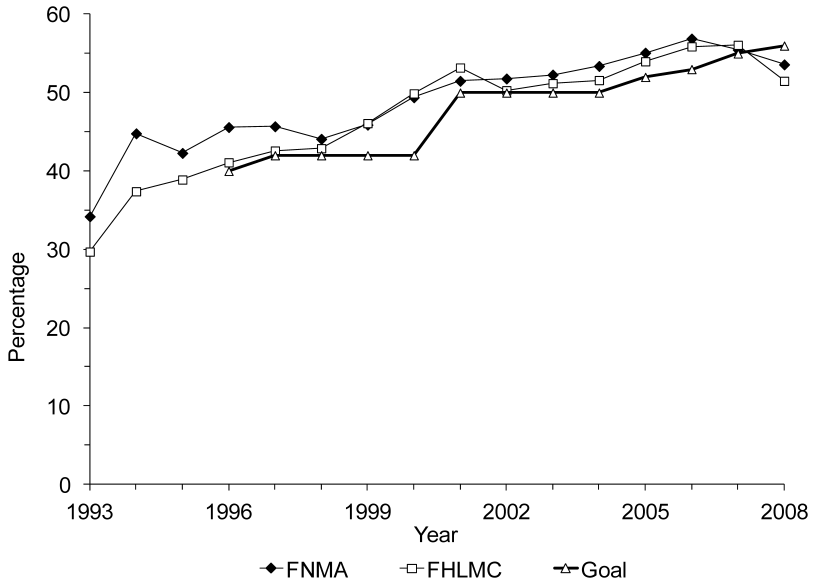

Fig. 8.5 GSE "low-moderate income" housing goal, 1993–2008 (percent of new loans to households with incomes below area median income)

Source: US Department of Housing and Urban Development, Office of Policy Development and Research, *Overview of the GSEs' Housing Goal Performance, 1993–2001, Overview of the GSEs' Housing Goal Performance, 2000–2007.*

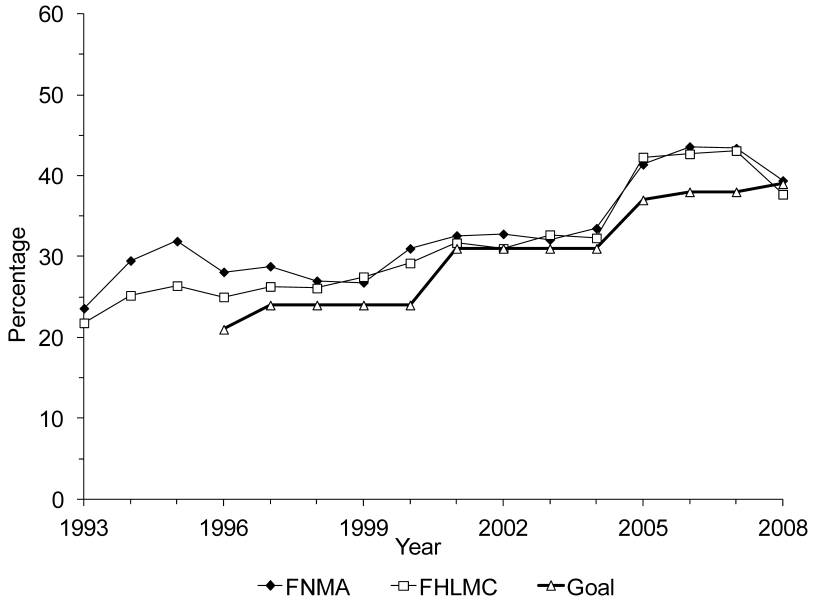

Fig. 8.6 GSE "underserved area" housing goal, 1993–2008 (percent of new loans credited toward goal)

Source: US Department of Housing and Urban Development, Office of Policy Development and Research, *Overview of the GSEs' Housing Goal Performance, 1993–2001, Overview of the GSEs' Housing Goal Performance, 2000–2007.*

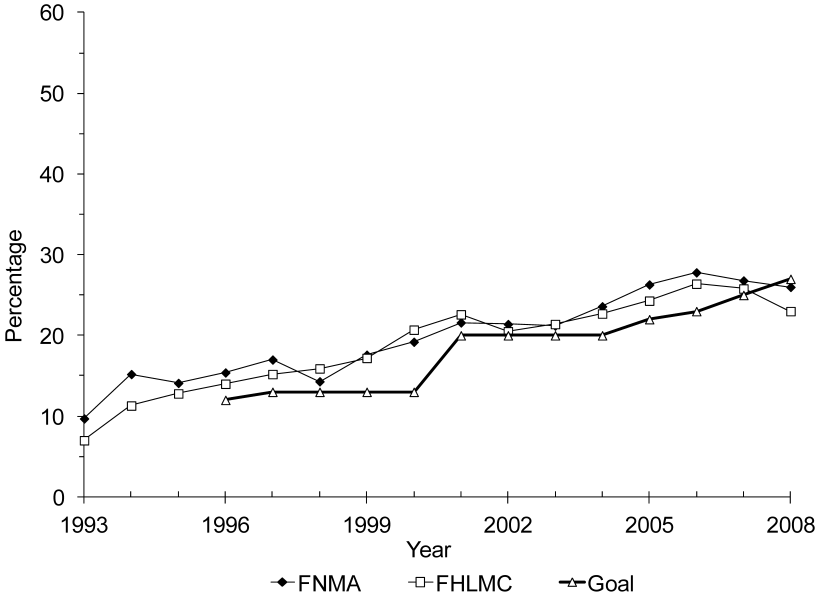

Fig. 8.7 GSE "special affordable" housing goal, 1993–2008 (percent of new loans credited toward goal)

Source: US Department of Housing and Urban Development, Office of Policy Development and Research, *Overview of the GSEs' Housing Goal Performance, 1993–2001, Overview of the GSEs' Housing Goal Performance, 2000–2007.*

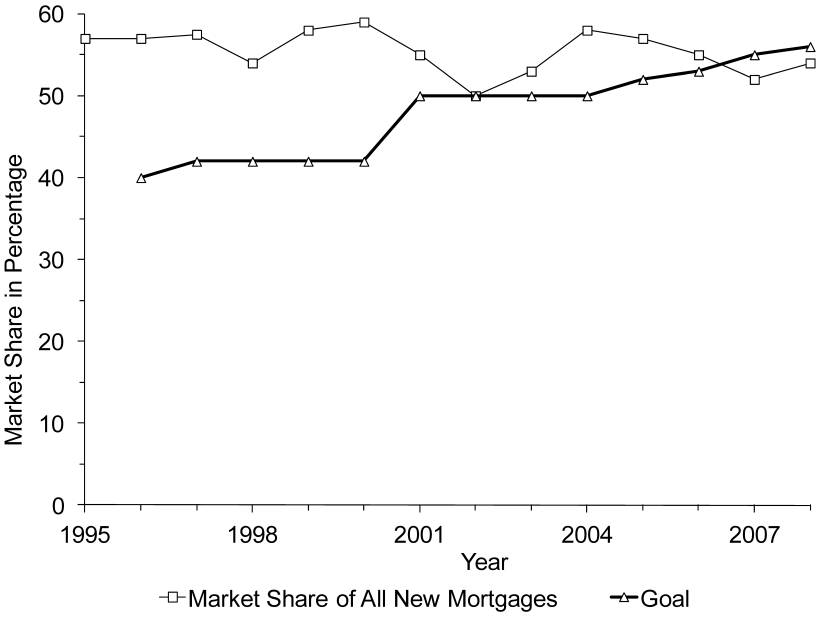

Fig. 8.8 GSE "low-moderate income" housing goals and market shares, 1993–2008

Source: Weicher (2010).

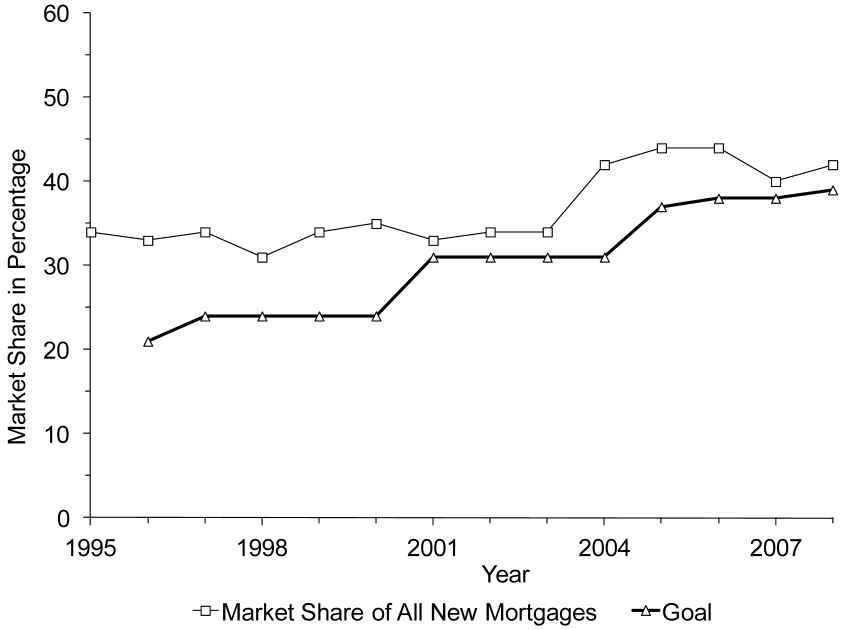

Fig. 8.9 GSE "underserved area" housing goals and market shares, 1993–2008
Source: Weicher (2010).

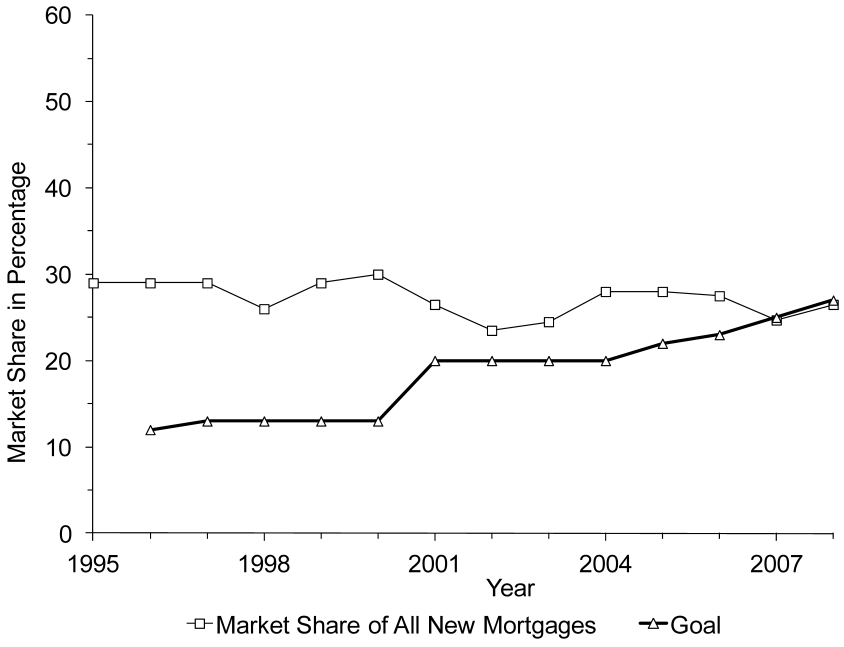

Fig. 8.10 GSE "special affordable" housing goals and market shares, 1993–2008
Source: Weicher (2010).

Increased Credit to Targeted Housing Types: Multifamily

Numerical goals for purchases of multifamily mortgages are not mentioned in the Financial Safety and Soundness Act of 1992, but there was considerable concern at the time that the GSEs were not financing their "fair share" of multifamily housing, especially small multifamily properties. For example, in 1991, small multifamily units accounted for less than 5 percent of Freddie Mac's multifamily unit purchases. At that time, small multifamily units constituted 39 percent of all recently-financed multifamily units (see Herbert 2001). Thus, the first rules for implementing the 1992 act put forward by HUD also included explicit goals for multifamily housing.

These goals have been in the form of dollar-based targets. Goals in 1996 to 2000 were approximately 0.8 percent of the mortgage purchases of Fannie Mae and Freddie Mac recorded in 1994; goals in 2001 to 2004 (2005 to 2007) were 1.0 percent of each GSE's estimated mortgage purchases in 1997 to 1999 (2000 to 2002). Beyond the achievement of these numerical goals, multifamily mortgage purchases also qualified for "bonus points" toward the achievement of the three goals specified in the 1992 law. It has been argued that these "bonus points" (discontinued in 2004) were a major inducement leading to an increase in participation by the GSEs in the multifamily housing market, particularly in their financing of small multifamily properties (see Manchester 2007).

Figure 8.11 reports the dollar goals for multifamily dwellings specified by HUD regulations and the performance of each of the GSEs. As shown in the figure, until quite recently purchases of multifamily dwellings exceeded the HUD goal by a substantial amount. Figure 8.12 also demonstrates that the GSEs' multifamily housing business was only a small fraction of the mortgage purchases of the GSEs in any year. It never amounted to even 7 percent of either GSEs' purchases. Finally, figure 8.13 reports the aggregate amount of commercial mortgage backed security (CMBS) and multifamily originations between 2003 and 2009 as reported by the Mortgage Bankers of America. Mortgage originations by Freddie Mac and Fannie Mae were small—less than $9 billion in any year. Until 2008, GSE originations were less than 20 percent of all such mortgage banker mortgage originations. Note, however that in 2008 and 2009, CMBS and commercial banks left the market entirely; originations by life insurers declined as well. Since the conservatorship in 2008, virtually all multifamily mortgages have been originated by the GSEs.

The Effectiveness of the GSE Goals in Directing Mortgage Credit: Further Evidence

Of course, the finding that the GSEs have achieved the annual goals specified in regulations need not imply that Freddie and Fannie have been very effective in increasing mortgage credit to targeted groups. For example,

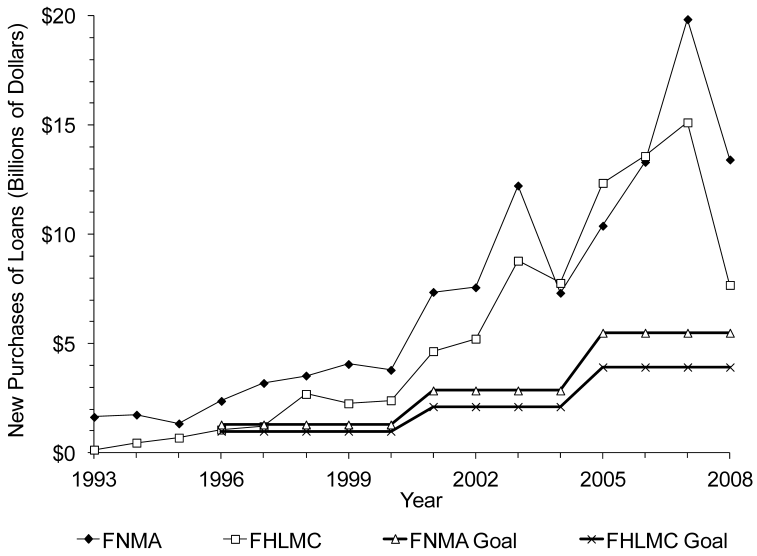

Fig. 8.11 GSE "special affordable multifamily" housing goals and GSE purchases, 1993–2008

Source: US Department of Housing and Urban Development, Office of Policy Development and Research, *Overview of the GSEs' Housing Goal Performance, 1993–2001, Overview of the GSEs' Housing Goal Performance, 2000–2007.*

Note: New loans to households residing in census tracts with incomes below the area median, in billions of dollars.

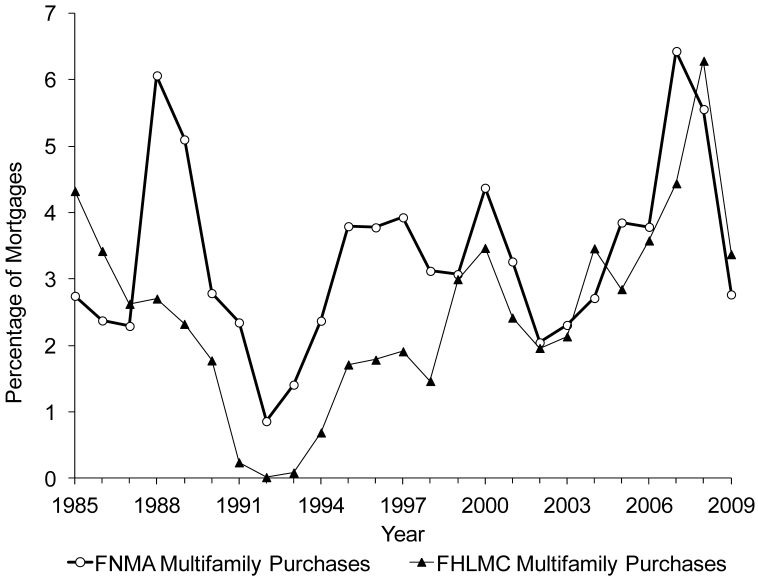

Fig. 8.12 GSE purchases of multifamily mortgages, 1985–2009 (as a percent of all mortgages)

Source: Federal Housing Finance Agency (2009, Historical Data Tables, 125, 142).

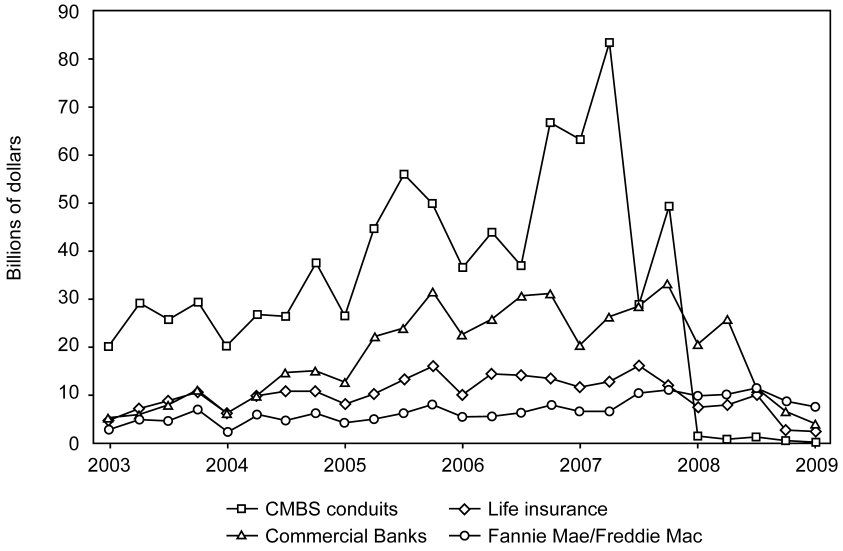

Fig. 8.13 Commercial and multifamily mortgage bankers' originations, 2004–2009
Source: Mortgage Bankers Association, September 2009.

many suggest that the numerical goals set for the GSEs have been far too low (e.g., Weicher 2010), and that as a result the GSEs have simply followed the market with a lag of a few years. Indeed, the data in figures 8.5, 8.6, and 8.7 provide no evidence that Freddie Mac or Fannie Mae purchased more than their "fair share" of mortgages in any of these areas of congressional concern. The GSE purchases of mortgages that satisfied any of these congressional goals—as a fraction of all new purchases—were consistently smaller than their "market share" in all newly-issued mortgages.

These simple comparisons suggest that any causal effect of the GSEs on lending to specific income classes, neighborhoods, and property types is not likely to be large—at least before 2008. Economic analysis of the potential impacts of the GSEs is also complicated by other public programs in effect. For example, in 1977, the Community Reinvestment Act (CRA) was passed to encourage banks to exert further efforts to meet the credit needs of their local communities, including lower-income areas. In identifying neighborhoods of special concern in administering the CRA, neighborhoods (census tracts) with median incomes below 80 percent of the area median income are targeted. As just noted, "underserved areas" of concern in GSE regulation are census tracts with median incomes below 90 percent of the area median income. In addition, many borrowers targeted under GSE criteria are also eligible for FHA loans or Veterans Administration (subsidized) loans.

The existence of parallel government programs under the CRA, FHA, and VA raises the possibility that the GSE purchases of qualifying

mortgages simply displaced lenders who would have made the same mortgage under one of the other programs. To the extent that this has been the case, the GSE purchases would have had no noticeable impact on the mortgage market for the qualifying borrowers. Of course, it is a subtle empirical problem to determine whether the GSE purchases were simply displacing loans from the other programs. Nevertheless, a number of academic papers have sought to identify and quantify the effects of the GSE goals on local and neighborhood housing markets and on classes of borrowers.

Table 8.6 summarizes much of this research.

An early paper by Canner, Passmore, and Surette (1996) examined loans eligible for insurance under the FHA. The authors evaluated how the risk associated with these loans is distributed among government mortgage institutions, private mortgage insurers, the GSEs, and banks' in-house portfolios. The results indicated that the FHA bears the largest risk share associated with lending to lower-income and minority populations, with the GSEs lagging far behind. Bostic and Gabriel (2006) analyzed the effects of the GSE mortgage purchase goals upon home ownership and housing conditions in California. A careful comparison of neighborhoods just above the GSE cutoff for "low-moderate-income" and "special affordable" designation with nearby neighborhoods just below the cutoff found essentially no differences in the levels and differences in home ownership rates and housing conditions during the decade of the 1990s.

In a more sophisticated analysis using a similar comparison of neighborhoods "just above" and "just below" the GSE cutoff, An et al. (2007) focused on three indicators of local housing markets: the home ownership rate, the vacancy rate, and the median home value. The authors related (an instrument for) the intensity of GSE activity in a census tract to these outcomes, using a variety of control variables. The results indicated that increases in GSE purchase intensity were associated with significant but very small declines in neighborhood vacancy rates and increases in median house values. The authors conclude that the "results do not indicate much efficacy of the GSE affordable housing loan-purchase targets in improving housing market conditions" (235).

Two papers by Bhutta (2009b, 2010) adopted a regression discontinuity design to test the effects of the "underserved areas" goal upon the supply of credit to those areas. Rather than attempt to match similar neighborhoods for statistical analysis, Bhutta exploited the facts that census tracts qualified for CRA scrutiny if their median incomes were 80 percent of the local area, and they qualified for scrutiny under the HUD GSE goals if their median incomes were 90 percent of the area median design. Bhutta merged tract-level data on mortgages (from the Home Mortgage Disclosure Act) with neighborhood (census) data. Bhutta's results (2009a) do find a significant effect of the "underserved area" goal on GSE purchasing activity—but the effect is very small (2 to 3 percent during the 1997 to 2002 period).

Table 8.6 **Effects of GSE goals on housing market outcomes**

Author	Time period	Data	Effect of outcomes on GSE goals	Effect on other housing outcomes	Remarks
Wyly and Holloway (2002)	1997–2000	Loan applications from HMDA		Increase in subprime market share of 1 percent leads to a rise in nondisclosure (of race-ethnicity) of 0.6 percent in the refinance market. Nonreporting rates are the highest in the subprime refinance markets, especially in inner city and low-income areas.	An increasing number of HMDA loan applications contain no information on the applicant's race or ethnic identity. They also conducted a case study in Atlanta on the disappearance of race data.
Ambrose and Thibodeau (2004)	1995–1999	Dollar volume of purchase and refinance loans from HMDA, by MSA.	Lenders increased the supply of mortgage credit in areas with higher proportions of underserved borrowers. Increases in GSE purchases of seasoned loans in an MSA lead to increases in total mortgage origination volume in the MSA.	Volume of mortgages increased steadily between 1995 and 1998, declining slightly in 1999. There was a 27 percent increase in volume of purchase mortgages by 1998, and mortgage refinances increased 211 percent. In 1999, mortgage refinance volume fell 42 percent and purchase mortgage volume increased another 12 percent.	1998 appears to be an unusual year and significance of the coefficients might arise from the sudden increase in mortgage purchase and refinance volume that year.
Friedman and Squires (2005)	2000	Loan application and purchase data from 2000 HMDA, by MSA. Restricted to conventional loans originated to purchase one to four family homes.		Blacks and Latinos are more likely to purchase homes in predominantly white neighborhoods in MSAs where more loans are made by CRA lenders.	Based on census tract racial composition grouped into three descriptive categories: predominantly white, racially integrated, and predominantly minority.
Avery, Bostic, and Canner (2005)	2000	Total lending and lending experiences of institutions from the Survey of the Performance and Profitability of CRA-Related Lending, 2000		Almost 60 percent of institutions explicitly responded to CRA obligations; half engaged in community development activities, and 30 percent had home mortgage purchases and refinance activities.	Survey conducted by the Board of Governors of the Federal Reserve to measure responses of lending institutions to CRA.

(*continued*)

Table 8.6 continued

Author	Time period	Data	Effect of outcomes on GSE goals	Effect on other housing outcomes	Remarks
Bostic and Gabriel (2006)	1994, 1999	GSE loan purchase volume in California census tracts analyzed by MSA.	San Francisco MSA had a greater increase in home ownership rates in designated tracts. No significant differences observed elsewhere in California.	No significant differences in housing market performance between GSE-targeted census tracts and those just above and below the GSE target.	Model relates breaks from 80 to 90 percent and 90 to 100 percent of median income census tract effects to changes in housing market outcomes.
An and Bostic (2006)	1995–2001	Shares of HMDA loans sold on secondary market, by purchasing institution and census tract.	Increase in GSE market share of 1 percent leads to 0.27 percent reduction in submarket share.	Increases in GSE purchase activity are associated with declines in subprime mortgage activity, especially in neighborhoods with high minority populations.	Effect of FHA growth on submarket share is smaller.
An et al. (2007)	1995–2000	Annual GSE home loan-purchase, from HMDA, by census tract.	Increases in the percent of GSE purchases by tract are associated with declines in neighborhood vacancy rates and increases in median home values.	Significant deterioration in the credit quality of FHA-insured borrowers after 1996; GSEs may have given FHA borrowers in targeted tracts better access to less expensive, conventional, conforming loans.	Possible endogenity: GSE percent of purchase may be function of other housing market trends; GSE loan-purchase may be a function of housing market trends; GSEs might simply shift their purchase activity among neighborhoods.
Laderman and Reid (2008)	2004–2006	Loan application and origination information from HMDA, and loan performance data from Applied Analytics (LPS). Analysis is restricted to conventional, first-lien, owner-occupied loans originated in MSAs in California.		Loans made by a CRA lender within its assessment area in low-income neighborhoods were less likely (odds ratio .73) to be foreclosed than loans made by independent mortgage companies (IMCs) in the same neighborhoods. In moderate-income neighborhoods, CRA lenders were 1.7 times less likely to be foreclosed.	Analyzed CRA mortgage lending activities to measure effect on current crisis, but did not examine the impact that CRA investment or service components may have had on the current financial crisis.

An and Bostic (2008)	1996–2002	Home Mortgage Disclosure Act (HMDA) loan level application and origination information, matched to census tracts. Analysis is restricted to owner-occupied home purchase loans.	GSE market shares are lower in central city tracts and in tracts with high minority populations and high vacancy rates. GSE market shares are higher in more affluent census tracts (with higher home values and/or higher incomes).	Negative and significant correlation between GSE and FHA market share, by census tract.	FHA and GSE loan purchases represent a small share of the market of loans. Other factors (like subprime mortgages) could dominate the relationship the authors found. The first stage regression is problematic; it showed no relationship between targeted census tracts and GSE market shares.
An and Bostic (2009)	1995–2001	Shares of HMDA loans sold on secondary market, by purchasing institution and census tract.	Tracts with fewer total loans have less GSE penetration.	Negative relationship between annual GSE purchase growth and annual growth in subprime loan originations. A 1 percentage point increase in GSE share is associated with a 0.45 percentage point decline in subprime market share.	GSEs do not purchase subprime loans; this study is based on two-stage least-squares (TSLS) regression.
Bhutta (2009b)	1997–2004	Loan amounts, originations, and loans sold on secondary market, by purchasing institution and census tract, from HMDA. Analysis is restricted to census tracts in MSAs.	Goals increased GSE purchasing activity by 3 to 4 percent in targeted tracts and increased GSE-eligible originations by 2 to 3 percent on average.	No evidence that underserved areas goal (UAG)-induced increases in GSE credit supply crowded out FHA and subprime lending.	Regression discontinuity design. In contrast to the An and Bostic (2008) paper, Bhutta estimates the impact of the GSE Act separately on the number of GSE purchases, the total number of GSE-eligible originations, and the number of GSE-ineligible loans in targeted tracts.

(*continued*)

Table 8.6 continued

Author	Time period	Data	Effect of outcomes on GSE goals	Effect on other housing outcomes	Remarks
Bhutta (2010)	1994–2002, 1998–2005	Loan information by lender type, application status, loan purpose, secondary purchaser (if any) from HMDA, by census tract of the property and borrower income.	On lending, CRA had little impact, even during the 2000s when lending to lower income areas soared. Small increase in nonbank lending in CRA-targeted neighborhoods of large MSAs, particularly in areas with historically low home sales.	Increased bank lending does not crowd out lending by mortgage bank subsidiaries and independent mortgage companies.	Regression discontinuity (RD) design. Limitation of RD design is that it only measures the CRA's impact at the cutoff (80 percent of median income), so if there were a larger impact for borrowers and neighborhoods further below the cutoff, the RD would understate the CRA's true impact.
Bhutta (2010)	1997–2002	Mortgage originations and applications from HMDA, by census tracts in MSAs.	Small UAG effect on GSE purchases and mortgage originations. GSEs purchase about 3.4 percent fewer loans in tracts below the eligibility cutoff.	No crowd out of FHA and subprime lending.	Regression discontinuity design. Analysis might understate UAG's effect because RD can only identify the goal's impact for tracts near the eligibility thresholds. Bhutta notes that the UAG mostly affects relatively stable tracts, indicating that GSEs respond where it is least costly.
Gabriel and Rosenthal (2010)	1994–2008	Loan purchases and originations from HMDA, by census tracts located within MSAs. Census tracts were adjusted to match the 2000 census.	The disappearance of GSE crowd out, with the 2007 financial crisis, suggests loans purchased by GSEs added substantively to the flow of mortgage credit.	From 1994 to 2003, GSE crowd out of private secondary market purchases was small. From 2004 to 2006, private loan purchases expanded and GSE crowd out estimates jumped to 50 percent. After 2007, GSE crowd out was small again.	Addressed GSE purchase endogeneity of instrumenting for applications using lagged tract home ownership rates. Increased local secondary market activity may result in some easing in local underwriting standards, causing local applications to increase. Thus OLS estimates would be biased upwards. With or without IVs, the trends were similar.

Avery and Brevoort (2010)	2001, 2004–2006	Loan origination and purchases from HMDA, by census tract, with three outcome variables: (1) Percentage of mortgage borrowers who were ninety or more days past due on at least one mortgage obligation, from Equifax. (2) Percentage of first-lien mortgage loans originated in a tract during 2004 to 2006 with estimated front-end debt-to-income ratios exceeding 30 percent, as a proxy for high-risk or subprime lending activity from HMDA. (3) House price changes between 2001 and 2006 and 2006 and 2008 calculated from HMDA.	No statistically significant relationship between loan sales to the GSEs and delinquency.	Found no evidence that CRA and GSE goals contributed to house price increases during the 2001 to 2006 buildup. CRA targeted census tracts show fewer loan delinquencies in 2008.	Regression discontinuity design. Believes loan quality and performance is important to measure for GSE and CRA goal success, in addition to loan volume. Loan performance data are missing; they measured loan quality by postbuildup delinquency rates and risk characteristics. Also, aggregation of analysis obscures the fact that subprime boom took on different forms in different geographic regions.
Moulton (2010)	1996–1997, 2006–2007	Loan originations and purchases, foreclosures, vacancies, high-priced loans, and other housing outcomes from HUD and HMDA, by census tract and also by loan applicant.	Special affordable goal (SAG) increased GSE purchases from very low-income borrowers by 4 percent but had no effect on mortgage lending. No evidence that the low- and moderate-income goal (LMIG) or UAG altered GSE purchase or mortgage lending decisions.	No relationship between GSE Act's affordable housing goals and increased foreclosures, vacancies, or other housing outcomes.	Regression discontinuity design. Diverges from Bhutta (2009) paper in a few ways. Bhutta uses data aggregated to the census tract level, while Moulton uses variation in loan applicant-level data to examine individual loan outcomes, allowing Moulton to examine the individual-level goals outlined in the LMIG and SAG.

A more recent paper by Moulton (2010), also using a regression discontinuity approach, finds no effect of the GSEs—on individual loans rather than aggregate credit allocations. Moulton uses micro data on mortgage loan applications to examine whether the GSEs' affordable housing goals altered the probability that a loan application was originated by a mortgage lending institution or that a loan was purchased by one of the GSEs. The analysis led to the conclusion that the GSE affordable housing goal had no effect at all on mortgage lending or on GSE purchases.

The consistent finding of little or no effect of the GSE goals on housing outcomes, mortgage applications, or mortgage finance could suggest that there is little effect of the GSE rules upon FHA lending as well. But several papers have reported that an increased market share of GSE mortgages in a census tract is associated with a decline in the FHA share of mortgages (An and Bostic 2008; Gabriel and Rosenthal 2010). These results may explain why the increases in lending mandated by the HUD regulations to achieve the congressional goals of the 1992 act have had very little net impact on housing and neighborhood outcomes. Small increases in GSE activity have been offset by roughly comparable declines in FHA activity.

The extent to which an expansion of GSE activity simply crowds out private mortgage purchases remains an open research question. For example, Gabriel and Rosenthal (2010) argue that increased GSE activity in the mortgage market involved little or no crowd-out until about 2005. After that, GSE activity crowded out private activity until the crash in mortgage markets in 2007.

But even if there were a complete crowd-out of private mortgage activity arising from GSE behavior, it is hard to attribute any of this to the goals set by the 1992 act—especially since the goals were substantially less than the share of these new mortgages in the market.

To summarize: the academic and scientific literature has generally found little effect from housing goals as they operated through the GSEs. The goals were low. Despite appearances, they provided no incentive for the GSEs to "lead the market" in providing credit to potentially riskier housing investments. They accomplished nothing in increasing credit for riskier loans.

But there is a view that the housing goals were actively harmful in facilitating the subprime housing crisis. This position has been put most forcefully by Peter Wallison (2011) in his rebuttal statement to the Financial Crisis Inquiry Commission. He argues that the requirement to meet the housing goals "forced" the GSEs to make substandard loans, which is why they ultimately acquired such large positions in subprime mortgages and subprime mortgage securities. Indeed, Wallison claims that the HUD goals actually "caused" the subprime crisis. Similarly, an impressive journalistic account of recent history in the mortgage market argues forcefully that the housing goals in the 1992 act led directly to the subprime mortgage debacle of 2008 (Morgenson and Rosner 2011).

Our earlier analysis of the empirical academic literature simply fails to support a claim that the GSE housing goals were a primary source of the

subprime crisis. First, there are simple questions of timing. The GSE goals were enunciated in a law passed in 1992; it is implausible that their effect was not felt until a quarter century had elapsed. In addition, as we have noted, the GSE accumulation of subprime mortgages accelerated only in 2007, too late to have "caused" the subprime bubble (but certainly early enough to have accelerated it).

Second, as already noted, it appears that the GSE mortgage purchases in support of the housing goals were principally loans that would otherwise have been made by other lenders. Lastly, the subprime crisis has a long list of proximate causes (including US monetary policy, a global savings glut, the error of assuming a national housing pricing collapse was highly unlikely, etc.); see Jaffee (2009) for further discussion. The GSE housing goals just do not appear to have this level of significance.

Now it is certainly possible that the passionate rhetoric from the GSEs provided a convenient "cover" for the trend toward lower-quality, even toxic, mortgages by 2004 and 2005. Ironically (or perhaps diabolically), the rhetoric about "affordable housing" from the GSEs had little effect upon *their own mortgage purchases* until the subprime crisis was well under way.

8.4.3 Benefits to All Housing Market Participants

There has been active research seeking to establish the value of the enhanced liquidity and subsidy to home owners. In principle, the subsidy provided by the implicit guarantee can be calculated. Freddie Mac and Fannie Mae issue debt in the same market as other participants in the banking and finance industry participate. The yield difference ("spread") between the debt of the GSEs and that of other firms can be applied to the newly issued GSE debt to compute the funding advantage in any year arising from the GSE status. Of course, it is not quite straightforward to apply this principle and to produce credible estimates. The relevant benchmark estimate (i.e., the appropriate sector and bond rating) is not without controversy, and a comparison with broad aggregate indices combines bonds containing a variety of embedded options. Pearce and Miller (2001), among others, reported comparisons of GSE and AA-rated financial firms, suggesting that the agencies enjoyed a 37 basis point (bps) spread. More sophisticated comparisons by Nothaft, Pearce, and Stevanovic (2002) suggest that the relative spreads are about 27 bps (vis-à-vis AA-minus firms). Table 8.7 summarizes available comparisons. A careful analysis of yields at issue for GSE debt and the option-free debt issued by a selection of finance industry corporations (Ambrose and Warga 2002) concludes that the GSEs enjoy a spread of 25 to 29 bps over AA bank bonds and 37 to 46 over AA financials. Quigley (2006) provides a terse summary of available estimates.[18]

18. These estimates are in the range of the spreads that have been assumed (41 bps) by the Congressional Budget Office (CBO 2001) in estimating the annual federal subsidy to the GSEs. They are similar to the estimates of spreads (40 bps) used by Passmore (2005) in a more recent exercise.

Table 8.7 Estimates of GSE funding advantage

Author	Data	Comparison	Spread in basis points
US Treasury (1996)	Bloomberg	Agency vs. A Financials	53–55
Ambrose and Warga (1996)	Fixed Income Research Program	Fannie Mae vs. AA Financials	37–46
		AA Corporate	38–39
		A Financials	56–72
		A Corporate	55–65
Freddie Mac (1996)	Lehman Relative Value	Freddie vs. AA & A	39
		AAA	23
Toevs (2000)	Lehman Bond Indexes	Fannie Mae vs. AA-Indexes	37
Pearce and Miller (2001)	Bloomberg	Agency vs. AA Financials	37
Ambrose and Warga (2002)	Fixed Investment Securities Database	Freddie and Fannie vs. AA Banks	25–29
Nothaft, Pearce, and Stevanovic (2002)	Fixed Investment Securities Database	Freddie and Fannie vs. AA Debentures	30
		A Debentures	45
		AA MTNs	27
		A MTNs	34
Passmore, Sherlund, and Gillian (2005)	Bloomberg Lehman	Freddie and Fannie vs. AAA & AA Financials:	
		68 firms	41
		44 firms	38
		15 firms	38

Sources: Nothaft, Pearce, and Stevanovic (2002); Ambrose and Warga (2002); Passmore, Sherlund, and Gillian (2005). See Quigley (2006) for additional details. MTNs = medium term notes.

The substantial subsidies arising from the funding advantage of the GSEs means that mortgage rates for all home owners can be lower than they otherwise would be; that is, the subsidy can improve the well-being of home owners and home purchasers.

But of course, in the first instance the subsidy is provided directly to private profit-making firms with fiduciary duties to their shareholders. It is thus not obvious that all, or even most, of the funding advantage provided by the public subsidy is passed through to home owners. As documented by Hermalin and Jaffee (1996), the secondary market for mortgage securities (at least for those securities composed of loans comparable to the rules under which Fannie and Freddie operate) is hardly a textbook model of atomistic competition. The two GSEs are large, and each has a large market share of the conforming segment of the market. There are high barriers to entry, and the MBS product is more or less homogeneous. Moreover, mortgage originators have an inherent first-mover advantage in deciding which newly-issued mortgages to sell to Fannie and Freddie. This may force the GSEs to pay a premium for the mortgages they purchase in the market. These factors, duopoly and adverse selection, may mean that much of the subsidy accrues

Table 8.8 Estimates of reduction in mortgage interest rates attributable to GSEs

Author	Time period	Region	Reduction in basis points
Hendershott and Shilling (1989)	1986	California	24–39
ICF (1990)	1987	California	26
		7 states	23
Cotterman and Pearce (1996)	1989–1993	California	25–50
		11 states	24–60
Pearce (2000)	1992–1999	California	27
		11 states	24
Ambrose, Buttimer, and Thibodeau (2001)	1990–1999	Dallas	16–24
Naranjo and Toevs (2002)	1986–1998	US	8–43
Passmore, Sparks, and Ingpen (2002)	1992–1999	California	18–23
CBO (2001)	1995–2000	US	23
McKenzie (2002)	1986–2000	US	22
	1996–2000	US	19
Ambrose, La Cour-Little, and Saunders (2004)	1995–1997	US	6
Woodward 1996–2001 (2004a)	1996–2001	US	35–52
Passmore, Sherlund, and Burgess (2005)	1997–2003	US	15–18
Blinder, Flannery, and Lockhart (2006)	1997–2003	US	23–29

Sources: McKenzie (2002); Ambrose (2004), Blinder, Flannery, and Lockhart (2006); Passmore, Sherlund, and Burgess (2005); Woodward (2004b). See Quigley (2006) for details.

to the shareholders of the GSEs or to the owners of other financial institutions, not to home owners or home purchasers.

The effects of the GSEs upon mortgage rates can be approximated from the spread between the interest rates on mortgages that conform to the loan limits and underwriting guidelines of the GSEs and the rates on otherwise comparable mortgages. As in the analysis of funding advantages, it is not quite straightforward to apply this principle and to produce credible estimates. (For example, most research compares the rates paid by borrowers with loans one dollar below the conforming limit with rates paid by borrowers with loans one dollar above the limit. But the latter group of borrowers differs from the former group, or else they surely would have made an additional cash payment and taken a conforming loan.)[19]

Early analyses, for example, by Hendershott and Shilling (1989), comparing interest rates on Jumbo and conforming mortgages, indicated that this

19. Of course, other reasons besides the greater liquidity provided by the GSEs could explain some of an observed spread between Jumbo and conforming mortgages. Jumbo mortgages are generally prepaid more aggressively—borrowers have more at stake, if nothing else. This means that investors will require higher rates on Jumbos merely to compensate for the increased prepayment risk. On the other hand, borrowers with Jumbo mortgages have better credit, and they make larger down payments, which should create lower rates on Jumbo mortgages. See also, Ambrose, Buttimer, and Thibodeau (2001); Heuson, Passmore, and Sparks (2001); or Woodward (2004).

spread was 24 to 39 bps. More recent studies, for example, by Passmore, Sparks, and Ingpen (2002), by McKenzie (2002), and by the CBO (2001), conclude that the spread is 18 to 23 bps. These more recent studies differ mostly in their application of more complex screens to insure comparable data for conforming and nonconforming loans. Table 8.8 summarizes these comparisons. More recent work by Passmore, Sherlund, and Gillian (2005) suggests that this spread may be as low as 16 bps.

In summary, it appears that the GSEs' funding advantage is about 30 to 40 bps, and the effect of this is to reduce mortgage rates by 16 to 25 bps. Stated another way, on the order of half of the subsidy rate to the GSEs is transmitted to home owners in the form of reduced mortgage interest rates. Presumably, the remainder is transmitted to the managers of the GSEs, the shareholders of the enterprises, or to the owners of other financial institutions.[20]

8.5 Where Do We Go from Here?

As noted in the introduction, most commentators agree that the current structure of the housing finance system must be reformed in the very near term. A question of first-order importance is then the role of government in support of the US housing and mortgage markets, whether as a modification or replacement of the GSEs.

The research results reported in this chapter make it clear, we think, that the public benefits arising from the GSEs have been quite small. The establishment of Fannie Mae a half-century ago and the establishment of Freddie Mac forty years ago did stimulate a more stable national market for housing finance and did substantially improve the liquidity and access of the market. As reported earlier, however, the specific benefits arising from the GSE structure have been modest and were generally achieved by the 1980s. The GSEs have more often followed innovation in the secondary market than created it. In any event, there now exists a well-established national market for home mortgages.

There have been surprisingly few benefits to deserving households or neighborhoods that can be attributed to the GSEs. There has been political or partisan attention to the cause of home ownership among lower-income households as a result of powerful advocacy by the interests of GSEs, but there is little evidence that lower-income home ownership was stimulated at all, at least not until the run-up to the housing bubble.

It is true that the GSE structure has reduced interest rates on home mort-

20. Of course, the net effects of the GSEs upon public welfare and the economy has greatly exceeded the three effects upon housing market participants discussed here. Indeed, the evidence suggests that the macroeconomic effects of the structure and operation of the GSEs during the past half decade has been much more important for the economy than the direct housing-market effects of the institutions.

gages, by about a quarter percent or so. But this benefit to home owners has arisen from the federal guarantee for GSE debt. And the public cost of the subsidy has far exceeded the benefits of lower interest rates to home owners. About half of the overall subsidy has accrued to GSE employees, shareholders, and other market intermediaries. These large losses are directly attributable to the GSE structure, which was created in 1968. We believe it is fair to say that there is now a consensus among economists and legislators alike that the GSE structure of a public/private partnership must be considered a failed experiment. Similarly, as we discuss further later, the GSE structure has also made regulation of the housing market far less transparent and has extended some of the consequences of the housing bubble of the past half decade. The policy question is now how to replace the GSEs.

8.5.1 The Appropriate Role for Government in the US Residential Mortgage Market

If the GSEs in current form are to be closed, the fundamental policy question is to decide which government interventions, if any, should replace GSE functions and which should be performed by the private sector. Once that is decided, there is also the delicate issue of how to manage the transition from the current GSE conservatorship. Fortunately, there are two quite flexible instruments available to close down the GSEs in a smooth, safe, and dependable manner: (a) steadily reduce the conforming loan limit until it reaches zero; and (b) steadily raise the fee charged by the GSEs for guaranteeing MBS. Although we will return to questions of the dynamic transition later, the key question is to determine the appropriate role of government in the US mortgage market.

A large number of proposals have been offered for the reform of the US mortgage market, ranging from a mortgage market managed primarily by private sector entities to recreation of the GSEs as public/private hybrids (albeit with new controls). Summaries and analyses of the general approaches are available in US Government Accountability Office (2009), Congressional Budget Office (2010), and Bernanke (2008). The following is an annotated list of the three primary proposals scrutinized:

- *Reestablish GSEs with tighter controls and explicit guarantees.* The entities would continue their organization as public/private hybrids, but with tight government controls, sometimes described as a "public utility" model. In most plans, the government guarantees would apply to the underlying mortgages, not the newly created entities. A cooperative structure such as that of the current Federal Home Loan Banks is an alternative version. The number of entities to be chartered varies by proposal.
- *Restructure GSE functions explicitly within a government agency.* A simple version would create a government agency that would explicitly

insure mortgages up to some conforming limit and then securitize pools of these mortgages, very much as the current FHA and GNMA agencies operate for lower-income borrowers. The support for underserved borrowers and areas, including multifamily housing, currently covered under the GSE housing goals, would continue in a revised form as explicit government programs.

- *Privatization of the US mortgage market.* This proposal would create a fully privatized mortgage market, with no special federal backing for the secondary mortgage market, although this could include spinning out the GSEs as new private entities.

More recently, in February 2011, the US Treasury and Housing and Urban Development agency, US Treasury/HUD 2011), issued a white paper that offered a list of three policy options. The policy options were based on three principles (white paper, 11):

1. Pave the way for a robust private mortgage market by reducing government support for housing finance and closing down Fannie Mae and Freddie Mac on a responsible timeline.
2. Address fundamental flaws in the mortgage market to protect borrowers, to help ensure transparency for investors, and to increase the role of private capital.
3. Target the government's vital support for affordable housing in a "more effective and transparent manner."

In effect, these principles rule out the reestablishment of the GSEs as private/public hybrids.

The white paper offers three options for long-term mortgage market reform:

Option 1: A privatized system of housing finance with the government insurance role limited to FHA, USDA, and Department of Veterans Affairs assistance for narrowly targeted groups of borrowers.

Option 2: A privatized system of housing finance with assistance from FHA, USDA, and the VA for narrowly targeted groups of borrowers and a guarantee mechanism to scale up during times of crisis.

Option 3: A privatized system of housing finance with FHA, USDA, and the VA assistance for low- and moderate-income borrowers and catastrophic reinsurance behind significant private capital.

Since the publication of the white paper, most discussions of specific proposals among academics, public interest groups, and market participants have centered on versions of "Option 3." The alternative views expressed in these discussions mainly concern the extent and form in which the government's mortgage guarantees would be provided. Of course, if the government guarantee is sufficiently limited, "Option 3" is no different from

"Option 2." While these discussions have focused on the form of the government mortgage guarantee, most commentators agree that the abusive mortgage market practices that evolved during the subprime boom must be ended through regulation; see US Treasury/HUD (2011, 15–18). In fact, Federal Reserve (2008) actions to modify the Truth in Lending Act and a wide range of requirements in the Dodd–Frank Act have already gone a long way to eliminating any possible replay of such abusive practices in the US mortgage market. Most commentators also appear to agree that the GSE housing goals should be replaced with an explicit and transparent system of targeted support for access and affordability. An obvious solution, and one endorsed by the white paper, is to strengthen and expand the FHA for this purpose. The white paper also proposes a public commitment to affordable rental housing.

8.5.2 Government Insurance of US Mortgages

We now review the major issues and differences among the plans that are proposed as the mechanism to replace the GSEs with a program of federal government mortgage insurance. Specific versions are available from Acharya et al. (2011); the Center for American Progress (2010); Ellen, Tye, and Willis (2010); and Hancock and Passmore (2010). While the plans differ in details and specificity, a composite can be summarized:

1. The plans anticipate government regulations will set the underwriting standards to be met by all mortgages that underlie the qualifying MBS, roughly comparable to the standards historically applied by the GSEs. The plans also generally anticipate a size limit roughly equivalent to the conforming loan limit historically applied to the GSEs.
2. Investors in the qualifying MBS will be protected from all default risk by a combination of private capital and government guarantee. The government guarantee component is considered essential. The various plans differ primarily in the split between private capital and government guarantee.
3. Risk-based insurance premia will be paid to the private capital and the government as compensation for the risks they bear.

For simplicity, we refer to this structure as the "government insurance proposal." A key feature of the insurance proposal relative to any plan that would re-create the GSEs is that the government would set the underwriting standards and be compensated for the risk it bears.

The immediate question is whether the government can be effective and efficient in carrying out such a mortgage insurance program. Evidence is available from a variety of existing government insurance programs. Perhaps the most positive evidence is the FHA program itself. As noted earlier, this program has existed since 1934, sets its premiums on an actuarial basis, and has never required a government subsidy or bailout for its self-supporting programs. Most interestingly, as documented in Jaffee and Quigley (2010),

the FHA effectively sat out the subprime boom, allowing its overall market share to fall from a peak share of 25 percent in 1970 to under 2 percent by 2006. Even more dramatically, its market share of loans to minority borrowers, which had been close to 50 percent of this market as recently as 2000, fell to well below 10 percent by 2006. In effect, the FHA took no action to deter its traditional clients from switching to private market lenders and the GSEs as the source of their mortgage loans. While this inaction could not protect the FHA from the rising loss rate that is now affecting most segments of the US mortgage market, it has certainly minimized the dollar amount of the losses that the FHA could still potentially impose on US taxpayers.

The FHA thus provides a model, or even a precise mechanism, for a broad government guarantee program, possibly covering the same market share—at times 50 percent of the overall market—that was traditionally served by the GSEs. Indeed, operating within its traditional programs, the FHA market share of total mortgage originations has already jumped dramatically from under 2 percent in 2006 to over 20 percent in 2010. The issue is whether the FHA mechanism, which has worked well serving a well-defined set of lower-income clients, can scale efficiently to serve what could be as much as three-quarters of the entire US mortgage market (summing a 50 percent GSE share with a traditional 25 percent FHA share). The major concern is whether the FHA—or any comparable government insurance plan—can resist the *political* pressures to reduce its underwriting standards and to subsidize its risk-based insurance premiums. The evidence here is not encouraging.

An interesting and comparable case is the National Flood Insurance Program (NFIP). The NFIP was created in 1968, following a series of disastrous midwestern floods that caused a large part of the private insurance industry to stop offering flood coverage. The NFIP legislation required premiums to be set on an actuarial basis, including risk-based premiums, to discourage the construction of new homes in flood zones. This noble goal floundered, however, when the owners of existing properties in dangerous flood plains successfully lobbied to obtain special "grandfathered" premium reductions. This all become evident when there were insufficient reserves to pay the losses created by Hurricane Katrina, thus requiring taxpayer bailout of the NFIP in an amount approaching $20 billion. For further discussion of the NFIP, see Michel-Kerjan and Kunreuther (2011), and of failed government insurance programs in general see Jaffee and Russell (2006).

The Terrorism Risk Insurance Act (TRIA) provides an alternative approach to government insurance and may provide a useful structure for a government mortgage insurance program. The TRIA was first passed by Congress in 2002, following the terrorism attack of September 2001. The issue was that, as a result of their World Trade Center losses, virtually all property insurers were refusing to renew policies on large commercial buildings unless there was a substantial government reinsurance program to cap

their potential losses. The TRIA accomplished this goal with a structure in which the government provides the insurers protection against possible catastrophic losses while placing the insurers in the first-loss position with a series of deductibles and coinsurance requirements. Roughly speaking, TRIA 2002 required the industry itself to cover most of the losses that would have resulted from another event comparable to 9/11, but provided quite complete government protection against any losses above that level. The TRIA has now been renewed two times, and both times the deductible and coinsurance requirements have been raised, so a taxpayer loss would now occur only with truly extreme events.[21]

The specific proposals offered by Acharya et al. (2011) and Hancock and Passmore (2010) both reference "catastrophe insurance" as the coverage to be provided under their plans. A particular concern, however, is that MBS investors might not consider government catastrophe coverage to be a sufficient inducement for them to take the first-loss positions on portfolios of US mortgages. For example, while the property insurers may have been most concerned with the last 20 percent of the tail risk from terrorist attacks, investors in residential mortgage pools may be primarily concerned with the first 20 percent of the risk distribution. In that case, for a government mortgage insurance program to be effective, it may have to mimic the NFIP more than TRIA. In other words, even if the starting point were the principle of a backstop to catastrophe, the political process may create a plan that covers high-risk mortgages at subsidized rates; that is, GSEs with a different "cover."

This appears to be the conundrum for creating a feasible program for government insurance of US mortgages. While a true catastrophe government insurance plan appears feasible, investors and other market participants will, of course, have incentives to push as much of the first-loss risk as possible under the government's coverage. If the political process can stand firm on the issue, then it is quite possible that private incentives will create an efficient market for US mortgages. After all, it is hard to believe that only the countries of Western Europe have the ability to create effective mortgage markets while maintaining a low level of government intervention.

8.5.3 The Role of GSE Mortgage Market Activity under the Conservatorship

In concluding, it is relevant to comment on the role of GSE mortgage market activity since the two firms were placed under a government conservatorship in September 2008. Relevant data on the home mortgage acquisitions of the GSEs and for the total home mortgage market are shown in table 8.9 for 2009 and 2010. The raw numbers suggest a significant GSE and overall government role. For 2009 and 2010, annual GSE mortgage acquisitions

21. On the other hand, the government's TRIA coverage is provided without charge.

Table 8.9 Home mortgage activity, 2009 and 2010

Home mortgage activity in billions (US$)	2009	2010	Total
Fannie Mae mortgage acquisitions	700	608	1,308
Freddie Mac mortgage acquisitions	475	386	861
Total GSE mortgage acquisitions	1,175	994	2,169
Total Home mortgage originations	1,840	1,630	3,470
Share of total home mortgage originations			
GSE share of total originations	64%	61%	63%
FHA and VA share of total originations	24%	23%	24%
GSE, FHA, and VA share of total originations	88%	84%	87%
GSE refinanced acquisitions as share of their total	80%	79%	80%
Aggregate share of home mortgage refinancings	69%	67%	68%

Sources: Federal Housing Finance Agency (2010c) Annual Report to Congress, *Inside Mortgage Finance* (for total and refinanced mortgage originations), and Fannie Mae and Freddie Mac 2010 Annual Reports (for GSE refinancings).

as a percentage of total home originations was 63 percent. The FHA and VA activity averaged 24 percent of total home originations over the same period, so government programs participated in 87 percent of all mortgage originations for 2009 and 2010.

The high GSE market share under the conservatorship, however, can be misleading. First, 80 percent of all GSE mortgage acquisitions were refinanced loans, so only 20 percent of the GSE activity represented loans for home purchase. The GSE refinancing activity includes the refinancings that occurred under the Home Affordable Refinance Program (HARP). In comparison, for the overall mortgage market, home refinancings represented 68 percent of total mortgage originations, leaving 32 percent of the originations for home purchase activity. The conclusion is that while the GSEs dominated US mortgage market activity in 2009 and 2010, most of this activity was simply the refinancing of mortgage loans that had already been guaranteed by the GSEs. To be clear, refinancing activities are certainly beneficial to the borrowers, and generally so for the GSEs as well (since they reduce the likelihood of default on these loans for which the GSEs are already at risk). On the other hand, refinancing is a zero-sum game, since the investors who are holding the higher rate mortgages will have to reinvest their money at the now lower market rates. Indeed, the Federal Reserve, US Treasury, and GSEs are major holders of these GSE mortgage securities, so the HARP program is far from cost-free for the government itself.[22]

The GSEs also participate in the Home Affordable Modification Program (HAMP), along with servicers for non-GSE home mortgages. As of Septem-

22. See Remy, Lucas, and Moore (2011) for a Congressional Budget Office analysis of the most recent changes in the HARP program.

ber 2011, the GSE share of total HAMP modifications was 52 percent, only slightly above the GSE share of all outstanding home mortgages. This suggests that the participation rate in HAMP modifications was about the same for GSE and non-GSE mortgages. Perhaps more importantly, the HAMP program is widely considered to be a disappointment: as of September 2011, just over 800,000 loans had been modified, compared to the earlier hopes of 3 to 4 million loans.

The overall conclusion is that the primary mortgage market result of maintaining the GSEs under the government conservatorship through 2011 appears to have been their role as a catalyst for the refinancing of their existing mortgages. In terms of funding for home purchase loans, private market lenders have actually been more active than the GSEs, even without the benefit of a government guarantee.

Data Appendix

The Federal Reserve Flow of Funds (FoF) tables provide the longest (1945 to the present), consistent quantification of home mortgages outstanding.[23] The FoF data include a separation between mortgages held directly in investor portfolios and those held within mortgage pools for mortgage-backed securitization (MBS), including some detail on the holders of each category. For tables 8.1 and 8.2 and figures 8.1 and 8.2, we apply the FoF data for the aggregate outstanding home mortgages and the separation between loans held in portfolios and in mortgage pools.

For the separation of MBS outstanding among three issuer classes, the FoF data directly quantify MBS issued by private label securitizers (PLS, meaning MBS without government or GSE backing), and the sum of GNMA and GSE data. We obtain direct measures of GNMA MBS outstanding from the Historical Statistics of the United States (with the latest 2010 data from *Inside ABS*), and compute the GSE MBS outstanding as the residual, (which closely aligns with direct measures of GSE MBS from the company's own reports).[24]

For the separation of whole mortgages and MBS among three holder classes, the FoF data directly quantify the whole home mortgages and the securitized pools held by depository institutions (commercial banks, savings

23. The FoF (flow of funds) data are available at http://www.federalreserve.gov/releases/z1/Current/data.htm. Home mortgages are defined as mortgages on one to four family homes, thus excluding multifamily, farm, and commercial mortgages.

24. Both GSEs adopted an accounting change—integrating their outstanding MBS commitments onto their balance sheet—that makes their 2010 data inconsistent with all previous data. Our method avoids this accounting change, allowing us to maintain consistency throughout the sample period.

and loan associations, savings banks, and credit unions). Whole mortgages and MBS held in the retained portfolios of the GSE are obtained from the 2010 report to Congress by their regulator, Federal Housing Finance Agency (2010c), with the 2010 data obtained from the companies' Monthly Volume reports. Whole mortgages and MBS held by other investors are computed as the residual category.

Table 8A.1 **Home ownership and social outcomes**

Author	Time period	Data	Housing outcome observed	Comments
Rossi and Weber (1996)	1988–1995	General Social Survey and the National Survey of Families and Households, supplemented by data from the American National Election Studies, by individual	Home owners have slightly higher self-esteem, life satisfaction, and are more involved with community groups.	The effects of home ownership are not large and sometimes inconsistent. It is difficult to determine endogeneity.
Oswald (1996)	1960s–1990	Statistical Abstract and Eurostat, by country	Home ownership reduces workers' mobility, thus causing them to stay unemployed longer. A 10 percent increase in home ownership is associated with approximately a 2 percent increase in unemployment.	Small sample sizes makes the results unreliable.
Green and White (1997)	1980–1987	Panel Study of Income Dynamics (PSID), the Public Use Microsample of the 1980 Census of Population and Housing (PUMS), and High School and Beyond (HSB), by child	Adjusting for income and parental differences in the PSID data, children of owner-occupied homes have a predicted probability of completing high school of .91, compared to .82 for renters. The differential falls as income rises. In the PUMS, home owners' children had a .9 probability of being in school, compared to .83 for children of renters at the same age.	The HSB data comes from parents who completed high school. Probit models are used to account for selection bias due to differences between parents who own and rent. Also, using the lifetime earnings differential between a high school dropout and a high school graduate, the benefit of a government policy to encourage low income renters to own homes is estimated to be about $31,000.
DiPasquale and Glaeser (1999)	1972–1994	General Social Survey, German Socio-Economic Panel, by individual	Controlling for age, race, sex, marital status, children, income, education, residential structure type, and city size, homeowners are roughly 10 percent more likely to know their US representative, 9 percent more likely to know the identity of their school board head, 15 percent more likely to vote in local elections, and 6 percent more likely to work to solve local problems than renters. Home owners invest more in social capital and local amenities. Home owners are better citizens.	Authors use the average home ownership rate of the individual's income quartile as an instrument for home ownership. They could not measure the extent of the positive externalities. They also found home owners are less likely to move than renters. The cost of immobility is not calculated.

(*continued*)

Table 8A.1 continued

Author	Time period	Data	Housing outcome observed	Comments
Aaronson (2000)	1975–1993	Panel Study of Income Dynamics, children aged seven to sixteen	For the base case, where the child is white, male, lives in a household with married parents, two siblings, average income, and the head of household is a high school graduate, the probability of graduating from high school for children who live in owner-occupied housing is 1.5 percent higher than renters. Latent family stability factors explain as least 20 percent of the home ownership effect.	Response to the green and white paper. Argues that a child's school graduation does not depend on home ownership as much as it depends on the stability home ownership offers the child.
Green and Hendershott (2001)	1986–1992	Panel Survey of Income Dynamics, by individual	A 10-percentage point increase in home ownership increases unemployment by months (4 percent increase).	Response to Oswald paper. There are seasonal effects of unemployment and how quickly unemployed individuals find work. For example, in 1988, heads of households who became unemployed were reemployed significantly quicker in December than in other months.
Boyle (2002)	1983	Ontario Child Health Study, the National Longitudinal Study of Children and Youth, by child	The correlation between home ownership and child problem behavior was –0.18. The correlation between neighborhood home ownership rates and the incidence of child problems was not significant.	The study controlled for socioeconomic differences between owners and renters, but not for other parental characteristics like the physical, mental, and social health of the parents, which might have also affected the association between home ownership and child problem behavior.
Haurin, Parcel, and Haurin (2002)	1988, 1990, 1992, 1994	National Longitudinal Survey of Youth, children aged five to eight	The longer a parent owns a home, the greater the child's cognition skills and the fewer the child's behavior problems. The correlation between home ownership with "Behavior Problems Index" is –0.07.	The explanatory variables included both contemporaneous home ownership and duration of home ownership. (Controlling also for the mother's and father's characteristics separately—education, wage, and race, as well as socioeconomic variables—and for community factors like neighborhood characteristics.)

Conley and Gifford (2006)	1981–1994	Luxembourg Income Study, Comparative Welfare States Data Set, by country	Compared different countries and found that more widespread home ownership is positively associated with higher income inequality and negatively associated with welfare spending. A 1 percentage point increase in social insurance spending by the government results in 0.75 percentage point decrease in home ownership.	This study does not measure the causal directionality of home ownership, social insurance, and welfare.
Munch, Rosholm, and Svarer (2008)	1993–2001	Statistics Denmark administrative registers, by individual	Home owners have a 29 percent lower unemployment risk than renters. Home owners have a wage premium 5.37 percent higher than renters, and owners set higher reservation wages for jobs outside the local labor market relative to renters.	Crude estimates.
Coulson and Li (2010)	1989, 1993	American Housing Survey, by cluster	Income increases with higher ownership rates, but the results are small and sometimes insignificant. The transition of a home from rental to ownership in a typical neighborhood creates $1,000–3,000 per year in positive externality value.	Measured the units of observation by neighborhood cluster, which typically had eleven houses.

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