

The Federal Home Loan Banks and Risk Distribution in American Housing Finance

by Alex J. Pollock

Every housing finance system can be viewed from at least two perspectives: an institutional structure and a pattern of risk distribution.

From the institutional point of view, many discussions of the American housing finance system center on two government-sponsored enterprises or GSEs, Fannie Mae and Freddie Mac, which together dominate the market for single-family home mortgages of \$275,000 or less (the conforming loan limit). The Federal Home Loan Banks (FHLBanks), 12 regional banks that together constitute the Federal Home Loan Bank System, are a third housing GSE. The FHLBanks, while similar in size and financial market presence to Fannie Mae and Freddie Mac, represent both a different institutional structure and a different pattern of risk distribution from the two better known GSEs. It is the purpose of this essay to explore these differences and the development of the FHLBanks over the last decade.

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THE "DISTRIBUTION OF RISK" PERSPECTIVE

In any financial system, and of course for our purposes in any housing finance system, various fundamental risks exist. They cannot be made to disappear, but only distributed in various ways among the different financial actors, among which are households, depository institutions, bond market intermediaries, capital market investors, and governments. The principal financial risks are credit risk, interest rate risk, prepayment risk, and liquidity risk. To these must be added institutional risk and political risk, with its related regulatory risk.

The housing finance system can be thought of in terms of the extent to which various actors bear each risk. Improvements in the design may be investigated by analyzing which existing or yet to be created actors are best equipped to bear various risks and, therefore, how the distribution might be changed.

Since, in the American housing finance system, the housing GSEs are major repositories of credit, interest rate, prepayment, liquidity, institutional, political and regulatory risk, it may be well to summarize their financial dimensions, as shown in Figure 1. They are obviously very significant financial enterprises by any standard. Freddie Mac's on-

balance sheet total assets at the end of 2000 were \$459 billion, the FHLBank's were \$617 billion, and Fannie Mae's were \$675 billion. Both Fannie Mae and Freddie Mac, in addition, have off-balance sheet liabilities for mortgage-backed securities, which they fully guarantee. Adding these to assets brings the total size of Freddie Mac to over \$1 trillion, and of Fannie Mae to \$1.4 trillion.

All of the housing GSEs are for-profit corporations, owned by their stockholders. Fannie Mae and Freddie Mac are publicly traded on the New York Stock Exchange, whose shares may be owned by any investor. The

Figure 1 U.S. Housing GSEs—
December 31, 2000 (in billions)

	<i>Fannie Mae</i>	<i>Freddie Mac</i>	<i>FHL Banks</i>
Assets	\$675	\$459	\$617
Off-Balance Sheet MBS	706	576	
Assets & MBS	\$1.38 trillion	\$1.04 trillion	
Capital	\$20.8	\$14.8	\$31.3
Net Profit	\$4.4	\$2.5	\$2.2

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share ownership of each FHLB is limited to its financial institution members. FHLB shares are not traded and have a constant value of \$100 per share, being issued or repurchased only at par. The capital and net profits of the housing GSEs are substantial, as shown in Figure 1.

Credit Risk

Through their balance sheet portfolios and off-balance sheet guarantees of mortgage-backed securities, about \$2.3 trillion of mortgage credit risk is concentrated in Fannie Mae and Freddie Mac. In contrast, the structure of the FHLBanks causes mortgage credit risk to remain with its financial institution members, primarily commercial banks and savings institutions. Since member institutions total more than 7,800, the FHLBanks represent a dispersion of credit risk, as opposed to a concentration. This is true of both the traditional business of making secured loans (called advances) to member institutions, and to the new FHLBank business, the Mortgage Partnership Finance® program (MPF®).

Figure 2 displays an interesting contrast between the implications of these two risk patterns. It shows the frequency distribution of net losses on mortgage loans, expressed as a percent of the loan portfolio, for Fannie Mae and Freddie Mac. The average net loss is low, only about 5 basis points (0.05%) per year. At three standard deviations over the mean, the annual loss rate is 16 basis points.

Figure 3 displays the losses on mortgage loans of a decentralized credit risk system represented by all of the savings institution members of the Federal Home Loan Bank of Chicago. The average losses are even lower, less than 3 basis points (0.03%) per year. In more than 60% of the observations, the annual losses are zero. Midwestern thrift institutions are obviously careful mortgage

Figure 2 Distribution of One-Year Net Charge-Off Ratios Fannie Mae and Freddie Mac 1975–1998, Mortgage Credit Quality

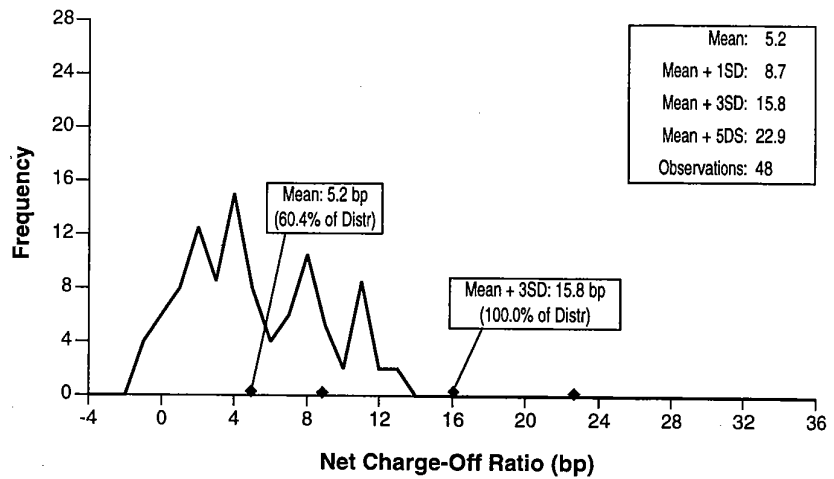
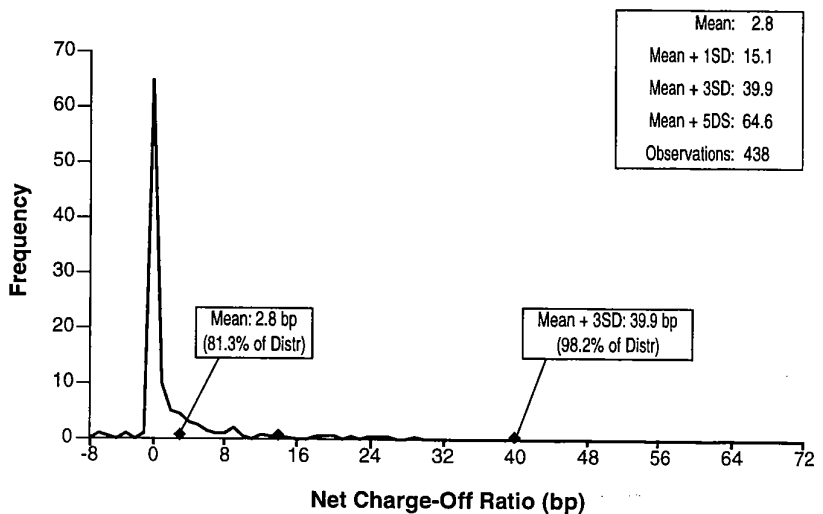


Figure 3 Distribution of One-Year Net Charge-Off Ratios FHLB Chicago Thrift Members by Institution 1994–1998, Credit Quality and Geographic Concentration



lenders. However, the variation is somewhat higher, with a loss rate at three standard deviations over the mean of about 40 basis points. Thus, in a small number of individual cases credit losses would be higher than in the national averages represented by the extremely large portfolios of Fannie Mae and Freddie Mac, while on average the losses of the individual institutions are only about half of those experienced by the two GSEs.

In designing the Mortgage Partnership Finance® program, this contrast led us to ask: Why should successful mortgage lending institutions be transferring the credit risk of their mortgage loans to a GSE and paying significant fees to do so? Our conclusion was that this represents a poor strategy for a high quality mortgage lender confident of its ability to manage the credit of the loans it originates. Therefore, the MPF program offers member institutions the opportunity to retain the principal credit risk and to be paid a fee by the FHLBank for doing so. Simultaneously, the interest rate risk of the mortgage loan moves from the financial institution to the FHLBank, just as it moves to the GSE in a loan sale to Fannie Mae or Freddie Mac.

Interest Rate Risk

The fundamental distinction between variable and fixed-rate mortgage loans has profound implications for both the structure and the risk distribution of all housing finance systems. Housing finance systems that rely on deposit funding must favor variable-rate mortgages, since the combination of long-term, fixed-rate mortgages and short-term deposit funding is a formula for disaster sooner or later. By the same token, to offer long-term, fixed-rate mortgages generally requires access to bond market funding in one form or another.

We may consider who has the interest rate risk in different situations. Figure 4 summa-

Figure 4 Interest Rate/Prepayment Risk Distribution

Borrower	<ul style="list-style-type: none"> • Variable-rate Mortgage • Mark-to-Market Prepayment Fees
Capital Market Participants	<ul style="list-style-type: none"> • Bond-based Systems • Passthrough MBS
Government Support	<ul style="list-style-type: none"> • GSE Balance Sheets • Deposit Insurance

rizes the risk distribution of various mortgage patterns.

Obviously, there is the risk that interest rates may rise, perhaps far higher and for far longer than anticipated. Variable-rate mortgages put the risk of rising interest rates on the borrowers. Since this means that the monthly payment required of the household may increase substantially, it is a very significant risk indeed. For example, a rise in the variable lending rate from 4% to 7% will represent about a 75% increase in the monthly cash demand on the household.

This logically leads households to prefer, and in the United States overwhelmingly to choose, fixed-rate mortgages with certainty of monthly payment. With the fixed-rate mortgage, the risk of rising rates is transferred to the lender, which will wish in turn to transfer it to capital market participants. This can be achieved by the issuance of mortgage bonds or of passthrough mortgage-backed securities, for example.

In contrast to the risk of rising interest rates, the risk that interest rates will decline signif-

icantly will be onerous to the fixed-rate borrower if it is not possible to refinance or if the loan agreement contains substantial prepayment penalties. Fixed-rate loans which are freely prepayable without penalty, the standard loan in the U.S., again transfers the risk, this time of declining interest rates, to the lender. The lender in turn will want protection from this risk from capital market participants, perhaps by the purchase of hedges, or for perfect risk transfer, by the sale of the loan, most often to a GSE.

Because it is possible to make mistakes in the management of interest rate and prepayment risk, and moreover because extreme scenarios such as the inflationary disaster of the 1970s and 1980s do sometimes occur, another risk bearing entity may be involved. This is the government as provider of support to the housing finance system, for example through deposit insurance, loan subsidy schemes, or the chartering of GSEs.

When an American mortgage lender sells a mortgage loan to Fannie Mae or Freddie Mac, it transfers the entire interest rate and prepayment risk to the GSE, and in the typical case, also the entire credit risk. A different approach is for a member institution of an FHLBank to fund mortgage loan portfolios by borrowing against the collateral of the mortgage loans. Such borrowing can have fixed rates, as well as fixed rates with prepayment options. In this way, interest rate risk can be mitigated, while the credit risk remains with the member institution, since the FHLBank is protected by overcollateralization. More than 5,000 financial institutions currently borrow from FHLBanks in this fashion, with total FHLBank advances of \$450 billion as of June 30, 2001. However, the interest rate and prepayment risk transfer in this situation is never perfect.

With the MPF program, the mortgage loan becomes the asset of the FHLBank and the

interest and prepayment risk transfer is thus perfect. At the same time, the member institution retains the principal credit risk by issuing a credit enhancement to the FHLBank and receives, in return, the credit enhancement fee.

In both cases, the FHLBank issues long-term bonds into the capital market, including callable bonds, to achieve its own fixed-rate funding.

It may be said that, in terms of risk distribution, the MPF program is an improved version of the risk distribution created by the traditional FHLBank secured lending business. From its first transaction in June 1997, the MPF portfolio has grown to over \$20 billion as of August, 2001.

In overall perspective, all three housing GSEs represent ways to link mortgage lending activity to the capital markets, and to transfer risks from mortgage borrowers and lenders to bond market investors, as well as to the GSEs themselves.

Institutional Risk

The theory of securitization holds that more efficient financing can be created when assets of known characteristics are isolated for investors. Mortgage loans are particularly conducive to this practice, because of their

Figure 5 Institutional Risk vs. Securitized Pools

- Management behavior may lead to high risk or disaster.
- Mortgage pool versus a financial institution's portfolio: Transparency for investors.
- Securitization trust and specialized mortgage institutions: Variations on transparency.

generally high credit quality and statistically predictable credit performance.

In contrast, as suggested in Figure 5, the creditors of an ongoing financial company, including the depositors of a bank, are always subject to the risk that the management may undertake unsound or even disastrous new ventures. In other words, since mortgage loan portfolios tend to have high quality and predictable characteristics, segregating them from riskier assets and financial businesses is a common theme in housing finance.

This segregation can be achieved by a separate securitization trust, but also by specialized mortgage banking institutions, as a structural alternative. All three American GSEs represent such institutional specialization, as do European mortgage banks. Such institutional specialization can lead to greater transparency and thus to capital market access. As suggested in Figure 6, this can be a robust strategy for creating bond market funding as shown by 200 years of experience in Denmark and a century in Germany with bond-issuing mortgage banks, and the almost 70 years experience of the FHLBanks in the United States.

Figure 6 Strengths of Specialized Mortgage Bank System

- Specialized institutions viewed as lower risk
 - More transparent
 - Separate and specialized regulatory focus
- Focus on pure mortgage finance
- Ability to tap capital market funding
 - Source for longer-term fixed-rate funds
- Tested model
 - 200 years in Denmark, 100 years in Germany, 69 years in the United States

Political and Regulatory Risk

Efficient housing finance leading to widespread homeownership is an important social and political objective around the world. The extensive involvement of governments in housing finance brings political and regulatory risks for the participants in all housing finance systems. The variety of these risks include:

1. Political risks:

- Taxes
- Chartering
- Creation and destruction of monopolies and cartels
- Granting and removing subsidies
- Political credit allocation
- Macro-economic mistakes

2. Regulatory risks:

- Capital treatment
- Production limitations
- Geographic limitations
- Lagging responses

In the American system, in which GSEs play so prominent a role, the nature and development of the GSE sector itself creates its own set of political and regulatory risks both for the housing GSEs and for the mortgage lending institutions that are involved with them as customers, investors, and competitors. The last two years in particular have brought a lively public debate about the role of Fannie Mae and Freddie Mac, with corresponding questions about where their continuing rapid growth and increasing market share may lead. The expanding role of the FHLBanks in financing member institutions, and providing competition for Fannie Mae and Freddie Mac through the MPF program, is also a topic of discussion in Washington, D.C., as well as of recent legislation in the Gramm-Leach-Bliley Act of 1999.

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Political and regulatory risk is viewed by many commentators as the most important risk faced by GSEs.

**A DECADE OF GROWTH
FOR THE FHLBANKS**

The last decade has been a remarkable time for the FHLBanks. Figure 7 shows the very rapid growth of the FHLBanks between 1991 and 2001. Still suffering the effects of the traumatic experience of the 1980s thrift industry, in 1991 the FHLBanks had about 3,000 members, of which 2,500 were thrift institutions, down from over 4,200 in 1980. Advances had declined 50% from their previous peak, down to \$80 billion. In the succeeding ten years, the membership has grown dramatically to over 7,800 and come to include 5,700 commercial banks. Total assets in this period have increased more than four times to \$665 billion and advances multiplied more than five times to \$450 billion. Capital has tripled to \$32.5 billion. The MPF program did not begin until 1997, but has also grown rapidly.

Figure 7 Federal Home Loan Banks

	<i>Dec. 31, 1991</i>	<i>June 30, 2001</i>
Member Institutions	3,064	7,865
• Thrifts	2,528	1,522
• Banks	508	5,740
Assets	\$155 billion	\$665 billion
Advances	\$80 billion	\$450 billion
Bonds Outstanding	\$108 billion	\$593 billion
Capital	\$10.7 billion	\$32.5 billion
MPF Loans Outstanding	0	\$18.3 billion

All of these represent compound growth rates far in excess of the growth of gross domestic product, the mortgage market, or financial institution assets, and suggest an endorsement by the growing financial institution membership of the risk distribution patterns represented by the third housing GSE.

The authors of the Federal Home Loan Bank Act of 1932 would presumably be pleased and would certainly be surprised at the size and financial market presence their creation has achieved.