

**Authorizing the Mortgage Holding  
Subsidiary Concept as a Complement to  
Privatizing the Housing GSEs**

A paper by

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# **Authorizing the Mortgage Holding Subsidiary Concept as a Complement to Privatizing the Housing GSEs**

## **Introduction**

The mortgage holding subsidiary (MHS) concept has been developed as a complement to a proposal to privatize Fannie Mae and Freddie Mac (F&F) and the Federal Home Loan Bank System (FHLBS). The three institutions constitute America's government-sponsored enterprises (GSEs) operating in the housing finance field.

MHS would help greatly to level the regulatory and tax playing field between two methods for financing residential housing in America -- originate-to-hold versus originate-to-sell. Privatizing F&F would level the playing field from one perspective, by eliminating the tax and regulatory tilt towards originate-to-sell, while authorizing MHS would level the playing field from a second perspective, eliminating the present regulatory tilt against originate-to-hold, particularly with regard to capital requirements.

The first portion of the paper frames the basic housing finance issue -- creating an ongoing horse race or competition between two housing finance models to reduce home mortgage rates to their lowest practical level. The second section of the paper describes the MHS concept, followed by a discussion of the structure of the U.S. housing finance industry after F&F are privatized and the MHS concept is enacted. The fourth section explores the potential mortgage interest-rate savings the MHS concept could produce. The paper closes with some concluding remarks.

## **Creating a housing finance horse race**

The American housing finance system tilts towards mortgage securitization and away from mortgage originators holding mortgages in portfolio. Privatizing F&F will reduce the tilt towards mortgage securitization. Authorizing the MHS concept will further reduce the tilt towards mortgage securitization while eliminating the tilt away from mortgage originators holding mortgages in portfolio. Imagine a seesaw with public policy pushing down on one end, holding mortgages in portfolio, while pushing up the other end, securitizing mortgages.

A discussion of how to privatize F&F and the FHLBS lies beyond the scope of this paper. However, privatization will eliminate the capital, tax, and regulatory advantages F&F now enjoy. That, in turn, will reduce important cost advantages mortgage securitization now holds over banks, thrifts, and other institutions subject to capital regulation who would like to retain the ownership of home mortgages they originate. Enacting the MHS concept will help make the housing finance playing field as level as possible. The seesaw will then tilt in which ever direction makes economic sense.

The author is agnostic about which horse wins the housing finance race. Instead, the MHS concept reflects a strong public policy desire to bring mortgage interest rates as low as possible. That desire requires improving the efficiency of making and servicing home loans; i.e., taking costs out of the mortgaging process in the same that Wal-Mart has boosted retail efficiency by taking costs out of the process of moving goods from manufacturers into the hands of consumers.

Competition must work at two levels to drive efficiency improvements. One level of competition takes place between different distribution channels -- buying over the Internet versus buying in a store; originating mortgages to hold in portfolio versus originating mortgages to sell into the secondary market. The second level of competition takes place among direct competitors within a distribution channel. For example, Wal-Mart competes against Target and K-Mart while on-line retailers compete against each other.

Privatizing F&F and enacting the MHS concept would create the same two-level competition in housing finance -- the two housing finance channels would compete against each other while individual firms would compete within each channel. Today, there is relatively little channel competition because that competition is constrained by the Fannie/Freddie oligopsony. Within the originate-to-sell channel, F&F are hardly vicious competitors. Likewise, competition within the originate-to-hold channel is restricted by the fact that so many mortgages, specifically the conforming conventional mortgages F&F buy, cannot be profitably held in portfolio under present bank/thrift capital regulations.

Competition between the two channels does not envision a competition between F&F as portfolio investors and MHS as portfolio investors. It is increasingly understood that F&F investments in mortgages and mortgage-backed securities (MBS) they have purchased, or repurchased in the case of MBS they have issued, have "little effect on mortgage rates and homeownership," as Federal Reserve economist Wayne Passmore recently noted.<sup>1</sup> Barbara Miles, an economist at the Congressional Research Service, made the same point in congressional testimony in 2000:

While it is clear that [F&F investments] increase shareholder value, it is difficult to understand what, if anything, they do for mortgage markets. In order to repurchase the securities, [F&F] must issue new debt. Given that U.S. capital markets are highly integrated, mainstream economic theory holds that there should be no lasting change in yields required by the market on either [their] debt or MBS. As a result, there should be no benefit to pass through to the housing markets. The exception would be if [F&F] debt and MBS were not good substitutes for one another, i.e., the products were not well integrated in the capital markets.<sup>2</sup>

F&F have built substantial mortgage and MBS portfolios (\$1.56 trillion as of September 30, 2003) for one simple reason -- those portfolios provide most of their profits and stock market value, as Passmore (Table 1, following page 7), and many others, have

noted. The F&F privatization proposal would immediately bar F&F from making new mortgage and MBS investments and would mandate a three-year schedule for liquidating the mortgage investments they held when the privatization legislation took effect.

## The MHS concept

The MHS concept is quite simple -- banks, thrifts, and other financial intermediaries subject to capital regulation would be authorized by statute to form MHS that would **not** be subject to capital regulation or other forms of bank-like safety-and-soundness supervision. Technically, an MHS would be an "operating subsidiary" of a national bank or a comparable type of subsidiary of a state-chartered commercial bank, a thrift institution, or any other type of entity subject to capital regulation. **Figure 1** illustrates the relationship of an MHS to its parent bank or thrift. The following are key characteristics of the MHS concept:

- ! MHS would be funded entirely in the wholesale debt markets with medium- and long-term debt, reflecting the relatively long life of fixed-rate residential mortgages. This approach parallels the widespread practice in Europe of funding long-term, fixed-rate mortgages with "mortgage bonds" sold in the capital markets, largely to institutional investors. Under no circumstance could an MHS accept deposits or sell small-denomination debt instruments to the general public, an unfortunate practice in which F&F now engage.
- ! MHS would not be subject to any regulatory capital requirements, either simple leverage ratios or risk-based capital standards.<sup>3</sup> Instead, they could be required to maintain at least an AA debt rating and a secondary market yield on their debt comparable to debt yields of other MHS. The comparability requirement would be a check on the accuracy of the MHS credit ratings.<sup>4</sup> To strengthen the credit rating of MHS debt, the MHS authorizing statute could give that debt bankruptcy priority over other general unsecured creditors of the MHS in a manner comparable to the liquidation preference domestic depositors in banks and thrifts enjoy over other general creditors. **Figure 2** sets out a conceptual representation of an MHS balance sheet.
- ! The parent's investment in an MHS (or multiple MHS) would be fully deducted from the assets and equity capital of the parent for the purpose of calculating the parent's compliance with bank capital regulations. Hence, the parent could not finance its investment in an MHS with deposits or borrowed funds.
- ! Sections 23A and 23B of the Federal Reserve Act<sup>5</sup> would govern transactions between an MHS and its parent bank or thrift. These restrictions on transactions between an MHS and its parent would prevent the parent from being harmed financially by transactions with its subsidiary MHS.

- ! The parent would be barred from injecting equity capital into an MHS if that capital injection would drop the parent from a well-capitalized status to an adequately capitalized or undercapitalized status. If a parent made such a capital injection, its regulator could direct its immediate return to the parent. In effect, an illegal capital injection into an MHS would be treated on the books of the MHS as a secured loan superior to all other claims on the assets of the MHS.<sup>6</sup>
  
- ! The MHS could issue common stock to third parties (including other banks and thrifts), preferred stock, subordinated debt, unsecured debt, and secured debt. For financial reporting purposes, the MHS's financial statements could be consolidated with its parent in accordance with Generally Accepted Accounting Principles. However, the MHS would issue audited financial statements and register its debt offerings with the Securities and Exchange Commission (SEC) so that investors in the MHS's debt could judge the MHS's financial condition on a stand-alone basis. This reporting structure parallels the General Electric Company, which files with the SEC consolidated financial statements (10-K, 10-Q, 8-K, etc.) covering all of its activities as well as financial statements for each of its four financial subsidiaries.
  
- ! The MHS could be managed by its parent bank or thrift, it could share officers and directors with the parent, purchase mortgages from the parent (as well as from third parties), and it could contract with its parent to service those mortgages.
  
- ! There would be no restriction on the size or type of residential mortgages the MHS purchased from its parent or from third parties. For example, an MHS could purchase a \$1 million mortgage on a mini-mansion as well as mortgages on second homes, apartment buildings, college dormitories, and other residential structures. In effect, there would be no conforming loan limit applicable to MHS comparable to the conforming loan limits applicable to F&F. Consideration should be given to permitting MHS to also own non-housing mortgages. At the same time, the MHS's parent would have complete latitude in determining which mortgages to sell to its MHS and which ones to keep in the parent bank or thrift. Quite likely, the parent would retain adjustable rate mortgages and fixed-rate mortgages with short maturities, funding them with deposits, while selling long-term fixed rate mortgages to its MHS.<sup>7</sup> By the same measure, the parent might buy back from its MHS long-term, fixed-rate mortgages just a few years short of maturity.
  
- ! An MHS could dramatically lower the cost of refinancing mortgages, i.e., reducing the interest rate on an existing mortgage, by simply adjusting the interest rate on the mortgage and recalculating the monthly payment. So-called "cash out refinancings," would not entail much effort by the MHS or its parent. In addition to repricing the existing mortgage and increasing the remaining loan balance, the parent bank or thrift might want to verify the collateral value, run a

credit check on the borrower, and file paperwork at the local courthouse evidencing the higher mortgage amount.

! In order to operate as efficiently as possible, particularly in dealing with mortgage refinances, the MHS would, to the extent tolerated by the financial marketplace, operate as one giant mortgage pool financed by preferential unsecured debt. This is how F&F operate with regard to the mortgages and MBS they own. However, when market conditions demanded, the MHS could create pools of mortgages funded by debt secured by the pool of mortgages.

! MHS could enter into interest-rate swaps and other interest derivatives to hedge interest-rate and prepayment risk. They also could enter into credit-derivative transactions to shift a portion of geographical or credit-quality concentrations to third parties.

! Since MHS would not be a federally insured depository institutions, they would not be subject to the Community Reinvestment Act.

### **The structure of the housing finance industry after privatizing Fannie and Freddie and authorizing MHS**

Leveling the playing field between the originate-to-hold and the originate-to-sell or mortgage-securitization channels of housing finance will significantly alter the structure of the U.S. housing finance industry. The author is of the opinion that the former channel will come to dominate housing finance because it is inherently more efficient than mortgage securitization. However, mortgage securitization would not disappear. The largest banks and thrifts, which are now among the nation's largest mortgage originators and servicers, will own many of the largest MHS. Non-bank firms, such as General Electric, General Motors Acceptance Corporation, and Countrywide Financial will be able to compete profitably against the MHS because the MHS will have no competitive advantage from a tax or regulatory perspective. Given the absence of capital regulations for MHS, banks and thrifts probably would shift many of their residential mortgage assets into subsidiary MHS, further swelling the size of MHS.

Given the \$7.4 trillion in outstanding residential mortgage debt on June 30, 2003,<sup>8</sup> the largest MHS will be very large. Mortgage servicing volumes give some idea of the potential asset size of the largest MHS. On June 30, 2003, the 20 largest mortgage servicers were servicing \$4 trillion of mortgages.<sup>9</sup> Topping the list was Washington Mutual with \$726 billion of mortgage servicing, followed by Wells Fargo Home Mortgage, \$592 billion; Countrywide Financial, \$559 billion; and Chase Home Finance, \$437 billion. Twentieth on the list was BB&T, with \$37 billion of servicing. These are enormous amounts, which means that any MHS with a balance sheet of that size could readily access the capital markets in a highly efficient manner. The largest MHS, like Fannie and Freddie today, would be among the largest debt issuers in the world. For example, an MHS with \$500

billion of assets might be raising \$100 billion, or more, in fresh debt annually, which is equivalent to \$2 billion per week.

Smaller banks and thrifts could own MHS, too, although they probably would access Wall Street through mechanisms that pooled the financing needs of numerous smaller institutions. Bankers banks would be one type of institution that could fill that role; in April 2003, there were 19 bankers' banks serving 6,100 community banks.<sup>10</sup> Some institutions, though, might sell all of their mortgage originations to MHS or to be securitized in the secondary mortgage market. For liquidity management reasons, even the largest MHS might find it desirable from time to time to securitize some of their mortgages or at least be prepared to securitize them if liquidity needs so dictated.

One virtue of F&F-guaranteed MBS is that through their nationwide scope, F&F can spread their credit risk across the entire U.S. housing market, thus escaping localized credit concentrations that can plague small lenders. That advantage is no longer unique to F&F as the large mortgage originators now operate on nationwide basis or across major regions of the country. By retaining the ownership of the mortgages they originate, they would achieve the same degree of risk diversification that F&F now enjoy. Further, credit derivatives would permit lenders with geographical concentrations of risk to shift some of that risk to others, thereby permitting smaller lenders to safely retain the ownership of mortgages they originate.

It is not necessary to get overly precise as to the likely structure of the U.S. housing finance industry after the playing field is leveled -- the financial markets will determine that structure, and modify it as conditions and technology change. Unfortunately, that flexibility is lacking today because F&F and the FHLBS are hard-wired, by statute, into the U.S. housing finance system.

### **How the MHS concept will reduce mortgage interest rates**

Mortgage interest rates break into two major components -- the cost of the money lent and the cost to make and service that loan. For the purposes of this paper, specific costs to make and service a mortgage loan include: mortgage marketing costs, loan origination, credit approval, loan servicing during the life of the loan, credit losses, and the cost of equity capital in excess of the funding value of that equity. For example, if the pre-tax cost of equity capital is 23% (which will produce a 14% after-tax return, assuming a 39% tax rate) and the weighted average cost of borrowed funds is 4%, then the excess cost of the equity capital is 19%. That excess pays stockholders for the right to put their capital at risk. In the mortgage business, these risks primarily consist of interest-rate, prepayment, credit, and operational risk.

Due to insufficient data at this time, the author cannot be as precise as he plans to become in contrasting the costs of the originate-to-hold mortgage lending channel, operating under the MHS concept, with the originate-to-sell channel operating in a mortgage world

dominated by F&F. Nonetheless, he has taken two approaches towards making the case that the MHS originate-to-hold mortgage funding model will produce lower all-in mortgage rates for home buyers than the present F&F originate-to-sell mortgage model, despite the funding cost advantage F&F's GSE status gives to the present originate-to-sell model. Absent that GSE funding cost advantage, the MHS model should easily trump the originate-to-sell model because of the additional costs the latter model incurs.

### **The first approach -- what happens to the lending spread?**

The first approach entails examining what is happening today to the rather substantial interest-rate spread between mortgage lending rates and funding costs. This examination tries to factor out the cost of dealing with maturity mismatching by assuming a funding cost yield curve that eliminates maturity mismatching through a combination of on-balance-sheet asset-liability management; interest-rate swaps to manage interest-rate risk; options, swaptions, and callable debt to manage prepayment risk; and equity capital to absorb the risks associated with any residual interest-rate risk. In other words, this examination focuses on mortgage costs associated only with credit risk, which is relatively low with regard to mortgages on owner-occupied housing. This is a valid approach because F&F assume no interest-rate risk on the mortgages in the MBS pools they guarantee.

Put another way, owners of F&F-guaranteed MBS face precisely the same interest rate and prepayment risks, and incur the same types of cost in managing those risks, that MHS will face in funding the mortgages they hold in portfolio. As the paper will argue below, MHS should enjoy some cost advantages in managing interest-rate and prepayment risks, but that is merely icing on the cake in contrasting the advantages of the MHS funding model with the present F&F-guaranteed MBS funding model.

**Figure 3** shows the spread of the 7-year and 10-year LIBOR swap rates over the 30-year mortgage interest rate commitment reported weekly by Freddie. The Freddie commitment rate has been adjusted upward to include the fees and points reported by Freddie to approximate the all-interest rate on these mortgage commitments.<sup>11</sup> The smaller spread over the 10-year LIBOR rate reflects the positive slope of the interest-rate yield curve, which prevails most of the time and certainly in recent years.

At the present level of 30-year fixed rates, approximately 6%, the duration of a 30-year mortgage, paid monthly until it matures is approximately 10.8 years (Macaulay Duration calculation method). If a 6% mortgage is paid off at the end of its tenth year, its duration drops to approximately 7 years; if it is paid off at the end of its seventh year, its duration drops to about 5.5 years.

Assuming that the magnitude of the recent refinance boom was a not-soon-to-be-repeated phenomenon, mortgage durations should be returning to more normal levels. Therefore, an assumed average duration of 7 years, for the purpose of this analysis, seems quite reasonable while an assumed duration of 10 years appears quite conservative, in terms of estimating the amount of mortgage interest spread left over after paying for all funding,

interest-rate and prepayment hedging expenses, and the related equity capital cushion. The remaining spread would pay for the costs of making and servicing a loan, including credit losses and the cost of the equity capital needed to protect funding sources from credit and operational losses.

Working from the data on which **Figure 3** is based, the mortgage spread under the 10-year LIBOR swap rate averaged 148 basis points in 2003 while the spread under the 7-year LIBOR swap rate averaged 200 points (one basis point equals .01 percent). For the last quarter of 2003, the respective spreads were 131 and 182 basis points. For 2002, the respective spreads were 141 and 181 basis points; for 2001, they were 125 and 149 basis points. On a 13-week moving average, from the second quarter of 2002 through the end of 2003, the lowest 10-year LIBOR spread was 120 basis points; the lowest 7-year LIBOR spread was 152 basis points -- both lows were reached in the spring of 2002. The 13-week moving average for the 10-year LIBOR spread went as low as 113 basis points in the summer of 2001. The spread peaks were reached in the fall of 2002, with the 10-year LIBOR spread hitting 164 basis points and the 7-year LIBOR spread going up to 212 basis points. It appears that the refinancing boom caused the LIBOR spread to widen significantly. In recent months, this spread has been returning to a more normal level.

Based on this LIBOR spread data, it appears reasonable, if not fairly conservative, to use 130 basis points as the spread which is available to cover all mortgage costs except funding costs (including the cost of hedging interest-rate and prepayment risks). The big question: How are these 130 basis points being spent?

A recent Mercer Oliver Wyman (MOW) study<sup>12</sup> of the mortgage marketplace in eight European countries (Germany, France, United Kingdom, Italy, Spain, Portugal, Denmark, and the Netherlands) provides a useful frame of reference for benchmarking U.S. mortgage costs even though the eight mortgage markets differ significantly in terms of size, products, funding sources, and legal environment. The MOW study readily acknowledged these differences and the difficulty in adjusting for them in making comparisons and drawing conclusions. None the less, the MOW study suggests that it is not unreasonable to propose that (1) the U.S. mortgage marketplace is hardly the efficiency wonder of the world and (2) the MHS concept could lower U.S. mortgage interest rates by at least a few basis points, if not more. Interestingly, European mortgages are funded primarily by deposits and long-term mortgage bonds sold in the capital markets, although mortgage securitization has made some headway.

For each country, MOW calculated an "adjusted price," expressed in basis points, for home mortgages. That price equals the mortgage rate plus fees minus funding cost, the value of the prepayment option, and credit risk. For the purpose of this paper, the cost of credit risk was added to the "adjusted price" to calculate a number that can be used to address the question of how is the mortgage interest spread being spent in the United States. MOW defined "operating costs" to include "distribution, origination, and servicing costs only." The following table sets out relevant numbers, in basis points:<sup>13</sup>

<u>Country</u>	<u>Operating Costs</u>	<u>Credit risk</u>	<u>After-tax profit</u>	<u>Taxes (imputed)</u>	<u>Total costs</u>
Germany	45	9	18	7	79
Denmark	35	6	22	27	90
France	68	13	16	5	102
Netherlands	45	8	33	19	105
Portugal	50	17	31	14	112
Spain	38	12	40	25	115
United Kingdom	40	12	46	29	127
Italy	72	19	33	29	153

Only Italy exceeds the 130 basis point spread assumption noted above. As MOW observed, on page 44, those countries with relatively high operating costs (Italy, France, and Portugal) appear to have "more complex legal processes (particularly Italy) and low average loan sizes which lead to higher cost as a proportion of loan size." The other five countries, MOW noted, "have both higher average loan sizes but also have more efficient mortgage processes such as mortgage registration and repossession."

To some extent, the numbers in the preceding table reflect sub-par returns on equity capital, but as the following table shows, mortgage lending in some European countries generates fairly high returns:<sup>14</sup>

<u>Country</u>	<u>Estimated after-tax profit</u>	<u>Estimated economic capital</u>	<u>Estimated risk-adjusted return on capital</u>
United Kingdom	46 B.P.	2.0%	23%
Spain	40 "	1.8%	22%
Netherlands	33 "	1.5%	22%
Denmark	22 "	1.2%	18%
Portugal	31 "	2.4%	13%
Italy	33 "	2.9%	12%
Germany	18 "	1.7%	11%
France	16 "	2.0%	8%

MOW states that its capital calculation "includes credit and operating risk capital." Presumably, it does not include capital to absorb interest-rate risk, a presumption reinforced by MOW footnote 6, which states that "Economic Capital is defined as the amount of capital that a company requires in order to support the economic risks it faces." Although MOW does not state how it measured economic capital for each country, the capital percentages do bear a relationship to the "credit risk" shown in the second table above. The ratio of economic capital to "credit risk" cost ranges from 14 for Portugal to 20 for

Denmark. These ratio calculations bear on the capital adequacy issue for MHS, as will be discussed below.

The following costs would be covered by the mortgage spread left over after all funding costs have been covered: mortgage origination, loan servicing, credit losses, and the cost of equity capital associated with credit and operational risks. These costs, in terms of basis points per loan per year, assuming an average 10-year life for a 30-year, fixed-rate home mortgage loan, are as follows:

**Loan origination** Loan origination costs vary widely as do mortgage sizes. Given the relatively fixed size of certain origination costs, such as appraisals and title insurance, origination costs will vary greatly in terms of the degree to which they add basis points to the all-in interest rate on a mortgage loan. The author could not find data on the average size loan Fannie purchases, but did find in the most recent data Freddie has published the following average sizes for purchased mortgages: 2002 -- \$173,608; fourth quarter, 2002 -- \$188,486; first quarter, 2003 -- \$164,605.<sup>15</sup> Based on these figures, an average mortgage loan size of \$175,000 is used for the purpose of calculating the basis point cost of loan origination.

Although loan origination costs vary widely, some representative numbers indicate how expensive the process can be. A benchmark Fannie survey of 101 lenders of all types, sizes, and locations found that the origination cost for correspondents increased dramatically over the past year, rising from \$1,601 per loan to \$2,144. The cost of originating a mortgage ranged from \$1,524 when the underwriting process was highly automated to \$2,549 when manual underwriting was used.<sup>16</sup> Quicken Loans, Inc., an online mortgage banker, earlier in 2003 estimated that closing fees on a \$150,000 loan ranged from \$1,207 in North Carolina to \$3,001 in Florida. In Maryland, closing costs were \$1,834, in Virginia \$1,924, and in the District of Columbia, \$1,957.<sup>17</sup> Based on these figures, an average loan origination cost of \$2,000 was used for the purpose of calculating the basis point cost of loan origination. A \$2,000 origination cost amortized over 10 years on an initial mortgage balance of \$175,000 carrying a 6% interest rate will account for 16 basis points of the mortgage's effective interest rate and therefore be covered by the mortgage's all-in interest spread.

Quite possibly, banks and thrifts would offer fixed-rate mortgages they intended to sell to their MHS at interest rates that would include all origination and loan settlement costs that now have to be itemized. This pricing approach would greatly simplify the mortgage financing process for both lender and borrower. All-in pricing would simplify the lender's business processes while an all-in interest rate would make it much easier for prospective borrowers to comparison shop for mortgage loans. This approach conforms with initiatives now underway to simplify loan closing and settlement procedures under RESPA, the Real Estate Settlement Practices Act.

**Loan servicing** According to a study by the Mortgage Bankers Association (MBA), the average cost (direct plus indirect) of servicing a mortgage loan in 2001 was

\$193. Partially offsetting that cost was net escrow income (\$89 average per loan) and other income (\$70 average per loan).<sup>18</sup> This analysis purposely excludes other costs commonly associated with a loan such as the amortization and impairment of loan servicing rights and related hedging expense since they are not costs directly related to servicing a mortgage. Data on the average size mortgage loan being serviced varies, depending on the source. The MBA study is based on an average loan size of \$103,000. The most recent Freddie data indicates an average outstanding loan size of \$142,889.<sup>19</sup> The average single-family home mortgage in Fannie's "credit book of business" at the end of 2002 was \$111,187.<sup>20</sup> For the purpose of this analysis, a \$125,000 average mortgage balance outstanding is used with an annual net servicing cost (actual servicing costs minus escrow income) of \$125. Loan servicing therefore chews up 10 basis points of the mortgage interest spread.

Loan origination and servicing essentially account for the activities MOW called "operating costs" in the second table above. They total to 26 basis points, which is roughly two-thirds the level of operating costs in the three most efficient countries -- Denmark (35 basis points), Spain (38 basis points), and the United Kingdom (40 basis points). It is quite reasonable that operating costs would be lower in the United States given the economies of scale associated with the relatively large mortgages over which the fixed costs of loan origination and servicing can be spread and the enormous size of the U.S. mortgage market. According to the MOW report (Figure 3.3 on page 14), the mortgage debt outstanding in the eight countries totaled 3.17 trillion euros, or approximately \$4 trillion at current exchange rates. On June 30, 2003, U.S. mortgage debt, excluding home equity loans and lines of credit, on owner-occupied housing, totaled \$5.54 trillion,<sup>21</sup> or almost 40% more than the eight European countries combined.

**Credit losses** F&F have enjoyed extremely low credit losses in recent years. Fannie's credit losses have been running under one basis point since 2000, but they reached 5.3 basis points in 1996 and 6 basis points in 1994. Freddie's credit losses were under one basis point in 2001 and 2002, but before then ran somewhat higher than Fannie's, reaching 10.4 basis points in 1996 and 10.9 basis points in 1995. However, much of its credit loss in those years was attributable to apartment loans. Based on this history, a very conservative allowance for credit losses would be 5 basis points; that amount could include the expense of purchasing credit derivatives to disperse geographical risk concentrations. That number is low relative to the European experience -- only Denmark approaches it, at 6 basis points - - but is justifiable in light of F&F's loss experience over the last decade and the strength of the U.S. housing market.

**Cost of equity capital** This cost-of-equity-capital calculation excludes any capital cushion associated with interest rate and prepayment risks as that cost of capital is assumed to be covered by using the 10-year LIBOR swap rate to cover all funding costs and risks. This notion conforms with MOW's calculation of economic capital for the eight countries it analyzed. The unweighted average of the capital ratios MOW analyzed is 1.94% (Table 3.6 on page 19). That number is well above the .45% capital requirement applicable to F&F's credit risk.<sup>22</sup> F&F's .45% capital requirement seems reasonable in light of a 2001 Federal Reserve study, which concluded that "newly originated loans with 80 percent loan-to-value

ratios and a prime borrower credit score of 700 require very little capital to cover credit risk: no more than .51 percent in a well-diversified portfolio . . . assuming a BBB solvency standard and an eight year horizon."<sup>23</sup>

The .51% capital determination by Calem and LaCour-Little is approximately 100 times the recent level of F&F's loss experience. That capital-to-loss ratio is in line with the ratio for the nation's savings banks, but well above the ratio for S&Ls, 39 times in 2002, and for commercial banks, 13 times in 2002. Based on this analysis, a capital cushion equal to 2% of the amount of credit and operational risk seems quite reasonable and is in line with MOW's economic capital calculation. That capital percentage is 40 times the credit loss assumption above of 5 basis points and at least twice the European ratios cited above. A capital cushion this low is supported by Passmore, in footnote 35 on page 30 of his paper, where he observed that if F&F "only securitized mortgages, the percent of capital needed would be substantially less because of the low credit risk associated with conforming mortgages. It is [their] mortgage portfolio, with its interest rate and prepayment risks, that requires much higher levels of capitalization."

The required rate of return for taking home mortgage credit risk should be less than banking returns overall. As Passmore noted on page 29 of his paper, F&F's "assets are generally safer than most other financial assets, but [F&F's] returns on equity are higher-- contrary to the common view that financial markets generally reward taking increased risk with higher financial returns." [emphasis supplied] In 2002, the 100 largest U.S. banks and thrifts (as distinguished from their parent holding companies) earned an average after-tax rate of return on their equity capital (ROE) of 15.3%. The median ROE for these 100 institutions in 2002 was 16.2%.<sup>24</sup> For all FDIC-insured institutions, the FDIC has calculated average ROEs for the 1998-2002 period that ranged from 12.98% to 14.71%, rising to 15.00% for the first three quarters of 2003.<sup>25</sup> In light of these ROE data, a 14% after-tax ROE target for home mortgage credit risk seems eminently reasonable. That target translates into a 23% pre-tax profit requirement, assuming a 39% corporate income tax rate. Base on the 2% capital requirement established above, that translates into a 46 basis point profit requirement per dollar of home mortgage credit risk outstanding. That number is in line with the MOW report, which determined that pre-tax profits ranged from 21 basis points in France to 73 basis points in the United Kingdom. The unweighted average pre-tax profit for the eight countries was 49 basis points.

**Adding it all up** The four cost elements just discussed total 77 basis points (16 + 10 + 5 + 46). This total cost comes in below the range of costs for the eight countries MOW studied. Germany had the lowest cost, 79 basis points, largely because of a low mortgage lending ROE while Denmark was the second lowest, at 90 basis points, largely because of low operating and credit costs. Yet a 77 basis point average cost for the United States seems quite reasonable, for the reasons discussed above. Therefore, we return to the BIG question -- how are 130 basis points of mortgage spread being spent, or to put this question another way, what is happening to the 53 basis point differential between the 130 basis points of available spread and the 77 basis point cost estimate?

This 53 basis point difference actually understates the magnitude of the issue since Fannie's pre-tax profit on its guaranty line of business is substantially less than the 46 basis point pre-tax profit goal discussed above. In 2002, Fannie conservatively earned 15 basis points per dollar of mortgage credit risk, 31 basis points less than the cost of capital calculated above.<sup>26</sup> Adding in that amount raises the cost differential to 84 basis points (53 + 31).

These basis point figures are not insignificant numbers. Given \$5.54 trillion of outstanding residential mortgage debt, each basis point of mortgage interest equals \$554 million annually! The 53 basis points unaccounted for in this calculation therefore totals \$29.36 billion, annually. The additional 31 basis points adds another \$17.17 billion, for a total of \$46.53 billion, annually -- not a modest sum.

Further analysis is needed to determine what has happened to this \$46 billion annually. Some of this amount may be consumed by all-in funding costs, including equity capital and interest rate and prepayment hedging costs that exceed the cost of funds evidenced by the 10-year LIBOR swap rate. Mortgage securitization costs would account for some portion of the \$46 billion as may a substantial portion of the cost of originating mortgage refinances. Finally, some of this spread may flow to mortgage finance intermediaries, and specifically F&F, in the form of excess profits. The MHS mortgage financing model offers the opportunity to eliminate these costs, through competition, and bring down mortgage interest rates as a result.

### **The second approach -- looking at mortgage costs from the bottom up**

Looking at mortgage funding costs from the bottom up, by contrasting cost components of the MHS originate-to-hold model with the cost components of the MBS originate-to-sell model, provides a second approach towards evaluating the efficiency of the two models. **Figure 4** illustrates the all-in interest rate of the two models, which divide into four cost components: Funding, raising that funding (funding underwriting), mortgage origination, and servicing and credit costs. Please keep this figure in mind when reading the following section of this paper.

**Funding the mortgage** As discussed above, the MHS model should be contrasted with the F&F's mortgage securitization activities (i.e., the creation and sale of MBS), not with F&F's portfolio investments in mortgages and MBS. F&F MBS and MHS debt have fundamentally the same characteristics, particularly with regard to maturity and prepayment characteristics, but with two exceptions. First, investors in F&F-guaranteed MBS willingly accept a lower yield on that debt because of F&F's implicit backing from the federal government. In the current interest-rate environment, that could give F&F-guaranteed MBS a 20 basis point or so cost advantage over MHS debt. That advantage disappears, though, for MBS not guaranteed by Fannie or Freddie. Second, MBS are collateralized by a specific pool of mortgages while MHS would issue unsecured debt, but debt with a liquidation preference over the MHS's other unsecured creditors. It is not clear how much of a funding cost advantage collateralized MBS would gain over uncollateralized MHS debt.

The apparent funding cost advantage of MBS will shrivel or even disappear, when contrasted with the cost of MHS debt, for several reasons. First, MBS investors incur costs in managing their MBS, particularly to assess and manage prepayment risk. Contrary to popular opinion, F&F MBS pools are more heterogeneous than is commonly believed,<sup>27</sup> which makes buying an MBS somewhat like buying a pig in a poke. Consequently, MBS investors have to spend money to protect themselves from buying MBS with inferior prepayment characteristics. Investors in callable MHS debt will face the threat of prepayment, but in a more predictable manner reflecting the MHS's overall duration situation, than is the case today with investors in F&F MBS. In effect, using detailed data about its borrowers, MHS will internalize much of the cost of monitoring prepayment risk, at a much lower cost than the cost incurred by MBS investors. Investors in non-callable MHS debt will not face prepayment risk.

Second, by operating as one large mortgage pool, MHS will gain substantial scale over MBS investors in managing interest rate and prepayment risks. In particular, a mortgage refinance that simply entails repricing downward an existing mortgage can easily be worked into the MHS's cash flow and duration management. In effect, many mortgage transactions will net out within the MHS that today are spread across tens of thousands of MBS investors. Nonetheless, MHS undoubtedly will issue callable debt to help manage their mortgage prepayment risk and they will have the same flexibility F&F do to use shorter-term debt and interest-rate derivatives to help manage prepayment risk. The annual transaction volume in MHS debt (issuing new debt, retiring maturing debt, and calling debt for early retirement) will be much less than the gross issuance and payoff of MBS today, with a corresponding reduction in transactions costs.

Third, MHS debt will be extremely liquid since MHS will have large balance sheets funded almost entirely by debt. As suggested above, the largest MHS could have \$500 billion, or more, of outstanding debt. Individual MHS debt tranches will be quite large -- in the range of several billion dollars or more. Relatively few MBS pools reach that size. Further, the larger MHS may mimic the F&F practice of issuing debt of specific maturities on a regular, pre-announced basis,<sup>28</sup> which in turn mimics the U.S. Treasury's debt issuance practices. This high degree of liquidity and regularity of issuance should reduce the cost of MHS debt by at least a few basis points relative to F&F-guaranteed MBS.

**Raising mortgage funding** Mortgage securitization is not an inexpensive process. Mortgage securitization entails moving small financial assets (home mortgages) to the capital markets while the MHS concept involves moving extremely large blocks of capital from the capital markets to MHS -- trainloads of cargo generally move more cheaply than truckloads. Furthermore, the composition of a pool of mortgages to be securitized has to be determined with some care, documentation must be assembled on each mortgage in the pool, investors must assess the composition of that pool and its likely prepayment characteristics before making an investment decision, mortgage principal and interest payments and mortgage payoffs must be distributed to MBS owners, and ongoing accounting for mortgages in the pool must be conducted for as long as the pool exists.

While highly automated, this process is far from costless. In effect, the MHS concept will reduce mortgage costs by addressing liquidity concerns on the liability side of the balance sheet rather than on the asset side of the balance sheet, where liquidity is obtained through the relatively expensive process of liquefying small assets, such as home mortgages.

Purchasers of MHS debt would not have to know the MHS's mortgage composition in such detail in order to determine the interest rate they would demand on MHS debt. Instead, they would judge the overall financial health and cash flows of the MHS. Servicing MHS debt also would be much simpler and cheaper since there will be far fewer issues of MHS debt outstanding than there are MBS pools. Further, the calculation of MHS principal and interest payments will be much simpler than the calculation of MBS payments.

**Mortgage origination** Originating a mortgage to sell into the secondary mortgage market so that it can be securitized is an expensive process because the mortgage originator has to meet the securitizer's standards in terms of documentation and terms and conditions. Mortgages sold for securitization usually must have title insurance, a written appraisal, a flood insurance certification, and a host of paperwork. On the other hand, mortgages originated with the intention that they will be held to maturity or prepayment do not have to be documented to meet a securitizer's requirements nor do they have to meet a securitizer's terms and conditions. This permits the originator to do only what it thinks is necessary to properly document the mortgage. For example, an originator might not always find it necessary to obtain title insurance or a written appraisal on a mortgage it intends to hold in portfolio.

Cost reduction potentials at the origination stage are particularly great for mortgage refinances. As noted above, a mortgage refinance fundamentally is a downward adjustment in the mortgage interest rate, a possible increase the loan balance (a "cash out refinance"), and a recalculation of the monthly mortgage payment. Nothing changes in the underlying security for the mortgage, which is why a mortgage refinance should be accomplished with just a few clicks of a computer mouse. However, refinance mortgages which will be securitized have to be documented and have to meet the same terms and conditions as a mortgage on a newly purchased home. This is the case because the refinance mortgage will not go into the same mortgage securitization pool as the mortgage it replaced.

Trimming mortgage origination costs will have a significant impact on a borrower's effective mortgage interest rate, which must include an amortization of the upfront origination cost over the effective life of the mortgage. This is an extremely important consideration because the amortization of up-front origination costs usually is left out of the calculation of mortgage interest rates. For example, trimming origination costs on a \$100,000 mortgage from \$1,500 to \$1,000 will lower the borrower's effective interest rate on a 30-year fixed-rate mortgage by 5 basis points, if the mortgage is not prepaid, by 7 basis points if the mortgage is paid off in ten years, by 10 basis points if it is paid off in five years, and by 19 basis points if paid off in three years.

Rate reductions from lower origination costs will double if the upfront origination cost is cut from \$1,500 to \$500. A reduction of that magnitude should be possible if a bank is merely repricing a mortgage it previously sold to its MHS. In an environment in which there are frequent mortgage refinancings or mortgage payoffs due to home sales, leveling the housing finance playing field will generate significant origination cost savings for borrowers, thereby lowering the borrower's effective rate of interest. **Figure 5** illustrates, for a \$100,000 mortgage, the extent to which mortgage origination costs paid up front add to a mortgage's effective interest rate, based on various early payoff dates for the mortgage. The lower line in **Figure 6** shows the reduction in the effective mortgage interest rate if up-front origination costs are trimmed by \$500; the upper line in **Figure 6** shows the interest rate deduction if origination costs are trimmed by \$1,000. A substantial reduction in mortgage origination costs will eliminate much, if not all, of any cost advantage the MHS originate-to-hold model has over the MBS originate-to-sell model.

**Mortgage servicing and credit costs** Mortgage servicing costs should be lower under the MHS model, particularly where MHS parents do the servicing, for several reasons. First, servicing software can be more closely integrated with mortgage origination software so that there is a seamless handoff of the just-executed mortgage to the servicing operation. Second, because MHS mortgage servicing will not have a dedicated income stream, expense will not be incurred in packaging servicing and the related servicing rights for sale as a hedging device. If servicing is outsourced, the arrangement will be done on a cost basis as is the case today with subservicing. Third, the parent bank can more efficiently link mortgage servicing with other customer service activities than is feasible today.

Credit costs have two components -- loan losses and related administrative costs and the cost of capital backstopping the MHS's credit and operational risks, as distinguished from capitalizing to backstop the MHS's interest-rate and prepayment risk. Given F&F's low level of loan losses today, it probably will not be feasible to reduce those costs further in a material way. F&F do have a capital cost advantage over private-sector mortgage lenders because they are allowed to operate with an extremely low capital requirement for credit risk -- just .45% of credit exposure. MBS investors accept that low capital backing because of F&F's implicit federal guarantee. The discussion above, in the "first approach" section, suggested using a 2% capital requirement for credit risk. That in fact is a conservative capital level for assuming mortgage credit risks comparable to F&F's credit risks. For a large MHS, a capital level equal to 1% to 1.5% of aggregate credit risk should be sufficient to earn an AA credit rating.

It is the author's understanding that F&F generally price MBS transactions that produce yields, in MBS pass-through structures, of approximately 50 basis points. That amount covers the MBS guarantee fee, generally in the range of 18-20 basis points and a servicing fee of 25 basis points that F&F permit the seller of the mortgage to retain. Servicing costs have dropped sufficiently such that a substantial portion of the standard 25 basis point servicing fee has become a source of profit for the seller of the mortgage, who often is the mortgage originator. One analysis of 40 Fannie mortgage pools that the author selected at random from the Fannie website produced an average servicing and guarantee

fee of 47.4 basis points.<sup>29</sup> Assuming a servicing cost of 10 basis points and credit losses over time of 2 basis points, an MHS could match that 47.4 basis point figure with a credit/operational risk profit of 35.4 basis points. Assuming a target ROE of 14%, which would require a 23% pre-tax profit on capital, a 35.4 basis point profit margin would fund a 1.5% capital level (.00354/.23).

**Adding it all up** The picture is less clear under the second approach as to the cost advantage of the MHS originate-to-hold model over the F&F-guaranteed MBS originate-to-sell model. The biggest uncertainty lies in the funding cost component of both models. It is conceivable that the all-in funding cost of the MHS model, including the cost of capital associated with interest-rate and prepayment risks, could be comparable with the yield on F&F-guaranteed MBS. This area warrants further research, specifically to more accurately specify MHS funding costs and the cost structure of MBS investors. Funding underwriting costs should definitely should be lower under the MHS model; research is needed to quantify this cost component under both models. Origination costs will definitely be lower under the MHS model, particularly for mortgage refinances. In fact, the origination cost differential may be the factor that gives the MHS model a decided cost advantage over the F&F-guaranteed MBS model. Servicing and credit costs may be a wash; the critical factor here is the amount of capital an MHS must hold for its credit and operational risks. Ultimately, that capital level as well as the acceptable rate of return on that capital will be determined in the financial marketplace.

**Other payoffs of the MHS model** The MHS model offers numerous other benefits, synergies, and payoffs that will enhance the benefits borrowers derive from the MHS model. One great benefit will be the reduced standardization of mortgage products, which now vary relatively little in the conforming mortgage market because all potentially conforming mortgages must be underwritten and documented to standards established by F&F. Mortgages destined to be owned by an MHS will vary more than they now do, which will offer a broader range of choice to homebuyers.

MHS and their parent banks and thrifts will have a greater incentive than they now do to seek changes in state laws that restrict prepayment penalties. This would enable banks and thrifts to offer mortgages at significantly lower interest rates to homeowners who do not anticipate moving or refinancing for a long time. Under the present no-prepayment-penalty regime, the interest rate of those who move or refinance frequently is subsidized by those who do not. That cross-subsidy represents bad public policy that is regressive in nature.

A significant, although difficult-to-quantify benefit, is the closer long-term relationship a bank or thrift will be able to establish with its customers if it retains the ownership of the mortgage it originates. No longer will customers be turned off because of problems that arise when the servicing rights to a mortgage have been sold to another servicer. Certainly, the MHS structure will offer parent banks and thrifts greater opportunities for cross-selling and integrating the mortgage product with other banking and financial services products. As the MOW study noted, on page 63, "there is strong evidence from interviews with mortgage lenders that the mortgage product is increasingly being seen

as a 'gateway' product to gain access to the customer and use as a basis for cross-selling other products."

Taxpayers would benefit from MHS if this concept helps to pave the way for privatizing F&F and the FHLBS so as to eliminate the taxpayer risk the three GSEs now pose. That risk is growing as the balance sheets and contingent liabilities of the GSEs continue to grow faster than the economy. Despite the enormous size of the largest MHS, they will not pose the systemic risk the GSEs pose, for two reasons. First, unlike banks, they will not accept deposits, thereby eliminating the fear of bank runs that could trigger a taxpayer bailout. Second, they will not be chartered by Congress, as the GSEs are. There is a widespread belief, particularly in the financial markets, that Congress will use taxpayer funds or the credit backing from the federal government to prevent a GSE from defaulting on its debts and guarantees. That belief is buttressed by the 1987 taxpayer bailout of another GSE, the Farm Credit System, the 1989 taxpayer bailout of the Federal Savings and Loan Insurance Corporation, and Congress's 1996 rescue of the Financing Corporation (FICO) bonds by extending to bank deposits the assessment base for the interest paid on those bonds.

### **Why have MHS not been created by non-bank financial firms**

A frequent question posed to the author simply asks: If the MHS is such an efficient mortgage funding model, why have non-bank firms, such as General Electric and General Motors Acceptance Corporation, not already created MHS-like entities to compete against F&F in owning long-term, fixed-rate mortgages? That is an excellent question, for which the author does not have a ready answer. After further development work on the MHS, he will pose that question to those companies and others. That is, it may be premature to pose that question to these companies since the MHS concept is still under development.

That said, the author will toss out several possible answers to this question:

! No one had thought of the idea. Innovation is widespread in the financial markets -- at some point in the past, today's well-established banking practices were brash new ideas. The MHS concept is possibly such an innovation.

! F&F may be seen as such dominant competitors, because of their GSE status, that no one believes any genuinely private-sector financial entity can compete against the two companies, particularly in holding mortgages in portfolio. Of course, that dynamic will change when F&F are privatized.

! The capital levels demanded by the rating agencies will make the MHS concept uneconomic, especially in the face of competition from F&F. It may take lots of work to get the rating agencies comfortable with seemingly low capital levels, particularly for credit and operational risk. The pending Basel II capital regulations, which substantially reduce capital requirements for home mortgages, may help to raise the rating agencies' comfort level about MHS.

! Non-bank firms may not have as much synergistic potential as banks and thrifts to integrate an MHS with their other consumer finance activities. A strong bricks-and-mortar presence where mortgage loans are being originated may be key to making the MHS concept feasible.

Despite these possible reasons why the MHS concept might never be feasible in the United States, the author offers this consoling thought -- the MHS concept is merely a slight adaptation of the mortgage bond concept used so widely to finance home mortgages in Europe, but with improvements which should enable the concept to function even more efficiently in the United States. That is a sound rationale for continuing to explore the feasibility of the MHS concept.

## **Conclusion**

The time is drawing closer when Fannie and Freddie must be privatized, just as Sallie Mae has been privatized. F&F privatization raises an important public policy question: How will long-term, fixed-rate home mortgages be financed, in an efficient manner? Although widespread, mortgage securitization is not a particularly efficient process for marrying long-term funding with long-term financial assets. The European mortgage bond concept offers a well-developed and highly efficient means for funding fixed-rate mortgages. The MHS concept adapts the mortgage bond concept to the U.S. economy and bank regulatory framework. Even if F&F are not privatized, MHS may still emerge as a sound vehicle for funding fixed-rate home mortgages, provided that the concept is not strangled by the banking regulators.

## **Endnotes**

1. Passmore, Wayne, "The GSE Implicit Subsidy and Value of Government Ambiguity," Board of Governors of the Federal Reserve System, December 2003, pg. 28.
2. Miles, Barbara, testimony before the Task Force on Housing and Infrastructure of the Committee on the Budget, U.S. House of Representatives, July 25, 2000, Serial No. 10-1, pg. 135.
3. Various banking laws would have to be amended to exempt MHS from consolidated capital regulation at the bank or thrift level and again at the holding company level. Specific sections of the law that most likely would

have to be amended include 12 U.S.C. '24, dealing with national banks; 12 U.S.C. 1464, dealing with federally insured thrift institutions; 12 U.S.C. 1831o, dealing with state-chartered banks not members of the Federal Reserve System; 12 U.S.C. 324, dealing with state-chartered members of the Federal Reserve System; and 12 U.S.C. 1844(b), dealing with bank and financial holding companies.

4. Some have argued that MHS should not be subject to any credit-rating requirement. Instead, an MHS's capital level should be determined entirely by market forces, based on the actual risks it has assumed. This is a valid argument that should be given serious consideration.

5. 12 U.S.C. Sec. 371c and 12 U.S.C. Sec. 371c-1, respectively.

6. This policy reflects a long-standing regulatory concern that insured banks and thrifts not be weakened by bailing out troubled non-bank affiliates and subsidiaries. An example of that concern was reflected in a joint interagency policy statement issued by the Office of the Comptroller of the Currency, the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, and the Office of Thrift Supervision on January 5, 2004, alerting "banking organizations . . . of the safety and soundness implications of and legal impediments to a bank providing financial support to investment funds advised by the bank, its subsidiaries, or affiliates. A banking organization's investment advisory services can pose material risks to the bank's liquidity, earnings, capital, and reputation, and can harm investors, if the associated risks are not effectively controlled."

7. A report by Mercer Oliver Wyman, "Study on the Financial Integration of European Mortgage Markets," which is discussed in more detail later in the paper, had this to say about funding mortgages (page 63): "The mortgage bond appears to be an efficient mechanism for funding long term fixed rate products but possibly less efficient for short-term products where the flexibility of deposits make this a more attractive option."

8. Flow of Funds Accounts of the United States, Board of Governors of the Federal Reserve System, Second Quarter 2003, Tables L.218 and L.219, pg. 94.

9. National Mortgage News Daily Briefing, September 12, 2003, table of top residential servicers.

10. News release issued by Bankers' Bank Northeast, April 2003.

11. An attempt is being made to clarify with Freddie what types of "settlement costs" are excluded from the "fees and points" component of the data Freddie reports in its weekly mortgage rate survey, called the Primary Mortgage Market Survey. Adding back excluded up-front settlement costs would raise the mortgage commitment rates Freddie now reports.

12. Mercer Oliver Wyman, "Study on the Financial Integration of European Mortgage Markets," European Mortgage Federation, October 2003.

13. Ibid. Data taken from tables 3.6 (pg. 19), 3.16 (pg. 34), and 3.21 (pg. 44).

14. Ibid., Table 3.6 (pg. 19).

15. Freddie Mac, "Investor/Analyst Report for the First Quarter of 2003," calculated from data on pgs. 4 and 5.

16. "Fannie: Origination Costs Up Sharply," National Mortgage News Daily Briefing, September 30, 2003.

17. "Fees, Fees, and More Fees," The Washington Post, June 7, 2003, pg. F1.

18. Presentation by Michael Borum of Chase Home Finance at a Mortgage Bankers Association forum, February 10, 2003.

19. Freddie Mac, "Investor/Analyst Report for the First Quarter of 2003," March 2003 data on pgs. 9 and 12.
20. Fannie Mae Annual Report for 2002, calculated from Tables 30 and 32.
21. Board of Governors of the Federal Reserve System, "Flow of Funds Accounts of the United States," Second Quarter 2003, Table L.218, line 2 - line 24.
22. 12 U.S.C. '4612(a)(2).
23. Calem, Paul and Michael LaCour-Little, "Risk-based Capital Requirements for Mortgage Loans," Board of Governors of the Federal Reserve System, November 2001, pg. 2
24. Calculated from bank call report and thrift financial report data compiled by Sheshunoff and Company, Austin, Texas.
25. FDIC Quarterly Banking Profile, Third Quarter 2003, Table 1-A, pg. 5.
26. Calculated from footnote 10, Line of Business Reporting, to Fannie's 2002 audited financial statements. Fannie earned an average guaranty fee, per dollar of mortgage credit risk, of 18.9 basis points in 2002 (\$3.19 billion of guaranty fee income/\$1.686 trillion of mortgage credit risk). Fannie charged \$1.07 billion of expense to its credit guaranty line of business, leaving a pre-tax profit of \$1.747 billion, or 12.6 basis points per dollar of mortgage credit risk. However, some of Fannie's administrative expense charged to the credit guaranty line of business apparently relates to servicing its outstanding MBS; i.e., forwarding mortgage principal and interest payments to MBS investors. Attributing 50% of that administrative expense to MBS servicing would raise the pre-tax profit of the credit guaranty business to 15.2 basis points. This calculation excludes 4.1 basis point of net interest income, per dollar of mortgage credit risk, Fannie attributed to its credit guaranty line of business. Because it has not completed its financial statement restatement process, comparable data is not yet available for Freddie.
27. A good example of this heterogeneity is Fannie MBS pool number CL-254868, which had an unpaid principal balance of \$6.427 billion when the pool's MBS were sold on August 1, 2003. This pool contained 35,595 mortgages reflecting a wide range of mortgage characteristics. For example, loan sizes ranged from \$13,000 to \$620,500 (the maximum limit in 2003 for a four-family unit), mortgage coupon rates ranged from 5.25% to 7.00%, although most fell in the 5.25 to 5.5% range, loan-to-value ratios ranged widely, with the middle half falling in the 63% to 80% range, while credit scores ranged from 484 to 900, with the middle half in the 691 to 766 range. The loans in the pool were drawn from every state as well as the District of Columbia, but no information was provided as to where within those states the borrowers are located. Information about loan originators is highly speculative, in part because there is only partial data on the loan servicers for these mortgages. Data on this pool was taken from the supplemental prospectus for the pool posted on Fannie's website.
28. Fannie calls this form of debt Benchmark Securities, specifically Benchmark Bills, noncallable Benchmark Notes, and Callable Benchmark Notes, while Freddie calls this form of debt Reference Securities, specifically Reference Bills, Reference Notes (with 2, 3, 5, and 10 year maturities), and EReference Notes denominated in euros.
29. The 40 pools were created by Fannie between July 1 and October 1, 2003. Half the pools consisted only of newly originated 30-year fixed-rate mortgages; the other half consisted of other maturities and terms and conditions. The pools consisting of just 30-year mortgages accounted for 93.2% of the \$22.73 billion principal amount of the mortgages placed in the 40 pools. The principal balance of the largest pool was \$6.43 billion; 15 of the 40 pools had principal balances under \$10 million. The 40 pools contained 133,359 mortgages;

approximately 70% of them were mortgage refinances. The average size of a 30-year fixed-rate mortgage was \$170,877; the average size of the other mortgages was \$164,689. Fannie's interest rate spread (weighted-average mortgage coupon rate minus the MBS pass-through rate) was 46 basis points; the rate spread on the other mortgages was 66.5 basis points.