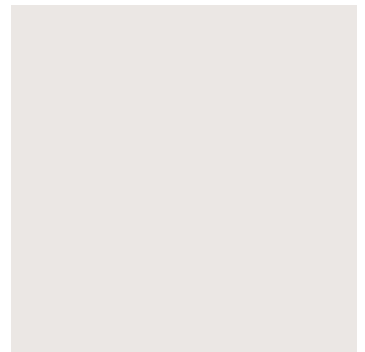
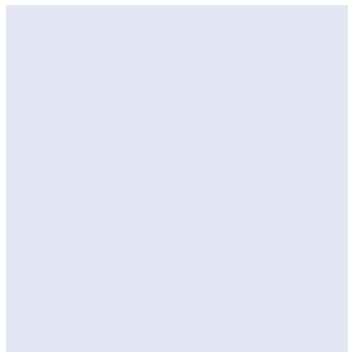
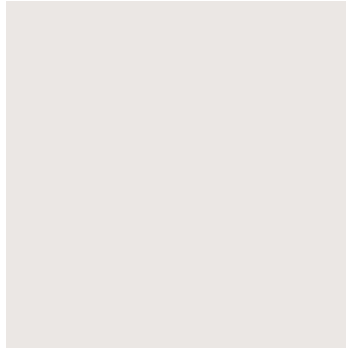
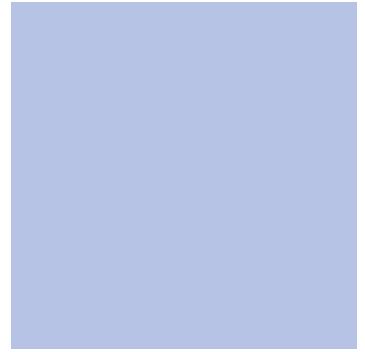


➤ Revisiting the  
Net Benefits of  
Freddie Mac and  
Fannie Mae



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## » Introduction and Summary

In the years since we published our first analysis many researchers have examined the economic impacts associated with the activities of Freddie Mac and Fannie Mae.<sup>1</sup> Much of this recent work supports our earlier conclusions that these two housing-related government sponsored enterprises (GSEs) confer substantial benefits on homeowners while posing manageable risks to the financial system and minimal costs to taxpayers.

What is new since 2001, however, is the growing concern about the GSEs' retained portfolios of

***Freddie Mac and Fannie Mae confer substantial benefits on homeowners while posing manageable risks to the financial system and minimal costs to taxpayers.***

mortgage-backed securities and whole mortgages. Indeed, certain trade associations and government agencies maintain that the

sheer size of the GSEs' portfolios poses substantial systemic risk and that they should therefore be capped, reduced, or even eliminated.

Many critiques also argue that the GSEs merely “pass through” part of a government subsidy, siphoning off a substantial portion for their own employees and stockholders. To the contrary, in carrying out their statutory goal of increasing liquidity in the mortgage market, the GSEs create value in a number of ways—not least by standardizing loan procedures, attracting more investors to mortgages, and providing the efficiencies of scale that reduce mortgage interest rates for homebuyers.

As several respected authorities have demonstrated, the activities of the GSEs have also brought greater stability to both the housing market and the overall economy. And, through their support of homeownership, the GSEs also contribute to important social goals such as expanding minority homeownership. This added value explains how the benefits the GSEs provide to the nation exceed the value of their funding advantage.

As for the contention that the GSEs' retained portfolios represent dangerous systemic risk, the evidence suggests that this risk—while neither unique nor trivial—is contained with strong safety and soundness regulation. In fact, the risks of failure associated with the GSEs is less than those associated with other large financial institutions that have federal or state charters and that could be characterized as receiving a “subsidy.”

In updating our estimates to reflect growth in mortgage markets and in GSE activities since 2001, we were careful to take the broader economic implications into account.

As a result, we found that the benefits that Freddie Mac and Fannie

Mae currently bestow on homeowners are even larger than previously stated.

In particular, we find that the GSEs' funding advantage (by virtue of their nexus with the

***The activities of the GSEs have also brought greater stability to both the housing market and the overall economy.***

<sup>1</sup> See Pearce and Miller (2001).

federal government) reduced their annual interest expenses by between \$4.7 billion and \$13.1 billion in 2005. At the same time, though, the annual interest savings the GSEs bestowed on home loan borrowers ranged between \$16.2 billion and \$20.7 billion. This range does not account for government subsidies to other financial institutions that the GSEs must match in the marketplace to further reduce

***Overall then, we conclude that the residential mortgage market functions well and that Freddie Mac and Fannie Mae contribute substantially to its performance.***

mortgage rates. For example, accounting for the federal subsidies that go to depository institutions (such as banks and savings and loans) and

members of the Federal Home Loan Bank (FHLB) System, we estimate the total savings to homeowners from Freddie Mac and Fannie Mae activities reach the \$18.8-26.9 billion range. As a result, even the low end of the savings to borrowers exceeds the high end of the funding advantage to the GSEs by a significant margin—more than \$5 billion.

Overall then, we conclude that the residential mortgage market functions well and that Freddie Mac and Fannie Mae contribute substantially to its performance. We agree that large retained portfolios—regardless of who owns them—involve distinct risks, and that the size and complexity of the GSEs' portfolios warrant close monitoring and supervision. But placing statutory limits on the GSEs' portfolios would reduce the liquidity in the mortgage market and constrain growth in homeownership, while reducing risk only marginally at best. Accordingly, we conclude that the current path of more focused, effective regulation is the best way to maximize the net contributions of the GSEs.

## » Today's Mortgage Markets

The U.S. mortgage market provides benefits to American families that are not generally available in other countries today and were only partially available 30 years ago. Homebuyers can now borrow at rates just slightly above yields on Treasury securities of similar duration, and mortgage money is almost always available even when credit for other purposes is difficult to obtain.

Prospective borrowers are also offered a wide range of mortgage options to fit their particular situations. Among the choices are the term of the loan, whether the interest rate will float or remain fixed, how much of the home purchase is financed, and when and if to lock in the interest rate. First-time and low-income homebuyers find educational and financial support available. Homeowners may choose to refinance on occasions that are to their own advantage.

These options are not limited to only a fortunate few. The U.S. ranks high among major nations in the ratio of mortgage debt outstanding to GDP,<sup>2</sup> and the volume of transactions is remarkable. In 2003, over \$4 trillion of mortgages were originated, with about three-quarters of that amount being refinance loans.<sup>3</sup> In a recent article Richard Green and Susan Wachter compared the U.S. market with mortgage markets in other countries, concluding that "... the unique characteristics of the U.S. mortgage market provide substantial benefits for American homeowners and the overall stability of the economy" (2005).

<sup>2</sup> Green and Wachter (2005), Table 2.

<sup>3</sup> Greenspan and Kennedy (2005), Table 1.

<sup>4</sup> Roll (2003), 32.

This combination of choice and performance is made possible by an array of specialized government and private institutions, including many firms that combine private ownership with government support and supervision. These firms include commercial banks and savings associations, as well as Freddie Mac and Fannie Mae, two government-sponsored enterprises (GSEs).

Freddie Mac and Fannie Mae have become key mortgage market participants, and their contributions have been recognized by prominent scholars in economics and finance. Richard Roll, founder of the mortgage securities research group at Goldman Sachs, has observed that, "Federal policy toward Freddie Mac and Fannie Mae is accomplishing its intended purpose: it makes housing more affordable to a broad range of Americans."<sup>4</sup>

### *Mortgage Market Participants*

The residential mortgage industry consists of primary and secondary mortgage markets that link homebuyers and investors. Lenders "originate" mortgages for borrowers in the primary market, often with the help of mortgage brokers. In the secondary market, lenders and investors buy and sell mortgages in the form of whole loans or mortgage-backed securities (MBS). Other participants include "conduits," which assemble mortgages into pools that can be used as collateral for MBS, loan servicers, and mortgage

insurance providers. Investment and trading in the secondary market support a continuous flow of funds to the primary market and help equalize mortgage rates across the country.<sup>5</sup>

Approximately five percent of mortgage originations carry some type of federal insurance or guarantee.<sup>6</sup> These include loans that are federally insured by the Federal Housing Administration (FHA), guaranteed by the Veterans Affairs (VA), and insured or guaranteed by the Rural Housing Service (RHS), a unit of the U.S. Department of Agriculture—all programs facilitated by Ginnie Mae, the common name of the Government National Mortgage Association (GNMA), a federal program operated by the U.S. Department of Housing and Urban Development (HUD).

Loans that are not federally insured or guaranteed are called “conventional” mortgages. Conventional mortgages are either “conforming loans” (eligible for purchase by Freddie Mac and Fannie Mae) or “jumbo loans” (for amounts that exceed the conforming loan limit).<sup>7</sup> Jumbo loans typically account for about 20 percent of the dollar

volume of mortgage originations and usually carry a higher rate of interest than conforming loans.<sup>8</sup>

Government agencies and private firms with ties to the government are prominent participants in both the primary and secondary residential mortgage markets. Federally insured depository institutions (“depositories”) and their affiliates are the dominant lenders in the primary market. Six of the top ten originators in 2005 were affiliates of banking organizations.<sup>9</sup> They accounted for 37 percent of total originations. In the mortgage insurance/guarantee market, FHA and VA—whose guarantees are fully backed by the U.S. Treasury—are very active. In the secondary market, Ginnie Mae guarantees pools of loans with FHA insurance or a VA or RHS guarantee, while Freddie Mac and Fannie Mae primarily securitize conforming conventional loans.<sup>10</sup> Among conduits, three depository institutions—Washington Mutual, Wells Fargo, and Bank of America—were among the top ten in securitizing jumbo conventional loans in 2005.<sup>11</sup>

<sup>5</sup> See, for example, Burtis, Higgins, and Miller (2001), Weicher (1994), and Follain and Zorn (1990).

<sup>6</sup> Greenspan and Kennedy (2005). The authors estimate the flow of originations from changes in regular single-family home mortgage debt (that is, debt other than home equity and construction loans used only to purchase or refinance a home) in the year 2004.

<sup>7</sup> As of January 1, 2006, this limit is \$417,000 for one-family homes (higher limits apply in Alaska, Hawaii, Guam and the U.S. Virgin Islands). The limit is reviewed and may be increased each year by the Office of Federal Housing Enterprise Oversight, based on a survey of single-family home purchase prices conducted by the Federal Housing Finance Board.

<sup>8</sup> McKenzie (2002).

<sup>9</sup> Inside Mortgage Finance Publications (2006), 45.

<sup>10</sup> The GSEs also may purchase and securitize FHA, VA, and RHS loans. A primary reason why their volume remains small is because Ginnie Mae, by virtue of the explicit guarantee of the federal government, has lower yields. Using OFHEO reports (2005, 27 and 43), we calculated that less than 1 percent of GSE purchases are FHA, VA, or RHS loans.

<sup>11</sup> Inside Mortgage Finance Publications, Inc. (2006), 173.

The coexistence of federally insured depositories and federally chartered GSEs produces a unique combination of options for homebuyers. In comparing mortgage markets in major developed countries, Green and Wachter (2005) find that in countries with well-developed financial markets, depositories are prominent investors, as they are in the U.S. They also find, however, that few countries outside the U.S. offer homeowners the same access to long-term, fixed-rate mortgages with no prepayment penalty. In countries with limited securitization, loans are short-term or carry adjustable rates. In countries with well-developed securitization, fixed-rate mortgages are more common but concern for depository risk has led to limits on prepayment opportunities.

### *The Role of Freddie Mac and Fannie Mae*

The federal government has long been involved in the secondary residential mortgage market. Congress first authorized the creation of national mortgage associations in 1934. Fannie Mae was created in 1938 to provide a dedicated secondary market outlet for FHA-insured mortgages. Its authority was expanded thereafter to include VA-guaranteed residential mortgages. By tapping new sources of funds in the domestic capital markets through debt issuance, Fannie Mae channeled a steady stream of funds into the financing of FHA and VA loans and provided a flexible supply of credit. However, this dedicated capital market access was absent for conventional loans. Interest rate volatility and geographical imbalances in the 1960s led Congress and

the President to extend the same secondary market facility to holders of conventional mortgages. In 1968 Congress chartered Ginnie Mae as a government-owned corporation within HUD mandated to guarantee payments on MBS representing pools of federally insured or guaranteed mortgages. Freddie Mac was established in 1970 to purchase conventional mortgages, and Fannie Mae was authorized to do the same.<sup>12</sup>

Today, Freddie Mac and Fannie Mae operate under essentially identical charters. They are directed to:

- provide stability in the secondary market for residential mortgages
- respond appropriately to the private capital market
- provide ongoing assistance to the secondary market for residential mortgages (including mortgages financing homes for low- and moderate-income families) by increasing the liquidity and improving the distribution of mortgage investment, and
- promote access to mortgage credit throughout the nation.<sup>13</sup>

Freddie Mac and Fannie Mae are major players in the secondary mortgage market. They are not, however, allowed to originate loans. Recently Greenspan and Kennedy (2005) estimated that the combined share of Freddie Mac and Fannie Mae purchases of mortgage originations to the total conventional market was approximately 36 percent.<sup>14</sup> As of the end of 2005, the two GSEs

<sup>12</sup> See Frame and White (2004, 3-4) for further historical perspective.

<sup>13</sup> 12 U.S.C. Sec. 1451 Note and 1716.

<sup>14</sup> Total Conventional Originations can be calculated from Table 1 of Greenspan and Kennedy (2005) by subtracting FHA and VA originations from Total Market Originations.

had securitized or held in their retained portfolios some 44 percent (in value terms) of all home loans outstanding and 47 percent of all conventional loans.<sup>15</sup>

Both GSEs are shareholder-owned, and their shares trade on the major exchanges.<sup>16</sup> By law, the U.S. Treasury may purchase a limited amount of the GSEs' securities, under terms and conditions imposed by the Treasury Secretary. Moreover, federally chartered banks are able to use the GSEs' securities in meeting reserve requirements imposed by the Federal Reserve System (and members of the FHLB System can use GSE securities as well as whole loans to collateralize advances).

The GSEs' securities are AAA-rated, in part because of their federal charters. Unlike Ginnie Mae securities and federally insured deposits, however, Freddie Mac's and Fannie Mae's securities do not carry an explicit federal guarantee. In fact, the GSEs are required by law to disclaim such a guarantee in their offerings of securities. As a result, although Freddie Mac and Fannie Mae securities trade at yields below those of securities issued by their fully private counterparts, their yields are above comparable Treasury and Ginnie Mae yields.

The GSEs have two primary lines of business—(1) a guarantee business whereby the GSEs

purchase mortgages, package them into securities and sell the securities into the market with a GSE guarantee of timely principal and interest payments, and (2) managing a retained portfolio of whole residential loans and MBS funded by debt in the form of uncollateralized debentures. The portfolio business appeals to the segment of investors, particularly foreign ones, which prefer debt to MBS. By financing retained portfolios, investor purchases of Freddie Mac and Fannie Mae debt issuances provide an additional source of funds to the U.S. mortgage market. Both guarantee and portfolio activities involve transforming mortgages into assets that are attractive to distinct groups of investors. These transformations add value to the market.

Pooling loans into securities fundamentally changes the characteristics of mortgages from the standpoint of a secondary market participant. A portfolio of mortgages carries risks of default and prepayment, and requires expenditures to collect payments of principal and interest. In the absence of securitization, the degree of risk and the arrangements for servicing would vary from one portfolio to another. Such portfolios are traded infrequently, because each transaction requires research to establish loan quality and servicing costs. Pooling bundles of loans into securities, which have been credit enhanced by a GSE and which do not require investors to

<sup>15</sup> Calculated by dividing the GSEs' purchases held in portfolio or their securitized pools held by other investors by total single-family mortgage debt outstanding. GSE portfolio holdings are from monthly volume summaries for each of the companies ending December 31, 2005. Single-family mortgage debt outstanding is from the Federal Reserve Flow of Funds. Mortgage debt outstanding held by the GSEs in their retained portfolios represents 17 percent of mortgage debt outstanding for conventional single-family mortgages.

<sup>16</sup> Under their charters, each company has up to 18 members on its Boards of Directors—up to 13 elected by shareholders and up to five appointed by the President.

service them—makes MBS much more attractive for investors to hold in their portfolios.<sup>17</sup>

This transformation has two effects. First, it broadens the investor base for mortgage-related assets. An investor no longer needs to be able to evaluate default risk, as this risk is very remote and similar from one security to another. Because the securities are relatively homogeneous, they are more liquid than a pool of unsecuritized loans, and the greater liquidity increases their appeal to investors. Second, the transformation can make other policies that support the mortgage market more effective.

Former U.S. Congressional Budget Office (CBO) Director Rudolph Penner and William Silber (1973) made this point over 30 years ago, drawing the distinction between “wedge-type” policies that directly subsidize interest rates and policies that change the characteristics of mortgages. They noted that the latter category can improve the effectiveness of the former by making mortgages a better substitute for other fixed-income assets. For example, securitization of FHA and VA loans by Ginnie Mae increases the effectiveness of the assistance to the particular classes of borrowers that these programs support. Similarly,

securitization of conventional loans increases the effectiveness of support to the mortgage market provided by the current insurance and regulatory regime for depositories, which combines access to insured deposits (at subsidized insurance premiums) with risk-based capital standards that favor mortgages and mortgage securities.

The GSEs’ management of portfolios of mortgages and mortgage securities supplement the benefits generated from their guarantee businesses. By standing ready to buy their securities at any time, the GSEs increase the liquidity of their outstanding MBS. In addition, portfolio operations can transform mortgages into securities that may appeal to investors who are unable to hedge the prepayment risk carried by MBS. By funding their portfolios with debt that has either no call option or a call option that is more predictable than the prepayment behavior of individual homeowners, the GSEs transform mortgages into securities that are even more substitutable for other investment-grade assets (such as bonds) than MBS.

<sup>17</sup> Black, Garbade, and Silber (1981) provide a good discussion of these points in their description of how Ginnie Mae securitization adds liquidity to FHA-insured loans that already carry federal backing.

## » The Policy Debate Over GSE Activities

Over the past decade critics of Freddie Mac and Fannie Mae have focused on two issues. One is whether the GSEs continue to provide material benefits to homeowners. The other is whether their retained portfolios should be capped, curtailed, or eliminated because they pose significant risks to the financial system while providing little benefit to the housing market.

The first line of criticism maintains that the benefit the GSEs provide to the housing market, through both securitization and portfolio operations, is confined to their effect on mortgage interest rates. Critics argue that the savings the GSEs pass through to homeowners are small relative to the cost savings the GSEs receive by virtue of their federal sponsorship. The second line of criticism maintains that the GSEs' retained portfolios of mortgages and mortgage securities are so large and contain such high levels of risk from changes in interest rates that they threaten the stability of the financial system. Critics argue that the retained portfolios have no effect on mortgage markets, while GSE capital is insufficient given their methods for managing interest rate risk.

In this section we discuss the assumptions and logic underlying these criticisms. We first focus on the claim that the only benefit of GSE activities is lower interest rates on conforming loans. We then turn to the risks and benefits associated with the retained portfolios.

### *The Residential Mortgage-backed Securities Market*

Mortgage securitization was uncommon before 1970. It evolved in stages in the different segments of the mortgage market. The government-insured segment was the first to be heavily securitized, with Ginnie Mae securities carrying an explicit federal guarantee. By 1980, almost 80 percent of fixed-rate FHA-insured loans were securitized. The fixed-rate conforming, conventional segment became heavily securitized during the 1980s.<sup>18</sup> Pooling of jumbo loans into securities did not become common until the early 1990s.<sup>19</sup> Securities backed by jumbo loans are often termed “private-label” securities because they carry no association with Ginnie Mae or the GSEs.

The development of the private-label MBS market and of markets for securities backed by other retail credit products, such as auto loans, has led some observers to infer that firms with no government ties can provide the full benefits of GSE securitization. From there, it is only a short step to critics' claims that Freddie Mac and Fannie Mae generate little benefit to mortgage borrowers.

Consequently, the critics' argument rests on a single assumption—that eliminating the GSEs' federal sponsorship would lead extricably, seamlessly, and quickly to a secondary market

<sup>18</sup> Hendershott and Van Order (1989).

<sup>19</sup> Cotterman and Pearce (1996).

with MBS on the same scale and with the same liquidity as the current secondary market supported by the GSEs. This assumption is clearly the foundation for statements dismissing the potential benefits of the GSEs, as is evident in this excerpt from a letter by former Federal Reserve Chairman Alan Greenspan:

The FHLBs [Federal Home Loan Banks], Fannie Mae, and Freddie Mac were each chartered with the purpose of smoothing our regional imbalances in mortgage supply and integrating regional mortgage markets into the national capital markets. Much to their credit they succeeded in accomplishing this goal many years ago. Today, however, these organizations alter the housing finance markets only to the degree that they pass through to homebuyers part of their government subsidy.<sup>20</sup>

A similar point of view is expressed in a publication of the Federal Reserve Bank of Atlanta:

At the time each housing GSE was created, the primary source of mortgage funding was local deposits; credit availability was thus closely linked to the local deposit market and general economic conditions. The housing GSEs improved the flow of credit to homebuyers by linking local and national credit markets. As financial markets have evolved, however, alternative mechanisms have arisen that enable retail lenders to tap national markets. Therefore, the major contribution of the housing GSEs is to transmit to homebuyers an interest rate subsidy that is made possible by the benefits the GSEs obtain from the federal government.<sup>21</sup>

The assertion that GSE securitization contributes nothing more than a subsidy is based on an assumption that mortgage securitization under fully private auspices would provide all the benefits of GSE securitization. To our knowledge, this

assumption has never been explained or defended. A comparison between MBS issued by Freddie Mac and Fannie Mae with private-label securities shows this assumption to be false. Not only would there be significant transition problems, but also, as we show, the GSEs offer significantly enhanced securities compared with those of their private-label counterparts.

### *The Unique Benefits of GSE Securitization*

The major difference between MBS issued by Freddie Mac and Fannie Mae and private-label securities is the nature of the credit enhancement. To be marketed successfully, a mortgage-backed security must have a credit rating of at least AA, a rating that pools of mortgages will not achieve without some form of enhancement. With their federal sponsorship, Freddie Mac and Fannie Mae enhance the credit of their securities by covering them with a guarantee. Non-GSE issuers, in contrast, usually obtain investment-grade ratings with a senior/subordinate structure—dividing the mortgage pool into at least two securities, with the credit risk concentrated in a small, subordinate security that is assigned a below-investment-grade rating (the “B piece while the senior securities receive a AA or AAA rating”).<sup>22</sup> This difference in credit-enhancement methods has important consequences. It is a qualitative difference that can have the broad scope of effects described by Penner and Silber (1973).

<sup>20</sup> Greenspan (2000).

<sup>21</sup> Frame and Wall (2002).

<sup>22</sup> In the early years of jumbo securitization, credit enhancement from pool insurance and from other sources external to the pool itself was tried, but this method proved vulnerable to deterioration in the financial standing of the guarantor (Cotterman and Pearce 1996, 112). The GSEs’ special status makes this type of problem unlikely, partly because their charters restrict their activities to the secondary mortgage market and also eliminate the possibility that they would be involved in mergers or acquisitions.

Liquidity is lower for securities produced under the private-label process than under the GSEs' guarantee because the latter process results in heterogeneous securities. In 2003 a report by staff at the Department of the Treasury, OFHEO, and the Securities and Exchange Commission found that "the mortgage loans in private-label MBS generally have more diverse collateral, credit risk, or other underwriting characteristics than GSE or Ginnie Mae MBS and have wider variances in a number of terms including interest rate, term, size, purpose and borrower characteristics."<sup>23</sup>

All Freddie Mac and Fannie Mae mortgage-backed securities have basically the same minimal credit risk, even after some seasoning. Investors are indifferent between pools with varying experience as far as credit losses go, because the GSE guarantee equalizes the risk. As stated by the CBO in its 2003 report,

The GSEs' MBS are highly liquid primarily because they are relatively homogeneous; the large size of the market also helps liquidity. Thus, investors determine value largely on the basis of generic characteristics such as coupon rate and maturity, rather than valuing each MBS issue on its own. Additional information that permits investors to differentiate among MBS on the basis of expected prepayment rates may fragment the market and thus reduce MBS' liquidity and price.<sup>24</sup>

The same is not true of securities that receive their AA/AAA rating through a senior/subordinate

structure. Differences in payment histories affect the perceived risk of the senior security, and these differences create an incentive for investors to undertake research to differentiate among securities. This incentive prevents the pools using the senior/subordinate structure from ever reaching the levels of liquidity now found in GSE mortgage securities (and the liquidity for the B tranches is even lower).

Another reason that the private-label credit-enhancement process would not necessarily replicate the benefits of the GSE guarantee is that the market for the subordinated tranche of mortgage pools would have to expand by several orders of magnitude. We think it is unlikely that such an expansion could occur without an increase in the yields on these securities, and this increase would lead to higher mortgage rates in the primary market.<sup>25</sup>

Thus, we find ourselves in agreement with Richard Roll that:

It is impossible to overstate the importance of credit enhancement in the process of mortgage securitization ...Since mortgages have promised payments for up to 30 years, credit guarantees from the GSEs (and from GNMA, FHA, and VA) are very long-term commitments and hence are made more credible by the government's association.<sup>26</sup>

<sup>23</sup> U.S. Department of the Treasury, Office of Federal Housing Enterprise Oversight, and U.S. Securities and Exchange Commission, 2003. "Staff Report: Enhancing Disclosure in Mortgage-Backed Securities Markets". Similar observations were made by former HUD Chief Economist Susan Woodward (2001) and by Green and Wachter (2005).

<sup>24</sup> CBO(2003),20.

<sup>25</sup> Woodward (2001) discusses the placement of the subordinate security in more detail.

<sup>26</sup> Roll (2003), 29.

### *Risks of GSE Retained Portfolios*

Critics of the GSEs, such as former Federal Reserve Chairman Alan Greenspan, Treasury Secretary John Snow, and some academics,<sup>27</sup> call for limiting the GSEs' retained portfolios. They argue that the GSEs' large portfolios provide minimal benefits to homeowners and subject the Treasury to risk that is not present in the GSEs' securitization activities. Moreover, they maintain that the size of the portfolios and the complexity of their management introduce systemic risk—the risk that loss of confidence in, or failure of, one entity would spread to others, reducing or possibly creating a collapse in financial liquidity and undermining economic activity generally.<sup>28</sup> These critics recommend that the GSEs' portfolios be curtailed or even eliminated.

The proponents of portfolio restrictions overstate the risks and understate the benefits of the retained portfolio. They tend to discount the effectiveness and stringency of the capital standards and regulatory structure that govern the GSEs. Whereas the major depository institutions are regulated and examined by the Federal Deposit Insurance Corporation and/or one of the other federal or state banking agencies, the GSEs are regulated for safety and soundness purposes by the Office of Federal Housing Enterprise Oversight (OFHEO), a separate office within HUD, substantially independent of the HUD secretary. The regulatory framework includes minimum and risk-based capital standards, safety and soundness supervision, and periodic examination by

OFHEO. The GSEs are also separately regulated for their adherence to their housing mission by HUD. As discussed below, some prominent economists have reviewed the capital standard and its associated stress test and concluded that compliance with them implies a low likelihood of GSE default.

Imposing limits legislatively without regard to a financial institution's risk management and control capabilities tends to limit competition and may increase mortgage rates, which leads to a decrease in the liquidity and the affordability of credit in the mortgage market. Because, the regulatory framework for the GSEs is relatively new compared with that of the depositories, its adequacy, at times, has been called into question. Nonetheless, without legislatively defined rules, OFHEO has required both GSEs to hold surpluses and, more recently, imposed portfolio growth limits on Fannie Mae. Nevertheless, as with other regulators and regulated institutions, the performance of OFHEO and the system in which the GSEs operate should be monitored continually and improved as appropriate.

Given the regulatory structure of Freddie Mac and Fannie Mae, exactly how and why the GSE portfolios might pose a high level of systemic risk is not clear from the available studies. Systemic risk has been a topic of research for only the past 25 years or so. Surveys of the literature, which focuses mainly on banking, find that there is no consensus of the causes of systemic risk. For example, George Kauffman wrote, "Although

<sup>27</sup> See, for example, Dwight M. Jaffe (2005) and John M. Quigley (2006).

<sup>28</sup> The Bank for International Settlements defines systemic risk as: "the risk that the failure of one participant in a transfer system, or in financial markets generally, to meet its required obligations will cause other participants or financial institutions to be unable to meet their obligations (including settlement obligations in a transfer system) when due." Committee on Payment and Settlement Systems (CPSS) Glossary (2003), 48.

systemic risk is frequently proclaimed during banking and currency crises, its meaning is vague and ambiguous. It means different things to different persons, particularly with respect to causation.”<sup>29</sup>

As best we can determine, the concern over systemic risk arises from a complex set of considerations that cannot be fully addressed here.<sup>30</sup> The points raised in this regard include the size and growth of the GSEs, their nominally low leverage capital ratios, their use of derivatives to manage prepayment risk, and concern that their counterparties in the debt and derivatives markets would allow their exposure to the GSEs to reach imprudently high levels.<sup>31</sup>

In our view, these concerns do not, either individually or in combination, suggest the GSEs pose unique threats to financial stability. The GSEs are indeed very large, although neither is as large as the largest depository institutions. More important, the GSEs are a different type of financial enterprise. Through the use of callable debt and with various “swaps,” “swaptions,” and the like, The GSEs are able to hedge against credit and prepayment risk much better than the typical depository.<sup>32</sup>

The capacity to manage risk is clear in the results of a study completed by the CapAnalysis

Group in 2003.<sup>33</sup> Taking the risk-based-capital standards promulgated by OFHEO for the GSEs and applying them to the thrift industry as a whole, CapAnalysis simulated the various risk scenarios OFHEO applies to the GSEs. The study found that even though the GSEs passed the tests, the thrift industry failed—confirming the stringency of the OFHEO test and reinforcing the agency’s conclusion that the GSEs are extremely unlikely to fail.<sup>34</sup>

Similarly, Paul Kupiec and David Nickerson (2004) conclude, “[h]olding constant asset risks,... intermediaries that issue contingent liabilities may exhibit low or no risk of insolvency while holding significantly less capital than deposit-taking institutions...” In another study of Fannie Mae’s risk of default, Glenn Hubbard, former Chairman of the Council of Economic Advisers (2004) concludes that an upper bound on the likelihood of a Fannie Mae default is one in 1,000, which is lower than the median probability of failure by commercial banks, and the expected loss from failure of large commercial banks is many times that from the failure of Fannie Mae. Likewise, Nobel Prize winner Joseph Stiglitz and two associates (2002) conclude, “The probability of a shock as severe as embodied in the risk-based-capital standard is substantially less than one in 500,000—and may be smaller than one in three

<sup>29</sup> Kauffman (1999), 19. Similar statements can be found in OFHEO (2003), 7, and Ludwig (2004), 1 and 2.

<sup>30</sup> Bear in mind that the first group to suffer should a GSE fail is the company’s stockholders, who thus have a strong incentive to make sure risk is maintained within reason.

<sup>31</sup> See, for example, Greenspan (2005, 2006), Poole (2005) and Eisenbeis, Frame and Wall (2006).

<sup>32</sup> For a discussion of hedging prepayment risk, see OFHEO (2003), 59-61 and Jaffee (2003).

<sup>33</sup> One of the authors (Miller) served as chairman of the CapAnalysis Group at the time.

<sup>34</sup> See OFHEO (2003)

million.” In other words, as long as the GSEs meet OFHEO’s risk-based-capital standard, the chance of failure is exceedingly small, certainly less than for other major financial institutions.

The Federal Reserve’s view of the GSEs’ threat to financial stability, as articulated by Alan Greenspan, focuses on the concern that the GSEs may run into supply or liquidity problems in the over-the-counter derivatives market when interest rates change suddenly and “vast reversal transactions are required to rebalance portfolio risks.”<sup>35</sup> This argument is related to the GSEs’ use of “dynamic hedging” to reduce some of the prepayment risk in their mortgage portfolios.<sup>36</sup>

We can offer three points in response to this concern. First, the GSEs use this type of hedging for less than half of their prepayment risk. Most of their portfolios is hedged with callable debt and other techniques that do not require rebalancing. Indeed, the GSEs rely more on callable debt than other mortgage investors. Thus, although Greenspan has stated that he would prefer that holdings of fixed-rate mortgages be more widely dispersed across investors with less leverage than the GSEs, it is not clear that dispersal would result in less rebalancing activity when interest rates changed.

Second, available information does not indicate that the GSEs’ activity in the derivatives markets is a likely threat to market stability. One expressed concern is that there are only a few dealers in the over-the-counter swaps and options used

by the GSEs, so the supply of these derivative securities may be vulnerable in a crisis. However, a study by the Federal Reserve System found that “Dealer concentration in the interest rate options markets is fairly high, but the risks resulting from that concentration seem to be reasonably well managed.”<sup>37</sup>

Third, concern has been expressed about a possible reduction in liquidity in the over-the-counter markets that the GSEs utilize. On this point, an OFHEO study of systemic risk concludes that “most Enterprise derivatives are simple instruments, the market for which is likely to remain liquid in all but the most extreme circumstances.”<sup>38</sup>

### *Benefits from the Retained Portfolio*

The error in the critics’ other premise—that GSE portfolio investments do not benefit homeowners—is eloquently rebutted by Roll (2003). Roll’s main point is that although the GSEs’ mortgage-backed securities have expanded the investor base for conventional mortgage loans, the difficulty in managing prepayment risk puts MBS off-limits for many investors. By purchasing mortgages and mortgage securities for their own portfolios and funding those purchases with unsecured debt that has either no call risk or more predictable call risk than mortgage prepayments, the GSEs further expand the investor base for mortgage loans.

<sup>35</sup> Greenspan (2005). See also Eisenbeis, Frame and Wall (2006) and Jaffee (2003).

<sup>36</sup> For a description of dynamic hedging, see Ferguson (2002).

<sup>37</sup> Staff of the Federal Reserve Board of Governors and the Federal Reserve Bank of New York (2005).

<sup>38</sup> OFHEO (2003), 66.

Roll's conceptual discussion is supported by empirical research. Andy Naranjo and Alden Toevs (2002) conclude that portfolio purchases affect rates and volatility of conforming and nonconforming loans. Akash Deep and Dietrich Domanski (2002) conclude that expansion of the GSEs' portfolios has absorbed, or enabled, a significant portion of new mortgages and refinancings. And Gloria Gonzalez-Rivera (2001), Stuart Gabriel (2001) and Douglas McManus and Buchi Ramagopal (2006) find that the GSEs' retained portfolio activities increase liquidity in the secondary mortgage market.

It is perhaps the case that the benefits of the GSEs' portfolios have not been quantified in terms of a single metric to compare with the risks of default. Yet, given that the risk of default is low and the benefits are numerous and significant, one should be wary of any proposal to curtail the GSEs' retained portfolios.

This is not to say the risks should be ignored. Certainly, continual improvement in the sophistication of OFHEO's risk-based-capital test is warranted, as is an insistence that the GSEs continually pass this test. Even greater transparency in the GSEs' portfolios and other activities would also reduce the risk and, perhaps as importantly, contribute to the public's confidence in the GSEs' operations.

# » Freddie Mac and Fannie Mae Contributions to National Goals

The GSEs' securitization and portfolio activities make the terms of mortgages more advantageous for borrowers. Although their effect on interest rates receives the most attention, the GSEs enhance other elements of mortgage contracts as well. They also improve access to mortgages with fixed interest rates and low downpayments. We discuss each of those issues in turn, and then discuss the GSEs' contributions to macroeconomic stability and review the benefits associated with homeownership.

## *Reducing Mortgage Interest Rates*

That the GSEs reduce mortgage interest rates has been well documented in research on the difference between rates on loans above the conforming loan limit (from which the GSEs are excluded) and those just below the limit (which the GSEs can and do purchase). This is called the jumbo-conforming spread. The earliest study on this topic estimated the spread to be about 30 basis points (that is, 0.3 percentage point) in 1986.<sup>39</sup> This study was based on loans originated by savings and loans in California. Cotterman and Pearce (1996) extended these results to lenders of all types in California and 11 other large states for the period 1989 to 1993. They found that the

spread varied widely over the period and concluded that the "core range" was 25-40 basis points.

The spread was in the high end of the Cotterman and Pearce range in 1989-91, when resolutions of insolvent thrifts may have disturbed the equilibrium in the mortgage market. The numerous studies conducted since then have estimated the spread at 30 basis points or somewhat lower.<sup>40</sup> Unpublished and subsequent studies have generally found the spread in the late 1990s and early 2000s to be 20-30 basis points.<sup>41</sup> Exceptions include Woodward (2004), who, using a private data set, estimates the spread to be 42 basis points, and Passmore, Sherland, and Burgess (2005), who conclude that the spread is 16 basis points.

Interpretation of the spread is more complicated than its estimation. There are issues on at least three levels.<sup>42</sup> First, the analyses may not hold constant all the respects in which conforming and jumbo loans differ. If jumbo loans are riskier on average than conforming loans, the spread will overstate the extent to which GSEs reduce rates on conforming loans. Among the factors not held constant in a typical study are differences in prepayments, house price volatility, and credit

<sup>39</sup> Hendershott and Shilling (1989).

<sup>40</sup> Studies published before 2002 are summarized in McKenzie (2002).

<sup>41</sup> See Pearce (2000), Flannery and Lockhart (2005), McManus and Ramagopal (2005) and Roll (2005).

<sup>42</sup> For discussion, see Pearce and Miller (2001) and McManus and Ramagopal (2005).

history. Studies that do investigate these issues either generate estimates that are within the range noted above (Ambrose, LaCour-Little, and Sanders (2004), using data that include credit scores; and Flannery and Lockhart, who include variables for prepayment risk and other factors) or have narrow applicability (Ambrose, Buttimer, and Thibodeau (2001), who studied differences in home-price volatility among loans secured by homes in Dallas, Texas).

A second concern is whether the GSEs affect rates on jumbo loans as well as on conforming loans. If the GSEs reduce rates on jumbo loans, the estimated jumbo-conforming spread will understate their effect on conforming loan rates. We offered a theoretical basis for estimating an impact on jumbo loans in our 2001 report (Pearce and Miller, 12-13). Naranjo and Toevs (2002) find that GSE purchases and securitization activity reduce rates on both jumbo and conforming loans.

A third concern is the effect of subsidies available to other participants in the mortgage market, particularly depositories. The issue here is that the residential mortgage market receives multiple layers of federal support. Depositories are the principal non-GSE investors in mortgage-related assets, and they have access to insured deposits—access that many economists regard as a funding advantage similar to that conferred on the GSEs by their federal charters.<sup>43</sup> Added to that advantage is the option of membership in FHLB System, which provides low-cost advances, funded by debt issued by the System in the GSE market.

Thus, before Freddie Mac and Fannie Mae can even enter the mortgage market, they must reduce interest rates by some minimum amount to be competitive with the terms offered by depositories. This issue has received little attention in the literature, with a study by Anthony Sanders being a recent exception. Hypothesizing a real estate investment trust (REIT) structure and adding rough estimates of the various costs of funding mortgages, Sanders (2005) concludes that 43 basis points should be added to the conventionally measured jumbo-conforming spread to arrive at the effect the GSEs have on conforming mortgage rates.

Our conclusions from this literature are that the jumbo-conforming spread averages between 24 and 30 basis points, and this range understates the full effect of the GSEs on conforming mortgage interest rates. However, for those who would use the spread to forecast the change in interest rates if federal sponsorship were fully withdrawn from Freddie Mac and Fannie Mae, we add a precautionary note. Although estimates of the spread provide useful information on the effect of changes in certain parameters within the current regime of mortgage market institutions, they are much less useful in inferring the effect of major changes in the regime itself. For example, we would consider the spread to be a good estimate of the effect of reducing the conforming loan limit on interest rates for loans that would no longer be eligible for GSE purchase, but a poor estimate of the effect of complete withdrawal of federal sponsorship.<sup>44</sup>

<sup>43</sup> Greenspan (2001) described federal deposit insurance, at the premiums generally charged, as a subsidy.

<sup>44</sup> This point was made in the conclusion of Cotterman and Pearce (1996). An important concern here is whether the market would absorb a greatly expanded supply of subordinated tranches of private-label pools if federal sponsorship were withdrawn from Freddie Mac and Fannie Mae.

### Improving Other Mortgage Contract Terms

The non-interest effects of the GSEs can be seen in the characteristics of conforming loans relative to jumbo or nonconforming loans. In addition to lower interest rates, conforming loans are more likely to have low downpayments and interest rates that are fixed for the life of the loan. These characteristics reflect the GSEs' support of such mortgages through their underwriting guidelines and purchasing priorities. Together with lower interest rates, this support—and possibly other factors such as an ability to lock in a rate in advance of closing<sup>45</sup>—induces many borrowers to prefer conforming loans to jumbos. The data reflect this preference with a concentration of conforming loans at the upper limit.

These phenomena are observed in the Monthly Interest Rate Survey (MIRS) conducted by the Federal Housing Finance Board. Exhibit 1, based on this data source, shows the distribution of loans with loan-to-value (LTV) ratios above 80 percent.<sup>46</sup> Loans below the limit are more likely to have an LTV above 90 percent than are jumbo loans. The jumbo-conforming difference is even more pronounced for LTVs above 95 percent.

This pattern reflects the GSEs' willingness to accept the credit risk on loans with downpayments below five percent. As we discuss later in this study, the GSEs' support for such loans enables many households to buy homes they would otherwise be unable to afford or to qualify for a conventional loan rather than a more costly or burdensome FHA loan.

<sup>45</sup> Green and Wachter (2005) discuss Freddie Mac and Fannie Mae activities in the “To Be Announced” (TBA) market. Unlike private-label securitizers and due to their operations in the TBA market the GSEs are able to lock in rates with originators before the existence of the actual mortgage contract.

<sup>46</sup> A loan with an 80-percent LTV is a loan that is equal to 80 percent of the value of the property.

*Exhibit 1*  
**Distribution of LTV for Fixed-Rate Conventional Loans with LTV>80% 1997-2005**

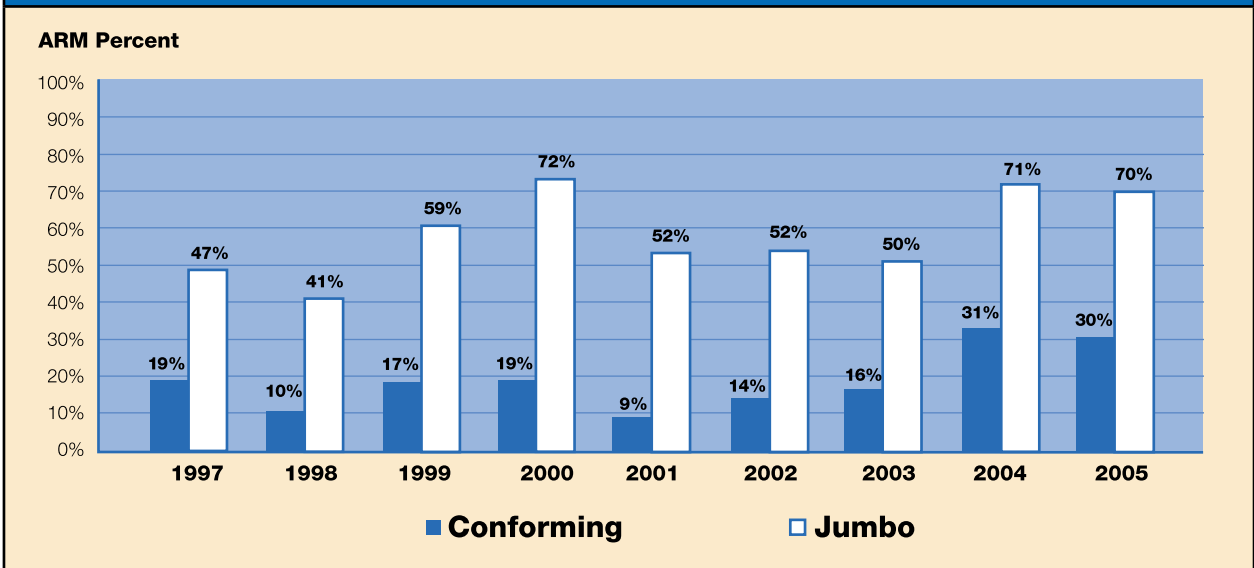
LTV Range(%)	Percent of Loans	
	Conforming	Jumbo
81-90	34.3	63.0
91-95	41.8	29.5
>95	24.0	7.5
Total	100.0	100.0

The GSEs' strong support of fixed-rate loans is illustrated in Exhibit 2. This chart, also derived from MIRS data, shows that home-purchase loans for amounts under the conforming limit are much more likely to carry a fixed rate than an adjustable rate. To some degree, this difference reflects the lower interest rates on conforming loans. As we pointed out in our 2001 study, however, the jumbo-conforming difference in the fixed-rate share is larger than can be explained by the difference in interest rates. Given the magnitude of most estimates of the jumbo-conforming differential, one would expect a difference in the fixed-rate share of about 10 percentage points. As Exhibit 2 shows, the difference in fact fluctuates around 40 percentage points.

The advantages of conforming loans lead prospective borrowers to prefer them to

Exhibit 2

**ARM Loans Are More Prevalent in the Jumbo Market**



nonconforming loans. The clearest manifestation of this preference is the concentration of loan amounts exactly at the conforming limit.

Exhibit 3, based on MIRS data, shows concentration (around the loan limit) figures for 1997 through 2004. The calculations are based on data for the first 10 months of each year to avoid possible dilution in November and December, when lenders price “small jumbos” like conforming loans in anticipation of an increase in the conforming loan limit.<sup>47</sup> Data show a higher level of concentration since 2000. Concentration in 1999 and later years ranges from 23 percent in 2002 to 38 percent in 2001.

Exhibit 3

**Fixed-Rate Mortgages at the Conforming Loan Limit as a Percentage of Fixed-Rate Mortgages At or Above the Limit**

(Loans originated from January through October)

Year	Percentage At Limit
1997	12.3
1998	14.5
1999	29.0
2000	31.6
2001	38.0
2002	23.1
2003	24.9
2004	28.3

<sup>47</sup> See Flannery and Lockhart (2005) and McKenzie (2002).

Loans exactly at the limit represent borrowers who, in the absence of support by the GSEs, would have taken out larger loans on less favorable terms. Because GSE activities improve terms on conforming loans relative to those on nonconforming loans, some borrowers adjust the size of their loans to take advantage of this benefit. Thus, the level of concentration reflects a marketplace response to the improvement in loan terms generated from the activities of the GSEs.

### *Increasing Macroeconomic Stability*

The GSEs contribute to stability in the U.S. economy by reducing cyclical fluctuations in the housing market. Historically, home building and mortgage lending have varied pro-cyclically—rising when the economy expands and falling when it contracts. The consequent cyclical variability of home sales and home values adds to fluctuations in income and employment over the business cycle.

Recent research suggests that the GSEs have helped reduce temporal variation in housing prices and thus variations in the economy overall. They accomplish this partly by stabilizing the flow of funds through mortgage markets and partly by supporting fixed-rate mortgage lending. Analyses addressing these issues fall into two groups: (1) studies of the relationship over time between the GSEs' activities and mortgage market variables, and (2) international comparisons relating the institutional characteristics of mortgage finance in a country to the volatility of mortgage flows and home prices in that country.

Among the major studies of the U.S. mortgage market, one presented informal statistical comparisons while others use formal statistical

techniques. Joe Peek and James Wilcox (2004) presented an informal analysis of mortgage flows and economic fluctuations. They find that outstanding residential mortgage balances in the U.S. have become less pro-cyclical since the 1970s. In addition, Peek and Wilcox found that total intermediation (the GSEs' holdings of MBS and mortgages in portfolio) increased during recessions. This counter-cyclical behavior offsets declines in mortgage holdings of banks and other mortgage investors during recessions. Thus, the growth of the secondary mortgage market combined with the counter-cyclical behavior of the GSEs, has likely dampened the amount of cyclical fluctuation in funds flowing into mortgage markets.

Peek and Wilcox (2006) also provided some formal statistical evidence in a subsequent study that examines the sensitivity of aggregate U.S. expenditures on home construction to fluctuations in mortgage interest rates and aggregate income. They found that as the secondary mortgage market grew in size between 1988 and 2004, aggregate expenditures on housing became less sensitive to fluctuations in income and mortgage rates.

The Peek-Wilcox result is consistent with findings by Calvin Schnure (2005), who analyzed the ability of aggregate income, unemployment, and inflation to explain indexes of home prices between 1978 and 2004. Schnure found that the relationships between home prices and these factors varied over the period, and that deviations between actual prices and levels that would be expected given income, unemployment, and inflation were smaller after 1989, when mortgage securitization was well-developed, than before 1989. He also found that the deviations became smaller as the share of mortgages in MBS grew

larger. From this evidence, Schnure concluded that “The change in mortgage market structure from a system based on balance sheet lending by depositories to a market-based system of securitized mortgage finance has capped the volatility of financing flows and real activity.”

In their study of the broader effects of GSE activities, Naranjo and Toevs (2002) found a negative and statistically significant correlation between month-to-month changes in conforming mortgage rates and Fannie Mae purchases. In other words, Fannie Mae’s activities may reduce mortgage rate volatility. Their analysis included variables controlling for variation in liquidity, risks associated with prepayments, changes in interest rates, and borrower default. Their study, and a similar analysis by Gonzalez-Rivera (2001), provided formal support for the patterns in summary statistics identified by Peek and Wilcox.

Studies by non-U.S. researchers also provide useful perspective on the contributions of the GSEs to the stability of the mortgage market. Of particular interest are two studies that focus on the role of fixed-rate mortgages in reducing fluctuations in home prices and in the overall economy. Most other developed countries rely more heavily on short-term or adjustable-rate mortgages than the United States, so it is valuable to compare the performance of mortgage markets and economies across countries. These studies show that the U.S. institutional structure in general, and the GSEs in particular, contribute to a relatively stable environment in the United States.

David Miles (2003, 2004) conducted an in-depth study of the British mortgage market for the United Kingdom Treasury, and the staff of the International Monetary Fund (2004) investigated mortgage contracts within a larger study of home price appreciation around the world. Both studies found that the underlying structure of a country’s institutions for funding mortgages determines what type of mortgage contracts prevails. Countries relying heavily on depositories to fund mortgages tend to have more adjustable-rate and short-term mortgage loans, while countries with well-developed institutions facilitating investment and trading in mortgage-related securities tend to have more fixed-rate lending. The IMF study cites the U.S. as “the most obvious case” of the second type, with the existence of MBS and long-term funding of mortgages in general aided by the GSEs and their low cost of funds.

The studies also note the positive relationship between the share of mortgage financing carrying long-term, fixed-rate contracts and the volatility of home prices and general economic activity. Miles analyzed the sensitivity of the British housing market and its economy to shocks in short-term interest rates and concluded that both would be more stable under a regime that supported more fixed-rate lending. The IMF analysis covered 18 countries and showed roughly a three percentage-point difference in home price volatility between countries with a very low incidence of fixed-rate mortgages and countries where fixed-rate mortgages predominate.<sup>48</sup>

<sup>48</sup> Not all analysts agree that greater reliance on fixed-rate loans contributes to economic and financial stability. For example, Perli and Sack (2003) conclude that mortgage-related hedging has increased interest-rate volatility. Chang, McManus, and Ramagopal (2005) address this issue by focusing on volatility in derivative instruments used in hedging. They find an insignificant relationship between proxies for mortgage hedging and interest-rate volatility. They observe that the Perli-Sack result is very sensitive to the inclusion of a few extreme observations around the time of the collapse of Long Term Capital Management in 1998 and the terrorist attacks on September 11, 2001. Overall, they conclude that the evidence does not support the hypothesis that mortgage hedging has increased interest-rate volatility.

### Promoting Important Social Goals

The benefits of the GSEs discussed thus far pertain to the reduction in homeowners' financing costs and to increased stability in the economy. Beyond these are the significant *social* benefits of homeownership that are facilitated by the GSEs. Researchers Quercia, McCarthy and Wachter (2003) reported that GSE activities have increased the rate of homeownership, particularly for minorities and underserved populations. By promoting homeownership through their various activities in the secondary mortgage market, the GSEs contribute to social goals.

For some time it has been recognized that the decision to acquire rather than rent a home leads people to become better citizens. For example, Denise DiPasquale and Edward Glaeser (1999) found that homeowners are more likely to be civic-minded. Peter Rossi and Eleanor Weber (1996) found that homeowners are more likely to vote, read newspapers, participate in and contribute money to political campaigns, and to know the names of their elected representatives.

Because their homes are their most significant assets, most owners understandably act to preserve them. Consequently, as George Galster (1983) found, they tend to spend more on maintenance. Further, according to James Shilling, C.F. Sirmans, and Jonathan Dombrow (1991), owner-occupied houses tend to depreciate more slowly than renter-occupied houses. As William Rohe and Leslie Stewart (1996) showed, owner-occupancy usually increases the value of the property. And, according to Dean Gatzlaff, Richard Green, and David Ling (1998), owner-occupied houses usually appreciate in value more rapidly.<sup>49</sup>

<sup>49</sup> Green (2001, 22) provides a good summary of these studies.

<sup>50</sup> As reported in Hoff and Sen (2005). See also, Edward L. Glaeser and Bruce Sacerdote (1999).

Children especially benefit from growing up in owner-occupied homes. According to Robert Sampson and Jeffrey Morenoff (2006), crime is lower in owner-occupied neighborhoods.<sup>50</sup> As documented by Tama Leventhal and Jeanne Brooks-Gunn (2000), exposure to crime has a long-term debilitating effect on children growing up in such areas. Richard Green and Michelle White (1997) found that children growing up in owner-occupied homes are more likely to finish high school and that the difference is most notable among those with lower incomes. Donald Haurin, Toby Parcel, and Jean Haurin (2002) found that young women under the age of 18 who grow up in owner-occupied homes are less likely to have experienced pregnancy. They also found that children of homeowners do better in math and have fewer behavior problems in school.

There have been recent attempts to quantify the value to homeowners of such social benefits. Edward Coulson, Seok-Joon Hwang, and Susumu Imai (2003) questioned what one would be willing to pay to live in an owner-occupied neighborhood as opposed to a renter-occupied neighborhood of the same physical quality. The answer, based on extensive econometric analysis, is that on average a person would be willing to pay about \$5,000 more per year to live in an owner-occupied neighborhood of the same physical quality. In other words, the value of the social benefits caused by homeownership is approximately \$5,000 annually. Specifically with respect to children, Green and White (1997) concluded that the expected benefit to a child growing up in an owner-occupied home is approximately \$31,000.

# » Estimating the Direct Benefits of Freddie Mac and Fannie Mae

Freddie Mac and Fannie Mae provide direct benefits to homeowners by lowering mortgage interest costs. The magnitude of these benefits, relative to the savings in interest expense realized by the GSEs, has been an important piece of the policy debate over the role of the GSEs. We presented estimates of these benefits in our 2001 report. Since then, the CBO has issued two updates of their original 1996 report, and a staff economist at the Federal Reserve Board has prepared an alternative study. There has also been additional research on the parameters underlying the estimates produced in the CBO studies as well as our own, and there have been increases in the amounts of mortgage loans outstanding and in the balance sheets of the GSEs. In this section we discuss the developments in this area since our previous report and update our estimates.

## *The CBO and Federal Reserve Studies*

The CBO studies (1996, 2001, 2004) all use a similar framework. They begin with the proposition that Federal sponsorship provides the GSEs with a “subsidy” in the form of lower interest expense on their securities. To estimate the amount of that subsidy, CBO multiplies outstanding balances on GSE securities by the spreads between yields on GSE securities and yields on securities issued by selected non-GSE financial firms. To estimate the amount of the subsidy “passed through” to homebuyers CBO multiplies

the jumbo-conforming spread by the volume of loans purchased by the GSEs. All the CBO studies portray the GSEs as providing benefits to homeowners that are substantially less than the subsidy provided by taxpayers.

We critiqued the CBO methodology in detail in our January 2001 report and in a May 2001 press release. Our primary criticisms are that the studies apply an inappropriate framework and use faulty measures of key parameters, particularly the GSE funding advantage on long-term debt securities. In the 2001 and 2004 studies CBO used 47 basis points for the spread between yields on GSE debt and comparable securities of other private firms. They derive this figure from comparisons of GSE securities with securities issued by financial firms having ratings ranging from AA+ to A-. The inclusion of the single-A securities is questionable, and it widens the spread considerably.<sup>51</sup>

In 2003 the Federal Reserve Board released a preliminary version of a study that also quantified the benefits of the GSEs. Like the CBO, Passmore (2005) concluded that the GSEs absorb a large share of the benefits from their funding advantage while passing only a small amount on to homeowners. Like the CBO studies, Passmore considered reduced rates on conforming loans purchased by the GSEs to be the only benefit resulting from Federal sponsorship. Furthermore, his assessment relied on the Passmore, Sherland, and Burgess (PSB) estimate of the GSEs’

<sup>51</sup> Toevs (2000, 2001) also critiques the CBO reports.

effect on conforming loan rates (7 basis points). However, prominent scholars have shown the PSB estimate to be biased downward.<sup>52</sup> Thus, Passmore's study understates the contributions of Freddie Mac and Fannie Mae to the housing market.

### *The GSE Funding Advantage*

GSE funding advantage estimates are needed for three types of securities—short-term, long-term, and mortgage-backed.

- *For short-term securities*, we used a range of 10-20 basis points in our 2001 study, and we believe that range remains valid.

- *For long-term securities*, our previous study estimated the range at 10-40 basis points.<sup>53</sup> Comparing recent estimates to what was available for our 2001 study, we believe our previous range was about right, but that a small increase to the lower bound is now warranted. Thus, for long-term debt we now apply a range of 15-40 basis points.<sup>54</sup>

<sup>52</sup> See Blinder et al. (2004), Greene (2004), Flannery and Lockhart (2005), Roll (2005) and McManus and Ramagopal (2005). PSB redefine, rather than re-estimate, the jumbo-conforming spread. Their measure is the difference between the average rate on jumbo loans and the average rate on loans over \$100,000. This will always be a much smaller difference than the conventional measure, which is the amount by which the functional relationship between interest rates and loan amounts shifts up at the conforming loan limit. (See Exhibit 1 in our 2001 report.) In a sensitivity analysis PSB report that their estimate with a conventional specification is 28 basis points, squarely in the range of conventional estimates.

<sup>53</sup> We believed then, as now, that the appropriate comparison for this purpose is between financial firms with ratings of AA or better. Nothaft, Pearce and Stephanovic (2002) estimate a range of 27-30 basis points for spreads between the GSEs' securities and AA- debt; this is likely an overestimate because it does not control for the greater liquidity of GSE securities. Their estimate is based on the same bond-level data analyzed by Ambrose and Warga (2000) in their update for the CBO, and it is very close to the estimated spread for AA securities reported in that study.

<sup>54</sup> Although none of the recent estimates is below 24 basis points, we are not confident that any of these estimates fully capture the effect of the liquidity advantage imbedded in GSE issues. Furthermore, Hubbard (2004) argues that the low GSE failure risk would justify GSE yields well below AA yields even without federal sponsorship. Thus, we believe the GSE advantage in the issuance of long-term debt could be as low as 15 basis points.

- *For mortgage-backed securities*, we used a range of 10-30 basis points, the same as in 2001. While the funding advantage on MBS is difficult to estimate, we believe it should be between the advantages for short- and long-term debt securities.

Exhibit 4 presents our estimates of the annual funding benefits to the GSEs from federal sponsorship. The estimates reflect the spreads discussed above, as well as balances outstanding for GSE debt and MBS as of year-end 2005. Total funding benefits to the GSEs are in the \$4.7-13.1 billion range, up from \$2.3-7.0 billion in our previous study based on data from September 2000.

### *Direct Benefits to Homeowners*

In a parallel analysis, we estimated the savings to borrowers from the GSEs' activities by applying the interest-rate reductions to the relevant outstanding mortgage balances.

*Exhibit 4*  
**Annual Benefits to GSEs**

Security Type	Balances Outstanding (\$ Billions)			Spread (Basis Points)		Benefits to GSEs (\$Billions/Year)	
	Freddie Mac	Fannie Mae	Total	Lower	Upper	Lower	Upper
Short-Term Debt	183	173	356	10	20	0.36	0.71
Long-Term Debt	584	594	1,178	15	40	1.77	4.71
MBS	974	1,598	2,572	10	30	2.57	7.72
<b>Total Benefits</b>						4.70	13.14

- *For the jumbo-conforming spread*, we used a range of 24-28 basis points in our 2001 study. Aside from Passmore, Sherland, and Burgess (2003), most studies since 2001 have produced estimates within that range.<sup>55</sup> While we keep the lower end of our range unchanged, we do raise the upper end of the range slightly in light of the analysis by McManus and Ramagopal (2005) that suggests an allowance for bias of two to four basis points is warranted. To err on the conservative side, we add two basis points to the top of our previous range, making the current range 24-30 basis points.<sup>56</sup>
- *For the effects on conforming adjustable-rate mortgages (ARMs) and jumbo loans*, we previously assumed that GSE activities reduce rates by five basis points. Here we use ranges to express a level of uncertainty about the specific magnitude, but continue to use five basis points as the center of the ranges. For the effect on ARMs, we assume four to six basis points, reflecting the availability of information from regular interest-rate surveys. We regard the effect of the GSEs on jumbos as subject to greater uncertainty, so the range we adopt is three to seven basis points.

<sup>55</sup> Those that do not, such as McKenzie (2002) and Torregrosa (2001), used Monthly Interest Rate Survey (MIRS) data and included observations prior to 1997, when the Federal Housing Finance Board first began to edit the data more attentively to exclude erroneously classified observations. Despite their use of the less-reliable data, those studies estimate the differential to be only slightly below 24 basis points.

<sup>56</sup> They point out that nearly all researchers using the MIRS data continue to trim the data for outliers and misclassified loans. In Section 3 of their study, they present a thorough analysis of the effect of this trimming. They conclude that although trimming does eliminate bias that would occur if ARMs misclassified as fixed-rate mortgages (FRM) were left in the data, some downward bias to the estimates of the jumbo-conforming spread remains, with the extent of the bias depending on the true spread and the rate of misclassified ARMs.

<b>Exhibit 5</b>									
<b>GSE Direct Annual Benefits to Homeowners</b>									
	<b>(1)</b>	<b>(2)</b>		<b>(3)</b>		<b>(4)</b>		<b>(5)</b>	
	<b>Balances Outstanding</b>	<b>GSE Reduction</b>		<b>Partial Benefits to Homeowners</b>		<b>GSE Reduction + Effect of Depositories &amp; FHLB System</b>		<b>Adjusted Benefits to Homeowners</b>	
	<b>(\$ Billions)</b>	<b>(Basis Points)</b>		<b>(\$ Billions)</b>		<b>(Basis Points)</b>		<b>(\$ Billions/Year)</b>	
<b>Loan Category</b>	Totals	Lower	Upper	Lower	Upper	Lower	Upper	Lower	Upper
<b>Fixed Conforming</b>	6,378	24	30	15.31	19.14	27	37	17.22	23.60
<b>Adjustable Conforming</b>	1,126	4	6	0.45	0.93	7	13	0.79	1.46
<b>Jumbo</b>	1,324	3	7	0.40	0.93	6	14	0.79	1.85
<b>Total Benefits</b>				16.16	20.74			18.80	26.92

The first three columns of Exhibit 5 show the range of savings to homeowners resulting from the lower interest rates generated by the GSEs alone. In the first row, the savings to borrowers with fixed-rate conforming loans are quantified by applying the range for the jumbo-conforming spread (24-30 basis points) to the outstanding balances of conforming, fixed-rate mortgages (not just the mortgages purchased by or securitized by Freddie Mac and Fannie Mae), or about \$6.4 trillion as of year-end 2005. Our estimate of the resulting annual benefit to homeowners within this category of loans is thus \$15.3-19.1 billion—well above the \$4.7-13.1 billion estimated reduction in interest expense on GSE securities.

When we include benefits to borrowers with conforming ARMs (four to six basis points applied

to \$1.1 trillion), another \$0.4-0.9 billion is added to the range of consumer benefits.<sup>57</sup> Taking the GSE effect on jumbo loans into account (three to seven basis points applied to \$1.3 trillion; we assume that jumbo loans comprise 15 percent of conventional mortgage debt outstanding), the range increases by an additional \$0.4-0.9 billion. The annual interest savings to homeowners from GSE activities alone thus totals between \$16.2 and 20.7 billion.

The final component of benefits to consider is the effect of the depositories and the FHLB System on jumbo loans. The issue here is that the residential mortgage market is covered by multiple layers of federal support. Depositories are the principal alternative investors in mortgage-related assets to Freddie Mac and Fannie Mae, and they

<sup>57</sup> According to Loan Performance data, adjustable-rate mortgages represent 14.2 percent of prime conforming single-family mortgage debt outstanding as of year-end 2005. We assume that the percentage of ARMs in the Mortgage Debt Outstanding (MDO) data from the Federal Reserve Flow of Funds (September 19, 2006 release) is 15 percent because these data also include second lien and subprime mortgages, which have a higher proportion of ARMs. Second and subprime loans represent approximately 15 percent of MDO.

have access to federally insured deposits—access as pointed out earlier that many economists regard as a funding advantage similar to that conferred on the GSEs by their federal charters.

Added to that advantage is the option of membership in the FHLB System. The FHLB System can raise funds in capital markets on terms comparable to those of the GSEs, and they can use those funds to make loans to depositories collateralized by mortgages. As a result, as noted earlier, the GSEs must reduce interest rates by some minimum amount even to compete with the terms offered by depositories.

Although we have a relatively clear picture of the support provided by Freddie Mac and Fannie Mae to the conforming loan market, our information is less clear on the support provided by depositories and the FHLB System. In our 2001 study, we assumed a reduction of five basis points and added that to the other spreads detailed in column (2) of Exhibit 5. Since then, two other studies have weighed in with widely disparate estimates.<sup>58</sup>

While we are pleased to see that this topic is receiving attention from the research community, we believe it is premature to increase our estimate of this effect at this time. We do, however, believe we should express this effect as a range, just as we have the other spreads in our calculation. Thus, the estimates in column (4) of Exhibit 5 reflect a range of three to seven basis points.

In total, then, our updated estimates put the annual savings to borrowers using fixed-rate conforming loans at \$17.2-23.6 billion, and the annual savings to all borrowers at \$18.8-26.9 billion. As a result, we conclude that the bottom of the range of borrowers' benefits exceeds the top of the range of GSE benefits by more than \$5 billion in 2005.

<sup>58</sup> CBO's 2001 study estimates the FHLB System's effect to be three basis points, and the authors add that to their 22 basis-point estimate of the jumbo-conforming spread in assessing the effects of the GSEs on conforming fixed-rate mortgages. In a more recent study, Sanders (2005) attempts to approximate the cost of funding a fixed-rate mortgage without any form of government support. Hypothesizing an REIT structure and adding rough estimates of the various costs, he arrives at an adjustment of 43 basis points that he states must be added to the conventionally measured jumbo-conforming spread.

## » Conclusions

Substantial research on the effects of the GSEs has been conducted since our first evaluation in 2001. Much of this work supports our conclusions in that earlier piece: the GSEs bestow substantial benefits on homeowners while posing manageable risks to the financial system and minimal cost to taxpayers. What is new since our earlier work is public focus on the GSEs'

***The GSEs bestow substantial benefits on homeowners while posing manageable risks to the financial system and minimal cost to taxpayers.***

retained portfolios of MBS and whole mortgages. Some in industry and in government argue that, primarily

because of their size, the GSEs portfolios pose substantial systemic risk and thus should be capped, reduced, or even eliminated.

This report refutes the predicates for such a policy view. Drawing on recent research, we conclude that the systemic risk posed by the GSEs, while not trivial, is well within bounds. In fact, we find that the risks of failure associated with the GSEs is less than the risk of failure associated with other large financial institutions that likewise have federal or state charters and likewise could be characterized as receiving "subsidy." Nevertheless, we caution that sustaining such a low level of risk requires maintaining transparency as well as focused and effective regulation.

Our review of the consequences of GSE activities, covering a large body of studies, finds that the GSEs lower mortgage rates generally, not just those in markets where they operate; that they

dampen fluctuations in residential investment, thereby providing more stability to the overall economy; and that they contribute to social goals by promoting homeownership: improvements in the housing stock, greater civic pride and responsibility, greater educational attainment by children, and, in general, a more wholesome home environment. Despite the critics' arguments to the contrary, many of the studies we discuss find that the retained portfolios make important contributions to these benefits.

In updating our earlier analysis of the costs and benefits associated with the GSEs, we assess their funding advantage to be between 10 and 20 basis points for short-term debt, between 15 and 40 basis points for long-term debt, and between 10 and 30 basis points for MBS. Upon applying these spreads to outstanding balances of each type of security, our estimate of the annual funding advantage ranges between \$4.7 billion and \$13.1 billion.

Turning to the benefits, we conclude that interest rates on conforming, fixed-rate mortgages are 24 to 30 basis points below the rate on fixed-rate jumbos. We also incorporate smaller estimates for the effects of the GSEs on conforming ARMs and jumbo loans and for the effects of depositories on all mortgage rates. Overall then, we estimate annual savings to homeowners ranging from \$16.2 billion to \$26.9 billion.

Thus, we conclude the benefits enabled by the GSEs exceed the savings from their funding advantage. The lower end of our estimates of savings to homeowners (\$16.2 billion) exceeds

the upper end of our estimates of annual funding advantages (\$13.1 billion). This is a conservative conclusion, because some of the funding advantage should be attributed to the GSEs' inherent efficiencies, the liquidity they bring to the market, and, as Hubbard (2004) maintains, their low risk of failure, rather than the GSEs' nexus with the federal government.

Given the important contributions of the GSEs, major new restrictions on the scope of their operations should be introduced only if they are clearly necessary. Those calling for new portfolio restrictions assert that the GSEs' pose systemic risk, but they provide no clear delineation of how the GSEs' activities could lead to a major financial crisis. Others who have reviewed the GSEs' participation in the debt

and derivatives markets find that these markets are resilient and that the GSEs' are not a threat to their stability. Furthermore, researchers who have examined financial operations of the GSEs conclude that their risk of default is low and their risk-based capital standard requires that they meet a high standard of safety.

Consequently, the prudent approach to oversight of Freddie Mac and Fannie Mae is to concentrate on monitoring and regulating risk. Introducing new statutory limits on their portfolios would not only fail to reduce risk but also have undesirable consequences for homeowners, the housing market, and the economy as a whole.

## » Appendix: Recent Literature

### *Benefits of the Retained Portfolio*

**Stuart A. Gabriel, “Opening Doors to Homeownership: Challenges to Federal Policy” (2001).** The author concludes that retained portfolio activities undertaken by Freddie Mac and Fannie Mae improve the pricing and liquidity of secondary markets.

**Gloria Gonzalez-Rivera, “Linkages between Secondary and Primary Markets for Mortgages: the Role of the Retained Portfolio Investments of the Government Sponsored Enterprises” (2001).** The author presents a time-series statistical analysis of the relationship between portfolio purchases and mortgage interest rates. She concludes that portfolio activities reduce mortgage rates.

**David M. Harrison, Wayne R. Archer, David C. Ling and Marc T. Smith, “Mitigating Externalities in Mortgage Markets: The Role of Government Sponsored Enterprises” (2002).** The authors find that purchases of mortgages by Freddie Mac and Fannie Mae are higher in areas with historically low transaction volume, and this increases the number of home sales and the availability of mortgages in these areas. While the paper does not directly address the role of the portfolios, the authors conclude that since Freddie Mac’s retained portfolio contains a large volume of such loans, it is likely that a sizable portion of the effect they find is due to the GSEs’ retained portfolios.

**Andreas Lehnert, Wayne Passmore, and Shane M. Sherlund, “GSEs, Mortgage Rates and Secondary Mortgage Activities” (2005).**

The three members of the staff of the Federal Reserve Board of Governors analyze most of the same issues as Naranjo and Toevs and reach the opposite conclusions. They find that purchases and issuance have little to no effect and that purchases are not more effective than securitization in reducing mortgage interest rate spreads. The authors also conclude that GSE activity had no effect on mortgage rates during the 1998 liquidity crisis.

**Douglas A. McManus and Buchi Ramagopal, “The Value of Liquidity Services in the Mortgage Market” (2006).**

The authors argue that Freddie Mac and Fannie Mae affect the conforming loan market by providing a take-out bid for conforming MBS. The authors model the take-out bid as an embedded option where the investor has an option to put the security back to Freddie Mac and Fannie Mae at a strike price related to the level of the option-adjusted spread. The effect of the embedded option raises the price of MBS and reduces the variability of the MBS option-adjusted spread.

**Andy Naranjo and Alden Toevs, “The Effects of Purchases of Mortgages and Securitization by Government Sponsored Enterprises on Mortgage Yield Spreads and Volatility” (2002).**

In a study for Fannie Mae, Dr. Toevs and Professor Naranjo use Fannie Mae purchase data and GSE securitization data to investigate the relationship between GSE activity and mortgage

rate spreads. The authors find (1) portfolio purchases have a greater role in reducing mortgage rates than securitization activities; (2) purchases and securitizations lower mortgage rates for conforming and non-conforming borrowers alike; and (3) portfolio purchases of the GSEs reduce the volatility of mortgage rates.

**Richard Roll, “Benefits to Homeowners from Mortgage Portfolios Retained by Fannie Mae and Freddie Mac” (2003).** Professor Roll presents a nontechnical discussion of the benefits of federal support to Freddie Mac and Fannie Mae MBS. He then describes the contributions of the retained portfolios of the GSEs. His discussion emphasizes the complexity of investing in mortgages, either through whole loans or MBS, and clearly describes how the portfolio operations expand the range of investors in mortgage related assets. He concludes that foreign capital that would otherwise not invest in the American mortgage market is channeled into that market through the GSEs’ retained portfolios.

### *Systemic Risk and the Retained Portfolio*

**CapAnalysis Group, “OFHEO Risk-Based Capital Stress Test Applied to U.S. Thrift Industry” (2003).** The authors of this study simulate the thrift industry and apply to it the risk-based capital (RBC) stress test recently promulgated by OFHEO to apply to the GSEs. They find that the thrift industry is more likely to fail under the RBC test than under the capital-to-asset ratio test traditionally favored by financial regulators. This suggests that the RBC test applied to the GSEs is quite stringent (especially in view of their extensive hedging) and that calls to replace it with a more traditional capital-to-asset ratio test are not sound.

**Yan Chang, Douglas A. McManus, and Buchi Ramagopal, “Does Mortgage Hedging Raise Long-Term Interest Rate Volatility?” (2005).** In response to Perli and Sack’s (2003) finding that hedging strategies employed by the GSEs increase long-term interest-rate volatility, the researchers find that dropping outlier events—namely the LTCM crises and the tragedy of September 11, 2001—generates estimates that suggest little relationship, or even an inverse relationship, between hedging and market volatility.

**Christopher L. Culp, “Demystifying Derivatives in Mortgage Markets and Fannie Mae,” (2003).** Dr. Culp describes the derivatives used by Fannie Mae and addresses the arguments that the scale of the GSEs’ participation in key derivatives markets poses systemic risk. He concludes that Fannie Mae’s management of credit risk in the derivatives markets is sound and that the size of its positions is not so large that a failure by Fannie Mae would bring down the rest of the market.

**Federal Reserve Board of Governors and the Federal Reserve Bank of New York, “Concentration and Risk in the OTC Market for U.S. Dollar Interest Rate Options” (2005).** This report analyzes the risks associated with OTC markets for US dollar interest-rate options on market participants, namely the GSEs and derivative dealers. Potential risks to the GSEs stem from dealer concentration in this market, such that a sudden exit of a leading dealer could diminish market liquidity in the options market. In addition, the report investigates the effect of a GSE or dealer failure on counterparty credit losses. After interviewing staff at the GSEs and leading OTC dealers, the authors conclude that

OTC markets for U.S. dollar interest rates reduce fixed rates by allowing GSEs and others to hedge prepayment risk. Furthermore, the report finds risks associated with the high concentration of dealers to be well managed.

**R. Glenn Hubbard, “The Relative Risk of Fannie Mae” (2004).** Professor Hubbard, Dean of the Business School at Columbia University and former chair of the Council of Economic Advisors, estimates the probability of default for Fannie Mae using a simulation model tailored to the risks specific to the GSE. He then compares the resulting risk to the corresponding risks of failure for large commercial banks. He finds that Fannie Mae’s likelihood of failure and the expected amount loss given failure are below the levels for most of the banks in his study. He also finds that Fannie Mae’s risk on a “stand-alone” basis is low in absolute as well as relative terms, and he challenges the assumption, made by most analysts of GSE finances, that the low yields on Fannie Mae securities are due to an implicit Federal guarantee rather than a low risk of default independent of whatever Federal support Fannie Mae may have.

**Dwight Jaffe, “The Interest Rate Risk of Fannie Mae and Freddie Mac” (2003).** This study evaluates the interest rate risk management of the two GSEs and develops public policy proposals. The analysis focuses on the enterprises’ dynamic hedging and use of derivatives. Professor Jaffe states that the GSEs’ should be commended for the interest rate risk disclosures they now provide. However, he recommends changes to these disclosures and to the OFHEO stress test.

**Paul Kupiec and David Nickerson, “Assessing Systemic Risk Exposure from Banks and GSEs Under Alternative Approaches to Capital Regulation” (2004).**

Kupiec and Nickerson present a two-period model of financial exchange to investigate whether minimum capital requirements mitigate the potential for systemic risks due to asymmetric information between the financial intermediaries and debt holders. The authors find that for comparable mortgage portfolios, banks are more likely to have higher risk of insolvency than GSEs, even though banks hold more capital.

**Eugene Ludwig, “Systemic Risk: A Regulator’s Perspective” (2004).** Ludwig, a former Comptroller of the Currency, provides his perspective on systemic risk. He begins by stating that the available literature on the topic is limited and contains disagreements about fundamental issues. He believes that unregulated institutions pose greater risk than regulated ones, that the largest institutions do not necessarily pose the greatest risk, and that government errors are less likely to lead to crises today than was the case in the past.

**Office of Federal Housing Enterprise Oversight, “Systemic Risk: Fannie Mae, Freddie Mac and the Role of OFHEO” (February 2003).** This study has sections on systemic risk, including a survey of the literature, a discussion of the operations of the GSEs, and an assessment systemic risk associated with the activities of the GSEs. The sections on GSE operations have detailed coverage of interest rate risk management. The section on systemic risk describes alternative scenarios in which the liquidity or solvency problems strike the GSEs or other parts of the financial system. The report

concludes with recommendations for changes in oversight and regulation, including some that require legislation to put into effect.

**Joseph Stiglitz, Jonathan Orszag, and Peter Orszag, “Implications of the New Fannie Mae and Freddie Mac Risk-based Capital Standard” (2002).** Professor Stiglitz and his co-authors calculate that the probability that conditions as extreme as those implied by the GSEs’ stress test is so low as to be barely measurable. Thus, they conclude that the GSEs’ probabilities of failure are extremely low if they meet the OFHEO capital standards.

### *Jumbo-Conforming Spread*

**Brent Ambrose, Michael LaCour-Little, and Anthony Sanders, “The Effect of Conforming Loan Status on Mortgage Yield Spreads: A Loan Level Analysis” (2004).** This study uses data from a major mortgage lender to compare rates on conforming and jumbo loans. The data includes credit scores as well as other factors typically used to control for differences in risk. The authors include models taking into account the endogeneity of conforming loan status. Among the many results is an estimated jumbo-conforming spread of about 28 basis points.

**Mark J. Flannery and G. Brandon Lochart, “New Estimates of the Jumbo-Conforming Spread” (2005).** Professors Flannery and Lochart explore the sensitivity of estimates of the jumbo-conforming spread to alternative specifications. Extending McKenzie’s research the authors pay particular attention to the role of loan size. They critique the analysis of Passmore, Sherlund, and Burgess (2005) (PSB) and explore a number of other issues, including the pricing of small

jumbos late in the year and the effect of a change in bank regulation that decreased banks’ costs of securitizing jumbo loans. Using data from 1997 to 2003 (the interval used by PSB), they find that the jumbo-conforming differential is between 23-29 basis points using a conventional specification.

**Douglas A. McManus and Buchi Ramagopal, “Interpretation and Misinterpretation of the Jumbo-Conforming Spread” (2005).** The authors, both economists at Freddie Mac, discuss problems that make estimation of the jumbo-conforming spread complex. They note that all U.S. financial institutions receive subsidies from the federal government, a fact that few estimates take into account. They also discuss data issues that compromise the validity of the estimates. In particular, they point out the filtering of the data (done by most researchers to prevent outliers from distorting the results) probably leads to lower estimates than would be observed if the data were sufficiently accurate to make the filtering unnecessary. McManus and Ramagopal also criticize the specification of loan size by Passmore, Sherlund, and Burgess (2003).

**Joseph A. McKenzie, “A Reconsideration of the Jumbo/Non-Jumbo Mortgage Rate Differential” (2002).** Dr. McKenzie, of the Federal Housing Finance Board, presents a history of the research on the jumbo-conforming spread, with a compact summary of key features of previous studies in his Table 1. In his own analysis, the author assesses the sensitivity of the estimated spread to alternative ways of specifying characteristics such as loan size and LTV. He also investigates the rates on loans originated late in the year for amounts only slightly above the conforming limit and finds that lenders’ pricing appears to anticipate the pending increase

of the conforming limit for these loans. Using data for 1986–2000, he estimates rate differentials for the whole period and for individual years. In the specification that is most comparable to those used elsewhere in the literature, his estimate of the jumbo-conforming spread for the whole period is 22 basis points.

**Wayne Passmore, Shane M. Sherland, and Gillian Burgess, “The Effect of Housing Government-Sponsored Enterprises on Mortgage Rates” (2005).** The authors (PSB), all on the staff of the Federal Reserve Board, estimate the jumbo-conforming spread to be small—about 16 basis points between 1997 and 2003—and only weakly related to variation in the spread between yields on the debt of fully private financial firms and yields on GSE debt. A primary theme of PSB’s argument is that however large or small the jumbo-conforming spread may be, much of that amount is due to factors other than GSE activities. In the second stage of their work, PSB estimate that the GSEs’ effect on interest rates is only seven basis points.

**Anthony B. Sanders, “Measuring the Benefits of Fannie Mae and Freddie Mac to Consumers: Between De Minimis and Small?” (2005).** After reviewing various studies of the jumbo-conforming spread, Professor Sanders turns to the failure of most studies to account for the effect on mortgage rates of subsidies to depositories. Sanders argues that rates on jumbo loans are reduced, perhaps substantially, by these subsidies. After estimating “synthetic” rates for jumbo and conforming loans, he concludes that the conventional jumbo-conforming spread should be adjusted upward by 43 basis points in order to account for the subsidies to depositories.

**David Torregrosa, “Interest Rate Differentials Between Jumbo and Conforming Mortgages, 1995–2000 (2001).** This is the study conducted by the CBO to support the Office’s May 2001 report on “Federal Subsidies and the Housing GSEs.” CBO concludes that the differential was between 18 and 25 basis points over the period studied. The study also includes some analysis of the sensitivity of the estimates to alternative specifications.

### *Macroeconomic Stability*

**Akash Deep and Dietrich Domanski, “Housing Markets and Economic Growth: Lessons from the U.S. Refinancing Boom” (2002).** The authors describe the 2001 refinancing boom in the U.S. and discuss how it helped stabilize the economy. They identify some contributors to the extraordinary magnitude of the boom, including GSE automated underwriting and retained portfolios.

**Calvin Schnure, “Boom-Bust Cycles in Housing: The Changing Role of Financial Structure” (2005).** Schnure, an economist with the IMF, explores the effect of financial structure on instability in U.S. house prices and housing construction. He concludes that home prices under the current structure of securitized mortgage finance are more stable now than in the past, when lending was funded primarily by bank deposits. The author attributes recent declines in GDP volatility to stabilization in residential investment resulting from the current secondary market structure.

**International Monetary Fund, “The Global House Price Boom” (2004).** IMF researchers compare house-price volatility over the period 1971–2003 with the proportion of fixed-rate lending in 18 developed countries. They find that countries with more fixed-rate lending have lower house-price volatility. The authors also suggest that changes in house prices affect consumers’ credit and their ability to borrow. In this way, house prices are linked with economic activity through consumer spending.

**David Miles, “The U.K. Mortgage Market: Taking a Longer Term View” (2003 and 2004).** Professor Miles prepared a study of the U.K. mortgage market at the request of the Treasury, which included an interim report and a final report. The interim report addresses why there is so little long-term fixed rate lending in the U.K.. Miles observes that U.K. mortgages are marketed with substantial emphasis on the initial rate, rather than the expected cost of the loan over longer periods. He also notes that home prices are “unusually sensitive to movements in short-term rates.” The final report concludes that the U.K. housing market and overall economy would benefit from greater usage of long-term, fixed-rate lending as apposed to the adjustable-rate mortgages (or very short-term balloons) that characterize the U.K. mortgage market. Miles finds that house prices are more sensitive to interest-rate movements in the U.K. than in the U.S. or the Netherlands. He also finds that countries with more fixed-rate mortgage lending have less house-price volatility and more macroeconomic stability over time.

**Joe Peek and James A. Wilcox, “Secondary Mortgage Markets, GSEs, and the Changing Cyclicity of Mortgage Flows” (2004).** Peek and Wilcox find that total outstanding residential mortgage balances in the U.S. have become less pro-cyclical since the 1970s. The decline in mortgage balances was larger in the recessions of 1973–75 and 1981–82 than in the recession beginning in 1990. In addition, Peek and Wilcox find that total intermediation (the GSEs’ holdings of MBS and mortgages in portfolio) increased during recessions. Thus, the counter-cyclical behavior of the GSEs, combined with the increasing role of the GSEs, has likely dampened the amount of cyclical fluctuation in funds flowing into mortgage markets.

**Joe Peek and James A. Wilcox, “Housing, Credit Constraints, and Macro Stability: The Secondary Mortgage Market and Reduced Cyclicity of Residential Investment” (2006).** Peek and Wilcox present a statistical study of the cyclical behavior of the U.S. economy between 1968 and 2004. They find that the impact of interest rates and aggregate income on housing expenditures declined as the secondary mortgage market expanded. They conclude that by tempering the volatility of residential investment, growth in the secondary market for residential mortgages has contributed importantly to the stability in the U.S. economy.

### *Social Benefits*

**Brent W. Ambrose and Richard J. Buttimer Jr., “GSE Impact on Rural Mortgage Markets” (2005).** The authors find that the GSEs are responsible for improving rural area access to mortgage funds. Although they do not address

the role of the GSEs' portfolios directly, it is likely that a sizable portion of this effect is due to the fact that the retained portfolios have tended to purchase more low-balance loans.

**N. Edward Coulson, Seok-Joon Hwang, and Susumu Imai, “The Benefits of Owner-Occupation in Neighborhoods” (2003).** The researchers find that residents of neighborhoods with a large proportion of homeowners receive positive external benefits from that ownership. The authors estimate that willingness to pay for neighborhoods with a high concentration of owner-occupied housing to be \$5,000 annually, justifying subsidies to homeownership.

**Donald R. Haurin, Toby L. Parcel, and R. Jean Haurin, “Does Homeownership Affect Child Outcomes?” (2002).** These researchers investigate the role of homeownership on the cognitive and behavioral outcomes of children by employing national panel data. Controlling for a variety of social, economic, and demographic characteristics, the authors find that children residing in owner-occupied housing (vs. rental housing) score nine percentage points higher in math achievement, seven percentage points higher in reading achievement, and three percentage points lower in negative behavior.

**Roberto G. Quercia, George W. McCarthy, and Susan M. Wachter, “The Impacts of Affordable Lending Efforts on Homeownership Rates” (2003).** Professors Quercia, McCarthy, and Wachter develop a methodology to analyze the effect of affordable lending activities, such as flexible underwriting standards and lower required downpayments, on homeownership rates by geographic region and targeted population. Using the American Housing Survey, they show that financially innovative products from the GSEs—

many of which are financed by the retained portfolio—have been responsible for increasing the homeownership rate for minorities by as much as five percent.

### *Quantifying Benefits from Federal Sponsorship*

**Brent W. Ambrose and Andrew Warga, “An Update on Measuring GSE Funding Advantages” (2000).** In a study commissioned by CBO, the authors estimate the spread between yields on debt securities issued by GSEs and other financial firms. The CBO used estimates from this study in its 2001 and 2004 studies of federal sponsorship.

**Michael Fratantoni and Peter Niculescu, “Subsidies in a Context of Efficient Markets, A New Framework for Evaluating the Role of Fannie Mae” (2005).** The authors argue that the “goods” model of characterizing subsidies to the GSEs is misapplied and that its subsequent implications of extra-normal profit and unbounded portfolio growth do not hold. They maintain that because financial markets are efficient, Fannie Mae cannot profit from an “implicit” subsidy in its funding through the retained portfolio since MBS yields would decline by the same amount as debt yields. Profits earned by Freddie Mac and Fannie Mae from their portfolios are tied directly to each GSE's ability to manage prepayment risk and are not the result of subsidy.

**Frank Nothaft, James Pearce, and Stevan Stephanovic, “Debt Spreads between GSEs and Other Corporations” (2002).** This study, supported by Freddie Mac, estimates the GSE funding advantage. The paper contains a comprehensive summary of previous research and

the results of the authors' own econometric analysis. Using multiple regression the authors estimate GSE spreads relative to yields on other corporate securities of varying credit ratings.

**Wayne Passmore, “The GSE Implicit Subsidy and the Value of Government Ambiguity”**

**(2005).** Dr. Passmore estimates how much the GSEs benefit from federal sponsorship. Under his “middle of the road” assumptions he estimates that the GSEs retain about 53 percent of this gain. The procedure relies on estimates of the GSEs' impact on mortgage rates from the Passmore, Sherland, and Burgess study.

**Alden Toevs, “A Critique of the CBO’s Sponsorship Benefit Analysis” (2000) and “A Critique of the CBO’s 2001 Study on ‘Federal Subsidies and the Housing GSEs’”**

**(2001).** In a pair of reports sponsored by Fannie Mae, Dr. Toevs critiques the CBO reports on benefits of federal sponsorship of Freddie Mac and Fannie Mae. In the first report Dr. Toevs assessed the 1996 CBO report, arguing that the funding advantage estimates for long-term debt and MBS were too high and that the reduction in mortgage interest rates should be applied to all conforming loans, not just loans purchased by the GSEs. In the second report Dr. Toevs argues that the CBO continues to overstate the “subsidies” to the GSEs and understate the benefits to homeowners.

**U.S. Congressional Budget Office, “Federal Subsidies and the Housing GSEs” (2001) and “Updated Estimates of the Subsidies to the Housing GSEs” (2004).** In 1996 CBO presented its first attempt to compare what it calls the subsidy received by the GSEs to the interest savings to homeowners resulting from

GSE activities. The 2001 report revisits this topic, providing an extensive discussion of GSE operations and CBO's estimation procedure. Although the basic framework used in the 1996 report was retained, CBO made some modifications in 2001. The 2004 report was an update, applying the same methodology and parameters to data for 2004.

*Role of the GSEs—Policy Recommendations*

**Robert A. Eisenbeis, W. Scott Frame, and Larry D. Wall, “An Analysis of the Systemic Risks Posed by Fannie Mae and Freddie Mac and an Evaluation of the Policy Options for Reducing Those Risks” (2006).**

The authors, all with the Federal Reserve Bank of Atlanta, review the literature on the risks and benefits of GSE activities. Their interpretation of this literature is that the GSEs, particularly their portfolios, provide limited benefits while presenting serious risks. After reviewing the policy options, they recommend limits on portfolio size to mitigate systemic risk.

**Richard K. Green and Susan M. Wachter, “The American Mortgage in Historical and International Context” (2005).**

Green and Wachter provide an historical overview of the development of the American mortgage market and contrast its structure to markets in other countries. They document the uniqueness and variety of mortgage products offered to borrowers in the United States. Although the authors recognize the risks involved with the current structure, they argue that the benefits of GSE activities in the secondary mortgage market, including liquidity and macroeconomic stability, should be weighed alongside any potential risks

to the financial system when making policy recommendations.

**Dwight M. Jaffe, “On Limiting the Retained Mortgage Portfolios of Fannie Mae and Freddie Mac” (2005).** The author reviews the GSEs’ role in the secondary mortgage market as well as the manner in which interest risk is hedged in their retained portfolios. He concludes that the retained portfolios threaten the U.S. financial system and American taxpayers and he advocates a reduction in their sizes.

**John M. Quigley, “Federal Credit and Insurance Programs: Housing” (2006).** The author recounts the development of the secondary market by reviewing the activities of FHS and the GSEs in increasing homeownership. Quigley suggests that GSE activities in their current form are no longer required to sustain the current levels of homeownership. He recommends reducing the conforming loan limit, restricting GSE purchases of mortgages to first-time homebuyers, reducing the size of the retained portfolios, and charging the GSEs for disaster insurance.

**Susan E. Woodward, “Rechartering Freddie Mac and Fannie Mae: The Policy Issues” (2001).** Dr. Woodward, a former Chief Economist at HUD and the SEC, reviews the policy issues surrounding the question of whether to privatize Freddie Mac and Fannie Mae. Her main theme is that the U.S. mortgage market is largely a creation of the federal government. Among other conclusions, she argues that a mortgage market without GSEs would likely be less efficient than the current market and that taxpayers would likely bear as much risk under such an arrangement as they do currently with the GSEs.

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