

July 2001

# FEDERAL HOME LOAN BANK SYSTEM

## Establishment of a New Capital Structure



G A O

Accountability \* Integrity \* Reliability

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## Abbreviations

FCS	Farm Credit System
FDIC	Federal Deposit Insurance Corporation
FHFB	Federal Housing Finance Board
FHLBank	Federal Home Loan Bank
FIRREA	Financial Institutions Reform, Recovery, and Enforcement Act
GLBA	Gramm-Leach-Bliley Act
GSE	Government-Sponsored Enterprise
HUD	Department of Housing and Urban Development
MBS	Mortgage-Backed Securities
MPF	Mortgage Partnership Finance
MPP	Mortgage Partnership Program
OFHEO	Office of Federal Housing Enterprise Oversight



July 20, 2001

Congressional Committees:

This report responds to a mandate in the Consolidated Appropriations Act of 2001 that we analyze the adequacy of the capital structure of the Federal Home Loan Bank (FHLBank) System. The FHLBank System—which consists of 12 regional FHLBanks and the System’s Office of Finance—is cooperatively owned by member financial institutions.<sup>1</sup> Currently, FHLBank capital lacks permanence compared to other firms’ capital because it is redeemable with only 6 months’ notice. As such, its usefulness as a cushion in times of stress is questionable. The existence of joint and several liability within the System also means that a FHLBank’s capital must be available to protect the System if one or more FHLBanks suffer losses severe enough to erode their capital.<sup>2</sup> In addition, in part because the FHLBank System is a government-sponsored enterprise (GSE) whose failure could lead to government intervention and potential losses to the taxpayer, there are regulatory capital requirements imposed by the Federal Housing Finance Board (FHFB) in the form of minimum leverage and risk-based capital levels.<sup>3</sup> The Gramm-Leach-Bliley Act (GLBA) of 1999 mandated a new capital structure that would increase the permanence of FHLBank capital and require that FHFB promulgate capital requirements related to the risk of activities undertaken by FHLBanks. The FHLBanks have not yet completed their plans to implement their new capital structures, which limited the scope of our analysis.

As agreed with your offices, our objectives were to (1) describe the basic characteristics of the capital structure being established for the cooperative FHLBank System; (2) analyze how risk management policies and the new capital structure address interest rate, credit, and operations risks that are associated with advances and the direct acquisition of mortgages; and (3) compare and contrast the risk-based capital standards proposed by FHFB for the FHLBank System to the standards proposed by

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<sup>1</sup> For financial purposes, capital is generally defined as the long-term funding for a firm that cushions it against unexpected losses.

<sup>2</sup> The imposition of joint and several liability means that each FHLBank is an obligor on the consolidated debt obligations of the System.

<sup>3</sup> Generally, a leverage capital requirement is the minimum amount—usually expressed as a percentage—of capital that must be held against total assets.

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the Office of Federal Housing Enterprise Oversight (OFHEO) for Fannie Mae and Freddie Mac (the enterprises).

FHFB and OFHEO have proposed new capital standards that are related to the risks of unexpected losses, but these standards have not been implemented. To date, FHFB and OFHEO have enforced leverage capital requirements that are based on asset, debt, and/or activity levels rather than the risks of specific activities. The FHLBanks facilitate mortgage financing primarily by making collateralized loans, called advances, to their members. These loans are funded by issuing consolidated bonds, which are the joint and several liability of the FHLBanks, through the System's Office of Finance. In contrast to the cooperatively owned FHLBank System, the enterprises are private corporations with publicly traded stock.

To complete our work, we reviewed FHFB and OFHEO capital standards; analyzed FHLBank proposals for the use of expanded collateral provisions and permissible uses of advances under GLBA; analyzed FHLBank information on direct mortgage acquisition programs; and interviewed financial institution regulatory body and GSE officials. We did not verify the accuracy of data provided by FHFB and the FHLBanks. We obtained and analyzed information the FHLBanks considered to be proprietary. Therefore, we do not report specific details of the various FHLBank products. In addition, although we made observations of some elements of risk management that appear to be implemented at the FHLBanks, we did not analyze risk management procedures employed by the FHLBanks, FHFB's oversight of risk management, nor the risks associated with FHLBank investments. We also did not analyze the risks of activities that have been or might be undertaken by either Fannie Mae or Freddie Mac.

We conducted our work in Washington, D.C., between February 2001 and June 2001, in accordance with generally accepted government auditing standards. Written comments on a draft of this report from FHFB appear in appendix V. We also obtained technical comments from the FHLBanks, enterprises, depository institution regulators, FHFB, and OFHEO that have been incorporated where appropriate. A detailed description of our scope and methodology is presented in appendix I. This report does not contain any recommendations.

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## Results in Brief

The FHLBank System is currently establishing a new capital structure that will include new risk-based and leverage capital requirements and will also make capital more permanent. Under this new structure, the FHLBank members—generally depository institutions—will purchase new classes of

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stock that will not be redeemable if a FHLBank fails to meet its minimum capital requirements.<sup>4</sup> Greater permanence is especially important given that the FHLBanks are jointly and severally liable for the System's outstanding debt securities. With such liability, all FHLBanks are at risk due to the possibility that a FHLBank could become troubled and not be able to meet its debt obligations. In addition, the troubled FHLBank would have incentives to undertake risky activities because profits would accrue to the FHLBank's owners, whereas losses could fall on the other FHLBanks. Thus, joint and several liability creates incentives for the FHLBanks to monitor each other's activities, which they do through a number of System-wide bodies of representatives from the 12 FHLBanks. The unique characteristics of FHLBank capital and the potential for risk taking within the System heighten the importance of supervisory oversight by FHFBS.

The new capital structure has the potential to better address the increased risks associated with advances and the direct acquisition of mortgages, because it offers greater capital permanence, and includes both leverage and risk-based capital requirements. However, it is too early to assess capital adequacy, because the capital plans and risk management practices to be implemented by the FHLBanks and capital supervision practices to be followed by FHFBS are not yet known. Additionally, the overall amount of risk introduced into the system will depend on the type and amount of advances and direct mortgage acquisitions undertaken by the FHLBanks. Advances utilizing small business and agricultural loan collateral are activities that are inherently more risky than traditional advances secured by residential mortgage collateral.<sup>5</sup> While officials from the FHLBanks told us they currently anticipate a low level of advances utilizing small business and agricultural collateral, the overall risk in the System could increase if these advances became an important part of the System's assets.

Direct acquisition of mortgages also creates additional risks, especially if these purchased mortgages are not regionally diversified and if member institutions do not have incentives to limit risks in mortgage origination.

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<sup>4</sup> Historically, the FHLBank System had mandatory and voluntary member institutions. Voluntary members could redeem stock with 6 months' notice. GLBA made membership all voluntary.

<sup>5</sup> GLBA authorized the FHLBanks to provide funds to any member community financial institution for small business and agricultural loans with corresponding expansions in eligible collateral. Community financial institutions are defined as FDIC-insured institutions that have less than \$500 million in total assets, adjusted for inflation.

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Based on activity to date, direct mortgage acquisition appears to provide regional diversification and incentives to member institutions for sound mortgage underwriting and servicing through the sharing of credit risks.<sup>6</sup> However, this activity is relatively new and its level is expected to grow, thereby increasing risks. In addition, risks could be affected if changes are made in the risk-sharing agreements between the FHLBanks and their member institutions. Increased activity in direct mortgage acquisitions by FHLBanks could also increase competition with the enterprises in the secondary mortgage market. Such increased competition could provide benefits to borrowers, but it could also generate additional risks for the FHLBanks, the enterprises, depository institutions, and taxpayers.

Both FHFB and OFHEO are implementing new risk-based capital regulations. Both risk-based capital regulations are intended to help ensure that the level of capital the FHLBanks and the enterprises maintain is sufficient to cover the risks that these GSEs undertake. Both regulations also address credit risk, interest rate risk, and operations risk. The regulations differ substantially due to the different business activities of the regulated entities, statutory requirements faced by each regulator, and conceptual approaches. In addition, the FHLBanks' leverage requirements differ from those of the enterprises, which may affect the relative impacts of the two proposed risk-based capital regulations.

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## Background

The FHLBank System and the enterprises are GSEs. Congress created GSEs to help make credit available to certain sectors of the economy, such as housing and agriculture, in which the private market was perceived as not effectively meeting credit needs. GSEs receive benefits from their federal charters that help them fulfill their missions. The federal government's creation of and continued relationship with GSEs have created the perception in the financial markets that the government would not allow a GSE to default on its obligations, even though intervention is not required. As a result, GSEs can borrow money in the capital markets at lower interest rates than comparably creditworthy private corporations

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<sup>6</sup> The FHLBank of Chicago has accounted for a majority of the acquisition activity to date.

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that do not enjoy federal sponsorship, and market discipline is reduced.<sup>7</sup> In fact, during the 1980s, the government did provide limited regulatory and financial relief to Fannie Mae when it experienced significant financial difficulties, and, in 1987, Congress authorized \$4 billion to bail out the Farm Credit System, another GSE. Additional background on the FHLBank System, the enterprises, FHFBS, OFHEO, and financial risks are presented in appendix II.

Our mandate directs us to analyze interest rate, credit, and operations risks. Interest rate risk is a component of what is commonly called market risk. Market risk is the potential for financial losses due to the increase or decrease in the value or price of an asset or liability resulting from broad movements in prices, such as interest rates, commodity prices, stock prices, or the relative value of foreign exchange. Credit risk is the potential for financial loss because of the failure of a borrower or counterparty<sup>8</sup> to perform on an obligation. Credit risk may arise from either an inability or unwillingness to perform as required by a loan, a bond, an interest rate swap,<sup>9</sup> or any other financial contract. Operations risk is the potential for unexpected financial losses due to inadequate information systems, operational problems, breaches in internal controls, or fraud. It is associated with problems of accurately processing or settling transactions and with breakdowns in controls and risk limits. Individual operating problems are considered small-probability but potentially high-cost events for well-run firms. Operations risk includes many risks that are not easily quantified, but controlling these risks is crucial to a firm's successful operation.

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<sup>7</sup> The enterprises made six commitments in October 2000 regarding, among other things, the issuance of subordinated debt, liquidity management, and public disclosure of financial information. They stated that the commitments would improve transparency and market discipline. While these commitments may be beneficial to the public, Congress, and regulators, the perception of an implied guarantee will continue to reduce funding costs and market discipline.

<sup>8</sup> In any financial transaction, each party is the counterparty to the other.

<sup>9</sup> FHLBanks and the enterprises enter into swap agreements. A swap agreement is an agreement between counterparties to make periodic payments to each other for a specified period. In a simple interest rate swap, one party makes payments based on a fixed interest rate, while the counterparty makes payments based on a variable rate.



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## A More Permanent Capital Structure Is Being Established for the FHLBank System

The FHLBank System is establishing a new capital structure that will include new risk-based and leverage capital requirements and will also make capital more permanent. FHLBank capital will continue to differ from capital issued by publicly traded corporations, however, because of the cooperative nature of the FHLBank System. Additionally, each FHLBank's capital is potentially available throughout the System, because the FHLBanks are jointly and severally liable for the System's outstanding debt securities. The unique characteristics of FHLBank capital and the potential for risk taking within the System heighten the importance of supervisory oversight by FHFB.

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## The FHLBank System's New Capital Structure Will Include Risk-based and Leverage Capital Standards

The new capital structure being implemented by the FHLBank System will include risk-based and leverage capital standards. In January 2001, FHFB published a final rule to comply with the provisions of GLBA that required regulations prescribing uniform capital standards applicable for all FHLBanks. These new capital standards, when fully implemented, will replace the current "subscription" capital structure for the FHLBanks. Under the current structure, the amount of capital that each FHLBank issued was determined by a statutory formula that dictated how much FHLBank stock each member had to purchase.<sup>10</sup> A principal shortcoming of the subscription capital structure was that the amount of capital each FHLBank maintained bore little relation to the risks inherent in the FHLBank's assets and liabilities. Under the new structure, FHLBanks will be required to maintain longer-term permanent capital and total capital in amounts sufficient for the FHLBanks to comply with the minimum risk-based and leverage capital requirements established by GLBA.

We have consistently supported the concept of risk-based capital standards applied in combination with a leverage ratio that requires a minimum capital-to-asset ratio for the FHLBanks.<sup>11</sup> A risk-based capital standard has a number of benefits. First, it gives the government a mechanism to influence risk-taking without involving itself in the FHLBanks' daily business. Second, it gives FHLBanks' shareholders an incentive to demand that management not take undue risks, since

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<sup>10</sup> In accordance with that formula, each member was required to purchase FHLBank stock in an amount equal to 1 percent of the member's total mortgage assets or 5 percent of the advances outstanding to the member, whichever was greater.

<sup>11</sup> See *Capital Structure of the Federal Home Loan Bank System* (GAO/GGD-99-177R, Aug. 31, 1999).

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increased risk taking would impose additional costs resulting from raising additional capital. Third, it provides a buffer that should be adequate to absorb unforeseen losses to FHLBanks and thus helps prevent or reduce potential taxpayer losses.

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### FHLBank System Capital Will Become More Permanent

The new capital structure the FHLBank System is implementing will also result in more permanent capital. After the enactment of GLBA in 1999, membership in the FHLBank System became all voluntary. Voluntary members can generally redeem stock with 6 months' notice.<sup>12</sup> Capital redeemable on such short notice does not provide a cushion against unexpected losses. Therefore, the change to all voluntary members increased the need for more permanent capital that could not necessarily be redeemed with 6 months notice, and GLBA required implementation of a more permanent capital structure.

Under the new capital structure, the FHLBanks are permitted to issue Class A stock, which can be redeemed with 6 months' notice, and Class B stock, which can be redeemed with 5 years' notice, or both. To help ensure that capital does not dissipate due to redemption in time of stress, GLBA does not allow a FHLBank to redeem or repurchase capital if following the redemption the FHLBank would fail to satisfy any minimum capital requirement. Based on discussions with FHFBS officials and their review of draft capital plans, it appears that a majority of FHLBanks might initially implement an exclusive Class B stock structure, while other FHLBanks might implement a mixed structure. The presence of 5-year capital, combined with the requirement that member institutions lose benefits of membership in the System if they withdraw capital, acts to create a financial interest that mirrors some, though certainly not all, characteristics of publicly traded perpetual equity stock.

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<sup>12</sup> If impairment of the FHLBank's capital were likely, FHFBS could withhold a portion of a withdrawing member's capital stock. In previous reports, we raised the possibility that if pending losses threatened the value of a FHLBank's stock, the FHLBank's voluntary members may try to withdraw their stock before the losses impair its value. We also concluded that, as a practical matter, the degree to which FHFBS's authority makes FHLBank stock a buffer for absorbing losses depends on the extent to which FHFBS exercises its authority to withhold stock redemption. We stated that for FHFBS to use this authority in a way that makes capital stock a meaningful buffer, FHFBS would have to recognize potential future losses in a timely manner and be willing to withhold proceeds from stock redemption requests. We have also consistently supported a more permanent capital structure for the FHLBank System.

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Permanent capital is defined in GLBA as amounts paid in for Class B stock plus the retained earnings. Class A stock plus permanent capital is to be at least 4 percent of assets. Class A stock plus 1.5 times permanent capital is to be at least 5 percent of assets. Therefore, a FHLBank meeting the 4 percent requirement will also meet the 5 percent requirement if its permanent capital equals at least 2 percent of assets. In addition, only permanent capital is included in the capital definition for the risk-based capital component of the minimum capital standards.

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### FHLBank Capital Will Continue to Differ From Capital Issued by Publicly Traded Corporations

Although the new capital structure will result in more permanent capital, FHLBank capital will continue to differ from the capital issued by publicly traded corporations such as the enterprises or banks. The voluntary, cooperative nature of the FHLBank System means that capital in this system has characteristics different from capital issued by publicly traded corporations.

First, the FHLBank stock will not be perpetual equity stock like that issued by publicly traded corporations. Stock issued by publicly traded corporations can be bought and sold freely and publicly at a market-determined price. In contrast, a FHLBank member institution can redeem FHLBank stock at par value<sup>13</sup> as long as all restrictions are met. For example, a member can withdraw capital with prior notice (i.e., of 6 months or 5 years) if after redemption the FHLBank satisfies all minimum capital requirements. However, FHLBank member institutions lose benefits of membership in the System if they withdraw minimum capital required for membership.<sup>14</sup> This lessens incentives to remove capital, if, for example, FHLBank earnings declined.

Second, investors cannot be obligated to buy the stock of publicly traded corporations. However, FHLBank members can be required to buy additional FHLBank stock to ensure that the FHLBank meets its capital requirements. Third, corporations with publicly traded stock have responsibilities to maximize the value of their stock. In contrast, FHLBanks have incentives to provide the best mix of services and dividend payments to their member-owners.

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<sup>13</sup> With respect to FHLBanks, par value is the price at which the member acquired the stock.

<sup>14</sup> If an institution withdraws from the system, it cannot rejoin for 5 years.

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## Each FHLBank's Capital Is Potentially Available Throughout the FHLBank System

Under the new capital structure, the capital of each FHLBank will continue to be available to other FHLBanks in the System because the FHLBanks are jointly and severally liable for the System's outstanding debt securities, called consolidated obligations. Joint and several liability for the payment of consolidated obligations gives investors confidence that System debt will be paid. Another related characteristic of joint and several liability is that it potentially creates a large pool of capital from all FHLBanks to provide a cushion in the event of unexpected System losses. However, joint and several liability also puts all FHLBanks at risk because of the possibility that one FHLBank could become troubled and not be able to meet its debt obligations. In such a situation, the troubled FHLBank would have incentives to undertake risky activities because profits would accrue to the FHLBank's owners, whereas losses and erosion of capital could fall on others. This scenario creates incentives for the FHLBanks to monitor each other's activities, which FHLBank officials told us they do through a number of System-wide bodies of representatives from the 12 FHLBanks.

In theory, joint and several liability appears to make most System capital available in the event of large, unexpected losses in the System. However, concerns about how joint and several liability would operate in the event of a default or delinquency on a consolidated obligation prompted FHFBS to issue regulations in 1999.<sup>15</sup> The regulations establish a process by which FHFBS will look first to the assets of a FHLBank that received the proceeds of the consolidated obligation. The regulations also contain certification and reporting requirements with which the FHLBanks must comply. For example, the FHLBanks must certify before the end of the each calendar quarter that they will remain in compliance with the liquidity requirements and will remain capable of making full and timely payments on their consolidated obligations. A FHLBank that is unable to provide the required certification must provide additional notifications to FHFBS, such as a payment plan specifying the measures the FHLBank will take to make full and timely payments of all its obligations. The regulations also specify that FHFBS may order any FHLBank to make principal and interest payments

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<sup>15</sup> The concerns arose out of the municipal bankruptcy and the resulting receivership of the County of Orange, California, and the ensuing litigation brought by the receiver for Orange County against the FHLBanks. The litigation raised issues concerning liability allocation arising from issuing and servicing consolidated obligations. In addition, the new activities undertaken by the FHLBanks since GLBA prompted at least one FHLBank to suggest that it would be beneficial to clarify how the joint and several responsibility for the consolidated obligations would be allocated if a FHLBank were to experience a payment problem.

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due on any consolidated obligation in the System. In this case, each contributing FHLBank is entitled to reimbursement from the FHLBank that was responsible for making the payment. Liability is to be allocated among the other FHLBanks on a pro rata basis in proportion to each FHLBank's participation in all consolidated obligations.

Joint and several liability provides incentives for the FHLBanks to monitor each other and appears to make most System capital available in the event of large, unexpected losses in the System. However, joint and several liability in a cooperative system has never been tested. The FHLBanks have never defaulted on principal or interest payments due on a consolidated obligation. Another cooperative GSE with joint and several liability, the Farm Credit System (FCS), experienced severe economic stress in the middle-1980s. To provide a broader perspective on joint and several liability, we obtained information on the FCS experience during and following its financial rescue by the federal government. Figure 1 describes the collapse and bailout of FCS in the 1980s and describes the problems invoking joint and several liability in FCS.

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**Figure 1: The Farm Credit System's Experience**

The FCS experience provided an example of how a cooperative system with joint and several liability can take actions in response to a financial crisis and demonstrates the limitations to such a self-help approach. The experience also illustrated limitations in the ability of a cooperative GSE to access debt markets when capital has been largely, but not completely, depleted.

FCS experienced severe economic stress in the middle-1980s due to deterioration in agricultural market conditions, interest rate volatility, and poor management practices. In 1985, FCS reported a \$2.7 billion loss followed by a \$1.9 billion loss in 1986. Amendments to the Farm Credit Act of 1985 formalized the Capital Corporation and authorized it to receive and administer federal assistance from the Treasury. The 1985 amendments provided that federal assistance was only to be considered after FCS's surplus had fallen so low that further contributions from stronger FCS banks or losses at weaker ones would preclude FCS banks from making credit available on reasonable terms. While the joint and several liability provisions were never invoked, the stronger FCS banks transferred over \$1 billion to weaker ones during 1985 and 1986 through a series of complicated capital preservation agreements. However, several healthy FCS institutions challenged in court the requirement that they subsidize unprofitable institutions they did not control. In some instances, the courts upheld the challenges. By mid-1986, the FCS's cost of funds had again begun to rise, reflecting continuing losses and investors' uncertainty over whether the federal assistance authorized by the 1985 amendments would, in fact, be provided.

FCS was able to continue borrowing throughout its financial crisis, but only at a relatively higher cost than it had historically. In 1987, Congress authorized issuing up to \$4 billion in Treasury-guaranteed bonds to fund assistance to FCS, abandoning the self-help approach taken in the Farm Credit Act of 1985. Bonds worth \$1.261 billion were actually issued. In the aftermath of the FCS experience, FCS and Congress took actions to improve monitoring of FCS banks and create mandatory actions to reduce risks to the System when a FCS bank became financially troubled.

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**Safety and Soundness Oversight Is Important**

FHFB supervisory oversight is a very important aspect of implementing a new capital structure. The extent to which the new structure results in an improvement over the old one depends on how the structure is implemented and on FHFB's oversight of the process. Many of the details of the new capital structure will be contained in the capital plans the FHLBanks are currently submitting to FHFB. The approach and criteria FHFB will use to review and approve the capital plans are being determined.

We looked at the Basel Committee on Banking Supervision's New Capital Accord, which is based on three pillars: minimum capital requirements, a supervisory review process, and effective use of market discipline. Although the New Capital Accord is to be applied to banks and their holding companies, its principles can be applied to GSEs as well.

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However, GSE status reduces market discipline, increasing the importance of supervision.

Beyond the FHLBank System's status as a GSE, the unique characteristics of FHLBank capital and the potential for risk taking within the System heighten the importance of supervisory oversight by FHFB. First, even after the new capital structure is in place, FHLBank capital will be less permanent than perpetual equity stock. Therefore, more so than other regulators, FHFB must be prepared to act in case a FHLBank's financial condition weakens. Second, although joint and several liability creates incentives for the FHLBanks to monitor each other's activities, the FHLBanks do not have the authority to direct a financially troubled FHLBank to take corrective actions. However, FHFB does have authorities it can use to take enforcement actions in such a situation.<sup>16</sup>

We last examined FHFB's supervisory oversight of the FHLBank System in 1998.<sup>17</sup> We concluded that FHFB's safety and soundness regulation is increasingly important to protect taxpayer interests due to the System's expanding activities and the changing business environment. We found deficiencies in FHFB's oversight of FHLBanks and made a number of recommendations to improve it. FHFB officials told us they have made progress in implementing these recommendations. However, we have not examined FHFB's supervisory oversight since completing our 1998 report, and therefore we have not verified the completeness of these actions.

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## Risk Management Policies and the New Capital Structure Can Mitigate the Increased Risks Associated With Advances and Mortgage Acquisitions

Expansion in the types of eligible collateral and increased direct mortgage acquisition will increase interest rate, credit, and operations risks in the FHLBank System. Interest rate risk, however, will remain unaffected by the new forms of collateral. The overall amount of risk introduced will depend on the type and amount of advances and mortgage acquisitions undertaken by the FHLBanks, the implementation of risk management practices by the FHLBanks, and oversight provided by FHFB. The new capital structure has the potential to address the risks associated with advances and mortgage acquisitions, because of greater capital permanence, leverage capital requirements, and the development of risk-

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<sup>16</sup> See *Comparison of Financial Institution Regulators' Enforcement and Prompt Corrective Action Authorities* (GAO-01-322R, Jan. 31, 2001).

<sup>17</sup> *Federal Housing Finance Board: Actions Needed to Improve Regulatory Oversight* (GAO/GGD-98-203, Sept. 18, 1998).

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based capital standards. However, capital requirements will not be finalized until FHFB approves capital plans developed by the FHLBanks.

GLBA authorizes advances to member community financial institutions that utilize small business and agricultural loan collateral.<sup>18</sup> These advances are inherently more risky than traditional advances backed by mortgages and generate credit risk that is more difficult to evaluate. However, the financial management policies of the FHLBanks, as reported to FHFB, that we have reviewed reflect the perception that the new collateral will entail greater credit risks than residential mortgage collateral, and the policies call for higher collateral levels compared to traditional advances.

The FHLBanks have also begun implementation of direct mortgage acquisitions with the program begun by the FHLBank of Chicago accounting for a majority of the System's acquisition activity to date. Based on existing direct mortgage acquisition activity, direct acquisition appears to provide regional diversification of mortgage acquisitions and incentives for sound underwriting by member institutions from member exposure to credit risks. However, this activity is relatively new, and its level is expected to grow, thereby increasing risks. In addition, risks could be affected if changes are made in the risk-sharing agreements between the FHLBanks and their member institutions. Increased activity in direct mortgage acquisitions by FHLBanks could also increase competition with the enterprises in the secondary mortgage market. Such increased competition could provide benefits to borrowers, but could also generate additional risks for the FHLBanks, the enterprises, depository institutions, and taxpayers.

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### New Forms of Collateral for Advances Will Increase Credit and Operations Risks

Credit and operations risks for traditional advances utilizing home loan and related types of collateral are relatively low. However, GLBA authorized advances to community financial institutions utilizing small business and agricultural loan collateral that will likely introduce greater credit and operations risk. Interest rate risk will not change, and FHLBanks will continue to manage this risk as they have managed it for traditional advances. The FHLBanks have extensive experience in

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<sup>18</sup> GLBA also authorized FHLBanks to expand the level of advances utilizing what is called other real estate related collateral, which includes commercial mortgages and home equity lines of credit. In this report, the new collateral we focus on is small business and agricultural loan collateral.



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managing their traditional advance business and have developed financial management policies for managing risks, as required by FHFBS.<sup>19</sup> In addition, according to FHFBS, the FHLBanks typically require 10 to 25 percent more than the value of an advance in collateral. Largely due to collateral protection and the System's lien status, FHLBanks have never experienced a credit loss on their advance business.

In contrast to their traditional advance business, advances to community financial institutions utilizing small business and agricultural loan collateral are inherently riskier and generate credit risk that is more difficult to evaluate.<sup>20</sup> First, small business and agricultural loans are more heterogeneous than single-family residential mortgage loans. In particular, small business loans finance businesses involved in a wide range of economic activities. Unlike mortgage loans that have fairly homogeneous characteristics, loans to a wide variety of sectors are more difficult to analyze. In addition, the value of each business is determined largely by the performance of those operating it. In contrast, appraising the value of a housing unit providing collateral for a single-family residential mortgage loan is more straightforward. Operations risk would also increase, because FHLBanks have not fully developed the expertise, information systems, and operational procedures necessary for these new activities.

Both FHFBS and the FHLBanks recognize that the new collateral will entail greater credit risks than residential mortgage collateral. FHFBS requires a FHLBank, prior to accepting the new collateral for the first time, to file a notice to demonstrate that the FHLBank has the capacity to manage the risks associated with the new types of collateral to be accepted.<sup>21</sup> According to FHFBS, the FHLBanks are requiring 65 to 150 percent more collateral over the size of advances when the collateral is loans secured by small businesses or farms. Consistent with the stringency of their financial management policies, officials from the FHLBanks told us that they currently anticipate a low level of funding utilizing small business and agricultural collateral.

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<sup>19</sup> FHFBS officials told us that once FHFBS accepts each FHLBank's capital plan and implements the new capital structure, FHFBS's financial management policy regulations will be replaced with new regulations that address each FHLBank's financial management policies and take into consideration the new capital requirements.

<sup>20</sup> See Comments on *Enterprise Resource Bank Act* (GAO/GGD-96-140R, June 27, 1996).

<sup>21</sup> We reviewed these notifications, which include the relevant credit and collateral policies to be implemented.

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New Forms of Collateral Will Not Change Interest Rate Risk

The FHLBanks have tools to manage interest rate risk, and the introduction of the new forms of collateral for advances will not change the way this risk is managed. The principal source of funds for FHLBanks is the consolidated debt obligations of the System. According to FHFB, each FHLBank calculates various measures of its exposure to interest rate risk. One of the measures is duration of equity.<sup>22</sup> This measures the sensitivity of market value of equity to changes in interest rates. FHFB's financial management policy specifies duration of equity limits, and the FHLBanks are to report the results of their duration of equity calculations to FHFB each quarter. If interest rate risk is well hedged, the market value of equity will change little as interest rates fluctuate.

Lien Status May Result in Increased Costs to Federal Deposit Insurance Funds

The FHLBanks have lien status in which their rights to the collateral they hold generally have priority over other security interests, including insured deposits, in the assets of failed insured financial institutions. Historically, all advances have been secured with collateral. More recently, FHLBanks have also required collateral to secure member-provided credit enhancements on mortgages FHLBanks acquire directly. By statute, FHLBank security interests generally have priority over the claims and rights of any party, including receivers, conservators, and trustees. This preference can result in increased costs to the Federal Deposit Insurance Corporation (FDIC) in resolving a possible bank or thrift failure. Potential expansion in FHLBank System advances, collateral, and direct mortgage acquisition activities could therefore also increase resolution costs to the FDIC.

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Direct Mortgage Acquisitions Will Increase Interest Rate, Credit, and Operations Risks

Interest rate, credit, and operations risks will increase from the direct mortgage acquisition programs implemented by the FHLBanks. Holding mortgage assets exposes FHLBanks to interest rate risk, because the FHLBanks assume the risk for any changes in the market value of the retained mortgage assets. If interest rates increase at a time when new debt has to be issued, borrowing costs will increase while returns from fixed-rate mortgage asset holdings remain constant. Because borrowers tend to prepay and refinance their mortgages when interest rates decline, falling interest rates carry another form of interest rate risk called prepayment risk. To the extent that FHLBanks rely on long-term debt that cannot be refinanced, returns will fall without a corresponding decline in

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<sup>22</sup> Generally, duration describes the average time to each payment on a financial liability (such as a bond) or a financial asset (such as an advance).

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debt costs. The prepayment risk associated with mortgage holdings differs from that associated with advances, because the advances to member institutions carry prepayment penalties. The FHLBanks, however, currently have experience in managing prepayment risk because they have investment holdings of mortgage-backed securities (MBS) and the associated prepayment risk. The FHLBanks and the enterprises tend to use financial instruments such as long-term, callable debt to limit their exposure to interest rate risk from holdings of mortgage assets.

FHLBanks use derivatives and callable debt to hedge interest rate risk resulting from direct investments in mortgage assets. To the extent that the duration of mortgage assets differs from that of debt obligations, FHLBanks often enter into a matching interest rate exchange agreement. This agreement is one form of financial derivative called an interest rate swap, in which the counterparty pays cash flows to the FHLBank designed to mirror, in timing and amount, the cash outflows the FHLBank pays on the consolidated obligation. The FHLBanks also use other financial arrangements to manage interest rate risk. For example, callable debt allows the FHLBank as issuer to buy (i.e., call) back issued debt when interest rates decline. Callable debt is attractive as a source of funds for mortgage asset holdings, because borrowers tend to prepay their mortgages and refinance when interest rates decline. FHLBanks had \$224.5 billion of callable debt outstanding as of December 31, 2000, out of total consolidated obligations of about \$592 billion.

Direct mortgage acquisitions expose the FHLBanks to credit risk. To qualify for FHLBank purchase, as is true for purchase by the enterprises, mortgage insurance is required for mortgage loans with loan to value ratios of over 80 percent. FHLBank purchases have included conventional mortgage loans with private mortgage insurance as well as mortgage loans with federal guarantees or insurance. The FHLBanks' credit risk management includes enforcement of lender guidelines for member institutions participating in direct mortgage acquisition. The FHLBanks have established stated actions they will take to ensure that member institutions follow these guidelines. For example, the FHLBanks are to collect quality control reports from participating members and perform a quality control review on a sampling of the mortgages purchased from each member. Participating members are also subject to audit by the FHLBank or its designated agents. FHLBank establishment and enforcement of guidelines for participating members help the FHLBanks mitigate credit risk by increasing the degree of assurance that lenders meet fundamental standards for originating and servicing mortgages. The FHLBanks credit risk management also includes implementation of lender

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credit enhancement requirements that subject participating member institutions to credit risk. For example, the FHLBank establishes an account in which payments to member institutions are reduced in the event of mortgage defaults. These credit enhancements further help the FHLBanks mitigate credit risk by creating incentives for sound mortgage underwriting and servicing by participating members. The FHLBanks also seek wide geographic distribution of their mortgage acquisitions to limit their exposure to any particular regional economic downturn.

Lenders who hold mortgages and member institutions use an infrastructure to manage their credit risk that is different from the infrastructure used by secondary market entities, such as the enterprises. These institutions can benefit in their management of credit risk from their potential ability to better understand their local markets and thereby the credit risk associated with mortgages they fund or mortgages they sell in which they still take on credit risk. In addition, institutions that take on credit risk from mortgages they originate do not face the moral hazard problems<sup>23</sup> secondary market entities have when they purchase mortgages and take on the associated credit risks. To address the moral hazard problem, secondary market entities develop infrastructures to oversee the lending and servicing practices of lenders from whom they purchase mortgages.

Direct mortgage acquisitions expose the FHLBanks to operations risk, because in the past the FHLBanks had not developed the expertise, information systems, and operational procedures to approve and oversee lenders. Exposure to operations risk is related to the FHLBanks' exposure to credit risk, because new operating infrastructure and procedures are necessary to the extent that member exposure to credit risk reduces the moral hazard problem faced by the FHLBanks. If the FHLBanks have little exposure to credit risk and moral hazard, then operations risk will be lower. The actions taken to avoid moral hazard, including systems used to provide lender oversight, entail operations risk. In contrast, credit and operations risks from traditional advances have been minimal because of collateral requirements.

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<sup>23</sup> The term "moral hazard" has been defined as "a description of the incentive created by insurance that induces those insured to undertake greater risk than if they were uninsured because the negative consequences are passed through to the insurer." In a situation where a secondary market entity purchases mortgages from a lender and takes on the associated credit risk, the lender would have incentives to originate riskier mortgages because profits would accrue to the lender whereas losses could fall on the secondary market entity.

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The FHLBank of Chicago Has Developed a Direct Acquisition Program

As of December 31, 2000, the FHLBanks held slightly over \$15 billion in fixed, long-term, single-family mortgages compared to about \$1.4 billion as of year-end 1999. The FHLBank of Chicago held about half of total mortgage loans in the System.

The majority of direct acquisition activity to date has been accounted for by the program begun by the FHLBank of Chicago, which is named Mortgage Partnership Finance (MPF).<sup>24</sup> MPF was initiated on a pilot basis beginning in 1997. The 10 FHLBanks from Boston, New York, Pittsburgh, Atlanta, Indianapolis, Chicago, Des Moines, Dallas, Topeka, and San Francisco, currently participate in MPF.

Although MPF offers multiple products, they share some common characteristics. First, mortgage purchases are limited to mortgage loans below the conforming loan limit for the enterprises, which is currently \$275,000 for a single-family housing unit. Second, the FHLBank holds an account with funds generated from transactions between the FHLBank and the member bank. This account takes the first-loss position after primary mortgage insurance payments; that is, costs due to borrower mortgage defaults are taken from this account before other sources of funds are utilized to cover credit losses. The funds are generated by providing the FHLBank a price deduction at time of sale and/or from an annual flow of payments. The latter device is often called a spread account, because it represents a spread between payments due to the member institution from the FHLBank (e.g., to compensate the member for taking on credit risk) and payments actually made by the FHLBank.<sup>25</sup> Third, for some MPF products the member institution is required to supply additional credit enhancements in the form of direct loss guarantees and/or supplemental insurance to provide a second-loss position before the FHLBank is exposed to credit losses. The loss positions taken by the first-loss account and the second-loss supplemental insurance and lender guarantees are lender provided credit enhancements. By FHFBS regulation, the FHLBank requires the member institution to provide collateral to secure direct loss guarantees provided by the lender. The collateral is

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<sup>24</sup> "Mortgage Partnership Finance" and "MPF" are registered trademarks of the FHLBank of Chicago.

<sup>25</sup> With MPF products, the FHLBank pays the member institution a guarantee fee. For some MPF products, when defaults occur, guarantee payments to the member institution are reduced.

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protected by the lien status applicable to collateral used to secure advances.

The FHLBank of Chicago has two primary means of achieving regional diversification of its credit risk. First, it purchases mortgages from member institutions that are affiliated with large, nationwide lenders, and second, it invests in the mortgage acquisitions (called participations) made by the nine other FHLBanks that participate in MPF. Table 1 presents the geographic distribution of MPF mortgages as of year-end 2000. Based on all MPF mortgage loans to date, it appears that regional diversification has been achieved.<sup>26</sup> According to FHLBank of Chicago officials, MPF serves both large and small FHLBank member institutions.

**Table 1: Regional Distribution of MPF Mortgage Loan Balances Outstanding as of Dec. 31, 2000**

Region	Share of MPF mortgage loans
Northeast	22%
Southeast	15
Midwest	24
Southwest	16
West	22

Note: Regions are as follows:

Northeast—Connecticut, Delaware, Washington D.C., Massachusetts, Maine, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia; Southeast—Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, Puerto Rico, South Carolina, Tennessee, and Virgin Islands; Midwest—Illinois, Indiana, Iowa, Michigan, Minnesota, North Dakota, Ohio, South Dakota, and Wisconsin; Southwest—Arkansas, Colorado, Kansas, Louisiana, Missouri, Nebraska, New Mexico, Oklahoma, Texas, and Wyoming; and West—Alaska, Arizona, California, Guam, Hawaii, Idaho, Montana, Nevada, Oregon, Utah, and Washington.

Source: FHLBank of Chicago.

### Three FHLBanks Have Jointly Developed a Direct Acquisition Program

The FHLBanks of Cincinnati, Indianapolis, and Seattle participate in the other direct mortgage acquisition program, which is named the Mortgage Partnership Program (MPP). MPP was initiated near year-end 2000. As of year-end 2000, less than \$500 million in mortgage loan holdings were accounted for by the FHLBanks participating in MPP.

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<sup>26</sup> We did not analyze the regional diversification of individual loan pools purchased by the FHLBanks through MPF. A lack of regional diversification of individual loan pools could affect credit risk exposure to the FHLBank to the extent that a member institution could not meet its contractual payment obligations.

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MPP is in its infancy compared to MPF. The products share some of the basic characteristics of MPF. A notable difference between MPP and MPF is that to date MPP participants have only been larger member institutions. Another difference is that the FHLBank MPP participants generally do not expect to enter into participations with the other MPP FHLBanks, even though the program parameters allow for such participations. Without joint participation among the three FHLBanks on individual mortgage pools, geographic diversification of mortgage assets might be limited if small member institutions, which are not diversified geographically, provide a large share of MPP activity.

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### Risks Can Be Sensitive to Changes in Risk-Sharing Arrangements

Two major FHFBS regulatory requirements that limit the risks of MPF and MPP are (1) the member institution is to assume the first-loss position in the transaction as defined by FHFBS and (2) each loan pool is to receive an investment grade rating based on FHFBS approved rating criteria and loan pools with ratings below AA (i.e., double-A) must be supported by additional retained earnings or reserves.<sup>27</sup>

#### The Member Institution Assumes the First-Loss Position

FHFBS regulations require member institutions to be in the first-loss position (i.e., after primary mortgage insurance). FHFBS uses an economic definition of first-loss position in implementing its regulation. In an accounting sense, it may not be apparent that the member is in a first-loss position, because the account that takes the first-loss might not be on the balance sheet of the member institution. However, the member institution is at risk because defaults reduce payments from the first-loss account to the member institution. These payments represent a fee paid to members for assuming credit risk. When losses from defaults occur, the account covers the losses and payments to the member are subsequently reduced. Therefore, this structure should help provide incentives to member institutions through the sharing of credit risks for sound underwriting and loan servicing practices.

#### Each Loan Pool Is Required to Receive an Investment Grade Rating to Mitigate FHLBank Credit Risk

Another FHFBS regulatory requirement that limits the risks of MPF and MPP is the requirement that each loan pool receive an investment grade rating based on FHFBS approved rating criteria, and loan pools with ratings below double-A must be supported by additional retained earnings or

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<sup>27</sup> FHFBS requires an investment grade rating at least equal to the fourth highest rating. The four highest ratings are triple-A, double-A, A, and triple-B.

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reserves.<sup>28</sup> FHFB has approved rating criteria contained in the computer package LEVELS, a product of the rating agency Standard & Poors. To date, participating FHLBanks have required a double-A rating. A double-A rating is the second highest rating attainable. LEVELS considers credit risk characteristics for loans in a mortgage pool, such as loan-to-value ratio, mortgage insurance coverage, economic conditions and expected house price changes in the metropolitan area where the residence is located, and borrower credit history. Based on these characteristics, LEVELS calculates the credit support necessary from the first-loss account and, when applicable, supplemental insurance to achieve the double-A rating. Standard & Poors officials we interviewed stated that LEVELS provides a comprehensive credit analysis of a mortgage pool. They also told us that LEVELS does not consider some factors that could affect FHLBank risk exposure such as the capacity of the member institution and the first-loss account to meet continuing obligations.

FHFB's required investment grade rating, especially if participating FHLBanks require a double-A rating from LEVELS, should help to limit credit risk faced by the FHLBanks based on a thorough credit analysis of each mortgage pool. Participating FHLBanks can further limit credit risk and thereby improve the performance of their acquired mortgage portfolios above what the LEVELS' model predicts by achieving regional diversification of their portfolios.<sup>29</sup> In addition, LEVELS does not consider factors such as concentrations of FHLBank credit risk with individual member institutions that may have limited capacity to meet their continuing obligations. Due in part to strategies to limit credit risk that can be implemented by participating FHLBanks and risk factors not considered by LEVELS, capital supervision of direct mortgage acquisitions by FHFB is important to ensure the safety and soundness of the System.

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<sup>28</sup> The latter requirement is effective until FHFB's risk-based capital rule becomes effective.

<sup>29</sup> According to Standard & Poors officials, LEVELS assumes a nationwide worst-case scenario, and regional diversification by a FHLBank could result in improved economic performance in the event of a regional economic downturn.



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## The Capital Structure Being Established Has the Potential to Address the Increased Risks of New Activities

FHFB published a risk-based capital regulation on January 30, 2001, that, if properly implemented, can establish a capital structure with the potential to address the increased risks of new activities. The capital regulation establishes classes of capital with varying degrees of permanence, leverage requirements, and risk-based capital requirements to be implemented. Each FHLBank is expected to hold capital commensurate with its credit, interest rate, and operations risk. FHFB's risk-based capital regulation requires credit risk to be calculated using four broad categories based on an evaluation of the credit risk associated with different types of assets and positions. This evaluation is based in part on the loss history of relevant assets with particular ratings and maturities. FHFB directed each FHLBank to develop its own internal risk-based model to estimate interest rate exposures and calculate risk-based capital requirements for interest rate risk. These internal models are to be approved by FHFB in connection with the approval of each FHLBank's capital plan, which is to be submitted to FHFB by October 29, 2001. The internal models must meet FHFB's technical restrictions and use interest rate scenarios approved by FHFB. FHFB's regulation includes a risk-based capital requirement to cover operations risk.

FHFB's minimum leverage requirement establishes two activity-based minimum capital ratios; both ratios must be met. The simplest measure is total capital equal to 4 percent of assets. The second measure is total capital equal to 5 percent of assets when permanent capital is weighted by 1.5 and other capital is weighted by 1. Only permanent capital is included in the capital definition for the risk-based capital component of the minimum capital standards.

FHFB's capital regulation included capital requirements for the credit risk of assets in two categories: advances and rated mortgage assets.<sup>30</sup> According to the published regulation, the credit risk capital requirement for advances was based on the highest estimated (proportional) loss by rating category and maturity class observed over a 2-year period of actual corporate bond data from the interval 1970 to 1999. FHFB also used its judgment to establish capital requirements. FHFB officials told us that the numeric capital requirements are subject to refinement based on FHFB's ongoing research.

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<sup>30</sup> FHFB's capital regulation also included capital requirements for the credit risk of other rated assets and unrated assets.

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FHFB's risk-based capital requirement for advances assumes little credit risk exists. Although FHLBanks have never incurred credit losses on advances backed by traditional mortgage collateral or securities, FHFB decided to impose capital requirements on advances. The capital requirement on long-term advances is higher than on short-term advances. FHFB used its judgement to set a capital requirement on all advances that includes some credit risk. This capital requirement is intended to reflect the potential credit risks created by new types of collateral. FHFB oversight of collateral policies and other aspects of FHLBank risk management of new collateral will be important, because all advances are included in the same category, and the new collateral entails greater credit risk than traditional advances collateral.

Credit risk percentage requirements for residential mortgage assets are based on FHFB's analysis of residential MBS and their ratings. In developing the capital requirements for mortgage assets, FHFB also took into account the requirements set by other regulators.<sup>31</sup> In general, the risk-based capital requirements for mortgage assets, such as mortgages on both single-family and multifamily units or MBS, vary with the creditworthiness of the assets.

FHFB's capital regulation, with its rating-based approach, allows capital requirements to vary based on the credit risk of the mortgage assets. In the case of MPF and MPP, participating FHLBanks have required a credit rating of double-A on each mortgage pool acquired. As stated earlier in this report, the double-A rating is to be based on a thorough credit analysis of each mortgage pool acquired. MPF and MPP assets are expected to become an increasing part of the assets held by the FHLBanks.

FHFB directed each FHLBank to create its own internal risk-based model to estimate interest rate risk exposures and calculate risk-based capital requirements for interest rate risk. The exposure to interest rate risk in each model is to depend on the level of stress from interest rate movements taking into account any hedges that affect the actual exposure to interest rate movements. These internal models must meet FHFB's technical requirements and use interest rate scenarios approved by FHFB.

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<sup>31</sup> Commercial banks have a 400 basis point requirement on residential mortgages, and 160 basis point requirement on mortgage-backed securities issued by GSEs. In addition, the leverage ratio for the enterprises on their own MBS held by other investors is 45 basis points.

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FHFB's regulation contains a stated preference that the internal models created by the FHLBanks be based on a value at risk approach. Using this approach, the loss is estimated based on several possible interest rate patterns in the future. FHFB must approve the interest rate scenarios used in the internal models and has placed some technical requirements on the models themselves. Each FHLBank is required to have sufficient permanent capital to meet the value at risk level established by FHFB, as well as other capital requirements.

FHFB's regulation requires that the FHLBanks maintain sufficient risk-based capital to cover operations risk, although GLBA did not stipulate such a requirement. FHFB's capital requirement for operations risk is 30 percent of the total capital required to cover interest rate and credit risk, but it may be reduced to no lower than 10 percent if a FHLBank can demonstrate to the satisfaction of FHFB that it has insurance or some other means to justify the reduction.

Appendix IV contains further discussion of FHFB's capital regulation.

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## Business With GSEs Affects Members' Capital Requirements and Risks

As alternatives to holding mortgages on their own balance sheet, depository institutions have a number of ways to obtain GSE funding for mortgage assets and thereby transfer some or all of the related risks. How these assets are funded and how the risks are transferred or shared has important implications for regulatory capital treatment at both the depository institution and at the GSE. For example, when mortgages along with all the attendant risks are sold outright to a GSE, the only relevant capital requirement would be at the GSE level. Alternatively, when a depository institution purchases an MBS issued by a GSE, there is a capital charge imposed at the depository level that is to reflect the credit risk of GSE obligations as well as a capital charge at the GSE level. For those funding arrangements in which credit risk is maintained, in whole or in part, at the depository institution level, the capital treatment by the depository institution regulators and the GSE regulators interact.<sup>32</sup> From an integrated perspective it is important that risks and capital requirements are in proper relation to one another. Otherwise certain arrangements can be disadvantaged if capital charges are too high or

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<sup>32</sup> A primary purpose of regulatory capital for depository institutions is to protect the deposit insurance funds. The primary purpose of regulatory capital for the GSEs is to reduce the probability that a financial emergency leading to government intervention to rescue a GSE would occur.

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advantaged if they are too low. As such, supervision is particularly important.

Depository institutions that engage in secondary market transactions with GSEs must hold capital based on (1) the amount of GSE obligations in their portfolios, (2) their capital investment in the GSEs, and (3) the risks retained when selling or transferring mortgage assets to a GSE. The depository regulators we interviewed told us that they generally assign relatively low credit risk weights to depository institution holdings of GSE obligations, because they take into account the perception of implied federal backing of GSE obligations. The regulators told us that depository institution holdings of FHLBank debt, enterprise debt, and enterprise MBS are in the 20 percent risk category.<sup>33</sup> Thus, rather than the general requirement of \$8 in capital for each \$100 of assets in the 100 percent risk category, such as unsecured loan assets, \$1.60 of capital is required (that is, 8 percent of \$20). Therefore, depository institutions that sold mortgages in the secondary market and purchased an equivalent amount of GSE backed MBS would lower their credit risk and their capital requirements. In fact, the combined capital requirement, including the capital requirement at the GSE level, would be lower possibly reflecting the GSEs' ability to reduce overall credit risk through geographic diversification. Currently, depository institutions are required to hold \$4 in capital for each \$100 in mortgage loan holdings and \$1.60 of capital for each \$100 in enterprise MBS holdings, and the enterprises are required to hold capital equal to 0.45 percent of MBS issued and held by outside investors. Thus, the transfer can result in \$2.05 of total capital required rather than \$4 of capital required without the transfer of assets.

The depository institution regulators have also established capital requirements for the risk associated with depository institution investments in GSE equity. The regulators told us that currently FHLBank capital is in the 20 percent risk category although they are actively reviewing this capital treatment and considering the new capital structure being established for the FHLBank System. In addition, they told us that enterprise equity is generally in the 100 percent risk category; the one exception is the Office of the Comptroller of the Currency, the regulator of national banks, which places enterprise equity in the 20 percent risk

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<sup>33</sup> Depository institution regulators have risk-based capital regulations that place assets into risk buckets based on associated credit risks. For example, unsecured loans are in the 100 percent risk bucket, whole mortgage loans are in the 50 percent risk bucket, and Treasury securities are in the zero percent risk bucket.

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weight category. The regulators stated that their supervision activities address concentrations of pledged assets and risks at individual depository institutions that could result from heavy reliance on FHLBanks as a funding source.

The depository institution regulators have provided guidance on the risk-based capital treatment of only one MPF program, MPF 100. Under this program, the member institution acts as agent for the FHLBank, underwriting, servicing and providing a credit enhancement for residential mortgage pools. The member receives fees for the credit enhancement that it provides. The FHLBank provides a first-dollar loss protection cushion equal to 100 basis points of the total mortgage pool's unpaid balance. As the FHLBank incurs credit losses allocable to this protection, the credit enhancement fees paid by the FHLBank to the member are reduced. However, the credit enhancement fees are not recorded on the balance sheet of the member institution until received. The second-loss credit enhancement provided by the member institution is sized so that the senior piece held by the FHLBank would have the credit quality equivalent to a double-A rating.

The depository institution regulators determined that since expected receipt of the guarantee fees by the member institution is not a balance sheet asset, and since the member institution is under no obligation to pay anything to the FHLBank, there is no risk of loss to the member's capital. The only consequence to the member institution in the case of credit losses is the receipt of a lower level of credit enhancement fees. Because expected credit losses would not affect the member's balance sheet, the depository institution regulators determined that the FHLBank is in the first-loss position. They determined that the member institution's capital requirement would be based on the face value of the second-loss credit enhancement.

In contrast, the FHFB analysis of the credit enhancement structure of MPF 100 leads to a different result.<sup>34</sup> According to the FHFB analysis, because the member institution's credit enhancement fees are reduced if the FHLBank incurs losses from the first-loss cushion due to mortgage defaults, the member's fees are contingent upon the performance of the

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<sup>34</sup> FHFB regulations require the member institution to bear the direct economic consequences of actual credit losses in an amount at least equal to the expected credit losses and positioned in the credit enhancement structure no later than immediately after expected losses.

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mortgage pools. FHFB determined that because the member bears the economic responsibility of the expected credit losses from the first dollar of loss, the member is effectively in the first-loss position.

While the depository institution regulators have provided guidance on one particular mortgage participation product, they have yet to opine on others. It is also likely that new products could arise with various combinations of credit risk sharing arrangements. The depository institution regulators have issued proposed regulations that would change the risk-based capital treatment of credit enhancements. The rules currently in effect provide for differing capital treatment for credit enhancements that have the same economic effect, depending on whether the credit enhancement is retained in a sale of assets or acquired in some other way. The regulators have proposed a more consistent treatment of economically equivalent credit enhancements. The cost of regulatory capital associated with credit enhancements could change based on the content of final regulations.

The Enterprises Questioned the Adequacy of the FHLBank System's Capital Structure to Support Direct Mortgage Acquisitions

During the course of this assignment, enterprise officials we interviewed raised questions about the adequacy of the capital structure of the FHLBank System as it relates to the risks posed by the direct acquisition of mortgages. In particular, it was suggested that if you view the FHLBank System, including its membership, as if it were a holding company then the System, in certain cases, could be viewed as engaging in "double leveraging." According to this view, the member financial institutions use their own capital to directly support their own activities but finance their purchases of FHLBank stock with deposits, debt, or other instruments not acceptable as regulatory capital. Figure 2 provides more information on double leveraging.<sup>35</sup>

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<sup>35</sup> The enterprises, at times during the course of this assignment, provided a different approach to leverage that resulted in higher levels of calculated capital leverage. We focused on their suggested holding company approach.

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**Figure 2: Double leveraging**

Double leverage can occur when a parent company of a financial holding company issues debt or other instruments that are not acceptable as regulatory capital and downstreams the proceeds to a subsidiary in the form of equity or other elements of regulatory capital. To address this concern, regulators of bank and thrift holding companies require that balance sheets be consolidated when such financial arrangements among closely controlled affiliates represent significant levels of activity for the parent company. Based on this analogy, the enterprises stated that the member institution can be thought of as the parent and the FHLBank can be thought of as the subsidiary.

Enterprise officials told us that FHLBank capital is not adequate to support the risks of direct mortgage acquisition, because debt issued to finance the investment is a liability on the balance sheet of the FHLBank, the investment is an asset on the balance sheet of the FHLBank, and the capital of the FHLBank is downstreamed noncapital proceeds from member institutions.

This approach appears to be an analogy based on accounting flows resulting from on-balance sheet investments by the FHLBanks. Based on our analysis, there appear to be countervailing factors that lessen the applicability of the analogy as a way of analyzing the ability of capital to address the risks of FHLBank mortgage acquisitions. First, the approach focuses on leverage directly, rather than on the relationship between capital and risks. The present risk sharing arrangements, which include the requirement that the member institution be in the first-loss position, limit credit risk to the FHLBank. At the member institution level, depository institution regulators rely on supervisory tools to limit exposure to potential risks resulting from FHLBank mortgage acquisitions.

As a second countervailing factor, MPF and MPP are not the only secondary mortgage market programs that reduce total capital requirements. When the enterprises purchase mortgages from depository institutions, capital requirements for the depository institutions are reduced without a corresponding increase in enterprise capital requirements. As stated above, depository institution regulators generally assign relatively low credit risk weights to depository institution holdings of GSE obligations. One reason why the capital requirements at the enterprise level are lower is that the enterprises can reduce credit risk through geographic diversification of their mortgage servicing portfolios.

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However, the relationship between the credit risk reduction from geographic diversification and the reduction in total capital required has not been established. As in the case of FHLBank mortgage acquisitions, depository institution regulators rely on regulatory oversight.

As a third countervailing factor, even if capital should be consolidated between FHLBanks and member institutions in some manner, the holding company analogy lacks sufficiency as a method of analysis. Consolidation of balance sheets has the most merit in the case of a parent holding company that controls a subsidiary in which the parent funds the closely controlled subsidiary with instruments not acceptable as regulatory capital and in turn uses the subsidiary as an investment vehicle. In the case of the FHLBank System, a parent holding company does not exist. The FHLBank System is a cooperative in which member institutions provide System capital, but no one member appears to hold a controlling interest in the corporate governance decisions of any one FHLBank. In addition, joint and several liability combined with all voluntary membership motivates the FHLBanks to monitor each other's financial activities.

While we have treated the concept of double leveraging as a distinct issue, the more fundamental concern raised by the enterprises appears to be associated with the nature of FHLBank capital. While we agree that the capital is not perpetual equity capital, it will become more permanent. However, we have not addressed the issue as to whether 5-year capital combined with statutory and regulatory restrictions on withdrawal of capital will result in the optimal level of permanence.

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## Increased Secondary Market Competition Can Generate Risks

MPF and MPP, while structured differently than the secondary market products offered by the enterprises, can generate increased competition in the secondary mortgage market. In a 1996 report, we addressed the implications of authorizing another GSE to compete with the enterprises.<sup>36</sup> In that report, we assumed that the newly authorized GSE would have a similar charter and be subject to the same regulatory requirements to compete with the enterprises. Therefore, the GSE would also operate in a similar manner to the enterprises. We indicated that such authorization could

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<sup>36</sup> *Housing Enterprises: Potential Impacts of Severing Government Sponsorship* (GAO/GGD-96-120, May 13, 1996).



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- increase the overall amount of GSE activity in the mortgage market and, as a result, raise the potential amount at risk in case of a government bailout;
  - increase the level of GSE risk, because entities operating in new markets often have greater managerial and operations risk than those operating in established markets;
  - increase credit risk if the new entity attempted to establish market share by lowering underwriting standards; and
  - increase competition and thereby reduce mortgage interest rates to borrowers.

Risks in the FHLBank System will increase from its direct mortgage acquisition activity. The acquisition activity could also generate benefits to borrowers and potential risks for the enterprises. The degree to which increased competition could affect risk-taking by the FHLBanks and the enterprises is among the unknowns in this competitive process. However, such developments also create potential risks for taxpayers and therefore challenges for both FHFBS and OFHEO.

The introduction of the mortgage acquisition programs by the FHLBank System has implications for competition between and the regulatory oversight of the System and the enterprises. The mortgage acquisition programs of the FHLBank System increase competition between the System and the enterprises. In past reports we have recommended, and we still support, combining the GSE regulators into one agency and authorizing the agency to oversee both the safety and soundness and mission compliance of the FHLBanks, Fannie Mae, and Freddie Mac.<sup>37</sup> We have pointed out the advantages of combining oversight responsibilities in one agency. Such an agency could be more independent and objective than the separate regulatory bodies and could be more prominent than either one alone. Although the GSEs operate differently, the risks they manage and their missions are similar. The regulators' expertise in evaluating GSE risk management could be shared more easily within one agency. In addition, a single regulator would be better positioned to be cognizant of specific mission requirements, such as special housing goals and new programs or initiatives any of the GSEs might undertake, and should be better able to assess the competitive effect on all three housing GSEs and better ensure consistency of regulation for GSEs that operate in similar markets. Having all staff in one regulatory agency should also

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<sup>37</sup> See *Government-Sponsored Enterprises: Advantages and Disadvantages of Creating a Single Housing GSE Regulator* (GAO/GGD-97-139) July 9, 1997.

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facilitate coordination and sharing of expertise among staff responsible for safety and soundness and mission compliance. Given the introduction of mortgage acquisition programs by the FHLBanks, the ability of a single regulator to assess competitive effects among the three housing GSEs and to better ensure consistency of regulation for the housing GSEs becomes relatively more important.

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## FHFB and OFHEO Approach Risk-Based Capital Regulations Differently

FHFB and OFHEO risk-based capital regulations are meant to ensure that the FHLBanks and enterprises maintain sufficient capital to weather stressful economic conditions and address credit, interest rate, and operations risks. However, we are unable to assess the relative stringency of each regulator's approach to risk-based capital, for two reasons. First, the final specifications of the risk models for both OFHEO and FHFB are not yet available. Second, even if the final specifications were available, differences in the assets and liabilities held by the FHLBanks and the enterprises create different risk patterns. These differences, in turn, led to different modeling approaches, making comparisons difficult. Although we cannot provide an overall assessment of the stringency of each regulator's approach, we can compare certain attributes of the modeling approaches and their strategies and procedures for estimating credit, interest rate, and operations risk. We also provide a comparison of the effects of the leverage requirement on the FHLBanks and the enterprises.

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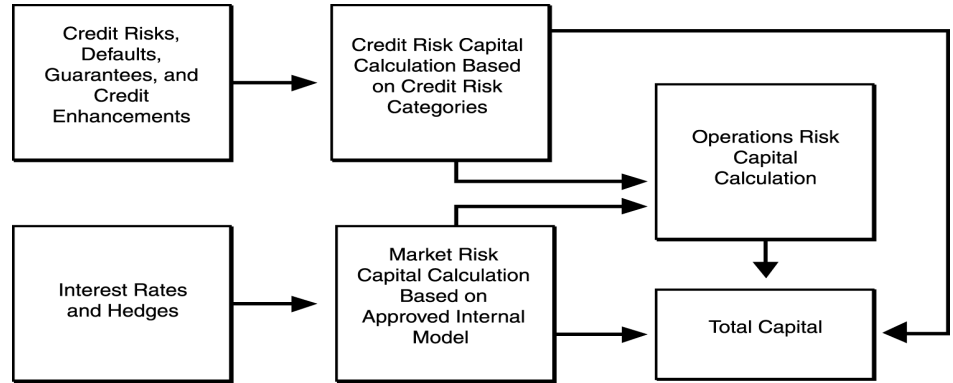
## FHFB's Risk-Based Capital Regulation

GLBA gave FHFB discretion to establish credit and interest rate scenarios to be covered by permanent capital.<sup>38</sup> In implementing GLBA, FHFB decided to require FHLBanks to hold capital for operations risk. The amount of permanent capital required under the risk-based capital regulation is the sum of capital for credit risk, interest rate risk, and operations risk. Figure 3 is a simplified illustration of FHFB's approach to risk modeling and calculating capital.

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<sup>38</sup> For consistency throughout this report, interest rate risk is the term used to designate the effects of movements in market prices on the financial condition of a firm. GLBA used the term market risk. Interest rate risk is the dominant determinant of market risk for FHLBanks.

**Figure 3: Simplified Illustration of FHFB’s Approach to Risk Modeling and Capital Calculation**



Source: GAO analysis of FHFB information.

## OFHEO’s Risk-Based Capital Regulation

The Federal Housing Enterprises Financial Safety and Soundness Act of 1992 (the 1992 act) established OFHEO as an independent regulator within the Department of Housing and Urban Development (HUD). OFHEO’s mission is to ensure the enterprises’ safety and soundness. The 1992 act also authorized OFHEO to develop a risk-based capital regulation that addresses credit, interest rate and operations risks. OFHEO began developing its regulation upon its creation in 1993. OFHEO has developed its own cash flow model to estimate risks and calculate the total capital needed to cover credit and interest rate risk.<sup>39</sup> The 1992 act specified the stresses that the model must address. The risk-based capital regulation also requires capital for operations risk. For risk-based capital, total capital is the sum of a general allowance for foreclosure losses, common stock, perpetual noncumulative preferred stock,<sup>40</sup> paid-in capital, and retained earnings.

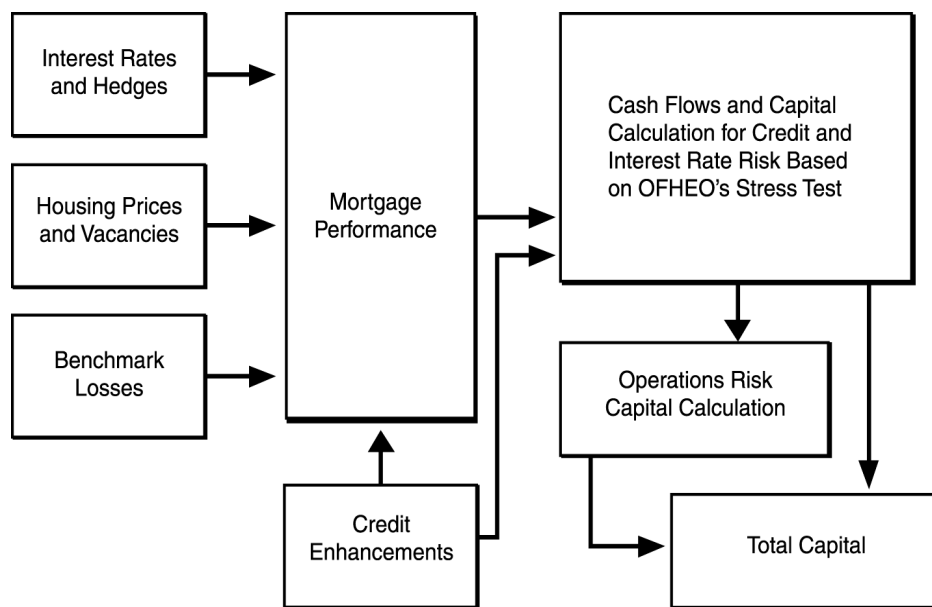
<sup>39</sup> This discussion of OFHEO’s risk-based capital regulation is based on the Second Notice of Proposed Rulemaking, published in the *Federal Register* on April 13, 1999. Details may differ in the final rule.

<sup>40</sup> Perpetual noncumulative preferred stock is stock that has a priority claim to dividends over common equity stock. However, if a dividend is missed on perpetual noncumulative stock, holders of that stock do not receive payment for this missed dividend in future time periods, while holders of perpetual cumulative preferred stock would receive payment for missed dividends in the future.

OFHEO did its own modeling of the risks for both enterprises so that the enterprises would face identical analytical measures of their risks based on their own assets, liabilities, and off-balance sheet positions. However, the model this approach uses does not reflect any business strategies that are unique to either enterprise.

Figure 4 is a simplified illustration of OFHEO’s approach to risk modeling and risk-based capital calculation. OFHEO runs a single model in which the capital calculations for credit risk and interest rate risk are based on the model’s estimates of how much capital each enterprise needs. This approach ensures that both credit risk, which is based on benchmark<sup>41</sup> losses, and interest rate risk are integrated in a cash flow model. Appendix IV provides a more detailed description of FHF’s and OFHEO’s risk-based capital requirements.

**Figure 4: Simplified Illustration of OFHEO’s Stress Test and Capital Calculation**



Source: GAO analysis of OFHEO information.

<sup>41</sup> The benchmark losses are based on criteria established by the 1992 act.

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## FHFB's and OFHEO's Modeling Approaches Differ

Generally, FHFB has not directly modeled risks in its risk-based capital regulation. For credit risk, FHFB has depended on data on historic losses, the loss history of relevant assets with particular ratings and maturities, and its own judgments to determine appropriate levels of risk-based capital. For interest rate risk, FHFB decided to establish a framework that each FHLBank must adhere to when it models its own interest rate risk. This approach made it possible for FHFB to publish its regulation within 15 months of GLBA. However, we have not been able to evaluate the interest rate risk models that are yet to be developed by each FHLBank and subsequently approved by FHFB.

In contrast, OFHEO used a complex modeling approach to determine risks and calculate required capital. This approach permitted OFHEO to fine-tune feedbacks between interest rate risk and credit risk and explicitly model the factors that created losses associated with particular assets. However, this approach was difficult to implement and created delays in the actual implementation of risk-based capital regulations for the enterprises.

Under the 1992 act, Congress set criteria for OFHEO to use in establishing the stress test for credit, interest rate, and operations risk in risk-based capital regulation. In contrast, GLBA required FHFB to create risk-based capital requirements for the FHLBanks taking due consideration of any risk-based capital test established by OFHEO pursuant to the 1992 act. GLBA allowed FHFB to choose the economic scenarios used in modeling credit and interest rate risks. On its own initiative, FHFB added operations risk to its version of risk-based capital regulation.

FHFB developed capital calculations based on balance sheet data, the market value of the portfolio for interest rate risk, and expected losses for credit risk. OFHEO developed capital calculations that begin with initial balance sheet positions but then use a 10-year cash flow stress test based on specified interest rate scenarios and credit stresses over the 10-year period. In the 1992 act, OFHEO was directed to run its model assuming that no new business would occur during the 10-year stress period except for already committed business of the enterprises. Therefore, enterprise assets, liabilities, and off-balance sheet positions decline over time in OFHEO's model. FHFB's balance sheet approach estimates the market value of the FHLBank's portfolio at risk under the financial stress scenarios and thus does not require an assumption about new business. FHFB's test is to be applied monthly while OFHEO's test is to be applied quarterly.

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## FHFB's and OFHEO's Strategies and Procedures for Calculating Capital Requirements Differ

FHFB and OFHEO have different strategies for calculating the capital needed to cover risks. FHFB requires that the FHLBanks calculate the capital needed to cover credit risk and interest rate risk separately. OFHEO jointly calculates capital needed for credit risk and interest rate risk. FHFB stated that in periods of stress, a positive correlation exists between interest rate risk and credit risk.<sup>42</sup> Given this positive correlation, they stated that a separate calculation of interest rate risk and credit risk is a conservative approach to calculating required capital. In contrast, OFHEO officials stated that their single calculation of the capital needed to cover credit and interest rate risk permits the model to deal with real-world feedbacks between interest rate movements and credit losses. FHFB and OFHEO also calculate capital required for operations risk based on the amount of capital required for credit and interest rate risk, although FHFB may reduce the amount required if a FHLBank demonstrates that it qualifies for a lower requirement.

## FHFB and OFHEO Take Different Approaches to Calculating Capital Requirements for Credit Risk

FHFB's and OFHEO's actual procedures for estimating credit stresses and calculating the capital required to cover credit risk differ. FHFB uses asset and position credit risk categories and assigns credit risk capital requirements for assets and positions in each category. In making these determinations, FHFB uses its own judgment and available information on factors such as default losses, credit ratings, and capital regulations for other regulated firms. For mortgage assets acquired from members with credit risk-sharing arrangements, FHFB depends on the results of a model from a credit rating agency to estimate and limit credit risk. In contrast, OFHEO uses a more granulated approach based on detailed econometric modeling. This approach allows the agency to address the effects of numerous variables on credit losses directly in its own model.

## FHFB and OFHEO Have Different Procedures to Calculating Capital Requirements for Interest Rate Risk

FHFB's and OFHEO's approaches to calculating the capital required to cover interest rate risk differ. FHFB uses a value at risk model that estimates changes in the value of capital based on hundreds of historical interest rate scenarios that represent possible stresses on the FHLBanks. The scenarios are to be applied to each FHLBank's balance sheet and should represent periods of significant economic stress. The interest rate scenarios are based on actual interest rate changes during periods that last

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<sup>42</sup> As evidence of this correlation, FHFB cited work by Mark Carey in *Prudential Supervision: What Works and What Doesn't*, ed., Frederic S. Mishkin, National Bureau of Economic Research, 2001.

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120 business days and cover historical interest rate movements since 1978. The test requires the FHLBank to hold capital sufficient to cover all but the worst 1 percent of potential losses. In contrast, OFHEO uses a 10-year cash flow model and two interest rate scenarios—one for a rising rate and the other for a falling rate. In each OFHEO interest rate scenario, the interest rate adjusts during the first year and then remains at the new level for the remainder of the 10-year period. According to OFHEO officials, both interest rate changes are greater than what has been observed historically over any 1-year period. The amount of capital required to cover interest rate risk is the amount of capital needed to cover the worst of the two mandated interest rate scenarios.

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#### FHFB and OFHEO Have Different Procedures to Calculate Capital Requirements for Operations Risk

Although GLBA did not require FHFB to establish a risk-based capital requirement to cover operations risk, FHFB decided such a requirement was needed. FHFB's capital requirement for operations risk is 30 percent of the total capital required to cover interest rate and credit risk but may be reduced to no lower than 10 percent if a FHLBank can demonstrate to the satisfaction of FHFB that it has insurance or some other means to justify the reduction. In contrast, the 1992 act that directed OFHEO to establish risk-based capital requirements for operations risk specified that capital for operations risk be equal to 30 percent of the total capital required for credit and interest rate risks.

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#### FHFB and OFHEO Minimum Leverage Requirements May Affect the Regulated Entities Differently

Minimum leverage requirements establish minimum capital levels a firm must hold irrespective of the level of risk it assumes. The leverage ratios required by statute differ for the FHLBanks and enterprises. The minimum leverage ratio for FHLBanks is measured in two ways; both ratios must be met. The simplest measure sets total capital at 4 percent of assets. The second measure sets total capital at 5 percent of assets, with permanent capital weighted by 1.5 and other capital weighted by 1. For the enterprises, the minimum leverage requirement is based on both the on-balance sheet and off-balance sheet positions. Off-balance sheet positions are generally guaranteed mortgage-backed securities held by investors but managed by the enterprises. Thus, the OFHEO rule includes more than just the assets held by the enterprises. The required leverage ratio for on-balance sheet assets is 250 basis points (2.5 percent), while the ratio for off-balance sheet positions is generally 45 basis points (.45 percent).

FHFB and OFHEO also define capital for the leverage ratios differently. OFHEO uses core capital in the minimum leverage requirement. Core capital is the sum of outstanding common stock, outstanding perpetual noncumulative preferred stock, paid-in capital, and retained earnings.

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FHFB's total capital for the leverage ratio includes shorter-term Class A stock, longer-term Class B stock, and retained earnings. FHFB's alternative 5-percent leverage ratio reflects the longer-term nature of Class B stock and retained earnings by valuing Class B stock and retained earnings at 150 percent of par value when calculating capital for the 5-percent leverage ratio. To the extent that FHLBanks develop a capital structure based on Class B stock, they will be using more permanent capital. In contrast, enterprise capital is never redeemable.

**FHFB's Leverage Requirement Will Initially Affect FHLBank Capital Levels More Than the Risk-Based Capital Requirement**

FHFB officials said they anticipate that when the capital plans are implemented, the risk-based capital requirement for all FHLBanks will be below the minimum leverage requirements under GLBA. This will be the case, in part, because FHLBanks are expected to establish an exclusive Class B or a mixed Class A and B capital structure. FHFB officials told us that based on seven draft capital plans submitted to FHFB, six of the FHLBanks indicated that they expect to establish an exclusively Class B structure initially because of the adverse tax consequences associated with a multiple class structure. However, three of these FHLBanks indicated that they anticipate issuing Class A stock in the future. Over time, issuing Class A stock and increasing mortgage acquisitions could cause a FHLBank's risk-based capital requirement to exceed its leverage requirement. However, FHFB's risk-based capital requirement is unlikely to constrain operations initially, given the current business of the FHLBanks.

**OFHEO's Risk-Based Capital Requirement May Limit the Enterprises More Than Its Leverage Requirement**

OFHEO's risk-based capital requirement may limit the enterprises more than the leverage requirement. In the Second Notice of Proposed Rulemaking, OFHEO estimated that Fannie Mae would not have had sufficient capital to meet its the risk-based capital requirement on either September 30, 1996, or June 30, 1997, although Freddie Mac would have been in compliance with its risk-based capital requirement. However, both Fannie Mae and Freddie Mac had sufficient capital to meet the leverage requirement.

**FHFB's and OFHEO's Risk-Based Capital Regulations Are Subject to Transition Rules With Differing Effective Dates**

In FHFB's risk-based capital regulation, the capital structure plan of each FHLBank is to specify the date on which the plan shall take effect and may provide for a transition period of up to 3 years to allow the FHLBank to come into compliance. During the transition period the FHLBanks are expected to remain in compliance with the preexisting leverage based requirement. FHFB officials told us that the implementation of the risk-based capital requirements depends on the submission of capital plans, including internal models for interest rate risk, from all FHLBanks by



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October 29, 2001. In addition, FHFBS must approve the plans, including any transition plans needed to ensure that the FHLBanks attain compliance with risk-based capital requirements.

For the enterprises, the risk-based requirement becomes effective when the final rule is published in the *Federal Register* and can be enforced 1 year after it is published. The rule for the capital requirement was cleared by the Office of Management and Budget on July 16, 2001.

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## Conclusions

The FHLBank System is currently establishing a new capital structure that, if properly implemented, is likely to be an improvement over the historic structure. Capital will become more permanent and new risk-based and leverage capital requirements will also be implemented. The new capital structure has the potential to address the risks associated with advances as well as the direct acquisition of mortgages. However, it is too early to assess the overall adequacy of the structure, because the capital plans and risk management practices to be implemented by the FHLBanks and capital supervision practices to be followed by FHFBS are not yet known.

Based on activity to date, direct acquisition appears to provide regional diversification of mortgage acquisitions and incentives to member institutions for sound mortgage underwriting and servicing through the sharing of credit risks. However, risks could be affected if changes are made in the level of mortgage acquisition activity and in the risk-sharing agreements that are currently present between the FHLBanks and their member institutions. Such changes might also increase the importance of risk-based capital requirements compared to FHFBS leverage requirements.

Going forward, risks in the FHLBank System will increase due to expanded collateral provisions in GLBA and direct mortgage acquisition activity. Effective mitigation of that risk will depend on risk management by the FHLBanks, the adequacy of the capital structure, and oversight by FHFBS. In addition to the FHLBanks, the acquisition activity could also generate additional risks for the enterprises. Although currently the FHLBank System and the enterprises primarily engage in different business activities, these differences may decrease if direct mortgage acquisition activity grows dramatically. Having one housing GSE regulator for safety and soundness and mission compliance would provide greater independence and objectivity, greater prominence, improved ability to

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assess the competitive impact of new initiatives on all housing GSEs, and improved ability to ensure consistency of regulation of GSEs that operate in similar markets.<sup>43</sup>

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## Recommendations

This report does not contain any new recommendations.

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## Agency Comments

The Chairman of FHFB provided written comments on a draft of this report, and these comments are reprinted in appendix V. FHFB and OFHEO provided technical comments on a draft of this report. The FHLBanks, enterprises, and depository institution regulators also provided technical comments on draft excerpts of this report that we shared with them. We incorporated technical comments into this report where appropriate.

The Chairman of FHFB stated that we did a commendable job of analyzing important and complex FHLBank System issues. His letter drew attention to some of our findings related to the potential of the new capital structure for the FHLBanks to address risks and the MPP and MPF programs. His letter also stated that our past recommendations, with regard to regulatory oversight, have been well received with many having been implemented.

FHLBank of Chicago officials wanted us to characterize the MPF first-loss account as an account established by the FHLBank, rather than as a lender provided credit enhancement. Our characterization is based on the FHFB requirement that the member institution bear the economic cost of expected credit losses. For example, the MPF arrangement in which the FHLBank is reimbursed by the member institution when defaults occur through the reduction of fees paid to the member is a mechanism in which the lender's credit enhancement is used to improve the rating of the mortgage pool acquired by the FHLBank.

A Freddie Mac official provided comments addressing Freddie Mac's concern about "double leveraging."<sup>44</sup> He stated that in addition to the risks posed by the direct acquisition of mortgages, Freddie Mac also has a

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<sup>43</sup> See *Government-Sponsored Enterprises: Advantages and Disadvantages of Creating a Single Housing GSE Regulator* (GAO/GGD-97-139, July 9, 1997).

<sup>44</sup> The draft report excerpt we shared with the enterprises was limited to our characterization of their views related to double leveraging. Fannie Mae officials thought that our characterization of their view was accurate.

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broader concern that relates to the overall fragility of the FHLBank System. He stated that the risk of member institutions withdrawing their capital in response to FHLBank losses is a direct result of the nonpermanent nature of the FHLBank System capital stock even after the GLBA reforms. He specifically referred to the potential for a run on the FHLBank System if member institutions had advanced knowledge of potential future financial losses.

We have addressed the question of capital adequacy directly by analyzing the relationship between capital and risks. We have treated the concept of double leveraging as a separate issue. In our discussion of the double leveraging concept, we made revisions to reflect the concern about the nature of FHLBank capital.

We will send copies of this report to the Chairman of the Board of FHFB, Director of OFHEO, Presidents of the FHLBanks, Chief Executive Officer of Fannie Mae, and Chief Executive Officer of Freddie Mac. We will also make copies available to others upon request.

Please contact me or William B. Shear at (202) 512-8678 if you or your staff have any questions concerning this report. Key contributors to this report were Rachel DeMarcus, Kristi A. Peterson, and Mitchell B. Rachlis.



Thomas J. McCool  
Managing Director  
Financial Markets and  
Community Investment

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*List of Congressional Committees*

The Honorable Paul S. Sarbanes  
Chairman  
The Honorable Phil Gramm  
Ranking Minority Member  
Committee on Banking, Housing,  
and Urban Affairs  
United States Senate

The Honorable Michael G. Oxley  
Chairman  
The Honorable John J. LaFalce  
Ranking Minority Member  
Committee on Financial Services  
House of Representatives

The Honorable Richard Baker  
Chairman  
The Honorable Paul Kanjorski  
Ranking Minority Member  
Subcommittee on Capital Markets, Insurance,  
and Government Sponsored Enterprises  
Committee on Financial Services  
House of Representatives

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# Appendix I: Scope and Methodology

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To describe the capital structure of the Federal Home Loan Bank (FHLBank) System, we reviewed Federal Housing Finance Board (FHFB) capital standards and regulations; conducted research on the role of capital in government-sponsored enterprises (GSE) with a cooperative system; reviewed our prior work addressing risk-based capital and the FHLBank System; and interviewed financial institution regulatory body and GSE officials. To analyze the adequacy of the capital structure of the FHLBanks, we also reviewed relevant literature on interest rate, credit, and operations' risks; analyzed FHLBank proposals for the use of expanded collateral provisions and permissible uses of advances under the Gramm-Leach-Bliley Act (GLBA) of 1999; and analyzed FHLBank applications to FHFB and other information on FHLBank direct mortgage acquisition programs.

During the course of this assignment, officials from Fannie Mae and Freddie Mac made presentations to us and provided extensive information reflecting their perspectives on the adequacy of the capital structure of the FHLBank System. On May 17, 2001, Freddie Mac provided us a consultant's report addressing the adequacy of the capital structure of the FHLBank System. We considered the information provided by the enterprises in conducting our work.

We analyzed information the FHLBanks considered to be proprietary. Therefore, we did not report specific details of the various FHLBank products. For example, due to this limitation, we did not report data on the Mortgage Partnership Program and provided general information on Mortgage Partnership Finance. To compare and contrast the risk-based capital standards proposed by FHFB to the standard proposed by OFHEO, we analyzed the standards; reviewed information provided by and interviewed officials from the enterprises, the FHLBanks, FHFB, and OFHEO; and reviewed comments on the proposed standards. The FHLBanks are yet to complete their capital plans implementing their new capital structures, which limited the scope of our analysis. In addition, although we made observations of some elements of risk management that appear to be present at the FHLBanks, we did not analyze risk management procedures employed by the FHLBanks, FHFB's oversight of risk management, nor the risks associated with FHLBank investments. Furthermore, we did not verify the accuracy of data provided by FHFB and the FHLBanks. We also did not analyze the risks of activities that have been or might be undertaken by either Fannie Mae or Freddie Mac. We conducted our work in Washington, D.C., between February 2001 and June 2001, in accordance with generally accepted government auditing standards. Written comments on a draft of this report from FHFB appear

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in appendix V. We also obtained technical comments from the FHLBanks, enterprises, depository institution regulators, FHFB, and OFHEO that have been incorporated where appropriate.

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# Appendix II: Background Information on the FHLBank System, Fannie Mae, Freddie Mac, and Their Regulators

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The FHLBank System is a GSE consisting of 12 federally chartered FHLBanks and the System's Office of Finance that are privately and cooperatively owned by member institutions. The FHLBanks are located in Boston, MA; New York, NY; Pittsburgh, PA; Atlanta, GA; Cincinnati, OH; Indianapolis IN; Chicago, IL; Des Moines, IA; Dallas, TX; Topeka, KS; San Francisco, CA; and Seattle, WA; with each FHLBank serving a defined geographic region of the country. The FHLBanks raise funds by issuing consolidated debt securities in the capital markets. The System was set up in 1932 to extend mortgage credit by making loans, called advances, to its member institutions, which in turn lend to home buyers for mortgages. Home mortgage loans and other collateral secure advances. These advances help member institutions, originally limited to thrifts and insurance companies, by enhancing liquidity and providing access to national capital markets. In 1989, as part of the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA), Congress opened membership to nonthrift federally insured depository institutions that offer residential mortgage loans. Thrifts with federal charters remained in the System as mandatory members while nonthrift institutions were voluntary members. GLBA created all voluntary membership and expanded the purposes of System advances with corresponding expansion in eligible collateral for community financial institutions. As of December 31, 2000, the FHLBanks held about \$438 billion in advances to members; \$186 billion in investments, \$16 billion in directly acquired mortgage assets; and \$31 billion in capital, of which \$728 million was in the form of retained earnings. In addition, the System had 7,777 members, which included 5,681 commercial banks, 1,547 thrifts, and 549 credit unions and insurance companies. Additional financial information on the FHLBanks is presented in appendix III.

Congress chartered Fannie Mae and Freddie Mac as government-sponsored, privately owned and operated corporations to enhance the availability of mortgage credit across the nation during both good and bad economic times. Fannie Mae's headquarters is located in Washington, D.C. and Freddie Mac's is in McLean, Virginia. The enterprises are to accomplish this mission by purchasing mortgages from lenders (banks, thrifts, and mortgage bankers) who can then use the proceeds to make additional mortgage loans to home buyers. The enterprises issue debt to finance mortgage assets that they retain in their portfolios. A majority of purchased mortgages, however, are pooled to create mortgage-backed securities (MBS) that are sold to investors. The enterprises collect fees for guaranteeing the timely payment of principal and interest on MBS held by investors. At year-end 2000, the enterprises had combined debt obligations of about \$1.1 trillion and combined MBS obligations to investors of about

\$1.3 trillion (a total of about \$2.4 trillion). Additional financial information on the enterprises is presented in appendix III.

FIRREA created FHFBS as an independent agency within the executive branch, with a five-member board of directors. FHFBS is organized into 6 offices and had about 95 permanent employees as of December 31, 2000. FHFBS's annual budget is about \$24 million, which is financed with assessments on the FHLBanks. The functions of three offices are most relevant to capital supervision of the FHLBanks. The primary responsibility of the Office of Supervision is to ensure the safety and soundness and mission-compliance of the FHLBanks; it conducts the federally mandated annual examinations of all FHLBanks. The Office of Policy and Office of General Counsel provide assistance to and share oversight responsibility with the Office of Supervision. These three offices have about 54 employees, of which 14 are in the Office of Supervision.

The Federal Housing Enterprises Financial Safety and Soundness Act of 1992 (the 1992 act) established OFHEO as an independent regulator within the Department of Housing and Urban Development (HUD) whose mission is to help ensure the enterprises' safety and soundness. Under the 1992 act, OFHEO's director has independent authority pertaining to matters of safety and soundness. OFHEO's primary means for fulfilling its mission are establishing capital standards for the enterprises and conducting on-site examinations to assess their management practices and financial condition. OFHEO has about 87 full-time equivalent employees and an annual budget of about \$20 million. OFHEO's expenses are funded with assessments on the enterprises. However, unlike FHFBS, OFHEO is subject to the annual appropriations process.



# Appendix III: Financial Information on the FHLBank System, Fannie Mae, and Freddie Mac

This appendix provides basic financial information on the FHLBank System, Fannie Mae, and Freddie Mac. Table 2 is a consolidated summary balance sheet of the FHLBank System. Table 3 presents information on the advances<sup>45</sup> and total assets of each FHLBank as of December 31, 2000. Tables 4 and 5 provide selected financial highlights for Fannie Mae and Freddie Mac.

As indicated in table 2, the FHLBank System has grown substantially over the past 5 years. The total assets in the FHLBank System increased 124 percent between December 31, 1996 and December 31, 2000; and advances increased 171 percent over the same time period. At the end of 2000, the assets in the FHLBank System totaled nearly \$654 billion. In comparison, the assets of Fannie Mae and Freddie Mac totaled \$675 billion and \$459 billion, respectively. (See tables 4 and 5.)

**Table 2: FHLBanks' Consolidated Summary Balance Sheet as of Dec. 31, 1996-2000**

	2000	1999	1998	1997	1996
Dollar amounts in millions					
<b>Assets</b>					
Advances	\$437,861	\$395,747	\$288,189	\$202,265	\$161,372
Mortgage Loans, net	16,149	2,026	966	37	—
Investments	186,437	171,425	137,193	140,106	125,231
Other assets	13,240	14,014	7,654	6,167	5,432
<b>Total Assets</b>	<b>\$653,687</b>	<b>\$583,212</b>	<b>\$434,002</b>	<b>\$348,575</b>	<b>\$292,035</b>
<b>Liabilities</b>					
Consolidated obligations	\$591,606	\$525,419	\$376,715	\$304,493	\$251,316
Deposits and borrowings	17,100	17,624	25,805	18,445	18,257
Other liabilities	13,716	11,154	8,730	6,463	5,586
<b>Total Liabilities</b>	<b>\$622,422</b>	<b>\$554,197</b>	<b>\$411,250</b>	<b>\$329,401</b>	<b>\$275,159</b>
<b>Capital</b>					
Capital stock outstanding	\$30,537	\$28,361	\$22,287	\$18,833	\$16,540
Retained earnings	728	654	465	341	336
<b>Total Capital</b>	<b>\$31,265</b>	<b>\$29,015</b>	<b>\$22,752</b>	<b>\$19,174</b>	<b>\$16,876</b>

Source: Federal Home Loan Banks 2000 Financial Report.

<sup>45</sup> FHLBank advances are essentially collateralized loans to member institutions—which include savings banks, commercial banks, savings and loans, credit unions, and insurance companies.

Table 3 presents the level of advances and total assets at each FHLBank at the end of 2000. The FHLBanks vary significantly in size. Total assets ranged from about \$27 billion at the FHLBank of Topeka to \$140 billion at the FHLBank of San Francisco. The amount of advances outstanding ranged from about \$18 billion to \$110 billion at the same FHLBanks. The percentage of total assets made up of advances also varied among the FHLBanks. At the FHLBank of Chicago, advances made up only 52 percent of total assets, while at the FHLBank of San Francisco, advances made up 78 percent of assets. Other assets at FHLBanks may include cash or investments such as U.S. government-agency securities or high-quality, short-term investments like federal funds sold, certificates of deposit, and commercial paper.

**Table 3: FHLBank Advances and Total Assets as of Dec. 31, 2000**

<b>FHLBank</b>	<b>Advances outstanding</b>	<b>Total assets</b>	<b>Advances as a percentage of total assets</b>
Dollars in millions			
Boston	\$21,594	\$38,282	56%
New York	52,396	76,600	68%
Pittsburgh	25,946	45,063	58%
Atlanta	58,249	80,641	72%
Cincinnati	31,935	55,615	57%
Indianapolis	24,073	33,391	72%
Chicago	18,462	35,389	52%
Des Moines	21,158	35,531	60%
Dallas	30,195	43,843	69%
Topeka	17,582	26,787	66%
San Francisco	110,031	140,190	78%
Seattle	26,240	45,392	58%

Source: Federal Home Loan Banks 2000 Financial Report and GAO analysis of data.

As shown in Tables 4 and 5, Fannie Mae and Freddie Mac have also grown substantially over the past 5 years. Fannie Mae's total assets increased 92 percent between December 31, 1996 and December 31, 2000; while Freddie Mac's assets increased 164 percent over the same time period. Their off-balance sheet obligations also increased.<sup>46</sup> For example, Fannie Mae's

<sup>46</sup> Off-balance sheet obligations may include guaranteed mortgage-backed securities (MBS), commitments to purchase mortgages or to issue and guarantee MBS, credit enhancements, and certain hedge instruments.

**Appendix III: Financial Information on the  
FHLBank System, Fannie Mae, and Freddie  
Mac**

outstanding net MBSs increased 29 percent from \$548 billion in 1996 to \$706 billion at the end of 2000. Freddie Mac's participation certificates (PC) increased 22 percent from \$473 billion to \$576 billion.

**Table 4: Fannie Mae Selected Financial Highlights as of Dec. 31, 1996-2000**

	2000	1999	1998	1997	1996
Dollar amounts in millions					
Retained mortgage portfolio, net	\$607,399	\$522,780	\$415,223	\$316,316	\$286,259
Total assets	675,072	575,167	485,014	391,673	351,041
Debt securities, net	642,682	547,619	460,291	369,774	331,270
Total liabilities	654,234	557,538	469,561	377,880	338,268
Stockholders equity	20,838	17,629	15,453	13,793	12,773
Total MBS, net	706,100	678,600	636,600	578,700	548,173

Source: Fannie Mae Annual Reports and OFHEO's 2000 Report to Congress.

**Table 5: Freddie Mac Selected Financial Highlights as of Dec. 31, 1996-2000**

	2000	1999	1998	1997	1996
Dollar amounts in millions					
Retained mortgage portfolio, net	\$385,693	\$324,443	\$255,009	\$164,421	\$137,755
Total assets	459,297	386,684	321,421	194,597	173,866
Debt securities, net	426,754	360,581	287,234	172,321	156,491
Total liabilities	443,865	374,602	309,978	186,154	166,271
Stockholders' equity	14,837	11,525	10,835	7,521	6,731
Total PCs, net	576,101	537,883	478,351	475,985	473,065

Source: Freddie Mac Annual Reports and OFHEO's 2000 Report to Congress..

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# Appendix IV: Summary of FHFB's and OFHEO's Risk-Based Capital Requirements

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This appendix summarizes FHFB's and OFHEO's risk-based capital requirements for the FHLBanks and the enterprises, respectively.

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## FHFB's Risk-Based Capital Requirement

FHFB's risk-based capital requirements are meant to ensure that the FHLBanks maintain sufficient capital to weather stressful economic conditions. The requirements address credit, interest rate, and operations risks.

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## FHFB's Capital Requirements for Credit Risk

FHFB's capital requirements separate FHLBank assets and positions into four credit risk categories and establish capital levels within these categories. The four categories are (1) advances, (2) rated mortgage assets, (3) rated assets and positions other than advances or mortgages, and (4) unrated assets. For the first three categories, maturity and/or a credit rating from a nationally recognized credit rating agency are the factors determining the capital charge for an asset or position. Longer terms to maturity and lower credit ratings increase the capital requirement because they tend to increase credit risk. All unrated items have an 8-percent capital requirement, except for cash, which has a zero capital requirement. The capital requirements extend to off-balance sheet items; also credit enhancements such as guarantees can reduce the credit requirements, if the providers have credit ratings superior to that of the FHLBank asset or position.

## Risk-Based Capital Required for Advances Assumes Little Credit Risk Exists

Although FHLBanks have never incurred credit losses on advances backed by traditional mortgage collateral or securities, FHFB decided to impose capital requirements on all advances, including short-term advances. FHFB's requirement assumes that advances will exhibit the same losses as the highest investment grade (triple-A) corporate bonds and that advances would have a recovery rate of 90 percent. FHFB stated this recovery rate is consistent with overcollateralization and other protections afforded advances. Additionally, longer term advances have higher capital requirements, because risks tend to increase with terms to maturity.

Even though traditional advances have little credit risk, FHFB recognized that new expanded collateral available to support advances may have greater credit risk. As a result, it set a capital requirement for advances that includes some credit risk. The expanded collateral includes real estate related collateral, such as commercial mortgages and home equity lines of credit, as well as nonmortgage agricultural loans and small business loans. Because of the unknown risk created by new types of collateral, FHFB used its judgment to set the capital requirement on all advances. For

example, advances with less than 4 years maturity have a 7 basis point capital requirement even though FHFBS had calculated the appropriate capital requirement to be 0 basis points.<sup>47</sup> This imposition of 7 basis points reflects, in part, concerns about potential credit risks in the new types of collateral. In contrast, when the term to maturity on advances exceeds 10 years, the capital requirement is 35 basis points.

To ensure sufficient collateral protection is available against advances, the extent of overcollateralization for different assets varies.

Overcollateralization is the extent to which the book value of collateral exceeds the book value of the advances it secures. Overcollateralization increases for riskier assets. FHFBS expects FHLBanks to determine the appropriate level of overcollateralization to be imposed on nontraditional collateral permitted by GLBA. During the regular examination of FHLBanks, FHFBS will examine the amount of overcollateralization required by the FHLBanks for different assets, if they permit nontraditional collateral to back advances. Based on FHFBS's supervision and examination approach to collateral policies, the risk-based capital regulation assumes that credit risk is equalized across all advances.

### Risk-Based Capital Requirements for Residential Mortgage Assets Reflect Credit Ratings

The credit risk requirements for residential mortgage assets was based on credit ratings by major credit rating agencies. When developing the capital requirements for mortgage assets, FHFBS also took into account the requirements set by other regulators.<sup>48</sup> In general, the risk-based capital requirements for mortgage assets, such as mortgages on both single-family and multifamily units or MBSs, vary with the creditworthiness of the assets.

The final rule is based on the assumption that the collateral underlying the residential mortgage assets will typically consist of conforming, prime quality loans with loan-to-value ratios below 80 percent as well as loans with higher loan-to-value ratios with appropriate mortgage insurance. FHFBS also assumes that the performance of any credit enhancement is reasonably ensured in all relevant economic stress scenarios and that the FHLBank's portfolios of residential mortgage assets will have appropriate

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<sup>47</sup> A basis point is one one-hundredth of a percentage point.

<sup>48</sup> Commercial banks have a 400 basis point capital requirement on residential mortgages, and 160 basis point requirement on MBSs issued by GSEs. In addition, the leverage ratio for the enterprises on their own MBSs held by other investors is 45 basis points.

diversification and that credit enhancements will take account of any geographic or other concentrations that increase credit risk.

Based on the above constraints, FHFB assigned credit risk requirements. For example, for unsubordinated<sup>49</sup> residential mortgage assets in the highest investment grade—triple A—residential mortgage assets have a 37 basis point capital requirement; unsubordinated mortgage assets in the second investment grade—double A—have 60 basis points capital requirement, and unsubordinated mortgage assets in the fourth highest investment grade—triple B—have a 120 basis points capital requirement.

In contrast, subordinated residential mortgage assets with ratings below triple-A can have higher capital requirements. For example, subordinated residential mortgage assets with a triple-B rating have a 445 basis point capital requirement.

Risk-based capital requirements are set on residential mortgages assets acquired by the FHLBank, where the FHLBank and the member selling the mortgage asset share credit risk as is the case in MPF and MPP. To date, participating FHLBanks have required the equivalent of a double-A on each residential mortgage asset acquired based on a model created by S&P. These mortgage assets have a 60 basis points capital requirement—the requirement for any double-A rated residential mortgage asset. Mortgage assets, where credit-risk is shared with members, are expected to become an increasing part of the assets held by the FHLBanks.

#### FHFB Risk-Based Capital Requirements for Assets Other Than Advances and Mortgages

FHFB has established risk-based capital requirements for assets other than advances or mortgages that are also rated. Risk-based capital requirements for such assets increase with decreasing creditworthiness and increasing terms to maturity. For example, U.S. securities of any maturity have 0 basis point capital requirement while for triple-A rated corporate assets the requirement ranges from 15 basis points to 220 basis points, with the requirement increasing with an increasing term to maturity. Lower rated assets carry a 100-percent capital requirement.

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<sup>49</sup>Unsubordinated residential mortgage assets based on a given pool of mortgages receive full payments of what is due to them before subordinated residential mortgage assets of that pool receive any payments.

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Unrated Items Are Given  
Specific Risk-Based Capital  
Requirements

Capital requirements for unrated assets are set according to type of asset. This category includes cash, premises and equipment, and investment assets that have not received ratings from the major rating agencies. Cash has a zero capital requirement, while premises and equipment have an 8-percent capital requirement. FHFB has assigned an 8-percent capital requirement to all investment assets that are unrated. This is the same as the requirement that the Basel Committee of Bank Supervisors assigns to unrated assets in its proposed revision of the bank capital standards.

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FHFB's Capital Structure  
Encompasses Off-Balance  
Sheet Items and Credit  
Enhancements

Risk-based capital requirements are also established for off-balance sheet assets such as commitments to purchase loans and standby letters of credit.<sup>50</sup> The risk-based capital rule establishes credit conversion factors that convert off-balance sheet positions into asset equivalents. Each position is multiplied by its credit conversion factor, measured as a percent, to obtain the nominal value needed to determine the credit risk capital requirement.

Risk-based capital requirements for derivatives are based on their current and potential risks and vary by type of derivative and term to maturity. Potential future risk exposures can be determined from a table in the regulation or a FHFB approved internal model. For example, in the table, interest rate derivative contracts with a term less than 1 year have a conversion factor of 0 percent, while for equities, the conversion factor is 6 percent. When the term exceeds 5 years, the conversion factor for interest rate derivative contracts is 1.5 percent, and the conversion factor for equities is 10 percent. The final regulation also establishes procedures to address the effects of multiple derivatives between two parties.

The FHFB's capital requirements can reflect credit enhancements such as third-party guarantees of an asset held by a FHLBank. If the credit enhancement or its provider has a rating from a major rating agency, the capital requirement will accord with the enhancement, if the FHLBank asset is lower rated or unrated.

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<sup>50</sup> A standby letter of credit is a commitment by a FHLBank to make a payment if certain conditions are met. Such payments are made on behalf of a customer.

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## FHFB Requires Each FHLBank to Hold Capital for Interest Rate Risk Based on the FHLBanks' Internal Models

The risk-based capital regulation requires each FHLBank to hold capital for interest rate risk equal to the sum of two calculations. One calculation estimates the potential losses in the FHLBank's portfolio under parameters specified by FHFB. The other measure is the amount by which the market value of total capital falls short of the adjusted book value of capital, in the event that the market value of capital is below this accounting benchmark.

FHFB prefers that the internal models be based on a value at risk<sup>51</sup> approach, which estimates level of capital that will prove sufficient to absorb losses in all but the worst 1 percent of the time. In a value at risk approach, the loss is estimated based on alternative possible interest rate patterns over the chosen time period. However, if approved by FHFB, a cash flow model can be used by a FHLBank as an alternative to a value at risk approach. When estimating interest rate risk and calculating capital required, each FHLBank is required to have sufficient permanent capital to meet the value at the risk level established by FHFB. The exposure to interest rate risk in each model is to depend on the level of stress from interest rate movements and any hedges used which affect the actual exposure to interest rate movements. These internal models must meet FHFB's technical restrictions and use interest rate stress scenarios approved by FHFB.

Additionally, added permanent capital will be required if the FHLBank's current market value of total capital, based on the estimated market value of assets minus market value of liabilities, at the time of the capital requirement analysis, is less than 85 percent of the FHLBank's book value of capital. The added capital will be the difference between the market value of the capital and 85 percent of the book value<sup>52</sup> of the FHLBank's capital. This requirement was implemented because FHFB was concerned that the book value of capital might not adequately reflect the economic value of capital in some cases. This requirement forces the capital

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<sup>51</sup> Value at risk is an estimate of the potential losses that might occur in a portfolio due to changes in market rates, based on a specified period of time during which the rates change, and at a specified probability level. For example, a firm may generate a value at risk estimate for a 10-day period at 99 percent probability and arrive at a figure of \$1 million. This means that 99 percent of the time it would expect its losses during a 10-day move of rates to be less than \$1 million.

<sup>52</sup> The book value of capital is calculated under Generally Accepted Accounting Principles and can differ from the market value of capital, which is adjusted for changes in interest rates and other market prices.



available to cover interest rate risk to have a market or economic value of at least 85 percent of the book capital value. This requirement is consistent with a value at risk approach, which calculates the market value of capital available under different economic stresses.

FHFB also established technical restrictions on how the internal value at risk model was to be designed in its risk-based capital regulation. FHFB required that the probability of a loss greater than the estimate of the market value of the bank's portfolio at risk shall not exceed 1 percent.<sup>53</sup> Thus, the estimated net market value of the portfolio will cover estimated losses 99 percent of the time. In the regulation, FHFB directed each FHLBank to assume a stress period of 120-business days, based on historic interest rates from 1978 to 1 month before the capital requirement is calculated. FHFB stated that the periods chosen should be representative of the periods of greatest potential stress in the market given the FHLBank's portfolio. FHFB officials told us that the 120-day periods will overlap. A new period will start at the first of each month since 1978. This provides about 270 periods for the analysis. In a value at risk analysis with a 1 percent confidence interval, this means capital required for interest rate risk will be sufficient to cover estimated losses in 267 out of a total of 270 stress periods.

FHFB directed each FHLBank to develop a model that is comprehensive given the FHLBank's capabilities. In addition, FHFB stated that the internal models may incorporate empirical correlations among interest rates or other market prices.<sup>54</sup> Lastly, FHFB required that the model be independently validated and satisfactory to FHFB.

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## FHFB Requires Capital for Operations Risk

Although GLBA did not require FHFB to establish a risk-based capital requirement to cover operations risk, FHFB decided such a requirement

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<sup>53</sup> To the extent the FHLBanks appropriately hedge their positions in terms of match funding or hedging instruments, there is less chance that movements in interest rates will lead to large losses.

<sup>54</sup> Another technical restriction is that FHLBank models should also address nonlinearities where the value of certain positions may not change for small changes in interest rates, even though larger changes in interest rates can create significant changes in the value of those positions. Mortgage prepayments can exhibit nonlinearity because borrowers may not prepay for a small decline in market rates. However, if rates decline enough, prepayments can accelerate as the market rate falls below the rate on a higher percentage of existing mortgages.

was needed. FHFBS's capital requirement for operations risk is 30 percent of the total capital required to cover interest rate and credit risk, but it may be reduced to no lower than 10 percent if a FHLBank can demonstrate to the satisfaction of FHFBS that it has insurance or some other means to justify the reduction.

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## OFHEO's Risk-Based Capital Requirement

OFHEO's risk-based capital requirements are meant to ensure that the enterprises maintain sufficient capital to weather stressful economic conditions. These requirements also address credit, interest rate, and operations risks.

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## OFHEO Calculates Risk- Based Capital Requirements for Credit and Interest Rate Risk in an Integrated Model

OFHEO has developed its own cash flow model to estimate risks and calculate total capital needed to cover credit and interest rate risk. OFHEO runs a single model in which the capital calculations for credit risk and interest rate risk are based on the model's calculation of how much capital is needed by each enterprise. To determine credit risks the model must include information on housing prices, vacancies and credit enhancements, as well as other variables that affect credit risk. To determine interest rate risk the model must include information on interest rates, interest rate hedges and other variables that affect interest rate risk.

The purpose of OFHEO's stress test is to calculate whether sufficient capital was set aside at the beginning of the 10-year stress test period to cover all benchmark losses and interest rate stress losses and to leave the enterprise with a positive capital amount in each accounting period and at the end of the stress period. Once the capital needed for credit and interest rate risk is calculated in the stress test, total required capital is the sum of capital for interest rate risk and credit risk plus 30 percent of this sum to cover operations risk.

The intent in integrating the stresses for credit risk and interest rate risk is to permit the OFHEO model to better deal with feedbacks between interest rate movements and losses due to credit risk. For example, when interest rates fall, prepayments accelerate, and this leads to a decline in the value of mortgages on the balance sheets of each enterprise. At the same time, the level of credit risk in the remaining mortgages may increase if borrowers with poorer credit ratings cannot prepay. In addition, other factors such as the recent history of interest rates and the number of mortgages at different interest rates may interact with declining rates to affect prepayments. Consequently, the cash flow model can only calculate

credit risk changes due to prepayments, if the values of all variables that affect prepayments and credit risk are fully specified in the model. To fully understand how interest rate risk and credit risk interact, a modeler would have to test different mixes of input variables, including interest rate changes. However, the accuracy of any feedbacks found in the model would depend on the quality of the model and how well it specified the underlying economic relationships that create losses due to interest rate movements and defaults.

Congress Established Criteria  
to Create Benchmark Losses  
for Credit Risk Stress in the 10-  
Year Stress Test

The credit stress, during the stress period, is specified in the 1992 act. The benchmark loss for credit risk is the “worst cumulative credit losses for 2 consecutive years in contiguous states encompassing at least 5 percent of the U.S. population”.<sup>55</sup> The actual area chosen by OFHEO to create benchmark credit losses is Arkansas, Louisiana, Mississippi, and Oklahoma, in 1983 and 1984.

OFHEO determined the factors or input variables that affected losses and prepayments due to credit stress. To identify the input variables, it reviewed the available literature on defaults and modeled defaults separately for single family and multifamily mortgages as well as other assets held by the housing enterprises. To actually estimate potential losses due to credit risk, OFHEO created numerous asset classifications based on factors such as:

- single-family or multifamily;
- loan-to-value ratio;
- retained in portfolio or in MBS;
- type of recourse available;
- fixed or variable rate mortgage;
- conventional, FHA, or VA mortgages;
- interest rate at origination; and
- origination date.

Given these characteristics, each loan is placed in a loan group, which determines its expected default loss. Credit enhancements can affect default losses in OFHEO's model, but the credit risk of the credit enhancer is also taken into account. Similar classification schemes are developed for other assets. Given this level of detail, OFHEO was able to create a

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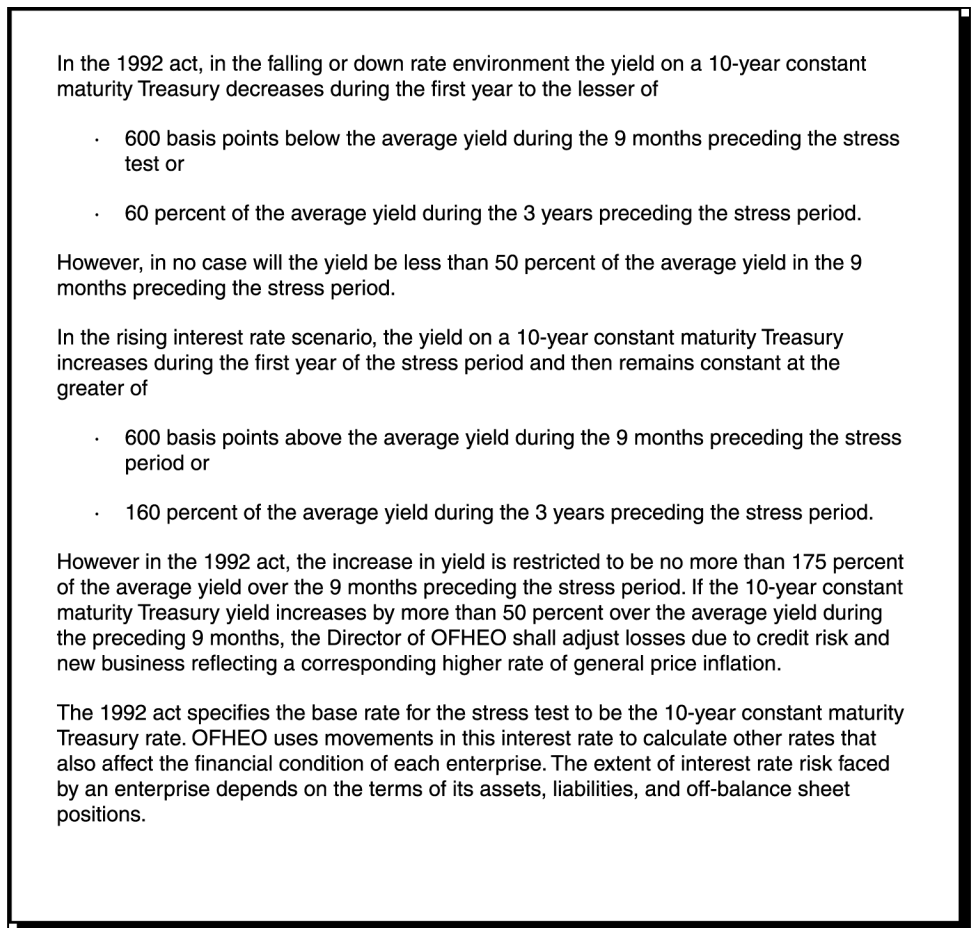
<sup>55</sup> 12 U.S.C. 4611 (a) (1).

Congress Established Interest Rate Scenarios for the 10-Year Stress Test for the Enterprises

finely granulated sense of what creates losses and what credit losses would occur during the stress test.

The 1992 act, which created OFHEO, established criteria for the size of the interest rate shocks the enterprises are required to withstand over the 10-year stress period. The criteria was based on a 10-year stress period for both an increasing rate and decreasing rate environment that could affect losses for an enterprise. In both environments, the rates move during the first year and stay constant for the rest of the 10-year period. The act specifies that capital must be sufficient to cover the more stressful of the two interest rate environments. (See fig. 5 for a detailed enumeration of the interest rate environments that the 1992 act required OFHEO to use.)

**Figure 5: Interest-Rate Risk Stresses in OFHEO's Risk-Based Capital Regulation**



Congress Mandated That  
OFHEO Assume a Limited  
Amount of New Business in 10-  
Year Stress Test Period in the  
Stress Test

According to the 1992 act, OFHEO must assume that the enterprises acquire no new mortgages other than those deliverable under existing commitments at the beginning of the 10-year stress period.<sup>56</sup> This approach focuses on the risks embedded in the book of business that existed at the beginning of the stress test period. This restriction on new business forces the model to act as if the enterprises are winding down their business during the stress period.

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Congress Established the  
Stress for Operations Risk  
as 30 Percent of the Sum  
of Capital for Interest Rate  
and Credit Risk

Operations risk is also specified in the 1992 act and is equal to 30 percent of the sum of interest rate risk and credit risk.<sup>57</sup> Consequently, total capital requirement for the enterprises for risk-based capital is always equal to 130 percent of the sum of capital needed to cover interest rate and credit risk.

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<sup>56</sup> 12 U.S.C. 4611 (a)(3). According to 12 U.S.C.4611 (a) (3) (C), within 1 year of the first issuance of the risk-based capital regulation for the housing enterprises, the GAO and Congressional Budget Office will submit studies to the appropriate Congressional committees addressing the advisability and appropriate form of any new business assumptions for OFHEO's risk-based capital regulation.

<sup>57</sup> 12 U.S.C. 4611 (c)(2).

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# Appendix V: Comments From the Federal Housing Finance Board

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## Federal Housing Finance Board

1777 F Street, N.W. Washington, D.C. 20006

Telephone: (202) 408-2500

Facsimile: (202) 408-1435

www.fhfb.gov

July 5, 2001

Mr. Thomas J. McCool  
Managing Director, Financial Markets and  
Community Investment Issues  
U.S. General Accounting Office  
Washington, D.C. 20548

Dear Mr. McCool:

Thank you for the opportunity to comment on GAO's draft report entitled, "Federal Home Loan Bank System: Establishment of a New Capital Structure." As it has in the past, GAO has done a commendable job of analyzing important and complex Federal Home Loan Bank (FHLBank) System issues.

As you are aware, the Gramm-Leach-Bliley Act (The Act) mandated that a new risk-based capital structure be created for the FHLBank System. As of July 2001, the process of transition from the current subscription capital regime to the new risk-based capital structure is underway and on schedule. The Act also created new opportunities for the FHLBanks to assist their approximately 6,800 small community financial institution members by granting expanded agricultural and small business collateral authority, which the FHLBanks are in the process of implementing.

As GAO correctly notes, the new capital structure for the FHLBanks has the potential to address any risks associated with the new activities that Congress has authorized the FHLBank System to undertake because it offers much greater capital permanence and includes both leverage and risk-based requirements. Further, GAO recognizes that the risk-based capital regulations that the Finance Board has adopted, as well as those that the Office of Federal Housing Enterprise Oversight has proposed, are intended to help ensure that the level of capital maintained is sufficient to cover the risks that the respective regulated entities undertake and that both standards address credit risk, interest rate risk, and operations risk.

GAO's report also describes the relatively new direct mortgage acquisition activities of the FHLBank System, i.e. the Mortgage Partnership Program (MPP) and Mortgage Partnership Finance (MPF). I agree with GAO that, to date, the programs appear to provide regional diversification and incentives to member institutions for sound mortgage underwriting and servicing through the sharing of credit risks. I also agree with GAO that additional options for mortgage sales into the secondary market could increase competition and thereby reduce mortgage interest rates to borrowers.

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**Appendix V: Comments From the Federal  
Housing Finance Board**

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Maintaining the safety and soundness of the FHLBank System continues to be the primary mission of the Finance Board. Past GAO recommendations with regard to regulatory oversight have been well received. Many recommendations have been implemented and others are being considered for future implementation. As in the past, the Finance Board appreciates the professionalism of the GAO staff and was grateful for the opportunity for our respective staffs to meet in order to provide technical and editorial comments on the draft report.

I hope that these comments will be useful in the preparation of the final report and we look forward to continued cooperation with GAO on FHLBank issues. Please feel free to contact me at (202) 408-2953 or Managing Director James Bothwell at (202) 408-2821 if we can be of further assistance. Please note that the views expressed in this letter are my own and do not necessarily represent the views of my colleagues on the Board of Directors, or those of the Administration.

Sincerely,

*J. Timothy O'Neill*  
J. Timothy O'Neill  
Chairman

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# Related GAO Products

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*Comparison of Financial Institution Regulators' Enforcement and Prompt Corrective Action Authorities* ([GAO-01-322R](#), Jan. 31, 2001).

*Capital Structure of the Federal Home Loan Bank System* ([GAO/GGD-99-177R](#), Aug. 31, 1999).

*Farmer Mac: Revised Charter Enhances Secondary Market Activity, but Growth Depends on Various Factors* ([GAO/GGD-99-85](#), May 21, 1999).

*Federal Housing Finance Board: Actions Needed to Improve Regulatory Oversight* ([GAO/GGD-98-203](#), Sept. 18, 1998).

*Federal Housing Enterprises: HUD's Mission Oversight Needs to Be Strengthened* ([GAO/GGD-98-173](#), July 28, 1998).

*Government-Sponsored Enterprises: Federal Oversight Needed for Nonmortgage Investments* ([GAO/GGD-98-48](#), Mar. 11, 1998).

*Federal Housing Enterprises: OFHEO Faces Challenges in Implementing a Comprehensive Oversight Program* ([GAO/GGD-98-6](#), Oct. 22, 1997).

*Government-Sponsored Enterprises: Advantages and Disadvantages of Creating a Single Housing GSE Regulator* ([GAO/GGD-97-139](#), July 9, 1997).

*Housing Enterprises: Investment, Authority, Policies, and Practices* ([GAO/GGD-97-137R](#), June 27, 1997).

*Comments on "The Enterprise Resource Bank Act of 1996"* ([GAO/GGD-96-140R](#), June 27, 1996).

*Housing Enterprises: Potential Impacts of Severing Government Sponsorship* ([GAO/GGD-96-120](#), May 13, 1996).

Letter from James L. Bothwell, Director, Financial Institutions and Markets Issues, GAO, to the Honorable James A. Leach, Chairman, Committee on Banking and Financial Services, U.S. House of Representatives, Re: GAO's views on the "Federal Home Loan Bank System Modernization Act of 1995" (B-260498, Oct. 11, 1995).

*FHLBank System: Reforms Needed to Promote Its Safety, Soundness, and Effectiveness* ([GAO/T-GGD-95-244](#), Sept. 27, 1995).



*Housing Finance: Improving the Federal Home Loan Bank System's Affordable Housing Program* ([GAO/RCED-95-82](#), June 9, 1995).

*Government-Sponsored Enterprises: Development of the Federal Housing Enterprise Financial Regulator* ([GAO/GGD-95-123](#), May 30, 1995).

*Farm Credit System: Repayment of Federal Assistance and Competitive Position* ([GAO/GGD-94-39](#), Mar. 10, 1994).

*Farm Credit System: Farm Credit Administration Effectively Addresses Identified Problems* ([GAO/GGD-94-14](#), Jan. 7, 1994).

*Federal Home Loan Bank System: Reforms Needed to Promote Its Safety, Soundness, and Effectiveness* ([GAO/GGD-94-38](#), Dec. 8, 1993).

*Improved Regulatory Structure and Minimum Capital Standards are Needed for Government-Sponsored Enterprises* ([GAO/T-GGD-91-41](#), June 11, 1991).

*Government-Sponsored Enterprises: A Framework for Limiting the Government's Exposure to Risks* ([GAO/GGD-91-90](#), May 22, 1991).

*Government-Sponsored Enterprises: The Government's Exposure to Risks* ([GAO/GGD-90-97](#), Aug. 15, 1990).

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