CHAPTER 1

SETTING A NEW STANDARD IN CAPITAL REGULATION

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The Office of Federal Housing Enterprise Oversight (OFHEO) is developing the next generation of capital regulation for the two largest housing government-sponsored enterprises - Fannie Mae and Freddie Mac (the Enterprises). Through the technique of stress testing, OFHEO will establish a risk-based capital standard that effectively captures both the credit and interest rate risk exposures of the Enterprises.

OFHEO's risk-based capital standard will represent a new standard in capital regulation because it will more closely align capital with risk than current capital standards for other federally regulated financial institutions. OFHEO's standard will be able to do this because it is being tailored to the specific risks facing the Enterprises, namely the risks associated with owning and guaranteeing conforming residential mortgages. In addition, OFHEO's risk-based capital standard will simulate the credit risk associated with mortgages along multiple risk dimensions. This allows distinctions to be made among the risks associated with different types of mortgages and mortgage products. By more closely aligning capital with risk, OFHEO's risk-based capital standard will be well-suited to permitting Fannie Mae and Freddie Mac to fulfill their public mission while ensuring their financial safety and soundness.

Risk-Based Capital Standards for Banks and Thrifts

The current capital requirements for banks and thrifts implement the principles articulated in the 1988 Basle Accord[1] and reflect an evolution in capital regulation that occurred during the 1980s. As the capital position of significant numbers of financial institutions deteriorated during this period, bank supervisory authorities adopted common standards for defining capital, and they formalized risk-based capital requirements and capital adequacy standards. The Basle Accord formalized several key ideas:

- Capital requirements must be tied to financial risk.
- Capital requirements should be tailored to the magnitude and nature of the risks (that is, the risk profile) of the individual financial institution.
- Off-balance-sheet contingent liabilities must be included in computing capital levels.

The resulting bank and thrift risk-based capital requirements were regarded as a significant improvement in capital adequacy regulation at the time that they were adopted. Previously, banks and thrifts were assessed a flat capital charge for all assets. However, distortions could arise because there was neither a penalty for risk-taking nor a benefit for risk reduction. Risk-based capital standards eliminated some of the distortions by establishing four categories of risk. The new rules also required the holding of capital against off-balance-sheet obligations, which were growing in importance and represented a potentially significant liability.

Yet the bank and thrift risk-based capital requirements are not entirely satisfactory. The implementation of the Basle Accord resulted in a risk-based capital standard that was only loosely related to the credit risks associated with a bank's or thrift's assets. The problem was that the standards had too few risk distinctions among types of assets, resulting in a failure to capture fully the risks associated with a bank's or thrift's assets.

A common criticism of the bank and thrift risk-based capital standards is that the required capital level for an institution is still more a function of asset size than of risk. That is, a large institution with very conservative investments may be required to hold more capital than a smaller institution with riskier investments. Also, as a financial institution's activities become more complex, bank and thrift risk-based capital ratios can be misleading; the ratios can give the appearance of capital adequacy because the limited number of risk categories are not adequate to capture accurately the risk associated with new types of financial instruments.

Although the bank and thrift regulators also were directed to create uniform rules that would take account of interest rate risk, that task proved to be very difficult to accomplish within the existing capital framework. Instead, banks and thrifts are currently required to determine the impact of significant shifts in interest rates, and there is no explicit link to required capital.

Risk-Based Capital Standards for Fannie Mae and Freddie Mac

The financial institution crises of the 1980s and the early 1990s not only motivated new approaches to bank and thrift supervision, they also focused attention on the potential liability to the government posed by the government-sponsored enterprises, especially the two largest ones, Fannie Mae and Freddie Mac. Though not explicitly guaranteed by the federal government, the Enterprises' financial obligations are priced in the market virtually as if they have such a guarantee. Market participants behave as though they are confident the federal government would make good on any financial obligation of an Enterprise that failed.

As the legislation that created safety and soundness oversight for Fannie Mae and Freddie Mac was being written, Congress recognized that the risk-based capital standards for banks and thrifts would be inappropriate for the Enterprises. In particular, Congress was concerned about the need to align capital closely with risk so that the taxpayers would be protected and the ability of the Enterprises to achieve the public policy goal of fostering homeownership would not be impaired. The single risk category for mortgages under the bank and thrift risk-based capital standards would not result in an accurate alignment of risk with capital because it could not distinguish between the relative risks associated with the specific types of mortgages the Enterprises purchased. Congress also recognized the need for the capital standard to capture interest rate risk associated with the Enterprises' activities.

The risk-based capital standard that Congress has mandated for the Enterprises adopts the key principles in the Basle Accord but implements them in a way that is tailored to the specific activities of the Enterprises. OFHEO is charged with developing a risk-based capital standard using a stress test methodology that measures credit and interest rate risk for the Enterprises more accurately than would a direct application of the bank and thrift capital standards.

Stress Testing

A stress test is a scenario of financial distress. It is a vehicle for estimating the losses that might occur under unforeseen circumstances. A computer model is used to simulate the cash flows from financial instruments in hypothetical severe economic conditions. The effects of the risks embedded in those instruments and the way the risks are managed are captured in the modeling of income and expense cash flows.

Stress testing is a common tool many firms use to quantify risk. Rating agencies use stress tests to simulate future performance of mortgage- and asset-backed securities. Banks use stress tests to simulate trading portfolio performance. Mortgage insurance companies use stress tests to project capital needs. The Enterprises, as well, use stress tests to simulate performance of their assets and obligations to project capital needs.

As a regulatory tool, a stress test allows the regulator to establish a capital requirement that is tailored to the specific risk profile of a financial institution. By simulating the performance of the assets and obligations held by the institution each time the stress test is conducted, the capital requirement will adjust appropriately as the institution's risk profile changes.

The basic parameters of the stress test that OFHEO will propose for the risk-based capital standard for the Enterprises are spelled out in the Federal Housing Enterprises Financial Safety and Soundness Act of 1992 (the 1992 Act). The Enterprises will be required to hold an amount of capital sufficient to remain solvent during a 10-year period of severe credit and interest rate stresses. The risk-based capital requirement will be equal to the amount of capital needed to survive the stress test, plus an additional 30 percent to cover unspecified management and operations risks.

The 1992 Act requires OFHEO to project credit losses on a national scale comparable to the worst historical mortgage default and loss experience in any region of the country.[2] Using historical Enterprise data, OFHEO found the worst regional experience for 30-year, fixed-rate mortgages to be the performance of loans originated in Arkansas, Louisiana, Mississippi, and Oklahoma in 1983 and 1984.[3] These mortgages were originated in the eastern part of the Oil Belt just before oil prices collapsed in the mid-1980s. OFHEO's research shows that 14.9 percent of these mortgages defaulted in their first 10 years, leading to dollar losses equaling 63.3 percent of the original principal balance of the defaulting loans. (These losses do not include the proceeds from mortgage insurance or other credit enhancements.) The defaults and losses associated with these mortgages serve as a benchmark for determining how all of the mortgages on the Enterprises' current books of business perform during the stress test.

The 1992 Act defined the interest rate stress in terms of sizable movements of the 10-year, constant maturity Treasury yield. The Treasury rate is assumed to increase by as much as 75 percent or decrease by as much as 50 percent during the first year of the stress test, whichever results in the greatest losses, and to remain at that level for the remaining nine years of the test. Other interest rates are assumed to move consistently with the Treasury rate and must be reasonably related to historical experience.

To subject the Enterprises to the types of credit and interest rate stresses required by the 1992 Act, OFHEO developed a sophisticated financial simulation model. The model is capable of simulating each Enterprise's financial performance for all assets, liabilities, and off-balance-sheet activities and projecting pro forma financial statements (See Box 1).

Advantages of Using a Stress Test to Determine a Risk-Based Capital Standard

There are important advantages in using a stress test to determine the risk-based capital requirements for government-sponsored enterprises like Fannie Mae and Freddie Mac. These advantages help strike a meaningful balance between the need for ensuring financial safety and soundness and the need for the Enterprises to fulfill their public mission.

The stress test will provide incentives to manage risk

A risk-based capital standard that closely aligns capital with risk provides market-like incentives to manage risk. Because capital market investors treat Enterprise debt as implicitly guaranteed by the federal government, the Enterprises' borrowing costs are little affected by changes in their leverage or general financial conditions. Since the Enterprises are not subject to the same type of market disci-

pline as fully private firms, the market cannot be relied upon to provide the Enterprises with the proper signals to hold additional capital when the Enterprises take on additional risk. OFHEO's stress test, however, will provide such signals. For example, if the Enterprises begin to purchase higher percentages of mortgages with higher risk characteristics, their overall risk will increase. The stress test will then project higher credit losses, resulting in a higher capital requirement.

The stress test will provide the Enterprises with options to meet regulatory capital requirements

Since the stress test closely aligns capital with risk, an Enterprise will have the option of adjusting its capital position to match its risk profile, or adjusting its risk profile to match its capital position. For example, rather than hold a large amount of capital against interest rate risk, an Enterprise might choose to engage in more derivative transactions that reduce risk. The stress test will incorporate the beneficial effects of those derivatives. Similarly, instead of holding more capital against higher risk mortgages, an Enterprise might utilize third-party credit enhancements that reduce the Enterprise's exposure to the risk associated with these mortgages. OFHEO's stress test will give the Enterprises credit for high quality, third-party credit enhancements such as private mortgage insurance. Thus, the stress test will provide each Enterprise with the flexibility to pursue its own business strategy in combination with its mortgage purchase, funding, and risk management strategies, while assuring that they are adequately capitalized.

The stress test will be forward-looking

Stress tests are by nature forward-looking. A stress test approach to capital regulation allows OFHEO to project how an Enterprise, with its current book of business and management strategies, would perform in the future under stressful conditions. The stress test requires the Enterprises to hold capital today for losses that are projected to occur over the next 10 years. In addition, the use of the stress test will provide an early warning signal to OFHEO of potential problems. The stress test will incorporate the changes to the risk profile of each Enterprise every time the test is run. In contrast, existing capital standards for other federally regulated financial institutions are tied to backward-looking book values. They have predetermined risk categories for broad classes of assets that are insensitive to changes in the underlying economic factors that determine risk.

The stress test will be robust in measuring credit and interest rate risk

OFHEO's stress test captures the significant credit and interest rate risk at the Enterprises. The performance of assets, liabilities, and off-balance-sheet activities are modeled in some detail. The model recognizes that, within one broad class of asset or liability, risk varies. For example, credit risk associated with the Enterprises' mortgage portfolios is modeled along multiple risk dimensions, including borrower equity, property type, mortgage type, and interest rates. This means that a high loan-to-value (LTV) adjustable-rate mortgage will be simulated as more risky than a low LTV fixed-rate mortgage. By modeling both assets and liabilities, the stress test will measure the interaction of risk factors, such as the mitigating effect that derivatives and callable debt may have on interest rate risk. It also will measure the interaction of the risk characteristics of the Enterprises' financial instruments and the external economic conditions. For example, changes in interest rates during the stress period will have a direct effect on mortgage defaults and prepayments of the Enterprises' mortgages.

Using Minimum and Risk-Based Capital Standards to Ensure Effective Capital Regulation

The minimum capital requirement for the Enterprises, which is based on simple ratios for on- and off-balance-sheet items, represents the amount of capital that the Enterprises must always hold. The risk-based capital requirement hypothetically may be equal to, higher than, or lower than the minimum capital requirement, depending on the risk profile of each Enterprise. If the risk-based requirement is higher than the minimum, the Enterprises must hold capital equal to the risk-based requirement. If the risk-based requirement is lower, the Enterprises must hold the minimum capital requirement. There is no fixed relationship over time between the minimum capital requirement and the risk-based capital requirement, nor will the relationship between the two requirements be the same for Fannie Mae and Freddie Mac.

Enhancing OFHEO's Regulatory Oversight of the Enterprises

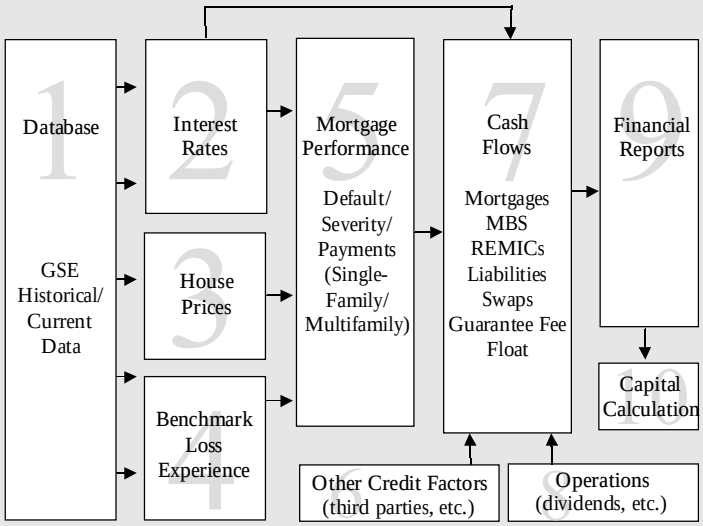
OFHEO's risk-based capital standard combined with our comprehensive, annual, risk-based examination program (discussed in Chapter 2) will provide OFHEO with powerful tools to oversee and promote the financial safety and soundness of Fannie Mae and Freddie Mac. These regulatory tools are designed to hold the Enterprises to a strong financial discipline. While the risk-based capital standard will be based on a single set of stressful conditions, the financial simulation model used to run the stress test will provide OFHEO with an unprecedented ability for a financial institution regulator to analyze the operations of the Enterprises under a wide variety of economic conditions.

Box 1

OFHEO's Financial Simulation Model

Translating the economic shocks produced by a stress test into projected company performance is no simple task. A financial simulation model was created to project the separate financial performances of Fannie Mae and Freddie Mac under the stressful conditions outlined in the 1992 Act. The model consists of several components: statistical models that project mortgage defaults, loss severities, and prepayment rates; computer programs that calculate the cash flows from assets, liabilities, and off-balance-sheet activities; and computer programs that translate these cash flows into pro forma financial statements. The diagram on the following page depicts the model and its components.

Box 1 (Continued)



1. Database: OFHEO standardizes and enters historical data obtained from the Enterprises into models to determine the appropriate relationships between mortgage risk factors and Enterprise performance. Data on the Enterprises' current books of business represent the starting positions for the stress test.

2. Interest Rates: Interest rate models built by OFHEO simulate future movements of Treasury yields, related interest rates, and indexes that affect Enterprise performance.

3. House Prices: OFHEO includes past house prices and future house price projections as part of the stress test because they directly affect the likelihood of mortgage default and prepayment, and the magnitude of resulting losses. House prices are measured by indexes calculated from past house price movements.

4. Benchmark Loss Experience: OFHEO makes assumptions regarding default losses for the stress test that are based, by law, on the country's worst regional default loss experience. Models of mortgage performance must produce results that are consistent with this benchmark loss experience.

5. Mortgage Performance: Models simulate whether and when a mortgage is prepaid or defaults, as well as any resulting default losses. These three factors translate directly into Enterprise financial performance. OFHEO's models replicate the benchmark loss experience based on mortgage risk factors for both single-family and multifamily properties taken from Enterprise databases, interest rates, and house prices.

6. Other Credit Factors: Models simulate benefits of third-party credit enhancements, such as private mortgage insurance, as well as the creditworthiness of such third parties.

7. Cash Flows: Models project cash flows from all Enterprise assets, liabilities, and off-balance-sheet activities.

8. Operations: OFHEO assesses Enterprise performance, in part, by accounting for key aspects of Enterprise operations, such as dividend payouts and assumptions about operating costs, new financing, and short-term investing.

9. Financial Reports: Accounting software generates pro forma financial statements showing resulting capital levels for each period during the 10-year stress test. Results are based on cash flow model outputs and certain assumptions about Enterprise operations.

10. Capital Calculation: A computer program determines the additional amount of starting capital that an Enterprise would need to pass the risk-based capital requirement, given the results of the stress test.

[1] The Basle Accord was adopted by representatives of banking supervisory authorities and central banks from the G-10 countries: Belgium, Canada, France, Germany, Italy, Japan, Netherlands, Sweden, United Kingdom, and the United States; plus Switzerland and Luxembourg. It was designed to diminish competitive inequality among international banks and to strengthen the soundness and stability of the international banking system.

[2] The 1992 Act defines the worst regional mortgage default and loss experience to have occurred in a contiguous area of the United States containing an aggregate of not less than 5 percent of the total population of the United States that, for a period of not less than 2 years, experienced the highest rates of default and severity of loss in comparison to the rates of default and severity of loss in other such areas for any period of such duration.

[3] In June 1996, OFHEO published a notice of proposed rulemaking on risk-based capital addressing the methodology for establishing the worst regional mortgage default and loss experience of the Enterprises.