

# NATIONAL HOME EQUITY MORTGAGE ASSOCIATION

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March 10, 2000

Mr. Alfred Pollard  
General Counsel  
Office of General Counsel  
Office of Federal Housing Enterprise Oversight  
1700 G Street, NW  
Fourth Floor  
Washington, DC 20552

Re: Risk-Based Capital; Second Notice of Proposed Rulemaking

Dear Mr. Pollard:

The National Home Equity Mortgage Association (“NHEMA”) is pleased to submit comments in response to the Second Notice of Proposed Rulemaking (“NPR2”) on Risk-Based Capital for Fannie Mae and Freddie Mac.

NHEMA recognizes the role that Fannie Mae and Freddie Mac have played in the American mortgage finance system, but we also recognize the risks posed by the highly concentrated aggregation of complex assets between the two GSEs. The GSEs continue to experience dramatic growth in their investment portfolios and off-balance sheet credit risk related to their MBS. This growth, combined with the increase in the GSEs’ holdings of GSE-issued MBS, participation certificates, and corporate debt, make it critical that the GSEs be required to maintain sufficient capital, and that there be diligent supervisory oversight to ensure that the GSEs’ business practices are conducted in a safe and sound manner.

NHEMA commends OFHEO for its diligent work to produce the capital standards proposed in this rulemaking. In our comments, NHEMA would like to make the following four points:

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1. We agree that many others in the mortgage industry that further delay in issuing a final capital standard would not be helpful. However, we do request that OFHEO make changes to the proposed rule to reduce distortions that otherwise might occur as a result of the rule. We urge OFHEO to adopt the seven changes that we present in Part I of our comments.
2. Even if OFHEO makes the changes that we believe need to be made now, the final rule nonetheless will contain many shortcomings. OFHEO needs to use this rulemaking to establish procedures so that OFHEO may make continuing changes to the stress test without engaging in further extensive rulemaking. NHEMA suggests such procedures in Part II of our comments.
3. OFHEO is issuing the risk-based capital rule to implement a statute that is too limited and rigid to take into account conditions that may occur in coming years that potentially could stress Fannie Mae and Freddie Mac. We urge OFHEO to analyze and publish the results of a more comprehensive set of scenarios than the statute prescribes for the purposes of setting risk-based capital under this rule. As discussed in Part III of these comments, OFHEO should run these additional scenarios as a part of OFHEO's supervisory responsibilities, rather than pursuant to this rulemaking.
4. The Congress has assigned OFHEO the responsibility for assuring the safety and soundness of Fannie Mae and Freddie Mac and protecting the American taxpayer and the mortgage market. In addition to implementing the capital standards required by the 1992 law, OFHEO needs to move beyond its limitations and protect the American taxpayer from financial exposure.

Therefore, as a part of its responsibility to assure the financial safety and soundness of Fannie Mae and Freddie Mac, OFHEO should apply the lessons that it learns through this rulemaking and through running additional scenarios. OFHEO then should notify the Congress about shortcomings in the 1992 Act that prevent OFHEO from setting appropriate capital requirements for Fannie Mae and Freddie Mac.

As we discuss in Part IV of our comments, the 1992 Act requires OFHEO to set capital standards for Fannie Mae and Freddie Mac that are much lower than would apply if OFHEO had the discretion to adopt approaches used by the federal bank and thrift regulators. OFHEO should seek from the Congress the authority to set capital standards that are proper for these institutions and current conditions.

When it is made final, this rule will result in preferential capital standards that provide an effective subsidy to Fannie Mae and Freddie Mac. This subsidy creates a shared monopoly between them in the residential mortgage market and results in an immense concentration of financial risk.

We urge OFHEO to seek clarity from the Congress on its intention to provide and continue this subsidy. If it is intended, then clarity is also needed on whether the public purpose of the subsidy is being properly met by limiting it to these two enterprises or whether it would be better met by expanding it to other financial institutions that also serve the mortgage market. An expansion of the subsidy across a greater number of financial institutions would no doubt reduce today's concentration of risk.

## **I. Changes to the Proposed Risk-Based Capital Rule**

We recommend that OFHEO make seven changes to the proposed rule that will help to reduce distortions that otherwise could be caused if the rule were applied to Fannie Mae and Freddie Mac in its present form. These are specific changes that OFHEO can make without causing significant delay in issuing a final rule.

The seven changes are as follows:

### **A. Re-calibrating the Default Model**

*The Problem:* The OFHEO loss model does not meet the standard of being reasonably related to the Benchmark Loss Experience (BLE). This problem arises in part because OFHEO uses a model that predicts less of a decline in house prices than actually occurred in the West South Central region. Even with addition of a so-called calibration factor (pp. 209-210 of NPR2), the OFHEO model understates losses relative to the Benchmark Loss Experience.

*Recommended Change:* OFHEO should alter the house price index to reflect a greater sustained decline, to offset the limitations of the house price index by capturing the price effect of defaulted loans. Using a house price vector from a different source, such as a Nationally Recognized Security Rating Organization (NRSRO), e.g., S&P, FitchICBA or Moody's could adjust the house price variable. Alternatively OFHEO could calibrate the loss models to the benchmark experience by lowering the current house price inflation rate vector until the model results equal the Benchmark Loss Experience. Regardless of the adjustment to the house price vector, OFHEO should also perform a calibration to pools of loans that are grouped according to their loan-to-value (LTV) ratios. This would ensure that the model reflects the Benchmark Loss Experience with respect to the most crucial variable.

*Discussion:* House price appreciation is an important component of the default models. The stress test assumes a particular pattern of house price changes over the stress test. OFHEO itself recognizes that the application of its models to the benchmark loans results in default and severity rates that are lower than the actual rates for the Benchmark Loss Experience. (pp. 207-208 of NPR2). OFHEO attempts to compensate for this understatement by calculating an adjustment in the form of a so-called "calibration factor" that includes so-called "calibration constants" in the default model.

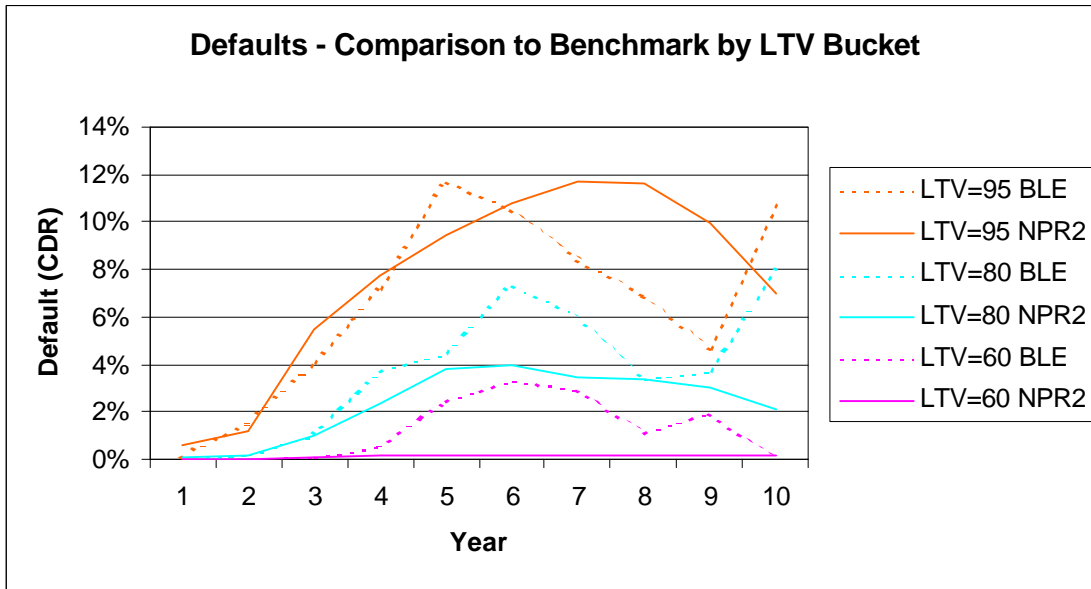
There is a reason for the shortcoming of the OFHEO model in this regard. OFHEO uses a house price index that excludes the value of defaulted loans, even though those loans may constitute that part of the portfolio that underwent the greatest decline in value. OFHEO's addition of the so-called calibration factor does not fully compensate for this effect.

While the losses of OFHEO's Benchmark Loss Experience are comparable to the losses assumed by the rating agencies (the NRSROs) for their highest rating categories, OFHEO assumes only a 12% price decline in the stress test, while the rating agencies assume home price declines of 30% to 40% in their highest rating category.

The shortcoming of the OFHEO model with respect to declines in house prices has three consequences. First, it understates the amount of capital that the GSEs will need to withstand the stress test. Second, it introduces a bias in favor of low-LTV loans. Only when house prices decline significantly, do low-LTV loans suffer significantly from application of the stress test; by understating the magnitude of this decline, the OFHEO model overstates the viability of low-LTV loans, as compared to higher LTV loans. Third, it creates a bias in favor of seasoned loans, which in normal times may have already experienced some degree of improvement in LTV, and with the modest home price decline of the stress test will then reflect lower than expected losses.

Figure 1 shows a comparison of the default rates of the OFHEO NPR2 model relative to the Benchmark Loss Experience for LTVs of 60, 80 and 95 percent. The Benchmark Loss Experience default rates are based upon a table provided by OFHEO, as NPR2 supplemental information number 16 dated 9/27/99, and are converted to conditional default rates (CDRs) based on estimated balances. The NPR2 default rates are taken from model results for the down rate scenario provided by OFHEO. While the characteristics of the loans used for the NPR2 forecast and in the benchmark are somewhat different, the implications are clear. The NPR2 model drastically understates default rates on moderate and low-LTV loans.

Figure 1



### B. Impact of Prepayments on the OFHEO Model

*The Problem:* The OFHEO model does not fully reflect the relationship between prepayments and defaults. The burnout variable used by OFHEO captures some of this relationship indirectly. The failure to capture fully the interaction between prepayments and defaults contributes to distortions such as *negative* capital requirements for low-LTV loans and low loss forecasts overall.

*Recommended Change:* OFHEO should calculate credit losses by applying the model first with an interest rate stress comparable to the Benchmark Loss Experience. These losses should be applied in the stress test based upon beginning balances rather than balances adjusted for prepayments. The prepayments in the stress test should be calculated based upon house prices growing at normal historical levels.

*Discussion:* OFHEO's prepayment model uses a "burnout" variable to try to identify those borrowers who have passed up earlier opportunities to prepay their mortgages, and who therefore are more likely to default and less likely to prepay their mortgages and refinance. Borrowers who are unable to refinance to more favorable rates may be either credit constrained, may not have enough equity in the house or there could be other factors at play.

The OFHEO burnout function does not apply during the first two years of the stress test, regardless of the prior rate history of the loans. Also, the OFHEO stress test and the burnout function are structured such that in the down rate scenario, a borrower who is classified as burnt out will not be able to come out of the burnt out stage. Historical experience shows, most recently in speeds of prepayments in late 1998 and early 1999, that borrowers who are burnt out at a certain point in time could take

advantage of refinancing opportunities if they occur at some later time. Due to the complexity of modeling burnout and the limitations of the OFHEO model, the OFHEO burnout variable cannot correctly capture the complex interaction of prepayments and losses.

Burnout is important because of the way that the OFHEO model computes losses and prepayments jointly: losses are calculated as a percent of remaining balances. Distortions in the prepayment function can lead to distortions in losses. In particular, the burnout variable acts to increase losses predicted by the OFHEO model during periods of falling rates. Presumably this effect is intended to capture the fact that cumulative losses on mortgages do not decrease as rapidly as loan balances during periods of fast prepayment rates. Nevertheless, the OFHEO model still produces substantially lower cumulative losses than are implied by the Benchmark Loss Experience.

NPR2 produces losses for all LTV buckets that are below the Benchmark Loss Experience. Furthermore, due to faster prepayments on low-LTV loans, the model serves to exacerbate further the bias in favor of low-LTV loans and against high LTV loans. This is one of a number of factors that add together to create a *negative* capital requirement for lower LTV loans. In other words, the OFHEO stress test gives credit to the GSEs for adding low-LTV mortgages (below a level of 60-70 percent LTV) to their portfolios despite the reality that these mortgages too would experience significant losses if the stress test were not distorted to understate the extent of loss that would occur in the stress period.

Figure 2 shows a comparison of the prepayment rates of the Benchmark Loss Experience to the prepayment rates in the NPR2 model applied to the stress test. During the time period of the Benchmark Loss Experience interest rates fell and then increased somewhat. The stress test rates (a down rate scenario is shown) fall more dramatically and remain at low levels throughout the stress test. The result is prepayments that exceed those of the Benchmark Loss Experience. Due to the form of the NPR2 model, these higher prepayments serve to decrease the amount of losses relative to the benchmark.

Figure 2

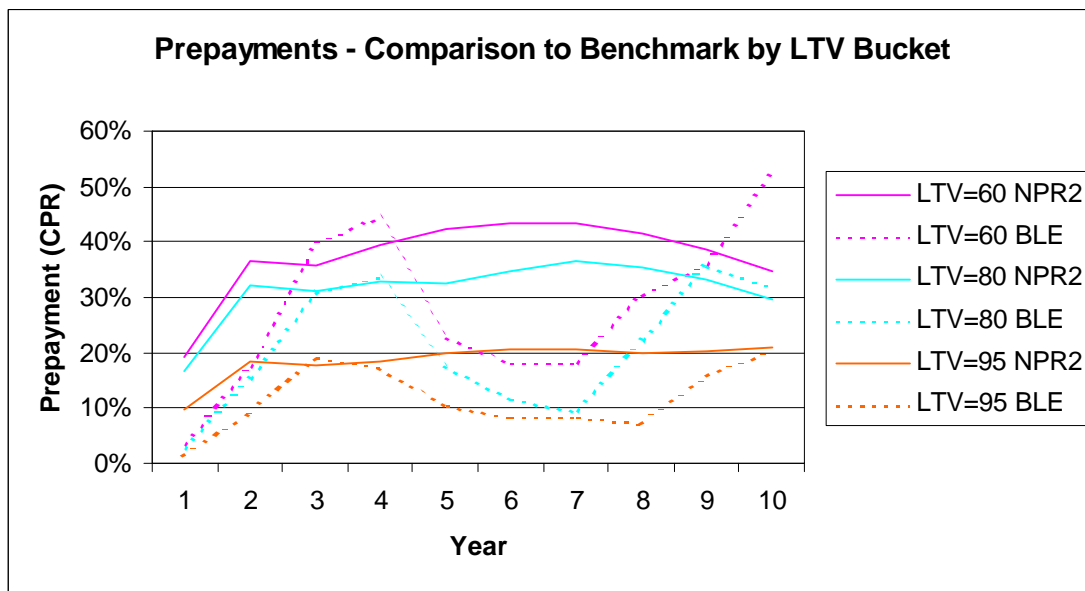
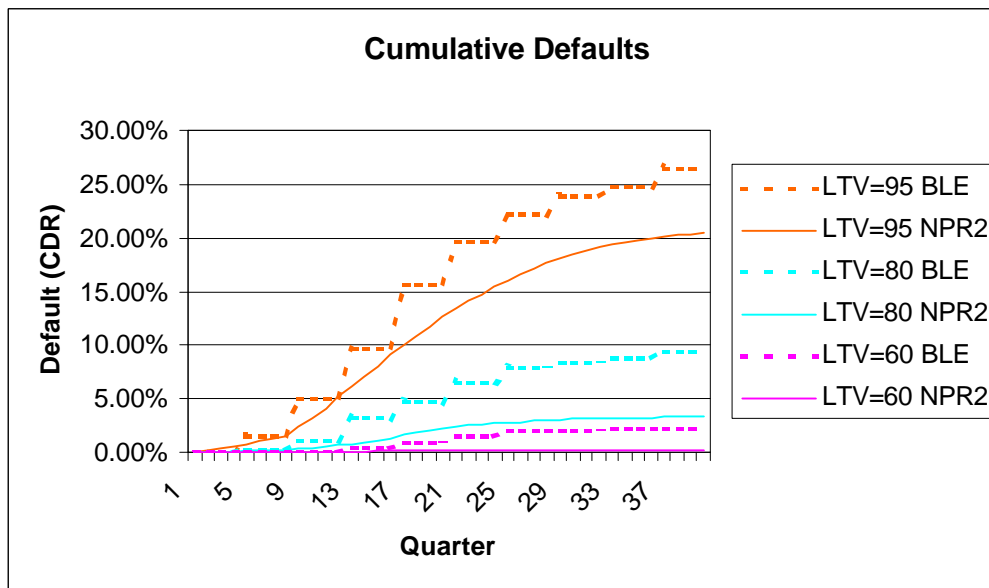


Figure 3 shows the cumulative defaults of the Benchmark Loss Experience versus the OFHEO NPR2 model applied to a down rate scenario. Despite the introduction of a calibration factor, NPR2 understates defaults across the LTV spectrum. In the low-LTV category losses are a small fraction of the Benchmark Loss Experience.

Figure 3



### **C. The Expense Formula**

*The Problem:* OFHEO assumes that expenses will decline dramatically in the declining rate environment; in fact, expenses may rise as the percent of delinquencies and defaults rises.

*Recommended Change:* OFHEO should alter the expense formula to keep expenses constant during the ten-year stress period.

*Discussion:* OFHEO assumes in NPR2 that operating expenses of the GSEs would decline over the stress period in direct proportion to the decline in outstanding loan balance. This assumption contradicts historical experience. Industry professionals generally believe that expenses are more related to defaults and losses than to total outstanding volumes. Therefore in a stress scenario, expenses probably would not decrease significantly, and actually might increase. This could be a particularly important factor in the down rate scenario, where higher prepayments would decrease operating expenses under the OFHEO assumption, even though defaults mount.

A straight-forward solution to this problem is to assume that total operating expenses remain constant over the stress period, on the reasonable assumption that savings in expense when some mortgages drop out of the portfolio are offset by increases in average expenses to manage those remaining.

### **D. Generation of Non-Treasury Interest Rates**

*The Problem:* The proposed rule suggests a process of generating non-Treasury interest rates that adds an unnecessary degree of complexity and uncertainty to the stress test.

*Recommended Change:* To preserve simplicity and portability, the non-Treasury rates should be calculated as a ratio or spread to various Treasury rates. This would maintain consistency across users and different time periods and also would maintain some of the structural dynamics observed between the various Treasury and non-Treasury rates. It may be appropriate to use a more complex methodology, such as moving averages of historical rates for COFI and perhaps PRIME.

*Discussion:* The proposed rule projects all non-Treasury interest rates using Autoregressive Integrated Moving Average (ARIMA) models. These models predict a value in a given time series using a linear combination of its own past values, shocks (past errors) and values of other time series.

OFHEO has determined the ARIMA equations used to forecast the non-Treasury rates in the stress scenarios. The parameters were obtained using data up to June 1997. OFHEO recommends updating the parameters as more data become available. If users try to refit the ARIMA models using post June 1997 data they could end up with different models and model parameters. This could potentially make the forecasts different across users. To eliminate this problem OFHEO recommends that the functional form be kept the same, that is, use the same equations but with different parameters. This creates a



problem because the relationships may change over time and the selected parameters may not be the most appropriate ones.

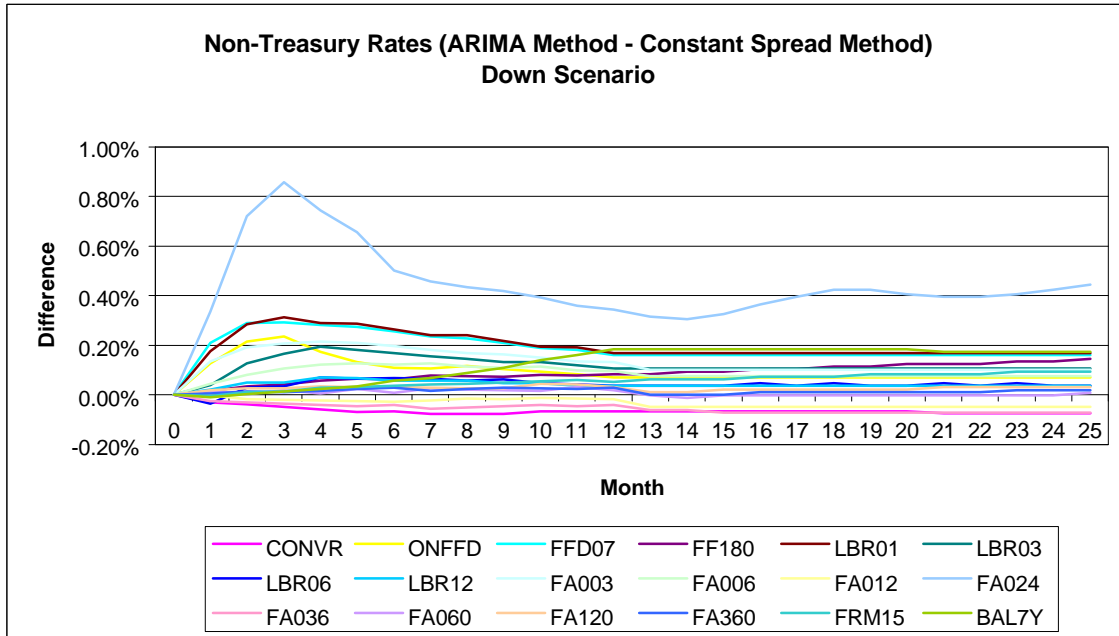
Users might also find it difficult to derive the non-Treasury rates (using available information) in a manner consistent with OFHEO depending on the software used to incorporate the OFHEO model. This will result in a loss of consistency in the predictions obtained by the various users.

To test an alternative methodology, the CMC obtained data from the spreadsheet 97q2.xls provided by OFHEO. We calculated the spread between the non-Treasury rates and the appropriate Treasury rate in the initial month, as summarized in Table 3-12 on pages 480-482 of NPR2. We then applied the same spreads to the respective Treasury rates to obtain future values of the non-Treasury rates. We found that, for most of the non-Treasury rates, there was little difference between the rates obtained using this methodology and those obtained by OFHEO using the ARIMA equations.

As shown in Figure 4, most of the non-Treasury rates, with the exception of PRIME, COF11 and FA024, lie within 35 basis points of the rates obtained by OFHEO using the ARIMA equations. This suggests that, for the sake of simplicity and robustness, using simpler spread methodology (instead of the more complex ARIMA equations) might make the task of forecasting non-Treasury rates easier.

Two of the non-Treasury rates, COF11 and PRIME, show the most deviation between the simple spread technique and the ARIMA equations. Given the short-term and long-term liability structure of COF11, it would be better if this index were modeled using a combination of lags and moving averages. PRIME could also be forecasted better using a model slightly more complex than the simple spread approach recommended for the other rates.

**Figure 4**



Therefore, we recommend that OFHEO calculate non-Treasury rates, other than COF11 and PRIME, as a ratio or spread to a particular Treasury rate. If OFHEO does decide to retain the ARIMA framework, then OFHEO should at least publish and update parameters for the ARIMA models on a regular basis. It is these rates that the loan performance models of NPR2 use as inputs, and differences in the inputs could change the outputs of the models. Also, to enable a user to apply the ARIMA equations in any systems framework or environment, OFHEO should add examples to demonstrate exactly how the ARIMA equations are being used to generate rates in the stress scenarios.

### **E. Calculation of House Prices**

*The Problem:* The proposed rule allows changes in house prices prior to the stress test period to have a significant impact on the forecast losses of the GSEs' portfolio. If house prices increase prior to a downturn, the GSEs may enter a period of stress with very low capital requirements. The forecasted losses may increase dramatically during the downturn and may thereby limit the ability or willingness of the GSEs to provide support to the housing finance system during periods of stress.

*Recommended Change:* Apply a two-year moving average of the House Price Index (HPI) in place of the HPI just prior to the start of the stress test for the calculation of the probability of negative equity in the mortgage performance model as a way to help reduce the disparity in capital that the rule would require between the up and down parts of the cycle of housing prices.

*Discussion:* The proposed rule requires a GSE to hold higher capital for high-LTV loans than for low-LTV loans. The calculation of LTV depends critically on the value of the home and, in the proposed rule, on the House Price Index that OFHEO applies. Frequently, the experience of geographical areas that have suffered declines in house prices shows that a runup in housing prices precedes the decline.

Because of the linkage in the rule between LTV and a GSE's capital requirements, the rule will require a GSE to hold less capital if it is applied in a year when housing prices are increasing (and therefore LTVs are declining) than in a year when housing prices decline (and therefore LTVs are increasing). This creates a procyclical bias: the rule would require less capital during boom years and more capital during years when house prices are dropping.

The rule should try to moderate this disparity. Instead of applying the House Price Index (HPI) directly, the rule should apply a two-year average of the HPI when adjusting the initial LTV. Another possible solution would be to limit the impact of house price increases but not decreases. Given the understatement of declines in house prices under the proposed rule (see subsection A of our comments, above) and due to the risk of home price decreases after price run-ups, it would not be appropriate to limit the impact of house price declines.

To the extent that the final capital rule reduces the bias in the proposed rule against lower LTV mortgages (as is discussed in subsections A and B of our comments, above), then the procyclical impact of the capital rule also will be reduced.

## **F. Third-Party Transactions**

*The Problem:* OFHEO proposes to apply substantially lower haircuts for derivative transactions, compared to other third-party transactions of potentially equivalent credit quality. Also, OFHEO gives credit for transactions with counterparties that have less than a "BBB" credit rating. The first convention would distort economic reality and the second would invite transactions with parties that in fact might not be able to perform in the stress period.

*Recommended Changes:* OFHEO should (1) apply the same haircuts to derivatives and all other third-party transactions and (2) should not give any credit for transactions with counterparties that have less than a "BBB" rating or that are unrated. The rule should treat collateralization of guarantees the same way for derivatives and third party guarantees.

*Discussion:* The stress test applies haircuts, or reductions in the amount of credit that will be given, for third party guarantees. The test distinguishes between guarantees depending upon the rating of the counterparty as well as the form of the guarantee, with derivatives receiving one-fifth the haircut of a corporate guarantee with the same rating.

The haircut methodology creates distortions. First, there does not seem to be sufficient justification for the lower haircut that OFHEO allows for derivatives. Unless changed, this feature of the stress test would create incentives for the GSEs to achieve

lower capital requirements by purchasing guarantees through derivatives rather than through more direct and financially equivalent methods. To the extent that lower haircuts are justified by the posting of collateral, the analysis of collateral should be the same for corporate guarantees and derivatives.

Second, OFHEO lumps lower rated and unrated entities within the “BBB” category. This will create incentives for the GSEs to use poorly capitalized firms as counterparties. Grouping the unrated or below investment grade firms into the BBB category creates significant distortions because the test treats firms which are unlikely to be able to pay in a stress scenario only marginally worse than it treats counterparties with excellent prospects.

### **G. Tail Risk**

*The Problem:* The OFHEO model fails to calculate the market value of each GSE at the end of the ten-year stress period. This overstates the equity remaining.

*Recommended Change:* OFHEO should include a mark-to-market adjustment to earnings and capital at end of the stress test, and should make more realistic assumptions about replacement funding.

*Discussion:* At the end of the ten-year stress test, the model assesses the accounting based equity of the GSEs, but does not adjust the carrying value of assets and liabilities. Due to this form of analysis the GSEs could be exposed to significant built in losses when they reach the end of the ten-year horizon of the stress test. This problem of accrued losses is called tail risk. It arises when the potential income on the remaining balance on the mortgages, which have up to twenty years of remaining life, is less than the cost of the liabilities required to hold those assets.

A related issue is that the stress test assumes that all replacement funding will be short term funding. When the yield curve is steep that assumption understates the cost of reissuing liabilities to protect the portfolio from rate increases.

A mark-to-market analysis at the end of the stress period is more accurate than an income-only calculation. The mark-to-market for loans could be computed by forecasting the cashflows using the loan characteristics and the prepayment rate in year ten of the stress test. These cash flows should be discounted at the mortgage rate. The mark-to-market for liabilities would be calculated by discounting the remaining cash flows of the liabilities at the appropriate federal agency discount rate.

OFHEO also must improve the methodology for replacement funding. One simple adjustment would be to assume that the funding mix would include a blend of liabilities, and not only short-term liabilities. Otherwise, OFHEO is constructing a mortgage institution that is not financially viable because it borrows short to fund its long-term mortgage portfolio.

## **II. Evolutionary Changes to the Stress Test**

If OFHEO is to issue a final rule anytime soon, then it will issue a stress test that inevitably will contain shortcomings, including a number that we have not selected for discussion in this comment letter. OFHEO needs to find a procedural way for continuing

to make modest and reasonable changes to the stress test without engaging in extensive rulemaking.

***Recommendation:*** In this rulemaking, OFHEO should set forth a procedure for updating its capital adequacy models and creating new ones. OFHEO should state that it will test all proposed changes in its model against the then current stress test.

If the changes would lead to less than a 10% change in the binding capital requirement for both GSEs, as of the most recent quarterly analysis, then OFHEO should reserve for itself the authority to implement those changes one year following publication of the changes, without opening a formal comment period. Of course, the one-year period would give OFHEO an opportunity to withdraw or revise the proposed changes. For proposed changes that would have a greater impact, OFHEO should provide for a 90-day comment period and a two-year period before the changes went into effect, to allow the GSEs time to accommodate to them.

While it is apparent that OFHEO needs to make many improvements to its stress test, OFHEO cannot make every change at once. Instead, OFHEO should establish an evolutionary process of changes to the stress test and to the risk-based capital regulation. Larger issues, that could have a significant impact on required GSE capital levels, deserve some form of notice and comment. OFHEO should reserve for itself the discretion to make smaller changes. A smaller change would be defined as one that did not result in more than a 10 percent increase in actual capital that either GSE was required to hold, taking into account both the risk-based and the minimum capital requirements.

To protect the GSEs and the mortgage market from unforeseen changes in capital requirements, OFHEO should provide that small changes in the stress test would become effective one year after OFHEO publishes them and that large changes would become effective two years after their publication in final form.

Given the difficulty that OFHEO has had in producing the proposed risk-based capital rule, we would like to emphasize that OFHEO should best carry out the following proposed changes in an evolutionary manner, rather than waiting a long period of time to produce more sweeping changes. As a part of the evolutionary improvement of the risk-based capital rule, OFHEO should make changes in a number of elements including (1) treatment of individual loans in the stress test, (2) generation of multiple scenarios for changes in yield curve, (3) periodic refitting of prepayment and default models, and (4) addressing the problem of low cost gaming of the risk-based capital rule.

We reiterate that it is our position that the rulemaking should move forward, incorporating the modest changes that we propose above, and that OFHEO should address other changes after it has issued the rule in final form.

- Treatment of individual loans

The stress test performs an analysis of the portfolio based upon placing loans in buckets. Each of the buckets has certain characteristics. The use of buckets presumably

reduces the computations to an acceptable level. However, by bucketing the data certain information about individual loans is lost. To the extent that all of the loans in the buckets have similar characteristics, or to the extent that the dissimilar loans only make up a small proportion of the portfolio, this approach is not costly. However to the extent that an important feature is not captured, this could create a bias in the analysis. Perhaps the most important form of bias would be loan characteristics that are not included in the prepayment and loss models, but that could have significant impact.

In this regard, the current bucketing methodology cannot separate sub-prime loans from higher credit quality loans. The loan features that describe the sub-prime loans are not captured by the bucketing system. Therefore, the stress test may seriously understate the risk of these loans.

*Recommendation:* Bucketing should be viewed as a dynamic process, with features of loans that are important in the modeling process being added to the bucketing methodology. For example either borrower credit scoring and loan scoring results or more inputs from loan scoring should be included. OFHEO should move toward collecting and using loan-by-loan data, although OFHEO may wish to group some of this data for some statistical purposes. This change also will help OFHEO to include a greater number of economically relevant variables in future loan performance models.

- Yield Curves

OFHEO needs to make its model more robust by adding additional yield curve shapes for both the up and down scenarios, and also needs to enhance the way that the model addresses basis risk.

The model forecasts that the yield curve will be steep in the falling rate environment and flat in the rising rate scenario. The use of a single yield curve shape for each scenario means that the test does not measure the risk of changing yield curve shapes. Thus if the GSEs faced risk associated with steep curves in the rising rate environment or, flat curves in the falling rate environment, those sensitivities would not be tested. Another complication is that, although the prepayment model incorporates four different yield curve slopes, the steepest curve and flattest yield curve in the prepayment model are not used in either the up-rate or the down-rate scenarios. Therefore, the two stress scenarios selected by OFHEO do not fully stress the prepayment model.

*Recommendation:* For each stress scenario OFHEO should generate multiple yield curve slopes.

- Prepayment and default analysis

OFHEO needs to revisit its decision to use a joint model of conditional default and prepayment rates. Again, despite its importance, this step probably cannot be taken within the scope of the current rulemaking. With regard to the mortgage performance models, a number of issues require OFHEO's attention. Those issues include:

- Aging curves: OFHEO should use standard aging curves in its stress test as a way to improve the treatment of prepayments and defaults.
- Burnout: OFHEO should revise this variable to be more flexible, including the possibility that many “burned-out” borrowers historically are able to prepay and refinance later.
- Loss models: OFHEO needs to fit its loss models to the historical experience with stressed environments, including adjustments in the number of mortgages that default and the extent of loss on each. It may be appropriate to add variables for payment shock and unemployment rates to the models.
- Subprime loans: OFHEO needs to distinguish subprime loans from other loans either through a separate model or by adding credit variables to its larger model.

*Recommendation:* OFHEO should refit its prepayment and default models on a regular basis.

- Low cost ways to game the capital standards

Perhaps the most important shortcoming of the stress test in this rulemaking was unintended. The structure of the stress test allows the GSEs to offset risks in a variety of ways. Positive cash flow generated by one line of business or one product can offset negative cashflows for the remaining businesses. Through this mechanism, any one business can be used to “hedge” all other business and effectively reduce the capital requirement. Moreover, it is not necessary that this business or product provide an effective hedge across all economic scenarios or even a majority of possible scenarios; it is only necessary that the business provide positive cash flow in the stress test scenario that produces the maximum capital requirement for the GSE.

In this way the structure of the stress test allows for a wide range of mechanisms to reduce capital requirements at low cost, including allowing credit risk and interest rate risk to offset each other. Although interest rate and credit risk may be correlated, this correlation has not been sufficiently established to allow OFHEO to rely exclusively on this relationship for purposes of risk management. Furthermore, the assumption of such a relationship creates the potential for inappropriate credit risk management with relatively less expensive interest rate derivatives rather than an appropriate credit risk management tool.

The model allows this by assuming specific relationships between interest rate and credit risks. As a result, it is possible to lower the capital requirement calculated for the credit risk of the agencies’ sold and retained portfolios with interest rate sensitive instruments. An example of this is shown in Table 1 on the next page.

**Table 1: Hedging Credit Risk with Interest Rate Instruments in the Sold Portfolio**

<u>Loan Information</u>		<u>Hedge Information</u>		
Amount	1,000,000	Amount	<i>Cap</i> 50,000	<i>Floor</i> 200,000
Rate	7.88%	Strike	9.00%	4.50%
Term	360 months	Premium	.02%	.02%
Guarantee Fee	.20%	Term	1 year	1 year
Risk-Based Capital Requirement		Risk-Based Capital Requirement with Hedges		
Rising Scenario	.51%	Rising Scenario	.43%	
Falling Scenario	1.36%	Falling Scenario	.41%	

In this example, the agency has guaranteed a mortgage-backed security. The binding risk-based capital requirement occurs in the falling rate scenario and is 1.36%. Adding an out-of-the-money cap and floor on interest rates reduces the capital requirement by 95 basis points to .41%, which is slightly below the 45 basis point minimum leverage requirement for this off-balance-sheet item. This is accomplished at a cost of 2 basis points per year, based upon the hedge, or ½ of a basis point on the asset balance.

While Table 1 shows a theoretical example of the ability to offset credit risk with interest rate hedges, Table 2 shows the results of calculations taken directly from Tables 5 and 18 of NPR2. These calculations represent the amount of capital required for a \$10 billion proportional increase in sold loans or assets, liabilities, and derivatives.

Looking at the calculations for FHLMC in the up-rate scenario (the binding scenario for capital), we see that the credit risk component (sold loans) actually makes a negative contribution to the total risk-based capital requirement. Thus, based upon these calculations, FHLMC would be able to increase all of its business proportionally with a capital requirement of 2.72% (-.09% + 2.81%), clearly demonstrating the ability to offset interest rate risk with credit risk. (Note that this is the opposite of the example in Table 2.)

Similarly, in the down rate scenario the incremental capital requirement for additional assets and liabilities, is well below the minimum leverage capital requirement. Even though the capital requirement for additional sold loans is above the minimum requirement, overall FHLMC does not need capital in excess of the minimum for the down rate scenario. This pattern of offsetting interest rate and credit risk, which is a result of the structure of the stress test, can be seen in the results for FNMA, as well. However, for FNMA there are no negative results available to offset one risk against the other.



**Table 2: Incremental Capital Requirements**

	Up-Rate Scenario		Down-Rate Scenario	
	FNMA	FHLMC	FNMA	FHLMC
Incremental Capital for a General Increase in:				
Sold Loans (as a % of additional sold loans)	.12%	-.09%	.83%	.89%
Assets & Liabilities (as a % of additional assets)	4.38%	2.81%	2.06%	.55%

Another example of this issue comes from Table 20 from NPR2, which shows the incremental capital required for different funding strategies. In July 1999, OFHEO published further variations of those published in Table 20. These are consolidated below in Table 3.

**Table 3: Incremental Capital for Fixed-Rate Mortgages with Differing Funding (as a percent of additional loan assets)**

Group Funding	Up-Rate Scenario		Down-Rate Scenario	
	FNMA	FHLMC	FNMA	FHLMC
1 Short Term	29.27%	32.69%	-9.21%	-7.85%
1 Long Term	-5.94%	-4.69%	30.40%	30.78%
1 Callable Long Term	-1.34%	-0.87%	-0.21%	-1.17%
2 Short Term	25.54%	28.13%	-7.74%	-6.45%
2 Long Term	-9.80%	-7.71%	32.02%	32.08%
2 Callable Long Term	-5.11%	-3.90%	1.21%	.15%
3 Short Term	26.86%	29.79%	-9.59%	-7.90%
3 Long Term	-8.42%	-6.80%	30.27%	31.02%
3 Callable Long Term	-3.86%	-2.99%	-0.68%	-1.27%

Group 1: Newly originated, 30-year fixed rate loans with 95% LTVs and 30% mortgage insurance coverage from a AA-rated insurer.

Group 2: Loans are the same as group one except that they are 4 years old.

Group 3: Newly originated, 30-year fixed rate loans with 80% LTVs and no MI or other credit enhancement.

Within each group, there are no differences in credit risk. Thus, the differences in required capital are attributable to the interest rate risk of the funding scenario. In 22 of the 36 cases presented here, the incremental capital requirement for adding additional assets is negative. If assets of this type were to be added, the negative capital requirement would offset any positive capital requirements from other sources, including credit risk. In this manner, the GSEs can use a funding strategy to help offset credit risk.

As a final example, Table 4 shows a portion of the simulations from Table 11 of NPR2, plus additional scenarios published by OFHEO in June 1999. In these tables, OFHEO calculated the incremental capital required (as a percent of additional sold loans) for loans of various LTVs and mortgage insurance coverage. In these simulations, the incremental capital requirements for loans with 70% or lower LTVs are negative, with

one exception. The negative capital requirement for these low-LTV loans can be used to offset the capital needed for higher LTV loans.

**Table 4: Incremental Capital for Loans with Differing Ages, LTVs, and Mortgage Insurance Coverage (as a percent of additional sold loans)**

Age	LTV	Coverage	Up Rate Scenario		Down Rate Scenario	
			FNMA	FHLMC	FNMA	FHLMC
0 years	50%	None	-1.13%	-0.85%	-0.64%	-0.05%
0 years	70%	None	-0.55%	-0.40%	-0.09%	0.34%
0 years	75%	None	0.54%	0.51%	0.88%	1.28%
0 years	95%	30%	3.17%	2.84%	6.04%	6.02%
4 years	50%	None	-1.08%	-0.78%	-0.52%	0.02%
4 years	70%	None	-0.66%	-0.46%	-0.02%	0.31%
4 years	75%	None	0.06%	0.19%	0.79%	1.02%
4 years	95%	30%	1.33%	1.32%	2.19%	2.20%

As a result of the relative ease with which the capital requirement for credit risk can be reduced to the leverage requirement, the test may no longer sufficiently differentiate between high and low credit risk assets as it was intended to do. The proposed stress test attempts to differentiate between loans with high versus low credit risk and requires more capital based upon the modeled risk. However, credit risk can be easily and inexpensively reduced with interest rate hedges to the point that the leverage test is the binding test. As a result, from a capital perspective, there may not be any true credit risk differentiation between high and low risk loans.

**Recommendation:** OFHEO should assure that its models limit the amount of regulatory arbitrage by the GSEs, so that any strategies by a GSE to reduce the amount of capital required to meet the stress test actually reduces the amount of a GSE’s financial risk by a comparable amount.

### III. Further OFHEO Analysis Needed

The 1992 Act requires OFHEO to apply a rigid and constrained stress test to determine the amount of risk-based capital that Fannie Mae and Freddie Mac must hold. If OFHEO issues a final rule with the changes that we have recommended, then the rule arguably will meet the statutory requirements.

But this is not enough. From OFHEO’s perspective as the safety and soundness regulator of Fannie Mae and Freddie Mac, the limited form of the stress test proposed in this rulemaking is much less useful than alternative stress scenarios that are more realistic. *Indeed, given the inexpensive hedging strategies that this rule would permit, a GSE could fail before it would fail the OFHEO stress test.*

This is not a good outcome, and the statute deserves much of the blame. We urge OFHEO to supplement the stress test that it applies under this rule with a series of stress tests that are more comprehensive. OFHEO should conduct those stress tests periodically

under its general regulatory authority to see that the purposes of the 1992 Act are carried out with respect to safety and soundness.

***Recommendation:*** OFHEO should run alternative stress scenarios that treat risks (1) independently, and (2) in a combination of circumstances. Because OFHEO would be attempting to model actual financial risks, without the constraints imposed by the 1992 law for purposes of capital calculations, OFHEO should attempt to make its scenarios as robust as possible. OFHEO should regularly publish the results of its work for comment by academics and other interested parties.

We request OFHEO to consider a number of variables when it designs the more realistic stress tests, including (1) more probable interest rate shifts; (2) additional scenarios for changes in house prices; (3) alternative basis risk scenarios; (4) tests of the durability of alternative hedging strategies under different scenarios.

- Interest Rate Shifts:

Under the legislation OFHEO is required to analyze two extreme scenarios. The stress test does not place any requirements on the GSEs for more likely interest rate movements, including a continuation of current interest rates. In the extreme, as noted above, it is possible to structure hedges in order to pass the stress test scenarios, yet fail the test for lesser moves in rates.

In contrast to the two very adverse scenarios that the legislation mandates for testing, it may be that the GSEs could face greater risk at an intermediate rate shock. OFHEO must test these, as well as alternative scenarios with respect to the shape of the yield curve.

***Recommendation:*** OFHEO should calculate and publish the stress test for a variety of rate shocks. While this information may not be used to determine the capital requirement it could be used by OFHEO to better understand the risk of the GSEs.

- Changes in house prices:

Experience shows that house prices can change in a variety of ways, depending upon interactions of variables such as the state of the economy of a geographic area and demographics.

***Recommendation:*** OFHEO should calculate and publish the stress test for a variety of house price changes, including variations in the timing and magnitude of the decline in price. While this information may not be used to determine the capital requirement it could be used by OFHEO to better understand the risk of the GSEs.

- Basis risk:

Basis risk involves the relationship among the financial indices that a financial institution uses to calculate the cashflows on its assets and liabilities. The GSEs are subject to the risk that the various interest rates driving their performance may not

perform as expected. NPR2 contains two yield curve shapes, one for each rate scenario, and a basis risk test that increases the GSEs' funding costs by 50 basis points.

*Recommendation:* OFHEO should run additional scenarios that vary the shape of the yield curve, along with additional changes in the relationship of the Treasury rate and other rates on which GSE assets or liabilities may be based.

- Alternative hedging strategies:

The proposed rule invites the GSEs to engage in what Federal Reserve Chairman Alan Greenspan has called "regulatory arbitrage." As described above, one easy device under the rule is the ability of the GSEs to purchase inexpensive out-of-the-money options to hedge against the extreme interest rate scenarios. OFHEO needs to pay special attention to the problem that the managers of a financial institution under stress may seek to implement more risky strategies than they would choose under less stressful circumstances.

*Recommendation:* OFHEO should run scenarios that test the durability of hedging strategies and other devices that permit a GSE to reduce the amount of capital required under the stress test that OFHEO uses to calculate risk-based capital.

#### **IV. OFHEO Report to Congress**

The proposed rule will have virtually no consequences for the GSEs or their behavior. As a result of constraints in the 1992 law, the risk-based capital requirement for the GSEs will be less than or very close to the minimum capital requirements set by law. OFHEO has learned much during the development of its stress test, and now is in a position to report back to Congress on improvements in the 1992 law that are required to make the stress test a useful supervisory tool that allows OFHEO to set more realistic risk based capital standards for Fannie Mae and Freddie Mac.

For a number of reasons, Fannie Mae and Freddie Mac should hold significant amounts of capital. Both GSEs specialize in funding mortgages; this creates significant concentrations of credit risk and interest rate risk. Both GSEs have a high proportion of off-balance sheet risk. Both GSEs have also been growing their balance sheets at a significant rate. The federal bank and thrift regulators cite all three of these factors as justification for requiring financial institutions to hold greater amounts of capital than the minimum amounts otherwise needed. The fact that all three of these circumstances exist should be a warning sign to OFHEO that the risk-based capital provisions of the 1992 law are inadequate to protect against financial risk.

*We are concerned that the 1992 law fails to require adequate capital for Fannie Mae and Freddie Mac.* We present a comparison of actual capital calculations for the GSEs and a thrift institution.

As a practical test of our conclusions about the advantage of the GSEs over banks in terms of capital requirements, the necessary capital under both OTS (Office of Thrift

Supervision) and OFHEO regulations for Fannie Mae, Freddie Mac, and a sample thrift institution, Washington Mutual Bank was calculated. In this analysis, the OTS regulations were applied since Washington Mutual is a thrift institution. There would be minor differences for Washington Mutual using OCC (Comptroller of the Currency) regulations.

The analysis is based upon the information available in the 1998 annual report of each institution. Most of the information needed to assign risk weightings and capital percentages was available from these reports, although in some instances it was necessary to make assumptions about the distribution of assets or off-balance sheet items. For each entity, our calculated capital was compared to the actual published capital requirement in order to determine how correct we were in our assumptions, although it is possible that there could be offsetting errors. The largest difference was a .41% difference as a percentage of assets for Freddie Mac. The analysis of the Freddie Mac financial statements required the greatest number of distribution assumptions. For Fannie Mae, the error was .10%, and for Washington Mutual, .04%. Thus, we are confident that our analysis is reasonable. Tables 5 and 6 summarize our results.

**Table 5: Comparison of Capital Requirements as a Percentage of Assets for Fannie Mae, Freddie Mac, and Washington Mutual**

	Actual Stockholders' Equity	GSE Core Requirement	OTS Tier 1 Requirement*	OTS Tier 2 Requirement*	OTS Total Requirement	GSE Risk-Based Requirement**
Fannie Mae	3.19%	3.16%	4.815%	4.815%	9.63%	4.84%
Freddie Mac	3.37%	3.21%	4.965%	4.965%	9.93%	3.71%
Washington Mutual	5.65%	2.52%	4.000%	0.280%	4.28%	n.a.

\* For the GSEs, the division between Tier 1 and Tier 2 capital was based upon Tier 1 capital as constituting a minimum of 50% of Total capital. The minimum of 4% Tier 1 capital overrides this division for Washington Mutual.

\*\* This calculation is based upon the June 1997 OFHEO stress test results. The calculation is the amount of capital required as a percentage of June 1997 assets.

**Table 6: Comparison of Capital Requirement as a Percentage of Assets and Off-Balance Sheet Items for Fannie Mae, Freddie Mac, and Washington Mutual**

	Actual Stockholders' Equity	GSE Core Requirement	OTS Total Requirement
Fannie Mae	1.09%	1.08%	3.28%
Freddie Mac	0.92%	0.88%	2.71%
Washington Mutual	5.03%	2.25%	3.82%

All of the numbers in Table 5 represent capital as a percent of assets, which is a common way to discuss capital requirements. For a bank or thrift, this makes sense since its off-balance sheet activities are not normally large in comparison to its on-balance

sheet assets. On the other hand, for a GSE, off-balance sheet activity can be double or triple the amount of its on-balance sheet assets. Thus, the capital requirement percentage appears large using assets alone as the denominator.

Table 6 presents the capital of each institution as a percent of assets plus off-balance-sheet activity as a means of clarifying this point. On this measure too, the GSEs lag significantly in capitalization compared to a bank or thrift that is subject to capital requirements that the federal regulators set in conformity with the Basle Accords.

From Table 5, expressing capital as a percent of assets, we see that all three entities meet the GSE Core capital requirement. Washington Mutual exceeds it considerably, while the GSEs have a small cushion. The difference between the GSEs' and Washington Mutual's requirements is the amount of off-balance sheet activity. For Fannie Mae and Freddie Mac, off-balance sheet items on a notional basis are 190% and 271% of assets, respectively. For Washington Mutual, off-balance sheet activity is 12% of assets on a notional basis. As a percentage of assets, hedge-related off-balance sheet items are 38% for Fannie Mae, 97% for Freddie Mac, and 6% for Washington Mutual. Guarantee/commitment related items make up the remainder: 152%, 174%, and 6% of assets, respectively.

Only Washington Mutual meets the OTS capital requirements. Fannie Mae and Freddie Mac would need three times their current capital, including additional Tier 1 capital, to meet the regulation.

The far-right column of numbers in Table 5 shows the capital requirement as a percentage of assets that was needed by each GSE to pass the stress test as of June 1997. (December 1998 results were unavailable.) Although no definitive statements can be made since balance sheet changes could alter the results significantly, both GSEs at December 1998 had somewhat less capital (as a percentage of assets) than was required to pass the stress test in June 1997. Freddie Mac did have sufficient capital to meet the stress test requirement in June 1997.

Washington Mutual has a reasonable cushion over the both GSEs' requirements, but this cannot be interpreted to mean that they would definitely pass the stress test, as the test was not designed for a Washington Mutual-type balance sheet. The stress test does not consider any asset, liability, or off-balance sheet instruments that the agencies do not currently hold. Of major significance, the test does not address the interest rate characteristics of deposits. Even within the mortgage portfolio, the stress test models only those types of mortgages the agency can purchase, leaving out jumbos, which many institutions target for their portfolios.

## **Conclusion**

The results of our comparisons and analysis clearly show that the GSEs are required to hold less capital than either a thrift institution or, although we do not present our calculations here, a bank. Largely because of the amount of their off-balance sheet activity, the GSEs would be required to triple their capital if they were subject to OTS

regulations. In contrast, Washington Mutual could reduce its capital requirement by 40% and its actual capital by 55% and still meet the OFHEO leverage requirement.

Because of the enormous amount of off-balance sheet activity by the GSEs, we believe that the inclusion of a capital requirement for off-balance sheet items in their leverage test is completely justified. Although a significant amount of this is hedge-related, a far greater share is not. Finally, if the GSEs were subject to the depositories' risk-based capital test, it is possible that, in terms of Table 5 showing capital as a percent of assets, both GSEs would be required to use something greater than the 8% minimum standard upon which our calculations were based. As was noted above, this is because of their concentrations of credit and interest rate risk, the growth rate of their balance sheets, and the high proportion of off-balance sheet risk, all cited by the various federal regulators as reasons for capital above the minimum standard. Thus, our estimates of the capital required if the GSEs were subject to depository institution risk-based capital rules are probably low.

This comparison places OFHEO in an awkward position. If OFHEO believes, as we do, that the 1992 law has serious shortcomings in setting risk-based capital standards for Fannie Mae and Freddie Mac, then OFHEO has an obligation to report the results of its analysis to Congress. If OFHEO fails to do so, then it becomes accountable for the added taxpayer risk that Fannie Mae and Freddie Mac could pose in the event that more realistic financial stresses do occur. OFHEO will be in an especially difficult position to carry out its responsibilities under such circumstances because a more appropriate cushion of capital would have given the regulator more time to respond to stresses at a GSE than OFHEO will have under the truly minimum standards set by the 1992 law.

The legislative history of the 1992 Federal Housing Enterprises Safety and Soundness Act was reviewed, and we have concluded that the House Banking Committee, especially, combined its intention to provide a subsidy for the housing GSEs with its intention to set appropriate capital standards. OFHEO should report to the Congress on ways to disentangle the safety and soundness aspects of capital standards from policymakers' intention to provide a subsidy for GSEs because of their role in the mortgage market.

In particular, we urge OFHEO to request that Congress permit OFHEO to apply capital requirements in a manner that is modeled on the powers of the federal bank and thrift regulators. Then Congress can decide whether to provide a special subsidy and whether the subsidy needs to be tied to the GSEs rather than being provided directly to housing. If the Congress does decide to attach the subsidy to the GSEs, then this should be done in a transparent manner, for example, by arbitrarily reducing the capital that OFHEO may require by a stated fraction. Once the subsidy is made explicit, then the Congress – rather than OFHEO – can be held accountable for the many shortcomings of the risk based capital standard that OFHEO is trying to apply under the constraints of the 1992 law.

Finally, if the subsidy is made explicit, we urge OFHEO to seek action and clarity from Congress to expand availability of the subsidy to other private companies that provide the desired services to the mortgage market. This will both diminish the current monopolistic concentration of risk and ensure that the subsidy is used for its public purpose and benefits the consumers for whom it is intended.

Thank you for the opportunity to comment, and NHEMA looks forward to working with you on this project.

Very truly yours,

Wright H. Andrews  
Washington Counsel to the  
National Home Equity Mortgage Association