

## **I. Executive Summary**

The Cranston-Gonzalez National Affordable Housing Act (NAHA) requires an independent actuarial analysis of the economic net worth and soundness of the Federal Housing Administration's (FHA's) Mutual Mortgage Insurance (MMI) Fund. This report presents our findings with respect to this required analysis for fiscal year (FY) 2001 using data as of March 31, 2001.

The primary purpose of this review is to estimate:

- The economic value of the MMI Fund, defined as the sum of existing capital plus the net present value of current books of business, and
- The current and projected capital ratio, defined as the economic value divided by the total insurance in-force (IIF).

### **Status of the Fund**

NAHA mandated that the MMI Fund achieve a capital ratio of at least 1.25 percent by FY 1992 and a capital ratio of at least 2.00 percent by FY 2000. Last year's Actuarial Review estimated that the MMI Fund's capital ratio at the end of FY 2000 was 3.51 percent, the sixth consecutive year it exceeded the 2.00 percent FY 2000 requirement. This year, we estimate that the FY 2001 capital ratio is 3.75 percent. We also estimate that the FY 2003 capital ratio will be 4.38 percent and that the FY 2008 capital ratio will be 5.10 percent. Table I-1 provides our estimates of the Fund's current and future economic values and capital ratios.

In defining the capital ratio, NAHA stipulates the use of unamortized insurance in-force. However, "unamortized insurance in-force" is defined in the legislation as "the remaining obligation on outstanding mortgages" – a definition generally understood to apply to amortized IIF. Deloitte & Touche (D&T) uses the unamortized IIF measure (as generally defined) in calculating the capital ratio. However, it is also instructive to consider the capital ratio based on amortized IIF, which is the basis the General Accounting Office has used in its previous reports on the status of the Fund. Our estimate of the FY 2001 capital ratio using amortized IIF is 4.03 percent, our estimate of the FY 2003 capital ratio is 4.66 percent, and our estimate of the FY 2008 capital ratio is 5.49 percent. Unless stated otherwise, all references to the Fund's capital ratios in this report refer to the ratio computed using unamortized IIF.

## **Sources of Change in the Status of the Fund**

### *Change in Economic Value from FY 2000 to FY 2001*

We estimate the economic value of the MMI Fund (the Fund) to be \$18.510 billion at the end of FY 2001; this is a decrease of \$1.723 billion, or 8.52 percent, over the FY 2001 estimate reported last year.

Our \$18.510 billion estimate of the Fund's economic value is comprised of an estimate of total capital resources as of fiscal year-end 2000 of \$16.385 billion and the present value of future cash flows for in-force business of negative \$0.470 billion. The sum of these two components (\$16.385 – 0.470 = \$15.915 billion) is shown as the economic value of the Fund at the beginning of FY 2001.

The difference between the economic value of the Fund at the end of FY 2001 and at the beginning of the fiscal year is the result of the activity in the Fund during the fiscal year. That is, the \$15.915 billion economic value at the beginning of the year should increase by the present value of any new loans endorsed during the year, increase by the amount of investment income accrued during the year, and decrease by the amount of administrative expenses paid during the year.

The development of the \$18.510 billion FY 2001 estimate of economic value is as follows:

Economic value at beginning of FY 2001:	\$15.915 billion
Present value of FY 2001 endorsements:	\$1.852 billion
FY 2001 investment income:	\$1.222 billion
<u>Less FY 2001 administrative expenses:</u>	<u>\$0.478 billion</u>
Economic value at end of FY 2001:	\$18.510 billion

The same calculation holds for future fiscal years, and is shown in Exhibit II.1 for FY 2001 through FY 2008 (under the baseline economic assumptions).

This 8.52 percent decrease in the estimated economic value of the MMI Fund since fiscal year-end 2000 is accompanied by a 7.46 percent decrease in the unamortized IIF relative to our expectations in last year's Review. These changes result in the capital ratio decreasing by 0.05 percent (a relative change of 1.14%) from 3.80 percent to 3.75 percent for FY 2001.

**Actuarial Review of MMI Fund as of FY 2001**

**Table I-1**

**Projected MMI Fund Performance for FY's 2001 through 2008  
(\$ Millions)**

<b>Fiscal Year</b>	<b>Economic Value of the Fund (FY end)</b>	<b>Capital Ratio (FY end)</b>	<b>Volume of New Endorsements</b>	<b>Unamortized Insurance In-force (FY end)</b>	<b>Economic Value of New Business</b>	<b>Interest on Fund Balances</b>	<b>Admin Expenses</b>
2001	\$18,510	3.75%	\$106,802	\$493,250	\$1,851	\$1,222	\$478
2002	\$22,535	4.24%	\$133,557	\$531,541	\$3,161	\$1,370	\$504
2003	\$26,021	4.38%	\$121,674	\$593,789	\$2,490	\$1,549	\$554
2004	\$29,347	4.47%	\$115,593	\$655,978	\$2,194	\$1,746	\$614
2005	\$32,936	4.62%	\$117,612	\$712,921	\$2,310	\$1,950	\$671
2006	\$36,640	4.77%	\$122,544	\$767,512	\$2,265	\$2,164	\$724
2007	\$40,652	4.95%	\$128,453	\$821,979	\$2,397	\$2,389	\$776
2008	\$44,851	5.10%	\$133,329	\$878,613	\$2,395	\$2,633	\$828

*Current Estimate of FY 2001 Economic Value Compared with the Estimate Presented in the FY 2000 Actuarial Review*

This year's estimate of the FY 2001 economic value is \$1.723 billion lower than the economic value projected for FY 2001 in the FY 2000 Actuarial Review. This decrease in the Fund's value is comprised primarily of three factors:

1. Change in economic forecasts
2. Revisions to econometric models, chiefly with respect to the unemployment and the probability of negative equity variables used in the loan termination regression analysis
3. Change in the estimate of the present value of the 2001 book of business

We estimate that the change in economic forecast accounted for \$585 million of the decrease. The revisions to the econometric model contribute an additional \$413 million to the decrease in estimated economic value. The estimated present value of the FY 2001 endorsements and the anticipated investment income and administrative expenses decreased by \$676 million relative to the FY 2000 Actuarial Review. Lastly, the estimated Total Capital Resources as of the beginning of FY 2000, used in the development of our FY 2000 estimate of economic value, decreased by \$49 million.

The impact of each factor is described in Table I-2 below, and in the paragraphs that follow.

Table I-2

Summary of Changes in MMI Fund Estimated Economic Value Between FY 2000 and FY 2001 (\$ Millions)				
	Change in FY 2001 Economic Value	FY 2001 Economic Value	Change in FY 2001 Capital Ratio	Corresponding FY 2001 Capital Ratio
<b>FY 2001 Economic Value Presented in the FY 2000 Review, Excluding the FY 2001 Book of Business</b>		<b>\$16,962</b>		
Plus: Forecasted Value of 2001 Book of Business, Interest, and Expenses Presented in the FY 2000 Review	+ \$3,271			
Equals: FY 2001 Economic Value Presented in the FY 2000 Actuarial Review		<b>\$20,233</b>		<b>3.80%</b>
Plus: Change in Estimated Present Value of Endorsements Originating in FY 2001	-\$587	\$19,646	-0.02%	3.78%
Plus: Change due to economic forecast	-\$585	\$19,061	-0.02%	3.76%
Plus: Change in Interest Income and Administrative Expenses	-\$89	\$18,972	-0.00%	3.76%
Plus: Change due to Total Capital Resources estimate	-\$49	\$18,923	-0.00%	3.76%
Plus: Econometric Model Refinements	-\$413	\$18,510	-0.01%	3.75%
Equals: <b>Estimate of FY 2001 Economic Value</b>	<b>-\$1,723</b>	<b>\$18,510</b>	<b>-0.05%</b>	<b>3.75%</b>

Further details of these changes are provided below.

- The net effect of loans endorsed in FY 2001 is a decrease in the economic value of the Fund of \$587 million and a decrease of 0.02 percent in the FY 2001 capital ratio due to slower growth in the economic value relative to the IIF. This is most likely driven by an increase in concentration of loans in the less profitable “high” loan-to-value category relative to our estimates from last year’s Review.
- The long-term macroeconomic forecast published by DRI as of October 2001 differs from the forecast used in the FY 2000 review. Interest rates are higher in the 2003 and subsequent years, which leads to lower prepayment rates and higher claim rates for the next several years. Unemployment rates are also higher relative to the FY 2000 forecast. Lastly, we are using DRI’s house price appreciation assumptions directly this year, whereas last year we based our assumptions on internal analyses. We estimate the impact of these changes to be approximately a \$585 million decrease in the economic value and a decrease of 0.02 percent in the FY 2001 capital ratio.

- In the 2000 Actuarial Review, countrywide unemployment was used as an independent variable in the regression analysis we performed. This year, regional differences were considered in the regressions. A second change we incorporated in our analysis was the inclusion of a covariance term in the calculation of the probability of negative equity in the forecast period, where we apply the results of our regression analysis (performed on regional historical data) to economic conditions that are countrywide. The combined impact of the changes to our modeling process is estimated to be a decrease of \$413 million to the economic value of the fund, and a decrease of .01 percent in the FY 2001 capital ratio.

#### *Change in Estimated Future Insurance In-force*

The estimated IIF for FYs 2001 through 2008 shown in this review are generally lower than the corresponding figures reported in the FY 2000 Actuarial Review. This is driven by a reduction in forecasts of loan volume in the overall mortgage market provided by DRI/McGraw-Hill. For additional detail with respect to our estimated endorsement year volume, please see *Appendix B, Demand Model*.

#### *Estimated Claim Severities*

In the FY 2001 review, as in FY 2000, we adopted a method that examines fiscal quarter loss rates and selects a claim severity rate by loan type – see *Appendix C, Claim Severity Model*. Since 1995 average claim severities have gradually decreased, particularly over the last few years. As explained in the *Claim Severity Model* appendix, we base the selected claim severity on the most recent experience. Using claim severities based on the more recent observed experience has a positive impact on the estimated economic value of the fund. This selection is justified, and in fact is most likely conservative, in light of loss mitigation efforts – again, please see *Appendix C* for details.

#### *Effects of Loss Mitigation*

It is our understanding that during FY 1996, Congress passed legislation that authorized the FHA to recompense mortgagees for actions taken to mitigate potential losses by providing mortgage foreclosure alternatives, such as special forbearance, pre-foreclosure sales, deed-in-lieu-of-foreclosure transactions, partial claim payments, and loan modifications. It is also our understanding that in the private conventional mortgage industry, Fannie Mae and Freddie Mac have successfully employed many of these loss mitigation techniques.

The loss mitigation program is expected to reduce the number of foreclosures and to significantly reduce the costs associated with many foreclosures. Evidence is emerging that indicates this program is having economic benefits and perhaps social benefits. The loss mitigation program has been employed for the past four years and has experienced rapid growth. The relatively short history of the program makes it difficult to incorporate in the conditional claim rate models. Because of this, the effects of the loss mitigation program have not been explicitly factored into the claim rate model. It should be noted that this provides a level of conservatism in our results. We are, however, beginning to reflect the impact of the loss mitigation program in the selection of the claim severities.

*Additional Comments*

The estimates presented here reflect projections of events more than 30 years into the future. These projections are dependent upon a number of assumptions, including economic forecasts by DRI and the assumption that FHA does not change its refund, premium, or underwriting policies from those assumed for this review. To the extent that these or other assumptions are not sufficiently accurate, the actual results will vary, perhaps significantly, from our current projections.

Estimation of the equations used for predicting prepayments and claims require large amounts of loan level data. These data take many weeks of intensive processing before they can be used to estimate the model parameters. Additionally, complete data for a fiscal year are generally not available until a few months after the end of the fiscal year because of reporting and processing lags. We obtained a data extract from FHA in June 2001 that represents activity as of March 31, 2001. This data extract contains loan level information, providing information on both the aggregate level of activity and the distribution of that activity. We have used these data to estimate our econometric claim and prepayment rate models.

Finally, while we have reviewed the integrity and consistency of the data supplied by FHA and believe it to be reliable, we have not audited it for accuracy. Additionally, the information contained in this report may not correspond exactly with other published analyses that rely on FHA data compiled at a different time or obtained from other systems.

**Impact of Economic Forecasts**

The economic value of the Fund and its pattern of capital accumulation depend on several factors. One of the most important factors is the future economic environment that will exist during the remaining life of the FHA's current books of business. We capture the most significant factors in the U.S. economy affecting the performance of the Fund's books of business through the use of the following economic variables:

- FHA mortgage contract rates – 30- and 15-year
- One-year Treasury Bill rates
- Appreciation in house prices
- Growth of mean household income levels
- Number of mortgage originations

The performance of the FHA's books of business, measured by the economic value of the MMI Fund, is affected by changes in these economic variables. Higher mortgage interest rates raise initial and ongoing payment burdens on household cash flows, and hence claim risks of new originations while decreasing the risk of claims on older loans with below-market interest rates. Lower mortgage interest rates have the reverse effect and tend to accelerate refinancing of earlier originations while increasing insurance claims. Faster average house price growth facilitates the accumulation of home equity, which tends to reduce the likelihood of a claim. It also contributes

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to greater mobility and household asset portfolio rebalancing, leading to greater turnover of housing and refinancing, thereby increasing prepayment rates. Faster income growth reduces the relative burden of mortgage payments on household cash flows over time, reducing the risk of claims as mortgages mature.

The base case results in this report are based on DRI's U.S. Economy forecast as of October 2001 for interest rates, average house prices, and inflation rates. We also considered four additional scenarios, three of which were based GAO's judgmental scenarios in *FHA's Fund Has Grown, but Options for Drawing on the Fund Have Uncertain Outcomes* (February, 2001). Please note that the scenarios we selected are not strictly derived from GAO's analysis, due in part to the fact that the modeling process we employ is not the same as GAO. The characteristics of these three forecasts are described in *Appendix F, Economic Forecast* of this report. The fourth scenario was based on the economic assumptions from the base case, except for interest rate, change in personal income, and unemployment, where OMB's economic assumptions for the FY 2003 Budget were used. It is important to note that these scenarios do not represent the full range of possible outcomes, but represent variations from the base case that might reasonably be expected. We present our estimates of the Fund's performance under each of economic scenarios in Table I-3.

We project that under all five scenarios, the Fund will exceed the NAHA FY 2000 capital ratio target of 2.00 percent.

**Table I-3**

<b>Projected MMI Fund Performance by Macroeconomic Scenario</b>					
<b>(\$ Millions)</b>					
	<b>Base Case</b>	<b>Low House Price Appreciation</b>	<b>High Interest Rates</b>	<b>High Unemployment</b>	<b>DRI/OMB</b>
Current Economic Value (FY 2001)	\$18,510	\$16,327	\$19,581	\$17,258	\$17,323
Current Capital Ratio (FY 2001)	3.75%	3.31%	3.97%	3.50%	3.51%
Projected Capital Ratio (FY 2003)	4.38%	3.51%	3.25%	3.96%	4.90%
Projected Capital Ratio (FY 2008)	5.10%	3.97%	4.18%	4.23%	6.09%