

Executive Summary

The 1990 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) 2004.

The primary purpose of our review was to estimate

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

A. Status of the Fund

NAHA mandated that the MMI Fund achieve a capital ratio of at least 2 percent by FY 2000 and beyond. The capital ratio of the Fund reached 2 percent in FY 1995 and has stayed above this mandated level ever since. This year, we estimate that the FY 2004 capital ratio increased to 5.53 percent from last year's 5.21 percent. We also estimate the FY 2011 capital ratio to be 6.71 percent. Exhibit ES-1 provides our estimates of the Fund's current and future economic values and capital ratios.

Exhibit ES-1

| Projected MMI Fund Performance for FYs 2004 to 2011 (\$ Millions) | | | | | | |
|--|---|-----------------|---|---------------------------------|--|---------------------------|
| Fiscal Year | Economic Value of the Fund ^a | Capital Ratio % | Volume of New Endorsements ^b | Insurance in Force ^c | Economic Value of New Book of Business | Interest on Fund Balances |
| 2004 | 21,977 | 5.53 | 113,565 | 397,285 | 1,921 | |
| 2005 | 24,430 | 5.82 | 96,465 | 419,989 | 1,722 | 731 |
| 2006 | 27,415 | 5.97 | 96,441 | 459,596 | 2,028 | 957 |
| 2007 | 30,817 | 6.25 | 95,956 | 493,001 | 2,228 | 1,174 |
| 2008 | 34,611 | 6.46 | 97,819 | 535,502 | 2,392 | 1,403 |
| 2009 | 38,795 | 6.53 | 100,861 | 593,879 | 2,533 | 1,650 |
| 2010 | 43,414 | 6.61 | 106,125 | 656,461 | 2,700 | 1,919 |
| 2011 | 48,523 | 6.71 | 113,237 | 723,057 | 2,896 | 2,214 |

^aAll values are as of the end of each fiscal year. The economic value for future years (FYs 2005 through 2011) is equal to the economic value of the Fund at the end of the previous year, plus the current year's interest earned on previous business, plus the economic value of the new book of business.

^bBased on Federal Housing Administration's projection as of August, 2004.

^cEstimated based on the data extract on March 31, 2004.

In describing the capital ratio, NAHA stipulates the use of unamortized insurance-in-force as the denominator. 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. Following the convention of previous actuarial reviews, we continue to use the unamortized IIF in calculating the capital ratio. 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 during the 1990's. The estimated capital ratio using amortized IIF is 5.9 percent for FY 2004 and 7.13 percent for FY 2010. Unless stated otherwise, all capital ratios mentioned in this report refer to the ratio computed using unamortized IIF.

We also subjected the Fund to stressful future economic scenarios (reported below) and found that the projected capital ratio in each case remained above 2 percent. **We therefore conclude that the MMI Fund has met and will continue to meet the mandate of the NAHA.**

B. Sources of Change in the Status of the Fund*Change in Economic Value from FY 2003 to FY 2004*

We estimate that the economic value of the MMI Fund is \$21.98 billion as of the end of FY 2004, which represents a decrease of \$0.76 billion over the economic value as of FY 2003 as reported in the previous year's Actuarial Review. Combining this 3.33 percent decrease in the estimated economic value of the MMI Fund with a 8.96 percent decrease in the unamortized IIF resulted in an increase in the capital ratio of 0.32. percentage points from 5.21 percent to 5.53 percent.

Current Estimate of FY 2004 Economic Value Compared with the Estimate Presented in the FY 2003 Actuarial Review

Our estimate of the FY 2004 economic value is \$5.72 billion lower than the economic value projected for FY 2004 in the FY 2003 Actuarial Review. The estimated FY 2010 capital ratio is 1.11 percentage points higher than that estimated in the FY 2003 Review. These differences are attributed to five changes: revised projection models, updated origination volume forecast by FHA, updated economic forecasts by Global Insight, Inc., the use of a new measure that now incorporates the volatility of house price appreciation rates, and calibration of the model to the most recent claim experience. Each of these changes had a significant impact on the estimated performance of the Fund, as follows:

- The implementation of a loan-level econometric simulation model and a quarterly cash flow simulation and discounting model reduced the estimated economic value by \$3.21 billion. Simulating termination rates at the loan-level enabled us to accurately capture the non-linear relationship between claim rates and loan-specific characteristics. Such models are applied in some of the largest mortgage investors as well as regulators such as the office of Federal Housing Enterprise Oversight (OFHEO).
- The significant decrease in origination volume in FY 2004 from the level forecasted in the FY 2003 Review reduced the economic value of the fund by \$0.67 billion. However, because of the much smaller size of projected insurance in force, the estimated FY 2010 capital ratio increased by 0.97 percentage points.
- The updated actual 2004 economy and the updated economic forecasts of Global Insight, Inc. translated into an increase of economic value by \$0.11 billion. According to the OFHEO, the national average house price growth rate between the second quarter of 2003 and the second quarter of 2004 is 9.36 percent. This is much higher than the 2.55 percent forecast by Global Insight, Inc. in June 2003. This recent high growth experience is incorporated in the Global Insight forecast for August 2004. The increase in housing values during the last several

quarters significantly improved the financial strength of the MMI Fund at the end of FY 2004. However, as the house price growth rate is forecasted to decrease from the current record high level to a lower than average level during the next 3 years, the performances of the FYs 2004 - 2006 books of businesses are expected to be less robust.

- The introduction of the dispersion of house price growth rates of local markets from the national average avoided inconsistency in calculating the probability of borrowers' negative equity during the estimation and prediction stages experienced in previous Reviews. This model enhancement caused the economic value to decrease by \$0.61 billion.
- The econometric model was estimated with data up to the first quarter of FY 2004. The process of calibrating the model to fit the most recently observed claim experience (after the sample period) caused the economic value to drop by \$1.33 billion.

Table ES-2 provides the details of the changes in the Fund's economic value between FY 2003 and FY 2004, including those attributable to these five changes.

Exhibit ES-2

| Summary of Changes in MMI Fund Estimated Economic Value Between FY 2003 and FY 2004 | | | | |
|---|---|-------------------------------|--|--|
| (\$ Millions) | | | | |
| | Change in FY 2004 Economic Value | FY 2004 Economic Value | Change in FY 2010 Capital Ratio (%) | Corresponding FY 2010 Capital Ratio |
| FY 2003 Economic Value Presented in the FY 2003 Review | | \$22,736 ^a | | |
| FY 2004 Economic Value Presented in the FY 2003 Review, Excluding the FY 2004 Book of Business: | +\$1,571 | \$24,307 | | |
| Plus: Forecasted Value of 2004 Book of Business Presented in the FY 2003 Review | +\$3,392 | | | |
| Equals: FY 2004 Economic Value Presented in the FY 2003 Actuarial Review | | \$27,699 | | 5.50% |
| Plus: a. Change by switching to loan level multinomial logit econometric model | -\$3,213 | \$24,486 | +0.79% | 6.29% |
| Plus: b. Update origination volume of FY 2004 and forecast of future books of business | -\$670 | \$23,816 | +0.97% | 7.26% |
| Plus: c. Change due to updated economic forecast | +\$109 | \$23,925 | +0.08% | 7.34% |
| Plus: d. Change due to improved inter-locational house price growth deviation | -\$614 | \$23,311 | -0.47% | 6.87% |
| Plus: e. Change by calibrating model to FY 2004 claim projection | -\$1,334 | \$21,977 | -0.26% | 6.61% |
| Equals: Estimate of FY 2004 Economic Value | -\$5,722 | \$21,977 | +1.11% | 6.61% |

^aEconomic value as the end of FY 2003.

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 Global Insight, Inc. and FHA, and the assumption that FHA does not change its policies regarding refunds, premiums, distributive shares, administrative expenses accounting method, and underwriting. To the extent that these or other assumptions are subject to change, the actual results will vary, perhaps significantly, from our current projections.

Estimation of the equations used for predicting prepayments and claims requires large amounts of loan level data. It takes several weeks to process the raw data before it can be used. In addition, complete data for a fiscal year is generally not available until a few months after the end of the fiscal year due to reporting and processing lags. For both reasons, in order to complete the Review within the limited timeframe required by OMB, we continue to adopt the

convention of using partial-year data to estimate the picture for the entire FY 2004. As part of this approach, we obtained a data extract from FHA in late April 2004 that represented activity as of March 31, 2004. This data extract contained loan-level information on both the new endorsement characteristics and terminations due to prepayments, claims, or other reasons. Finally, while we have reviewed the integrity and consistency of the data supplied by FHA and believe it to be reasonable, 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.

C. Impact of Economic Forecasts

The economic value of the Fund and its pattern of capital accumulation to FY 2011 depend on many factors. One of the most important factors is the nation's future economy during the remaining lifetime of FHA's 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 variables in our models:

- 30-year home mortgage commitment rates
- Ten-year Treasury rate
- One-year Treasury rate
- Average growth rate of national house prices
- Dispersion of individual house price appreciation rates from the national average rate

The performance of FHA's books of business, measured by their economic value, is affected by changes in these economic variables. The base-case results in this report are based on Global Insight, Inc. forecasts as of August 2004 for interest rates and national average house prices, the house price growth rate dispersion estimates published by OFHEO, and additional dispersion parameters estimated by our research team. We considered four stress scenarios to assess the strength of the MMI Fund in sustaining difficult market situations: 1) low house price appreciation for 3 consecutive years, 2) low house price appreciation combined with high interest rates for 3 consecutive years, 3) high dispersion in house price growth rates among local real estate markets and 4) higher loss rate on claimed mortgage loans. These four scenarios do not represent the full range of possible experiences, but represent variations from the base case that might reasonably be expected. They demonstrate the sensitivity of the analysis to reasonably stressful variations in economic conditions and hence provide insights into the capability of the MMI Fund to withstand difficult economic situations. The results of these sensitivity analyses of the Fund's performance are presented in Exhibit ES-3.

Compared to the base case, the estimated FY 2004 economic values under alternative scenarios could decrease by \$2.21 billion, the estimated FY 2004 capital ratio could decrease by 0.56

percentage points to 4.97 percent, and the FY 2011 capital ratio could be reduced to 5.33 percent. These alternative scenario analyses suggest that the MMI Fund would continue to meet the NAHA mandated 2 percent capital ratio through FY 2011 even under all these stressful economic environments.

Exhibit ES-3

| Projected MMI Fund's Capital Ratio Under Alternative Economic Scenarios | | | | | |
|--|------------------|-----------------------------------|---|--|---------------------------|
| Fiscal Year | Base Case | Low House Price Growth | Low House Price Growth & High Interest Rates | High House Price Dispersion | High Loss Rate |
| FY 2004 Economic Value | \$21,977 | \$19,763 | \$20,008 | \$19,964 | \$20,776 |
| FY 2004 Capital Ratio | 5.53% | 4.97% | 5.04% | 5.00% | 5.23% |
| FY 2011 Capital Ratio | 6.71% | 5.67% | 5.33% | 5.49% | 6.17% |

D. Volatility in Fund Performance

Despite the continued financial strength of the MMI Fund, this Review points out the sensitivity of the Fund to changes in economic conditions. The Fund's current portfolio is highly concentrated in the recent books of business, with 54 percent of outstanding insurance-in-force (57 percent measured with amortized IIF) comparing to loans that were originated in FY 2003 and FY 2004. This high concentration is mainly due to the historically high prepayment rates and the high origination volumes experienced during the past two to three fiscal years. This significant concentration of business in new books may reduce the Fund's ability to spread risk over time, as it has done in the past. In particular, the overall claim rate of the Fund could steadily increase during the next few fiscal years as these newly originated loans enter their peak claim years. However, the alternative scenario analyses performed in this study suggest that this concentration is not likely to reduce the capital ratio of the MMI Fund to below the NAHA-mandated 2 percent level in the foreseeable future.