Section II: Summary of Findings and Comparison with FY 2003 Actuarial Review

This section presents the economic value and capital ratios of the Fund for FY 2004 and presents an explanation of how the results of this year's Review compare with those of last year.

A. The FY 2004 Actuarial Review

The FY 2004 Actuarial Review assesses the actuarial soundness of the MMI Fund as of the end of FY 2004 (September 30, 2004) and projects the status of the Fund through FY 2011. The objectives of our analysis include:

- evaluating the historical experience of the fund, including loan termination experience due to claims and prepayments, and losses associated with those terminations;

- estimating future loan termination rates and their corresponding losses and projecting future cash flows of the existing Fund portfolio and future books of business;

- determining the adequacy of current and future capital resources to meet estimated cash requirements.

We conducted this review by estimating the economic relationships of historical loan performance using historical data provided by FHA, applying the appropriate policy parameters, and using forecasts of future macroeconomic conditions.

The econometric and cash flow models are newly developed for this FY 2004 Review. The analysis reflects loan level data on the Fund's experience reported through March 2004. These models also incorporate a set of economic assumptions and forecasts as of July 2004. The model applies the average claim loss rates realized in the FY 2002 and FY 2003 to estimate future claim losses. (For descriptions of the individual models and assumptions, see Appendices A through D.) Our major findings are as follows:

- as of the end of FY 2004, the MMI Fund had an estimated economic value of **$21.977 billion** and an unamortized insurance-in-force of **$397.285 billion**;

- the FY 2004 book of business has added an estimated **$1.921 billion** in present value to the economic value of the MMI Fund;

- we estimated that the capital ratio was **5.53 percent** as of September 30, 2004, and projected that it will be **6.71 percent** as of September 30, 2011. Based on these estimates, we conclude that the Fund would continue to exceed the NAHA mandated 2.00 percent capital ratio in the foreseeable future.

Our current projections indicate that the Fund's economic value will continue to increase in the future, rising by an average of 11.98 percent in each successive fiscal year through FY 2011. Due to the expected interest rises and the associated reduction in prepayment rate, the insurance in force of the fund increases by an average of 8.95 percent per annum through FY 2011. The higher growing rate of the economic value than that of the IIF implies that the Fund's reported capital ratio will gradually increase to the 6.71 percent at the end of FY 2011. Exhibit II-1 provides estimates of the Fund's economic value, insurance in force, and capital ratio through the end of FY 2011.

Exhibit II-1

Projected MMI Fund Performance for FYs 2004 to 2011 ($ Millions)

Fiscal Year	Economic Value of the Fund[a]	Capital Ratio (%)	Volume of New Endorse-ments[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

[a] All 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.
[b] Based on Federal Housing Administration's projection as of August, 2004.
[c] Estimated based on the data extract on March 31, 2004.

B. Change in the Estimated Strength of the Fund

Exhibit II-2 displays the components of the Fund's current economic value and capital ratio from the FY 2004 Review and the FY 2003 Review. The FY 2003 Review estimated that the Fund had $22.736 billion in economic value at the end of FY 2003 to cover future claim losses.

Exhibit II-2

Estimates of MMI Fund Economic Value as End of FY 2004 ($ Millions)		
Item	**End of FY 2003[a]**	**End of FY 2004**
Cash	$ 4,589	
Investments	23,975	
Properties and Mortgages	2,205	
Other Assets and Receivables	283	
Total Assets	31,052	
Liabilities	8,996	
Total Capital Resources	22,056	
Investment Interest		348[b]
Net Insurance Income in FY 2004		389
Total Capital Resources		**22,794**
PV of Future Cash Flows		(817)
Economic Value	22,736[c]	**21,977**
Unamortized Insurance-In-Force	436,401[c]	397,285
Current Capital Ratio	5.21%[c]	**5.53%**
Amortized Insurance-In-Force		372,613
Current Capital Ratio with Amortized Insurance-In-Force		5.90%

[a]Source: Audited Financial Statements for FY 2003.
[b]Estimated by assuming the total capital resources as of the end of FY 2003 earns an investment return equal to 1.58 percent during FY 2004. (See Exhibit B-8).
[c]From the FY 2003 Actuarial Review.

The FY 2004 Review estimates that the fund had total capital resources of $22.794 billion at the end of FY 2004 and that the present value of future cash flows was -$0.817 billion. Thus, the Fund had $21.977 billion in economic value, which can cover unanticipated future claim losses of the existing portfolio.

As seen in Exhibit II-2, despite the decrease of the economic value, the Fund's capitalization actually increased. This is because the insurance in force decreases even more due to the high level of refinancing activity continuing from the past two years and the significantly lower volume of the FY 2004 book of business. Exhibit II-3 compares the two Reviews by annual books of business. It shows that the present value of future cash flows improves from the FY 2003 projection. The improvement is mainly from the 2000-2002 books of business partially due to the high house price appreciation rate realized during FY 2004. The total present value of future cash flows from prior books of business is still negative $1.207 billion.

Exhibit II-3

Present Value of Future Cash Flows by Book of Business, FY 2003 Review, FY 2004 Review, and Difference($ Millions)			
Book of Business	**2003 Review[a]**	**2004 Review[b]**	**Difference[c]**
1975	0	0	0
1976	1	0	-1
1977	2	1	-2
1978	5	2	-3
1979	10	3	-7
1980	11	2	-8
1981	9	1	-8
1982	7	0	-6
1983	21	2	-19
1984	-2	-1	1
1985	-3	-2	1
1986	-9	-7	2
1987	-22	-10	11
1988	-20	-7	13
1989	-17	-9	8
1990	-27	-13	14
1991	-28	-15	13
1992	-37	-21	16
1993	44	-34	-79
1994	70	-43	-113
1995	-5	-30	-24
1996	-15	-80	-64
1997	-47	-103	-57
1998	-78	-158	-80
1999	-228	-292	-64
2000	-741	-330	411
2001	-503	-261	241
2002	-384	-237	148
2003	-	434	434
Total	-1,984	-1,207	777

[a]Values as of the end of FY 2003
[b]Values as of the end of FY 2004
[c]Numbers do not add due to rounding for this and some subsequent Exhibits.

C. Decomposition of Changes from the FY 2003 Review to the FY 2004 Review

This section describes the sources of change between the FY 2003 Review and FY 2004 Review estimates of FY 2004 economic value and the FY 2010 capital ratio. Separating out the effects of interrelated approaches and assumptions can be done only to a certain degree of accuracy. The interrelationships among the approaches and assumptions prevent us from identifying and analyzing these as purely independent effects as these are sometimes jointly determined. However, this section still presents a reasonable allocation of all changes from last year, by source of change. The purpose of the decomposition is twofold. First, it describes the change in the economic value from FY 2003 to FY 2004. Second, it explains changes between the current estimates of the capital ratio in FY 2004 and the estimates for FY 2004 that were presented in the FY 2003 Review.

1. Change in Economic Value from FY 2003 to FY 2004

The FY 2003 Review estimated the economic value of the Fund as of the end of FY 2004 at $27.699 billion, and projected the FY 2004 and FY 2010 capital ratios to be 5.70 percent and 5.50 percent, respectively. We now estimate the current economic value of the MMI Fund to be $21.977 billion, which represents a decrease of $5.722 billion from the estimate reported in the FY 2003 Review. This 21 percent decrease in the estimated economic value of the MMI Fund, which accompanied a 8.96 percent decrease in the unamortized IIF, resulted in the estimated capital ratio decreasing by 0.17 percentage points from 5.70 percent in the FY 2003 Review to 5.53 percent in the FY 2004 Review.

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

The FY 2003 Review projected that the FY 2004 book of business and interest on the Fund's balances would add $3.392 billion and $1.571 billion, respectively, to the economic value of the Fund, resulting in a projected FY 2004 economic value of $27.699 billion. This year’s estimate of the FY 2004 economic value is $5.722 billion lower than the economic value projected for FY 2004 in last year’s Review. Exhibit II-4 provides a summary of the decomposition of changes in the current economic value of the Fund and the FY 2010 capital ratio from the FY 2003 Review to the FY 2004 Review. This decrease is mainly attributable to the change of econometric approach. The high overall prepayment and claim rates experienced during FY 2004 also lead to higher projected short-term claim rates across all books of business and result in a reduction in the present value.

Exhibit II-4

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%**

[a]Economic value as the end of FY 2003.

3. Decomposition of the Differences of Economic Value and Capital Ratio of the Current Review and Those of the FY 2003 Review

We decompose change in the estimated status of the Fund that resulted from the change of model methodology that occurred during FY 2004 and from new economic forecasts into 5 components. Exhibit II-4 summarizes the individual effects of the changes on the Fund's economic value and capital ratio in FYs 2004 and 2010.

a. Change in Projection Models

To conduct this year's Review we developed new econometric and the discounted cash flow models. The main changes include switching to loan-level multinomial logit econometric models, improved age functions to better fit claim rates during the early years of the mortgage life, and a competing risk specification for prepayment and claim risks. The future cash flows are simulated and discounted at quarterly interval. The model switch resulted in a net decrease in the estimated FY 2004 economic value of $3.213 billion, and a corresponding increase in the FY 2010 capital ratio of 0.79 percentage points to 6.29 percent.

b. Updated Origination Volume of FY 2004 and Forecasts for Future Books of Business

The second element of change depicted in Exhibit II-4 is with respect to the Fund’s economic value and capital ratio resulting from the updated FY 2004 origination volumes and the projected volumes of future books of business. We adjusted the model to include the realized partial year of originations during FY 2004 and the updated future demand forecast by FHA. In general, the forecasted origination volume of each of the FY 2004 to FY 2011 books of business decreased by 20.9 to 34.8 percent from the forecasted volumes reported in the FY 2003 review.

The substantial reduction in forecasted business volume has different impacts on the economic value and the capital ratio. As the volume of FY 2004 originations is lower, it contributes less economic value to the Fund, causing the FY 2004 economic value to decrease by $0.67 billion. On the other hand, the smaller size of new books implies much smaller insurance in force. As the denominator gets smaller, the FY 2010 capital ratio is estimated to increase by 0.97 percentage points to 7.26 percent.

c. Changes in Economic Environment

Interest rates on Treasury securities increased through FY 2004 from their FY 2003 levels. The one-year Treasury rate rose from 1.09 percent on June 30, 2003 to 2.09 percent on June 30, 2004. The ten-year rate rose from 3.54 percent on June 30, 2003 to 4.62 percent on June 30, 2004. Mortgage interest rates also rose sharply. The average conventional 30-year fixed-rate mortgage commitment rates posted by Freddie Mac increased from 5.51 percent to 6.13 percent between the second quarter of 2003 and the second quarter of 2004.

Consistent with this rising trend, Global Insight, Inc. also forecasted interest rates to rise rapidly during the next few years. By the end of the projection period of this Reivew, FY 2011, the one-year Treasury rate is expected to rise to a stable level of 5.40 percent. Due to the rapid rate hike during the last year, the actual MMI Fund origination volume during FY 2004 is 20.87 percent lower than that forecasted in the FY 2003 Review. With the rising interest rate trend expected to continue in the next few years, the future origination volume would remain lower. The smaller origination volume for new books of business will lead to slower growth in the insurance in force of the MMI Fund.

On the other hand, rising interest rates also means there will be less incentive for existing mortgage borrowers to refinance. The current rising interest rate environment, therefore, indicates that the prepayment rate of the mortgages in the MMI Fund would slow down, making the insurance in force of the existing portfolio drop more slowly. The extended duration of the existing MMI Fund portfolio implies that more loans would remain in the portfolio.

According to OFHEO, the house price growth rate between the second quarter of 2003 and the second quarter of 2004 was 9.36 percent. This is much higher than the 2.55 percent Global Insight forecast back in June 2003. This high house price growth experience is incorporated in the Global Insight August 2004 economic forecast. The resulting increase in borrower equity during the last several quarters improved the financial strength of the FY 2003 and previous books of business. As a result, the economic value of FY 2004 increased by $0.109 billion. However, as the house price growth rate is forecasted to decrease from the current record high level during FYs 2005 - 2007, the performances of the FYs 2004 – 2006 books of business are expected to be less robust than the existing books. Due to the change in the economic forecast, the capital ratio of FY 2010 increases by 0.08 percentage to 7.34 percent.

d. Change Due to the Treatment of Regional House Price Dispersion

The only house price forecast provided by Global Insight, Inc. is at the national average level. This year, we developed a method to address inconsistencies between the aggregation of house price growth rates used in the estimation stage and that used at the forecast stage. A local dispersion measure was developed to upwardly adjust future house price dispersion during the forecast period. In order to accurately capture the deviation of the house price growth rate for a specific house against the national average, we estimated the deviation of regional markets' average house price growth rate against the national average, which is to be added on top of the dispersion of individual house price against the regional average. Details of this methodology are explained in Appendix C.

The incorporation of local market house price dispersion increases the estimated probability of negative equity during the forecast period, which in turn leads to an increase in the projected number of claims. Introducing regional dispersion reduces the economic value of the MMI Fund for FY 2004 by $0.614 billion and reduces the capital ratio for FY 2010 by 0.47 percentage points.

e. Change Due to Calibrating the Claim Rate Estimation to FY 2004 Experience

Based on the March 31, 2004 data extract, there were already 40,687 claim cases recorded. An updated extract for July 31, 2004 reported 67,647 claim cases. Based on these two numbers, if the average number of claims per month remains similar during the last two months in FY 2004, there could be about 80,000 claims during FY 2004, which is likely to exceed the number estimated based on the econometric model. Although the econometric model fits the historical performance very well, it is subject to the limitation of policy or market regime shifts. If there is major regime change in the recent past, such change of structure may not be picked up by the model, which is mainly established to capture the long-run stable relationship. The noticeable deviation of the actual claim rate during FY 2004 from the model estimate could be due to a temporary event or to a long-term regime shift. We did not find evidence indicating any major policy modification or market structure change that would change the economic structural relationship on a permanent basis. As a result, we assume such a deviation is caused by a temporary deviation from the long-run relationship.

To capture this temporary effect, we calibrated the projected claim rates to match the recorded FY 2004 claim counts. This is achieved by applying a claim rate multiplier of 1.5 to the two main product types, the 30-year fixed-rate mortgages (FRMs) and the 30-year streamlined (SR) FRMs. This multiplier is assumed to remain at the same level of 1.5 in FY 2005, decay to 1.25 in FY 2006, and returning to the long-term stable level of no multiplier (*i.e.*, a multiplier of unity) for FY 2007 forward. This step of calibrating the model to the short-term claim behavior causes the FY 2004 economic value of the MMIF to be lowered by $1.334 billion to $21.977 billion, and the FY 2010 capital ratio be lowered by 0.26% percentage points to 6.61%.