Section V: MMI Fund Sensitivities - Performance of the Fund under Various Scenarios

This section reports the results of the sensitivity analyses we performed as part of FY 2004 Actuarial Review of the MMI Fund. To understand the possible deviation of the economic value and capital ratio of the MMI Fund with respect to the economic forecasts and some key assumptions in the base scenario, several sensitivity analyses are conducted and presented in this section. Although these scenario analyses cannot describe all possible outcomes, they provide insights into the relative importance and the magnitude of the impact of each factor on the performance of the MMI Fund. Among those parameters and economic factors, one of the most critical factors is the future economic conditions that may prevail during the remaining life of the FHA's currently existing portfolio. Essentially, the purpose of this analysis is to test the sensitivity of the economic value of the MMI fund in response to possible negative economic developments.   The selected scenarios are those we believe that may have the most significant impacts on the MMIF Fund's economic value.   These sensitivity analyses include:

- Low house price appreciation
- Low house price appreciation combined with higher interest rates
- High regional house price dispersion
- High claim loss severity rates

In the base-case scenario of the economic value of the MMI Fund, we use quarterly economic forecast from Global Insight, Inc. forecast. The forecast series include the national average sales price of existing single-family homes, FHLMC 30-year fixed-rate mortgage commitment rates, and 10-year and 3-month Treasury rates. Based on the 10-year and 3-month rate forecasts, we then impute the 1-year Treasury rate forecast. In addition, we calculate the regional house price dispersion index and also assume the loss rate to be 35 percent in the baseline scenario. Details of the methodology and support for the selection of the assumed values of these economic variables are described in Appendix D.

Exhibit V-1 displays the projected MMI Fund performance based on the base case scenario. The current forecasted economic value of the MMI Fund is $21.977 billion and the estimated current capital ratio is 5.53 percent, which exceeds the NAHA mandated capital ratio of 2 percent. It also shows the predicted economic values and capital ratios for the MMI Fund from FY 2005 to FY 2011. The economic values and capital ratios of the MMI Fund between FY 2004 and FY 2011 under alternative scenarios are presented in Exhibits V-2 to V-5.

Exhibit V-1

Projected MMI Fund Performance with Base Case Scenario ($ Millions)						
Fiscal Year	Economic Value of the Fund	Capital Ratio (%)	Volume of New Endorse-ments	Insurance in Force	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. Low House Price Appreciation Scenario

The house price appreciation rate is the most important factor that influences mortgage claim rates. Under the low house price appreciation scenario, we investigate the impact of the MMI Fund performance by assuming the house price appreciation rate to be 5 percentage points lower than the Global Insight, Inc. forecast for FY 2005 through FY 2007, returning to the baseline level starting at FY 2008. Compared to the baseline scenario, Exhibit V-2 indicates that the economic value of the MMI Fund could decrease by $2.214 billion. The capital ratio of FY 2004 would reduce to 4.97 percent. The impact lasts through FY 2011 and could reduce the FY 2011 capital ratio by as much as 1.04 percentage points. This can be explained by the change in the level of claim rates due to higher probabilities of negative equity as mortgage loans age.

Exhibit V-2

			Projected MMI Fund Performance with Low House Price Appreciation Scenario ($ Millions)			
Fiscal Year	**Economic Value of the Fund**	**Capital Ratio (%)**	**Volume of New Endorse-ments**	**Insurance in Force**	**Economic Value of New Book of Business**	**Interest on Fund Balances**
2004	19,763	4.97	113,565	397,285	224	
2005	20,463	4.86	96,465	421,306	43	658
2006	22,277	4.81	96,441	463,553	1,012	802
2007	25,166	5.02	95,956	501,181	1,935	954
2008	28,704	5.25	97,819	546,972	2,392	1,146
2009	32,605	5.38	100,861	606,111	2,533	1,368
2010	36,918	5.52	106,125	669,279	2,700	1,613
2011	41,697	5.67	113,237	735,944	2,896	1,883

B. Low House Price Appreciation Combined with Higher Interest Rates Scenario

In this part, the house price appreciation rates are 5 percentage points below that of the Global Insight forecast for FY 2005 through FY 2007. In addition, we assume an interest rate shock 300 basis points higher than the Global Insight forecast between FY 2005 and FY 2007, then return to the baseline levels in FY 2008.   In contrast to prior Reviews, a compounded effect of both interest rates and house prices are imposed on the MMI Fund, making this one of the most severe tests.

From the previous scenario, it is clear that low house price growth rate would lead to high claim rate. The high interest rate scenario interacts with the low house price growth rate in the following way. As the interest rate goes up, prepayment rates go down. As fewer loans are prepaid, more loans would remain in the Fund and are therefore subject to risk of claim. Even if the conditional claim rate does not increase, the cumulative claim rate would increase, causing the lifetime claim loss to increase.

Exhibit V-3 displays the results from this scenario.   Holding the low growth rate on house price constant (by referring to the results above), the impact of higher interest rates is primarily driven by higher lifetime claim experiences and higher IIF in future years due to slower prepayments. This scenario puts the FY 2010 capital ratio of the MMI Fund to an even lower level. The capital ratio for FY 2004 dropped by 0.49 percentage points from the base case scenario and for

FY 2011 dropped by 1.38 percentage points. However, we realize that the capital ratio still remains above NAHA's mandated 2.00 percent level through FY 2011.

Exhibit V –3

Projected MMI Fund Performance under Low House Price Appreciation Combined with High Interest Rates Scenario ($ Millions)						
Fiscal Year	Economic Value of the Fund	Capital Ratio (%)	Volume of New Endorse-ments	Insurance in Force	Economic Value of New Book of Business	Interest on Fund Balances
2004	20,008	5.04	113,565	397,285	245	
2005	20,972	4.62	96,465	453,801	299	666
2006	22,964	4.39	96,441	523,655	1,169	822
2007	25,927	4.40	95,956	589,547	1,980	983
2008	29,501	4.69	97,819	628,904	2,393	1,180
2009	33,440	4.92	100,861	680,285	2,533	1,406
2010	37,795	5.12	106,125	737,705	2,700	1,654
2011	42,618	5.33	113,237	799,336	2,896	1,928

C. High Regional House Price Dispersion Scenario

Using OFHEO's historical MSA and regional house price indices, we estimated the dispersion of the local house price growth rates from the national average growth rate. In Appendix C, we estimate that such dispersion grows with the time between two observed time periods, with an average annualized standard deviation of about 5.5 percent for both across 43 representative MSAs and across 9 census regions. Over its history, there are times this dispersion rate is above or below the long-term average rate. To obtain a clear understanding of the impact of this parameter to the MMIF Fund, this scenario analyzes the strength of the Fund under the assumption that the regional dispersion rate could be twice as high as the historical average. Specifically, we assign the annualized standard deviation of the local dispersion parameters to be 11.07 percent and 10.8 percent for MSAs and census regions, respectively. All other economic forecast series used here are the same as in the base-case scenario.

Exhibit V-4 shows the results of this particular scenario. The performance of the MMIF Fund is highly sensitive to the local house price growth dispersion.   The increase in house price dispersion means the possibility for individual houses to experience large decrease in value relative to the national average growth rate, thereby increasing the probability of claim. In other words, when house price dispersion increases to twice the historical average, conditional claim

rates tend to increase significantly due to higher probabilities of negative equity. The high dispersion parameter decreases the FY 2004 economic value by $2.013 billion and the FY 2004 capital ratio by 0.53 percentage points. Since this change is applied to all future years, its impact is particularly large in the long term. The FY 2011 capital ratio drops by 1.22 percentage points when the dispersion parameters are doubled. Nevertheless, the capital ratio stays above the required 2.00 percent level.

Exhibit V-4

Projected MMI Fund Performance with High Regional House Price Dispersion Scenario ($Millions)						
Fiscal Year	**Economic Value of the Fund**	**Capital Ratio (%)**	**Volume of New Endorse-ments**	**Insurance in Force**	**Economic Value of New Book of Business**	**Interest on Fund Balances**
2004	19,964	5.00	113,565	399,369	1,055	
2005	21,615	5.10	96,465	424,238	986	664
2006	23,835	5.12	96,441	465,739	1,373	847
2007	26,476	5.28	95,956	501,705	1,620	1,020
2008	29,455	5.39	97,819	546,692	1,773	1,205
2009	32,763	5.40	100,861	606,484	1,904	1,404
2010	36,434	5.43	106,125	670,371	2,051	1,620
2011	40,503	5.49	113,237	738,350	2,211	1,858

D. High Claim Loss Severity Rates Scenario

The loss rate is defined as the portion of the unpaid principal of a claimed loan that is not recovered through the disposition of the foreclosed property. This scenario test is of critical importance because losses on claims comprise the largest expense to the MMI Fund. In recent years, the loss rate on FHA claim cases has decreased significantly from its historical level. In the base-case scenario, we assume that the lower loss rate observed in the last three fiscal years would remain in the future. However, there exists the possibility that the recent lower loss rate may be a temporary phenomenon of the strong house price expansion in the late 1990's and early 2000's. If so, there is a chance that the loss rate can return to its historical level. This high loss severity scenario is designed to investigate the impact if loss rates start rising again. In particular, the loss rate is assumed to be 40 percent, which is the level during the FY 1999 to FY 2001 time period.

Similar to the local house price dispersion scenario, this impact is also assumed to last for all future years. The high level of loss severity indicates lower economic values and capital ratios for all from FY 2004 through FY 2011 as shown in Exhibit V-5. An increase in the loss rate by 5 percentage points would decrease the FY 2011 capital ratio by 0.54 percentage points, but it would still remain above the 2.00 percent level required by the NAHA.

Exhibit V-5

Projected MMI Fund Performance with High Claim Loss Severity Rates ($ Millions)						
Fiscal Year	Economic Value of the Fund	Capital Ratio (%)	Volume of New Endorse-ments	Insurance in Force	Economic Value of New Book of Business	Interest on Fund Balances
2004	20,776	5.23	113,565	397,285	1,604	
2005	22,876	5.45	96,465	419,989	1,409	691
2006	25,515	5.55	96,441	459,596	1,743	897
2007	28,564	5.79	95,956	493,001	1,956	1,092
2008	31,982	5.97	97,819	535,502	2,118	1,300
2009	35,764	6.02	100,861	593,879	2,257	1,525
2010	39,947	6.09	106,125	656,461	2,415	1,769
2011	44,579	6.17	113,237	723,057	2,594	2,038

E. Summary

Exhibit V-6 reports the projected MMI Fund's capital ratio corresponding to the selected alterative scenarios: base-case, low house price appreciation, low house price appreciation and high interest rates, high house price dispersion, and high loss severity. In all five scenarios, the estimated capital ratios exceed the NAHA mandated capital ratio of 2.0 percent for all future fiscal years.

Exhibit V-6

Projected MMI Fund's Capital Ratio between Scenarios (%)					
Fiscal Year	**Base-case**	**Low House Price Appreciation**	**Low House Price Appreciation Combined with High Interest Rates**	**High Regional House Price Dispersion**	**High Loss Claim Severity Rate (40%)**
2004	5.53	4.97	5.04	5.00	5.23
2005	5.82	4.86	4.62	5.10	5.45
2006	5.97	4.81	4.39	5.12	5.55
2007	6.25	5.02	4.40	5.28	5.79
2008	6.46	5.25	4.69	5.39	5.97
2009	6.53	5.38	4.92	5.40	6.02
2010	6.61	5.52	5.12	5.43	6.09
2011	6.71	5.67	5.33	5.49	6.17