

An Update on the Capital Adequacy of the FHA Single Family Insurance Program

by
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February 9, 2009

In November, we released a report on the financial strength of the single-family FHA program. Our analysis was based on the methodology used in HUD's FY2007 audit, but was adjusted to reflect current market conditions and projected house price and interest rate trends. Shortly after our report came out, HUD's FY2008 audit was released. While the results are remarkably similar, the similarities are sometimes more apparent than real. In fact, when we adjust our projections to reflect HUD's estimates of projected loan volume, initial capital and initial insurance in force, we find that the Fund will be unlikely to meet its statutory capital requirements by the end of this fiscal year.

This paper updates the projections presented in our original report¹ to reflect new information contained in HUD's FY2008 audit.² In particular, we have replaced our assumptions regarding initial capital and insurance-in-force with the presumably more accurate figures used in the HUD report. We have also increased our projections of FHA endorsements from about \$250 billion to \$350 billion a year to be consistent with the FY2008 audit. In all other respects, our underlying assumptions and approach are the same as those described in our original report. In particular, we continue to rely on house price and interest rate projections from Economy.com's October 2008 forecasts. We also use default and prepayment models developed for the FY2007 audit. While the models were updated for the FY2008 audit, the impact of this change was reported to be relatively small.³

Statutory Capital Requirements

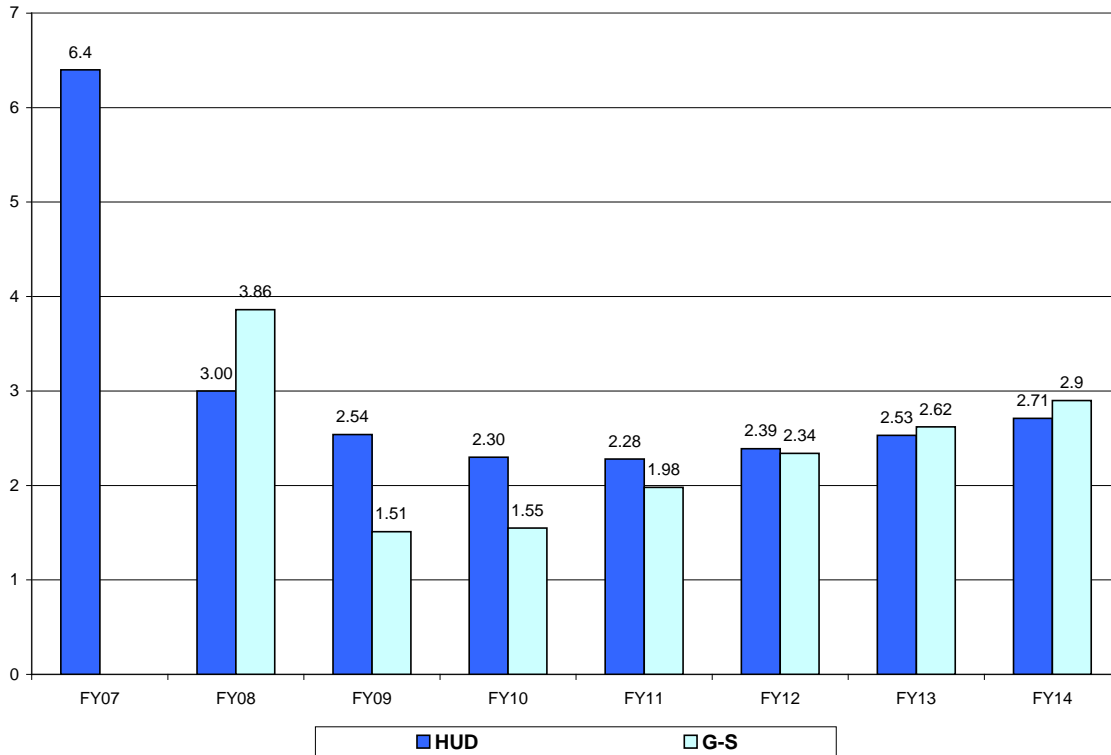
Exhibit 1 compares our revised projections with those presented in the HUD's FY2008 audit. Both forecasts predict a dramatic reduction in the capital ratio between FY2007 and FY2008, with further declines in FY2009 and FY2010; both predict that capital ratios will begin to rise in FY2011 with the presumed recovery of the housing market; and both predict that this recapitalization process will be relatively slow due to the dramatic increase in insurance-in-force. However, the HUD audit concludes that the Fund will continue to meet its capital requirement throughout the forecast period, although the margin for error is relatively small. In contrast, our analysis predicts that the capital ratio will fall below the mandated 2 percent minimum in both FY2009 and FY2010, producing capital deficits of roughly \$3 billion and \$4 billion, respectively.

¹Michael Goldberg and Ann B. Schnare, "An Alternative Look at the Financial Strength of the FHA Single Family Insurance Program," November, 2008.

²IFE Group, "FY 2008 MMI Fund Actuarial Review," November, 2008.

³Switching from the FY 2007 to the FY 2008 prepayment and default models reduced the economic value of the Fund in FY 2008 by \$582 million. Op. cit., p.20

Exhibit 1 Projected Capital Ratios



The primary reason that our projections differ from those presented in the HUD report appears to be related to projected loss severity rates. The HUD audit based its projections on the average rates observed in FY2007 and FY2008, which ranged from about 40 to 50 percent depending on product type and state.⁴ In contrast, our loss severity rates were predicted by our model, and are based on the location, predicted house price, and the unpaid principle balance of the loan. These projected rates averaged about 60 percent, considerably higher than the loss rates assumed by HUD. In fact, our projections for FY2009 are about the same as a “worse case” scenario presented in the HUD report, which assumed a loss severity rate of between 45 to 57 percent.

Given the shifting geographic distribution of FHA loans and the continued deterioration of the housing market, we believe that our loss severity rates will more accurately reflect conditions going forward. As documented in our earlier report, FHA lending activity is rising rapidly in states that are experiencing some of the most rapid house price declines. For example, California’s share of new originations has risen from one to 10 percent in less than a year. Growth rates are similarly high in states like Florida and Nevada. While our methodology enables us to capture these important trends, the HUD approach does not.

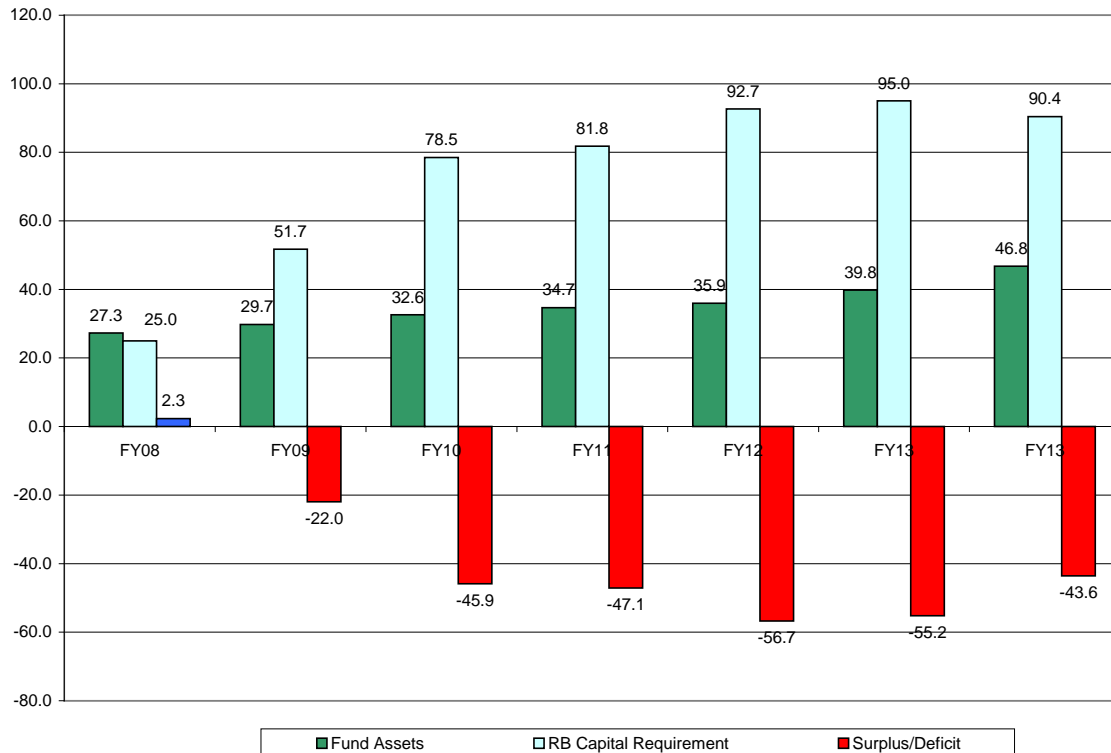
⁴ Loss rates are higher for loans with non-profit provided down payment assistance. However, like HUD, we assume that such programs are ended in FY2009.

Applying a Risk-Based Capital Standard

In addition to projecting capital ratios, we also subjected the Fund to the OFHEO stress test. This test, which is used to determine capital standards for Freddie Mac and Fannie Mae, was designed to ensure that the GSEs would have enough capital to survive an unexpectedly adverse economic environment. While government agencies are not required to hold capital in the traditional sense, i.e., to guard against *unexpected* losses, applying a risk-based capital standard provides a useful benchmark for measuring FHA's ability to survive an unexpectedly adverse economic event.

Not surprisingly, if a risk-based capital standard were used to measure capital adequacy, FHA would face large capital shortfalls in the coming years. Exhibit 2 shows the capital requirements that would arise under a risk-based capital standard. It also shows the projected capital resources of the Fund, as well as the resulting surplus or deficit (i.e., the difference between the capital resources and capital requirements in a given year.) While the Fund would have met a risk-based capital standard at the end of FY2008, it would face large capital deficits in subsequent years. In FY2009 and FY2010, for example, the Fund would have capital shortfalls of \$22 billion and \$46 billion, respectively.

Exhibit 2
Projected Risk-Based Capital Surpluses/Deficits



Alternative Scenarios

The projections presented in previous exhibits may well prove optimistic. Mortgage originations are now expected to rise to about \$1.9 to \$2 trillion next year. If FHA maintains a 20 to 25 percent market share, the pressure on the Fund would be even greater than our baseline projections suggest. For example, if FHA endorsements rise to \$500 billion next year—which would be consistent with a 25 percent market share—the projected capital ratio would fall below one percent in FY2009. In addition, the economy has deteriorated significantly since Economy.com’s October forecasts were produced. While we have not attempted to update our projections with a more recent economic forecast, doing so would undoubtedly lead to higher projected defaults and additional pressure on capital reserves.

Implications

Like many other players in the mortgage market, the outlook does not look good for FHA. While the capital shortfalls at FHA may pale in comparison to the losses projected at Fannie Mae and Freddie Mac—which are now essentially federal agencies—the prospect that the MMI Fund may fail to meet its mandatory capital requirement is nevertheless troubling. As the GSEs continue to tighten their underwriting standards, FHA has become virtually the only game in town for borrowers with blemished credit or little equity to put in their homes.

FHA has long been recognized as resource-constrained. Most observers believe that the agency does not have the staff, technology or authority it needs to operate effectively. Our analysis suggests that FHA will likely face a significant capital shortfall in the coming year. In fact, if conditions are worse than expected, the FHA could easily become insolvent.

It will undoubtedly take many years and resources to solve the long-standing problems at FHA. However, several things could be done in the near term to limit the exposure of the federal taxpayer. At a minimum, FHA should be required to provide more timely reports on its ongoing financial health. Waiting another year for the next official audit is unacceptable in today’s economic environment. FHA should also take steps to strengthen its risk management capabilities by establishing a Chief Credit Risk Officer and hiring or reallocating staff to support this critical role. Finally, FHA should begin to recapitalize the Fund through a series of incremental price increases. None of these actions will solve the long term problems at FHA. However, they may help to ensure that the Agency will be able to continue to serve the market at this critical moment in our country’s history.

An Alternative Look at the Financial Strength of the FHA Single Family Insurance Program

by

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Executive Summary

Turmoil in financial markets here and abroad has led to a dramatic increase in the federal government's involvement in financial markets, including mortgage lending. From the takeover of Fannie Mae and Freddie Mac to the passage of the Emergency Economic Stabilization Act of 2008, the government's increasingly direct role in ensuring a liquid and stable mortgage market has become the subject of headline news.

Yet relatively little attention has been paid to another aspect of this increased involvement—the growing volume of FHA lending. Since the beginning of HUD's fiscal year, FHA's share of single family home sales has increased from 4.0 percent in October 2007 to 18.6 percent in July 2008.

HUD's actuarial analysis for FY 2007 found the Mutual Mortgage Insurance (MMI) Fund to be adequately capitalized. However, the economic environment has changed considerably since that time. The housing market has continued to weaken, both the subprime and jumbo mortgage market have collapsed, and seemingly invincible financial institutions have been brought to their knees by mounting mortgage losses. At the same time, FHA loan limits have been increased up to \$729,500 in high cost markets¹ and the Agency's role has been expanded to help troubled borrowers facing foreclosure.

This paper assesses the current and future financial health of the MMI Fund in light of these dramatic changes. The analysis is based on a sample of 2.5 million currently active FHA mortgages originated on or before July 31, 2008. According to our estimates, the sample covers roughly 64 percent of FHA's existing book of business.

While our approach and underlying models are similar to the FY 2007 actuarial analysis, we make very different assumptions about economic conditions going forward and the likely characteristics of FHA loans. We also subject the Fund to two different capital standards. The first was established by the Cranston-Gonzalez National Affordable Housing Act of 1990, which requires that the economic value of the Fund be at least 2 percent of unamortized insurance in force. The second and more stringent standard subjects the Fund to the risk-based capital requirements applicable to Fannie Mae and Freddie Mac. While the MMI fund is not required to meet this second standard—and while capital requirements for the GSEs have been suspended with the Federal conservatorship—they nevertheless provide a useful benchmark for assessing the ability of the Fund to survive an unexpectedly adverse economic environment

Our projections rely on a number of key assumptions that affect our results:

- **Economic Forecast.** Future movements in house prices and interest rates are based on economic forecasts released by Economy.com on October 15, 2008. These forecasts assume that house prices at the national level will fall by 13.6 percent in 2009 and another 2 percent in 2010, and then recover.

¹ The \$729,500 limit expires on December 31, 2008. After that, the limit will fall to \$625,000.

- **Characteristics of Future Books.** Since the beginning of the fiscal year, the share of FHA loans in high cost markets has been increasing rapidly, while loan-to-value (LTV) ratios and credit scores are generally improving. Since conditions leading to these developments are likely to persist, we have assumed that future books will resemble FHA mortgages originated in the second half of FY 2008. We have also assumed that seller-funded non-profit downpayment assistance programs will be discontinued in FY2009.
- **Future Insurance Premiums.** In September 2007, FHA announced its plan to implement risk-based pricing based on the borrower's downpayment and credit score. However, the Housing and Economic Recovery Act of 2008 placed a one-year moratorium on this initiative. In response, FHA announced a new premium schedule, effective October 1, 2008. For purposes of our analysis, we assume that this new pricing schedule will extend beyond the one-year moratorium and cover loans endorsed from FY 2009 through FY 2014.
- **Future Lending Volume.** Genworth projections were used to forecast future loan origination volumes. These projections assume that FHA endorsements will remain relatively high, ranging from about \$250 billion to \$260 billion a year from FY 2009 through FY 2014.

The FY 2008 Book of Business

The net economic value of the Fund is derived by adjusting total capital resources at the end of the year (\$28,443 million) by the net present value of future cash flows from the existing book (negative \$11,710 million.) Based on the above assumptions, we estimate that the net economic value of the Fund at the end of FY 2008 was \$16,733 million.

The capital ratio, as defined by the Cranston-Gonzalez Act, is derived by dividing the net economic value of the Fund (\$16,733 million) by the unamortized insurance-in-force (\$491,528 million.) According to our estimates, the capital ratio at the end of FY 2008 was 3.40 percent, considerably below the FY 2007 estimate (6.40 percent) but still above the 2.0 percent minimum required by legislation. According to this standard, the MMI Fund would currently hold about \$6.4 billion in excess capital.

If FHA were held to the risk-based capital requirements established for the GSEs, the MMI Fund would be required to hold about \$28,341 million in total capital. Since the Fund had an estimated \$28,443 million in total capital at the end of FY 2008, applying a risk-based capital standard would result in a very small capital surplus of \$102 million.

Future Books of Business

Incorporating the impact of future books of business paints a very different picture due to the dramatic increase in new endorsements and the projected performance of the FY 2009 book. Large losses projected for the FY 2009 book cause capital ratios to fall to 2.03 percent in FY 2009 and 2.06 percent in FY 2010—just above the regulatory minimum. While capital ratios rise in subsequent years, the increase is relatively modest because of the dramatic increase in

insurance-in-force. Thus, even under the current regulatory regime, the capital cushions that have characterized the MMI Fund in the past will disappear.

The imposition of OFHEO risk-based capital requirements paints a considerably bleaker picture. Risk-based capital requirements are projected to rise by 76 percent in the upcoming fiscal year, from \$28,321 million in FY 2008 to \$49,785 million in FY 2009. Since the total assets of the Fund grow relatively slowly, this results in a risk-based capital deficit of \$19,984 million at the end of FY 2009. Risk-based capital deficits remain high in subsequent years, peaking at \$36,395 million in FY 2010.

The rapid increase in risk-based capital requirements reflects the dramatic growth in insurance-in-force as well as the projected house price declines in FY 2009 and FY 2010. Risk-based capital requirements as a percent of unpaid principal balances (UPB) rise from 6.28 percent in FY 2008 to 8.76 percent in FY 2010. Over the same period of time, overall insurance-in-force grows by 71 percent. These mutually reinforcing trends increase the risk-based capital requirements of the Fund by 139 percent between FY 2008 and FY 2010. While risk-based capital requirements as a share of UPB begin to decline as housing prices recover, total capital requirements remain relatively high due to the continued growth of the FHA book.

Alternative Growth Scenario

All else equal, slower growth would reduce the pressures on the capital resources of the Fund. For example, if one assumes that FHA origination volumes are only \$125 million in future years, the capital ratio would remain above the 2 percent threshold in FY 2009 and increase steadily in subsequent years. However, as before, the MMI Fund would consistently fail to meet the GSEs' capital standards. Although risk-based capital deficits would be considerably smaller than they are in the baseline estimates, they would nevertheless range from \$13 to \$18 billion a year.

Slower growth would also cause the net income of the Fund to become negative in FY 2009 (i.e., credit losses would exceed total revenues from insurance premiums and investments.) Net income losses would continue through FY 2012, peaking at roughly \$1 billion in FY 2011. While slower growth would result in lower credit losses, it would have a proportionately larger effect on premium income. Since so much of the insurance premium is received upfront, slower growth would remove an important buffer that otherwise protects the fund from mounting credit losses.

Implications

Instability in housing and credit markets and the economy at large makes any effort to project the likely health of FHA an extremely difficult task. Conditions could change within a matter of days or weeks in ways that would quickly make our projections obsolete. Likewise, models that performed well in the past may be less predictive today. However, at this point in time, we believe that if anything, our projections for the Fund are optimistic.

Despite the uncertainties involved, several broad conclusions can be drawn from our analysis. The first relates to the vulnerability of the MMI Fund to unanticipated downturns in the housing

market. Under the existing approach for determining capital, our forecasts suggest that any excess capital of the Fund is likely to be exhausted by FY 2009. As a result, the Fund will have little, if any ability to sustain larger-than-expected losses going forward. If a risk-based capital standard were employed, the Fund would face large capital deficits in FY 2009 and beyond—a finding that again underscores the vulnerability of the Fund to continued weakness in the housing market.

Whether or not the Fund should be recapitalized to OFHEO (or any other risk-based) standard is a matter for some debate. Conventional wisdom assumes that government insurance programs do not require capital in the traditional sense, i.e., to guard against unanticipated losses, or risk. While reserves are typically required to meet expected losses, if a catastrophic event occurs, the Government can either turn to the printing press or federal taxpayers to cover the necessary losses.

However, the experience of the past three months suggests that the conventional wisdom should be reconsidered, particularly with respect to mortgage lending. In our view, risk-based capital requirements would be desirable because they would make the potential exposure of the taxpayer more transparent and the flow of federal subsidies, more explicit. Risk-based capital requirements would also be more consistent with the cyclical nature of the housing market and the long-term (or “long-cycle”) risk that is inherent in mortgage lending. To protect the taxpayers’ interests, FHA pricing and capital standards should be subject to the same underlying principles that are applied to other mortgage insurers, including the GSEs.

Some might question the appropriateness of the OFHEO standard in light of recent developments at Fannie Mae and Freddie Mac. However, in considering the adequacy of the OFHEO standard, it is important to recognize that the stress-tests applied to the GSEs covered both interest rate risk and credit risk, which tend to be off-setting. In our analysis, we subjected the MMI Fund to a stand-alone credit stress test evaluated under two extreme economic environments. The resulting capital requirement is more difficult to meet than that applied to the GSEs. While alternative approaches are clearly possible, we believe that our approach represents a reasonably conservative way of measuring the potential exposure of the Fund to an unexpectedly adverse economic environment.

Unfortunately, meeting risk-based capital requirements within a relatively short period of time would require a significant increase in insurance premiums, making the mortgages unaffordable to the very families the program was designed to serve. However, a more incremental approach could be adopted that would help to rebuild the capital base with only a minimal impact on affordability. Alternatively, FHA could engage in risk-sharing programs to reduce the demands on its capital resources. In the absence of such steps, FHA could find itself in a precarious position in the upcoming years. While our analysis suggests that there is no immediate need for an infusion of Treasury funds, this situation could easily change if the economy continues to deteriorate. If the past three months has taught us anything, it is better to error on the conservative side in accounting for mortgage risk.

1.0 Introduction

Turmoil in financial markets here and abroad has led to a dramatic increase in the federal government's involvement in financial markets, including mortgage lending. From the takeover of Fannie Mae and Freddie Mac to the passage of the Emergency Economic Stabilization Act of 2008, the government's increasingly direct role in ensuring a liquid and stable mortgage market has become the subject of headline news.

Yet relatively little attention has been paid to another aspect of this increased involvement—the growing volume of FHA lending. The collapse of both the subprime and jumbo mortgage markets in the past 12 months has made government and government-sponsored lending the only games in town. In less than a year, FHA's share of single family home sales has increased from 4.0 percent in October 2007 (the beginning of its fiscal year) to 18.6 percent in July 2008.² This unprecedented rate of growth represents a level of government involvement that has not been seen in many years.

While FHA's critical role in helping to stabilize the mortgage market can not be denied, the Agency's continued financial health must not be sacrificed in the process. The latest FHA audit³ found the Mutual Mortgage Insurance (MMI) Fund to be adequately capitalized at the end of FY 2007.⁴ In fact, the MMI Fund had a capital ratio (6.4 percent) that was more than three times as high as the congressionally mandated two percent minimum.

However, the market has changed dramatically since the time that the audit was done. Housing prices have continued to fall, the private mortgage market has virtually collapsed, and seemingly invincible financial institutions have been brought to their knees by mounting mortgage losses. At the same time, FHA loan limits have been increased up to \$729,500 in high cost markets and the Agency's role has been expanded to provide financing to borrowers facing foreclosure.⁵

This paper uses up-to-date information on the characteristics of FHA loans and the overall state of the housing market to project the current and future financial health of the MMI Fund. Our analysis is based on a sample of 2.5 million active FHA mortgages originated on or before July 31, 2008. The sample was obtained from McDash, and according to our estimates, covers roughly 64 percent of FHA's existing book of business.⁶

While our approach is similar to the one used in the FY 2007 audit, we make very different assumptions about economic conditions going forward and the likely characteristics of FHA loans. We also subject the MMI Fund to the capital standards that are imposed on Fannie Mae and Freddie Mac, which require the GSEs to hold enough capital to cover both expected and *unexpected* losses. While the government does not hold capital in the traditional sense—its reserves are generally designed to cover only expected losses—using the GSE capital standard as

² <http://www.hud.gov/offices/hsg/comp/rpts/fhamktsh/fhamktcurrent.pdf>

³ Integrated Financial Engineering, Inc., An Actuarial Review of the Federal Housing Administration Mutual Mortgage Insurance Fund for Fiscal Year 2007, October 12, 2007

⁴ The MMI Fund covers losses in FHA's unsubsidized single-family insurance programs

⁵ The \$729,500 limit expires on December 31, 2008. After that, the limit will fall to \$625,000.

⁶ Further details on the sample are provided in Appendix A.

a benchmark provides a useful way of measuring the potential exposure of the MMI fund and the federal taxpayer to unanticipated downturns in the overall economic environment.

1.2 Background

Since the enactment of the Cranston-Gonzalez National Affordable Housing Act in 1990, the Federal Housing Administration (FHA) has been required to conduct an annual independent actuarial review of its Mutual Mortgage Insurance Fund. The legislation also required that the net economic value of the Fund be at least 2 percent of the *unamortized* value of loans outstanding, beginning in FY 2001.⁷

The net economic value of the Fund at a given point in time is determined by adjusting its total capital reserves by the net present value of future cash flows from the existing book of business. This adjusted value is then compared to the unamortized dollar value of the book to determine if the 2 percent minimum has been met. Since the capital requirement took effect, estimated capital ratios have been well above the mandated threshold.

The MMI audit for FY 2007 was no exception. While the net present value of future cash flows from the existing book of business was negative (- \$3,952 million), the projected losses were more than offset by large capital reserves (\$25,365 million).⁸ The overall value of the fund at the end of FY 2007 was estimated to be \$21,277 million, resulting in a capital ratio of 6.4 percent.⁹ In dollar terms, the resulting capital cushion (i.e., excess capital) was about \$14,631 million.¹⁰

The FY 2007 audit also considered the impact of future business on the ongoing health of the insurance fund. While the economic value of the 2007 book was projected to be negative (-\$406 million), future books of business were projected to have positive and increasing economic values. As a result, the audit concludes that the fund would remain adequately capitalized in the coming years. The premium increase scheduled to take effect in FY 2010, which was not considered in the Audit, would have only strengthened these results.

However, changing market conditions could call these findings into question. The economic forecasts that were used to predict performance going forward now appear optimistic, particularly with respect to house price appreciation. The HUD audit assumes that housing prices (at the national level) fall by 2.14 percent in FY 2007 and another 1.17 percent in FY 2008, but then return to positive territory. However, according to the Case-Shiller 20 City Composite Index, actual house declines were about 6 percent in FY 2007, and another 13 percent in the first three quarters of FY 2008.¹¹ While the OFHEO Index for Purchase Loans shows a pattern that is

⁷Capital ratios are typically based on the unpaid (or remaining) mortgage balance. Basing the ratio on the original loan amount is a more conservative approach.

⁸Since projected cash flows for the existing book do not include upfront premiums received in earlier years, they do not describe the economic value of previous book years.

⁹See Integrated Financial Engineering, Inc., op. cit, Exhibit II-2, p.14

¹⁰ The minimum capital requirement was \$6,642 million, defined as 2 percent of unamortized insurance-in-force at the end of the fiscal year (\$332,293 million).

¹¹ See S&P/Case-Shiller Home Price Index, June 2008.

closer to Audit's assumptions for FY 2007 and 2008¹², most analysts now expect that price declines will continue well into 2009, if not beyond.

Assumptions regarding the risk characteristics of future FHA loans may also prove optimistic. The audit used the attributes of the 2006 and 2007 books to project the future characteristics of FHA loans. Compared to earlier years, these books were relatively favorable in terms of their risk characteristics. For example, the concentration of loans in high cost markets such as California was relatively low and FICO scores--while lower than those that would be found in the conventional market--were generally improving. However, as described in the following section, FHA loans are now changing in ways that could have a significant impact on the overall profile of the FHA book, particularly with respect to their growing concentration in high cost markets.

1.2 Report Outline and Contents

The remainder of this report is organized into three chapters and three Appendices. Chapter 2 describes trends in the risk characteristics of FHA loans, focusing on the changes that have occurred in the past fiscal year. Chapter 3 presents our forecasts for the expected performance of both the existing and future FHA books. Chapter 4 summarizes our results and their implications for FHA. Appendix A discusses the representativeness of the sample; Appendix B provides additional details on our technical approach; and Appendix C presents the detailed financial forecasts.

¹²According to the OFHEO Index for Purchase Loans, average housing prices at the national level were relatively stable in FY 2007 but declined by 3 percent in the first three quarters of FY 2008 (or by about 5 percent on an annualized basis.) See <http://www.ofheo.gov/hpi.aspx>.

2.0 The Changing Nature of FHA Lending

As described in more detail below, recent developments in the mortgage market have led to dramatic shifts in both the volume and characteristics of FHA lending. Both market share and origination volume have increased dramatically in the past 12 months, making FY 2008 the largest book on record.¹³ At the same time, the risk characteristics of FHA loans are changing rapidly. On the negative side, there has been a marked shift in the geographic concentration of FHA loans towards high cost markets experiencing significant price declines. On the other hand, like other segments of the mortgage market, FHA lenders appear to be tightening their credit standards, particularly with respect to LTV and credit score. However, these latter developments are largely lender-driven and could change overnight in the absence of policy change.

2.1 Market Share

Since the beginning of the decade, FHA's market share of single family home sales has generally been on the decline, falling from about 13.6 percent in FY 2000 to about 3.8 percent in FY 2006 at the height of the housing boom. (See Exhibit 1.) In fact, FHA's low market share in 2005 and 2006 has served to protect the insurance fund because a lower fraction of its book was originated when housing values were at their peak. Borrowers who took out high LTV loans in 2005 and 2006 have often seen their equity disappear once housing prices began to fall. In contrast, borrowers who took out loans in earlier years have generally experienced enough appreciation in their homes to maintain positive equity positions even in the face of house price declines.

The collapse of the subprime market in August 2007 and the subsequent increase in FHA loan limits has led to a dramatic reversal in the downward trend in FHA's market share. As shown in Exhibit 2, FHA's monthly market share of single-family home purchases (based on number of homes) increased from 6.4 percent in October 2007 to 15 percent in June 2008.¹⁴ On an annualized basis, the market share observed in June was the highest since 1991. This increase has also been accompanied by a dramatic increase in the issuance of Ginnie Mae securities, the securitization vehicle for both FHA and VA loans. In July 2008, Ginnie Mae issued \$25.8 billion in new securities, more or less on par with Fannie Mae (\$36.6 billion) and Freddie Mac (\$21.7 billion.)¹⁵

¹³FHA follows the US Government's fiscal year, which begins on October 1 and ends on September 30 of the following year.

¹⁴ Source: FHA Single Family Activity in the Home-Purchase Market Through June 2008 <http://www.hud.gov/offices/hsg/comp/rpts/fhamktsh/fhamktcurrent.pdf>. Recently release data for July show a market share of 18 percent.

¹⁵Inside Mortgage Finance, September 15, 2008.

Exhibit 1

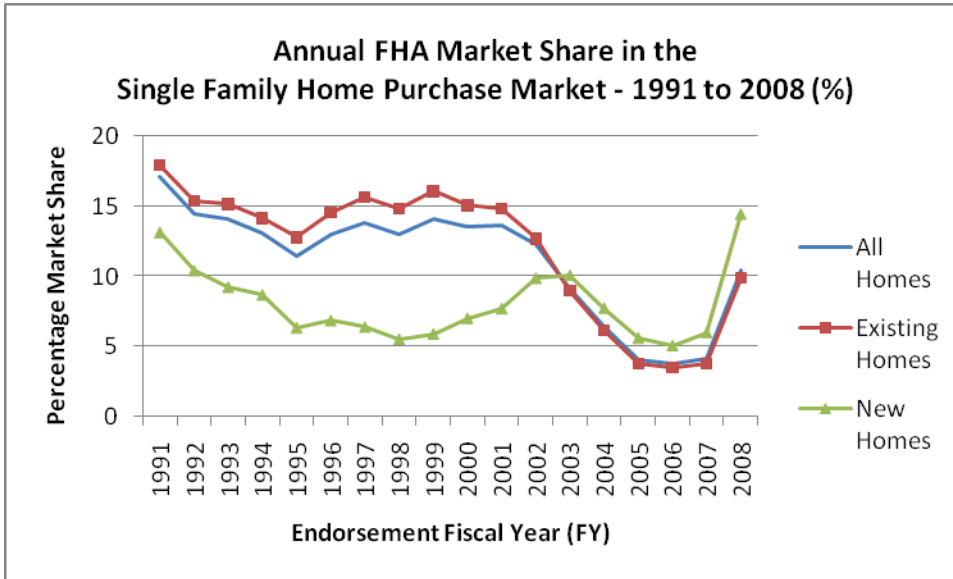
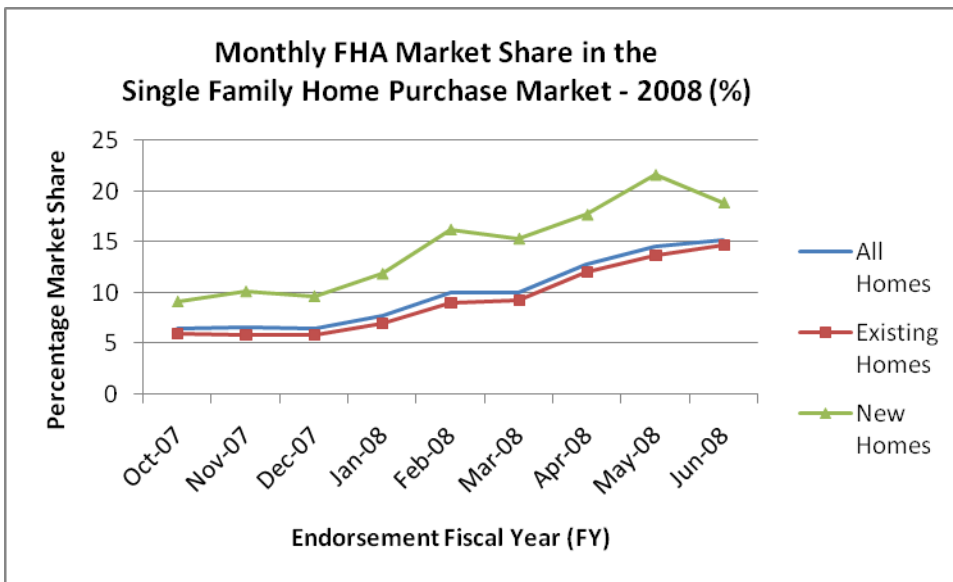


Exhibit 2

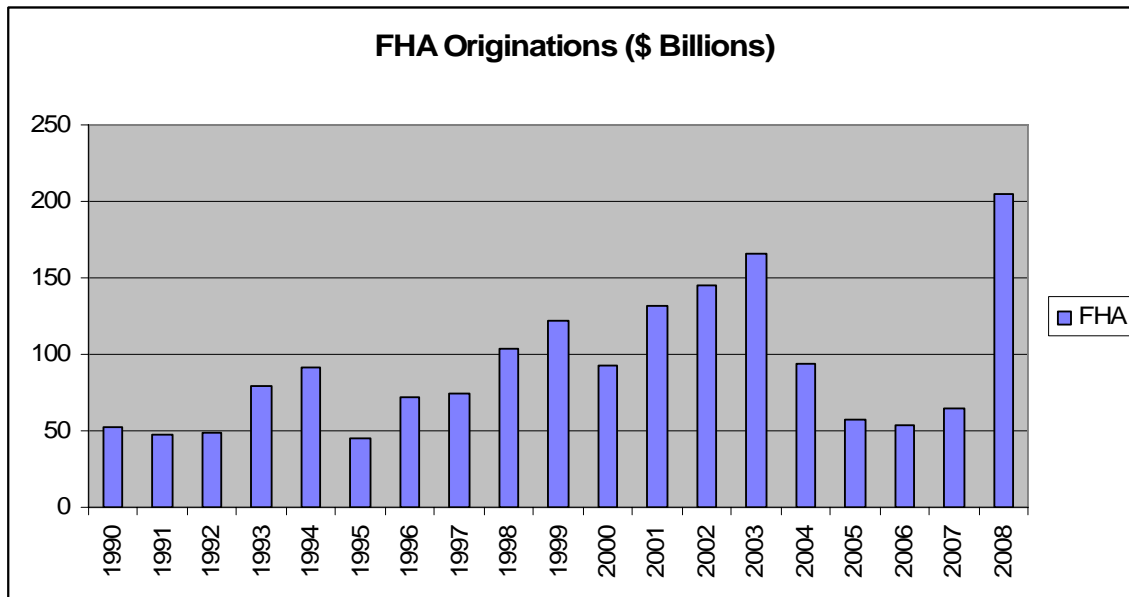


2.2 Origination Volume

Origination volume has also risen rapidly despite the slowdown in the overall mortgage market. While *total* originations are expected to fall from \$2,430 billion in 2007 to \$1,547 billion in 2008, FHA originations are expected to more than triple, from \$64.74 billion in 2007 to an

estimated \$205 billion in 2008.¹⁶ On a fiscal year basis, FHA volume is projected to rise to about \$181 billion in FY 2008, making it the highest year on record.¹⁷

Exhibit 3



Source: Inside Mortgage Finance

2.3 Geographic Distribution

The characteristics of FHA mortgages are also changing rapidly, particularly with respect to their geographic distribution. FHA originations in California increased by an estimated factor of 12 between the first and final quarter of FY 2008, making California the second largest producer of FHA loans (just behind Texas.)¹⁸ As shown in Exhibit 4, while California represented only about 1.7 percent of all FHA lending in FY 2007, its share has risen steadily since that time, from 2.4 percent in the first quarter of FY 2008 to 10.1 percent in the first month (July) of the final quarter.

FHA’s low market share in high cost markets at the height of the housing boom has also served to strengthen the underlying health of the insurance fund. Since high cost areas have generally experienced the most rapid house price declines, FHA’s relatively low concentration in these markets in the past few years has protected the Fund from some of the nation’s most dramatic house price declines.¹⁹ However, the rapid increase in FHA lending in high cost markets threatens to change this situation. Providing 100 percent guarantees on \$729,500 (or \$625,000)

¹⁶ Numbers are based on calendar year. 1990 through 2Q08 from Inside Mortgage Finance.

¹⁷ Based on HUD estimates through August 2008. FY 2008 projection assumes that volumes are maintained in September. See www.hud.gov/offices/hsg/hsgroom.cfm

¹⁸ Estimates for 4Q08 assume current originations levels are maintained at July levels throughout remainder of fiscal year.

¹⁹ In accordance with Economy.com’s observed house prices in FY 2008, the nationwide decline was 6.5% with CA having the greatest decrease of 20.3%. Forecasts for FY 2009 have CA, AZ, FL and NV declining more than 15%.

mortgages with loan-to-value ratios that are close to 100 percent is a highly risky business, particularly in markets that are continuing to experience house price declines.

Exhibit 4
Percent Distribution of Originations by State¹:
Top Ten States in 2007 + California

State	2003	2004	2005	2006	2007	1Q08	2Q08	3Q08	4Q08 ²	YTD 2008 ³
Texas	9.27	11.42	13.53	12.56	11.19	8.55	7.18	6.65	6.73	7.01
Georgia	4.24	5.33	6.22	6.11	6.05	5.74	5.37	4.59	4.06	4.67
Ohio	3.40	3.81	4.24	4.90	4.62	4.15	3.67	3.66	3.29	3.58
Florida	4.78	5.28	4.34	3.91	4.59	5.22	5.19	4.95	5.00	5.05
New Jersey	3.65	4.05	3.99	3.58	4.40	5.18	5.28	4.68	3.82	4.52
Illinois	5.00	4.78	4.40	4.08	4.24	4.69	4.86	4.15	4.31	4.41
Michigan	3.01	3.33	3.83	3.82	3.81	3.47	3.53	3.16	2.37	2.96
Colorado	5.53	4.99	4.59	3.74	3.49	3.43	3.52	3.43	2.93	3.25
New York	3.00	3.56	2.88	3.33	3.46	3.57	3.28	3.16	3.23	3.26
N Carolina	2.76	2.88	3.53	3.46	3.24	3.29	3.25	2.95	2.84	3.01
California	8.89	5.19	2.33	1.52	1.74	2.40	3.42	6.62	10.06	6.83
% of Total	53.53	54.62	53.88	51.01	50.83	49.69	48.55	48.00	48.64	48.55

Source: Data through FY 2007 from 2007 MMI Fund Analysis Actuarial Review, Exhibit IV-3. FY 2008 data through July 2008 from HUD website, <http://www.hud.gov/offices/hsg/comp/rpts/sfsnap/sfsnap.cfm>.

¹Based on total dollar volume

²4Q08 estimates are based on July results.

³YTD through July 2008.

2.4 Loan Characteristics

Other loan characteristics have also changed in the past fiscal year. The following charts describe the characteristics of FHA endorsements from FY 2003 through FY 2008. Data for FY 2003 through FY 2007 were obtained from the FY 2007 audit,²⁰ while FY 2008 estimates were based on the sample of loans provided by McDash or if available, from the HUD website.²¹ Since the McDash estimates differ somewhat from the HUD statistics for comparable years, we have provided FY 2007 estimates from both data sets to better illustrate underlying trends.²²

Credit Scores. While the McDash data generally reports lower credit scores than those reported in the FY 2007 MMI Fund Analysis Actuarial Review²³, there is a clear indication that FICO scores have improved significantly over the past fiscal year. For example, the share of loans with a borrower FICO above 680 rose from about 17 to 35 percent over the course of the year, while the share of loans with FICO scores below 580 declined from about 27 to 5 percent. This trend is consistent with the tightening of underwriting standards that have occurred in other sectors of

²⁰IFE Group, FY 2007 MMI Fund Analysis Actuarial Review See <http://www.hud.gov/hsg/hsgroom.cf>

²¹See <http://www.hud.gov/hsg/hsgroom.cf>

²² See Appendix A for a comparison of the McDash data to the FY 2007 estimates used in the HUD audit.

²³ See Appendix A for a discussion of the McDash data.

the mortgage market. Information available from the HUD website generally confirms this positive trend. The average FICO score of FHA borrowers was 676 in June compared to 651 the previous fiscal year.²⁴

Exhibit 5
Percent Distribution of Originations by FICO Score¹

FICO Score	HUD			McDash					
	2005	2006	2007	2007	1Q08	2Q08	3Q08	4Q08 ²	2008 ³
Missing	0.0	0.0	0.0	} 5.43	4.80	11.25	11.62	9.99	10.21
No Credit History	6.83	5.67	5.08						
300-539	3.68	3.52	4.43	11.40	11.38	7.66	2.93	1.37	4.66
540-579	10.45	9.92	11.12	13.60	15.23	11.21	6.46	4.19	8.06
580-619	22.82	22.76	24.35	21.30	22.89	20.93	17.27	15.36	18.31
620-679	40.02	41.35	39.98	29.26	29.00	29.58	32.82	33.94	31.92
>680	16.20	16.79	15.05	19.01	16.70	19.36	28.90	35.14	26.84
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: HUD data from FY 2007 MMI Fund Analysis Actuarial Review, Exhibit IV-6. McDash data do not distinguish between missing score and no credit history.

¹Based on total dollar volume and FICO score at time of origination. Current FICO was used when Original FICO was missing.

²4Q08 estimates are based on July results.

³YTD through July 2008.

Loan-to-Value Ratio. Loan-to-value (LTV) ratios also appear to be declining, a trend that is again consistent with developments elsewhere in the market. While FHA continues to be dominated by low downpayment borrowers, the share of mortgages with LTVs of 97 percent or more has declined from about 40 percent in FY 2007 (using the McDash estimates) to about 35 percent in FY 2008 year to date. Most of the decline occurred in the first two quarters of the fiscal year. While the share of high LTV loans appears to be somewhat higher in the second half of the year, it is still well below the level observed in FY 2007.²⁵

²⁴FHA Outlook, Single Family Operations, August 16-31, 2008, p.2.

²⁵ Mortgage credit risk is exacerbated by the compounding of high-risk attributes. From that perspective, it is worth noting that the high-cost states (CA, AZ, FL and NV) contributed proportionately fewer High-LTV and low-FICO loans (measured as LTV > 95% and FICO < 620) in the second half of FY 2008. For example, CA accounted for 6.1% of these high-risk loans but 10.0% of all loans. Only FL delivered proportionately more high-risk loans at 4.7% relative to total deliveries of 4.5%. Thus there appears to be little layering of high-risk and high-cost loans.

Exhibit 6
Percent Distribution of Originations by LTV¹

	HUD					McDash					
	2003	2004	2005	2006	2007	2007	1Q08	2Q	3Q8	4Q08 ²	2008 ³
Missing	0.0	0.01	0.01	0.01	0.01	0.20	0.22	1.07	0.56	0.31	0.55
≤ 80%	5.47	5.56	5.76	6.81	7.52	7.39	8.45	8.20	6.61	5.75	6.97
>81%, ≤ 90%	9.61	9.17	9.22	10.06	11.52	12.48	14.87	15.48	13.67	13.08	14.05
>90%, <95%	5.92	5.88	5.71	9.56	12.99	17.02	18.47	19.10	19.23	18.67	18.96
≥95%, <97%	25.36	25.00	23.75	24.23	25.70	22.55	24.64	24.55	24.23	24.33	24.38
≥ 97%	53.63	54.38	55.52	49.33	42.27	40.35	33.34	31.60	35.70	37.88	35.08
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: HUD estimates from 2007 MMI Fund Analysis Actuarial Review, Exhibit IV-5; 2007 statistics based on partial year data.

¹Based on total dollar volume

²4Q08 estimates are based on July results.

³YTD through July 2008.

Downpayment Assistance. The use of downpayment assistance also appears to have declined, particularly with respect to grants provided by non-profits. (See Exhibit 7.) While such loans have accounted for about 20 percent or more of all endorsements in the past few years, they are down to about 16 percent in FY 2008. Seller-funded non-profit downpayment assistance programs will become ineligible for FHA funding in FY 2009. Given the relatively poor performance of such loans, these developments should also increase the overall credit quality of FHA's book.

Exhibit 7
Percent Distribution of Originations by Downpayment Source¹

	2003	2004	2005	2006	2007	1Q08	2Q08	3Q08	4Q08 ²	2008 ³
No Gift	81.35	70.24	63.87	62.02	65.97	66.10	78.03	76.81	72.61	74.62
Relative	7.41	9.59	9.50	9.39	7.70	6.66	5.29	6.25	7.80	6.35
Non-Profit	9.76	18.05	23.52	24.30	22.82	18.29	15.25	15.71	18.25	16.46
Government	1.42	2.04	3.03	4.18	3.43	2.25	1.40	1.17	1.27	1.42
Employer	0.06	0.08	0.08	0.10	0.08	0.05	0.04	0.05	0.07	0.05
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: 2003-2007 data from 2007 MMI Fund Analysis Actuarial Review, Exhibit IV-10, 2008 data from <http://www.hud.gov/offices/hsg/comp/rpts/sfsnap/sfsnap.cfm>

¹Based on total dollar volume, including refinancings and purchase money loans

²July numbers only

³YTD through July 2008.

Loan Purpose and Type. Loan purpose and type showed less variation over the year. While the McDash data generally show a lower share of purchase loans than the share reported by HUD, the 2008 book looks relatively similar to 2007 with respect to these characteristics.

Exhibit 8
Percent Distribution of Originations by Loan Type¹

	HUD					McDash					
	2003	2004	2005	2006	2007	2007	1Q08	2Q08	3Q08	4Q08 ²	2008 ³
TYPE											
Fixed	92.83	86.94	88.48	97.14	98.58	97.79	98.84	99.45	99.10	96.69	98.54
ARM	7.18	13.06	11.52	2.86	1.42	2.21	1.16	0.55	0.90	2.21	1.46
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
PURPOSE											
Purchase	56.65	73.68	79.47	92.65	93.98	88.65	84.06	83.78	87.63	88.54	86.58
Refi	43.36	26.32	20.53	7.35	6.02	11.35	15.94	16.22	12.37	11.46	13.42
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: HUD data calculated from FY 2007 MMI Fund Analysis Actuarial Review, Exhibit IV-4.

¹Based on total dollar volume

²4Q08 estimates are based on July results.

³YTD through July 2008.

3.0 Financial Forecasts

This section presents a baseline forecast of the financial health of the MMI fund based on its existing book of business at the end of FY 2008. It also presents projections on the capital adequacy of the Fund in future years based on certain assumptions regarding both the size and the characteristics of the FY 2009 through FY 2014 books. Our analysis is based on a representative sample of over 50,000 loans drawn from the data provided by McDash. As described in Appendix A, the McDash data are generally representative of the broader universe of FHA loans.

Unlike the FY 2007 audit, the adequacy of the fund is assessed using two different standards. The first is based on the mandated minimum capital ratio, i.e., the estimated value of the fund divided by the unamortized insurance in force. Legislation requires that the value of the Fund be at least 2 percent of unamortized insurance in force. The second and more stringent standard subjects the Fund to the capital standards applied to Fannie Mae and Freddie Mac.²⁶ While the MMI fund is not required to meet this standard, it provides a benchmark that can be used to assess the health of the fund in an unexpectedly stressful economic environment.

3.1 Technical Approach

In most respects, our technical approach was similar to the one employed in the FY 2007 audit. For example, like the FY 2007 audit, we used house price appreciation estimates from OFHEO to mark the existing book to market based on the MSA (or state) of every loan. We also used the same underlying default and prepayment models to project performance in future years. However, our technical approach differed from the audit in several important ways:

- First, we used a different approach to estimate losses arising from foreclosures. The FY 2007 audit used fixed percentage loss rates based on those observed in FY 2006; six different loss rates were applied, depending on the state, mortgage type and source of downpayment. Our approach was to project a specific loss rate for every loan, based on the outstanding mortgage balance, the projected house price decline, and the average time to foreclosure in the state. In general, average losses calculated through our approach are higher than those assumed in the FY 2007 audit, which averaged about 39 percent of UPB. For example, we estimate that the cumulative loss severity rate for the existing book of business will be about 51 percent over the next ten years.
- Our analysis also differed with respect to the treatment of house price appreciation. The FY 2007 audit used a national house price forecast, and then assigned volatility parameters to represent the dispersion of individual property values from these national means. Our

²⁶The OFHEO stress test models the performance of the GSEs' investment and guarantee businesses under both a rising and falling interest rate scenario. Only the guarantee business (i.e., credit risk) is relevant to the MMI Fund. The specific test that was used to determine risk-based capital standards for FHA was based on the so-called "down rate" scenario, which is generally more binding in determining the capital required to meet credit risk. The OFHEO stress test is based on the historic experience of 1983-1984 originations in the Oil Patch states. While the results vary by LTV, 95 percent LTV mortgages are assumed to have a default rate of about 23 percent and gross severity rate of between 50 and 60 percent.

approach used house price forecasts that were specifically tied to the MSA, and then generated dispersion of the individual property values from these more regional geographic means. House price appreciation varies significantly from market to market. As a result, our approach should be more sensitive to the geographic distribution of FHA loans.

We view each of these modifications as a significant improvement to the approach adopted in the FY 2007 audit. A more detailed discussion of these and other technical issues is presented in Appendix B.

3.2 Key Assumptions

Like the FY 2007 audit, our projections rely on a number of key assumptions regarding past and future house price trends, movements in interest rates, and the volume and characteristics of loan originations in future years.

Economic Forecast. Future movements in housing prices and interest rates were based on economic forecasts released by Economy.com on October 15, 2008. As shown in Exhibit 9, our baseline forecasts assume that housing prices at the national level will continue to fall through 2009, and then stabilize and recover by 2011. However, house price appreciation forecasts for specific MSAs are often very different. For example, in 2009, prices are projected to fall by 23.3 percent in Riverside-San Bernardino, while prices are expected to remain relatively stable in Fort Worth (-0.4 percent.) As noted above, our forecasts take these MSA-specific forecasts into account.

**Exhibit 9
Key Economic Assumptions**

Economic Indicators	2008	2009	2010	2011	2012	2013	2014
House Price Appreciation (%)							
• US Average	-7.76	-13.55	-1.92	5.99	6.88	4.09	4.10
Interest Rate (FHLMC 30 YR FRM)	5.95	6.63	7.53	7.15	6.93	6.88	6.88

Characteristics of Future Books. The FY 2007 audit assumed that future FHA loans would look like the FY 2006 and FY 2007 books combined. However, as noted earlier, the characteristics of FHA mortgages are changing rapidly. While loans are increasingly concentrated in higher cost markets, they tend to have higher credit scores and lower loan-to-value ratios than previous FHA books. Since conditions leading to these developments are likely to persist, we have based our estimates on the characteristics of the loans that were originated in the second half of the year.²⁷ We have also assumed that seller-funded non-profit downpayment assistance programs will be discontinued in FY2009.

Future Insurance Premiums. In September 2007, FHA announced a plan to implement risk-based pricing based on downpayment and credit score. However, the Housing and Economic

²⁷ Fourth quarter estimates only cover July.

Recovery Act of 2008 placed a one-year moratorium on this plan. In response, FHA announced a new schedule of premiums, effective October 1, 2008. Under the new pricing regime, the upfront premium on purchase money loans was raised from 1.50 to 1.75 percent, while the on-going premium on all high LTV loans (> 95 percent), including refinances, was increased from 0.50 to 0.55 percent. For purposes of our analysis, we assume that the current pricing schedule will extend beyond the one-year moratorium and cover loans endorsed from FY 2009 through FY 2014.

Future Lending Volume. Finally, we used Genworth estimates of future loan origination volumes to project FHA activity in future years. As shown in Exhibit 10, these projections assume that FHA endorsements will remain close to their current levels over the next few years.

Exhibit 10
Forecasted FHA Endorsements (\$ Billions)

	2009	2010	2011	2012	2013	2014
Total Originations	\$1,554	\$1,665	\$1,725	\$1,755	\$1,775	\$1,775
FHA Originations	\$250	\$256	\$251	\$257	\$262	\$262
FHA Share (%)	16.3	15.4	14.6	14.6	14.8	14.8

3.3 Baseline Forecasts for Existing Book of Business

Exhibit 11 summarizes the results of our baseline forecasts for the existing book of business at the end of FY 2008. These estimates assess the value of the fund in a run-off mode, i.e., assuming no new business after FY 2008. The detailed projected cash flows that underlie these summary statistics are presented in Appendix C.

HUD has not released its estimates of the total capital resources of the MMI fund at the end of FY 2008. However, we were able to estimate its value by using data presented in the FY 2007 audit, combined with data available from a HUD website.²⁸ The FY 2007 audit estimated that the MMI fund would have total capital resources of \$25,365 million at the end of FY 2007. In FY 2008, we estimate that net income from investments was roughly \$763 million, and Net Insurance Income, about \$2,315 million.²⁹ As a result, Total Capital Resources at the end of FY 2008 should be roughly \$28,443 million.

The economic value of the Fund, as defined by HUD, is derived by adjusting Total Capital Resources at the end of the year by the net present value (NPV) of future cash flows from the

²⁸ See www.hud.gov/offices/hsg/hsgroom.cfm

²⁹ The FHA Monthly Report for the Single Family Insurance Fund provides estimates of total insurance-in-force (UPB), claims, prepayments and endorsements through August 2008, but does not distinguish by program types (i.e., MMI vs. GIF/SRIF.) We estimated premium income for the entire fiscal year by assuming that September would be identical to August and that the MMI fund accounts for about 95 percent of all insurance-in-force (based on its share of total endorsements.) Estimated premium income was derived by applying standard insurance rates to both existing and the 2008 books of business. Estimated losses were derived by using the HUD severity rate (39 percent) on projected claims (UPB). Income from investments was based on an average rate of 2.76 percent for one year Treasuries.

current book.³⁰ According to our estimates, future cash flows from the existing FHA book have a negative NPV of about \$11,710 million. This projected negative cash flow is about three times as high as the estimate produced in last year's audit (\$3,952 million) and reflects the continued deterioration of the housing market. The cumulative default rate on the existing book over the next ten years is projected to be 10.7 percent, with a cumulative severity rate (i.e., loss given default) of about 51 percent of UPB.

Adjusting Total Capital Resources at the end of the FY 2008 (\$28,443 million) by the net present value of future cash flows (negative \$11,710 million) produces an Economic Value of \$16,733 million. With an estimated \$491,528 million in unamortized insurance-in-force, the capital ratio at the end of FY 2008 is 3.4 percent. This ratio is considerably smaller than the one produced in the FY 2007 audit (6.40 percent) but still above the 2.0 percent minimum required by legislation.³¹ According to this standard, the MMI Fund would currently hold about \$6.4 billion in excess capital.

Exhibit 11
Estimates of MMI Fund Capital Adequacy as of End of FY 2008
(\$ Millions)

	End of FY 2007	End of FY 2008
Total Capital Resources	\$25,365 ¹	
Net Gain from Investments	\$763	
Net Insurance Income in FY 2008	\$2315	
Total Capital Resources		\$28,443
NPV of Future Cash Flow on Existing Book		(\$11,710)
Economic Value of the Fund		\$16,733
Insurance in Force		
Unamortized Dollar Volume	\$332,293 ¹	\$491,528
Unpaid Principle Balance	\$305,449 ¹	\$450,955 ²
Capital Ratio		3.40 %
Risk-Based Capital		\$28,341
Excess Capital based on RB Capital Standard		\$102

¹FY 2007 MMI Fund and Actuarial Review, p.14

²UPB was estimated from HUD data on total insurance in force at the end of August 2008. Estimated value at end of fiscal year assumes that September is identical to August and that the MMI fund accounts for roughly 95 percent of total insurance in force.

While the MMI Fund appears to be well capitalized according to current legislative requirements, the results would be somewhat different if one applied OFHEO's risk-based capital standard. According to our estimates, if FHA were held to GSE capital requirements, the MMI Fund would be required to hold about \$28,341 million in total capital at the end of FY

³⁰ The FY 2007 audit also allowed for a \$136 million loss reserve for Damages from 2005 Hurricanes.

³¹The minimum capital standard is 2 percent of \$491,528, or \$9,830.

2008.³² Since the fund has an estimated \$28,443 million in total capital resources at the end of the fiscal year, it would have a very small risk-based capital surplus of \$102 million.

3.4 Baseline Forecasts Including Future Books of Business

Exhibit 12 presents baseline forecasts of capital needs that account for both current and future books of business. As noted above, books originated from FY 2009 and beyond are assumed to have the same characteristics as loans originated in the second half of FY 2008. The overall volume of FHA lending is projected to remain at historic levels, averaging about \$250 million to \$260 million per year. This high projected volume leads to a dramatic increase in total insurance-in-force, which grows by about 32 percent between FY 2008 and FY 2009.

Incorporating the impact of future books of business significantly weakens estimates regarding the underlying strength of the MMI fund due to the rapid growth of insurance-in-force and the poor performance of the FY 2009 book. While the net present values of the FY 2009 book is projected to be negative (- \$4,166 million), subsequent books return to profitability with the presumed recovery of the housing market and the increase in insurance premiums. Nevertheless, due to the rapid growth of insurance-in-force, capital ratios fall to the 2 percent minimum in both FY 2009 and FY 2010, and recover only gradually. While the economic value of the fund begins to rise in FY 2010, its growth does not keep pace with the rapid expansion of the FHA book.

Exhibit 12
Projected MMI Fund Performance for FY 2008 to FY 2014¹
(\$ Millions)

	2008	2009	2010	2011	2012	2013	2014
Total Capital Resources	\$28,443	\$29,802	\$31,357	\$32,023	\$33,150	\$36,216	\$41,366
Economic Value²	\$16,733	\$12,956	\$16,809	\$23,937	\$31,810	\$39,902	\$48,381
Capital Ratio³	3.40	2.03	2.06	2.41	2.73	2.99	3.25
Risk-Based Capital	\$28,341	\$49,785	\$67,751	\$64,872	\$68,324	\$72,451	\$67,408
Excess R-B Capital	\$102	(\$19,984)	(\$36,395)	(\$32,849)	(\$35,174)	(\$36,234)	(\$26,042)
NPV of New Book	(\$11,982)	(\$4,166)	\$3,413	\$6,331	\$6,669	\$6,512	\$6,504
Endorsements	\$181,000	\$231,500	\$254,500	\$252,250	\$255,500	\$260,750	\$261,000
Insurance-in-Force							
Unamortized	\$491,528	\$636,904	\$816,703	\$993,710	\$1,166,611	\$1,335,830	\$1,488,683
Amortized	\$450,955	\$597,171	\$773,259	\$942,539	\$1,105,216	\$1,262,394	\$1,401,509

¹All values are for end of fiscal year

²The economic value for future years (FYs 2009 through 2014) is equal to the economic value of the Fund at the end of the previous year, plus the current year's interest earned on the previous fund balance, plus the economic value of the new book of business.

³Based on unamortized insurance-in-force

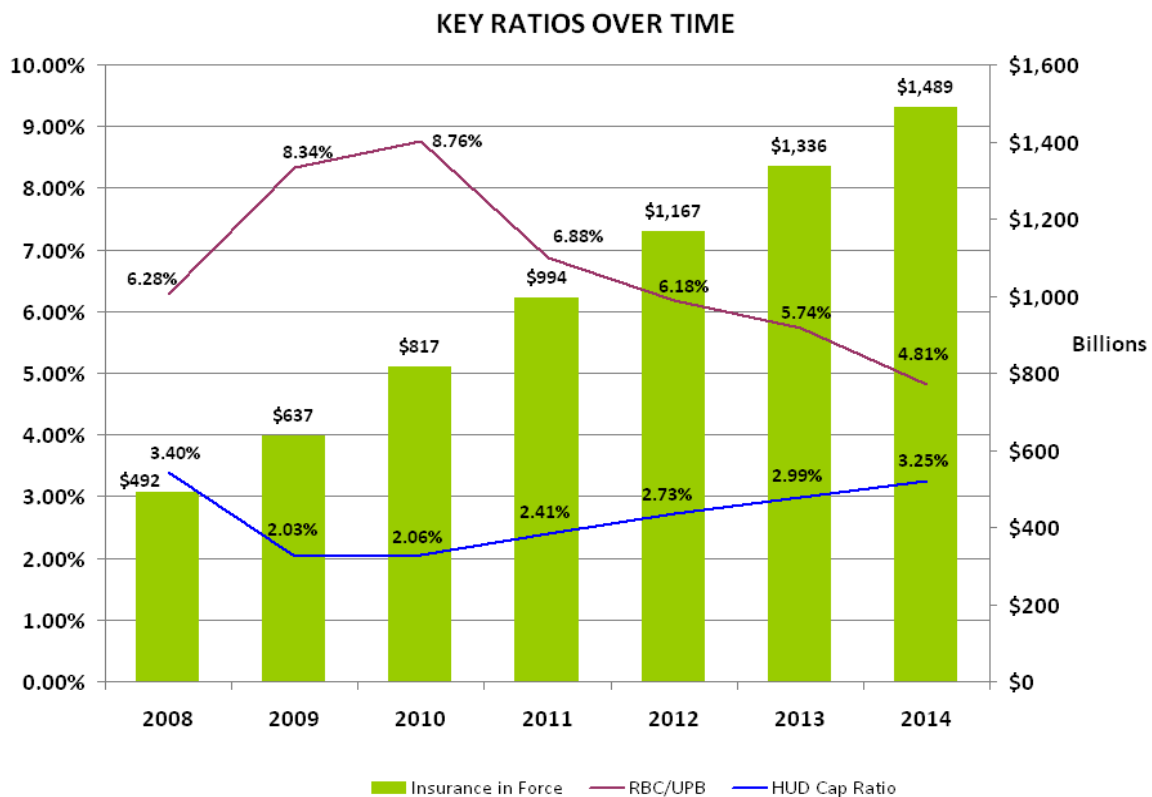
⁴Reflects NPV of existing book at end of FY 2008. Other values refer to NPV of specific book years.

³² Our model also predicts the RB capital required in future years with the run-off of the existing book. These range from about \$6 to \$30 billion over the six year period. See Appendix C.

The imposition of OFHEO risk-based capital requirements paints a considerably bleaker picture. Risk-based capital requirements are projected to rise by 76 percent over the next fiscal year, from \$28,321 million in FY 2008 to \$49,785 million in FY 2009. Since the total assets of the Fund grow relatively slowly, this results in a risk-based capital deficit of \$19,984 million at the end of FY 2009. Risk-based capital deficits remain high in subsequent years, peaking at \$36,395 in FY 2010.

The rapid increase in risk-based capital requirements reflects the growth in insurance-in-force as well as the projected house price declines in FY 2009 and FY 2010. As shown in Exhibit 13, risk-based capital requirements as a percent of UPB rise from 6.28 percent in FY 2008 to 8.76 percent in FY 2010, reflecting the growing share of relatively unseasoned loans in the FHA book and the deteriorating economic environment.³³ Over the same period of time, overall insurance-in-force grows by 71 percent. These mutually reinforcing trends increase the risk-based capital requirements of the Fund by 139 percent between FY 2008 and FY 2010. While risk-based capital requirements as a share of UPB begin to decline as housing prices recover, total capital requirements remain relatively high due to the continued growth of the FHA book.

Exhibit 13

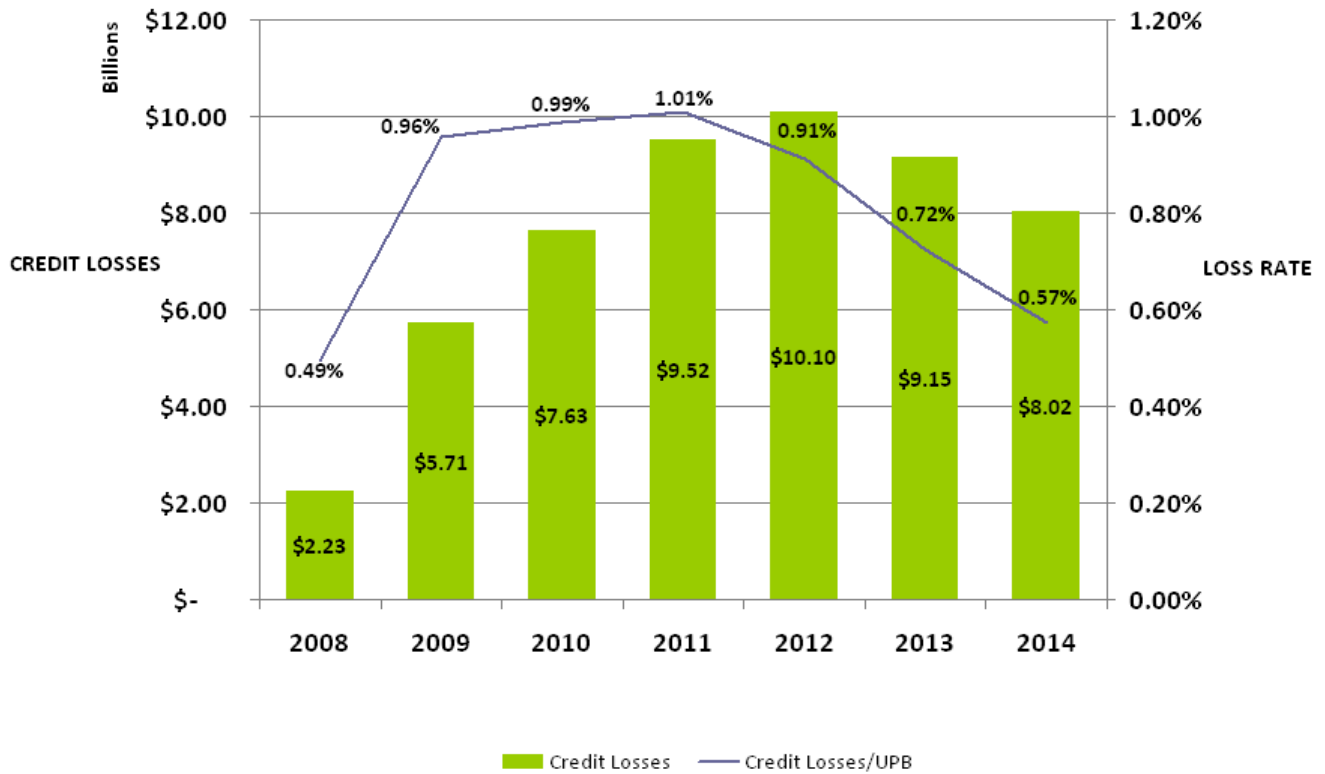


³³Risk-based capital requirements are higher for high LTV loans. As a result, in a declining house price environment, risk-based capital requirements for a given book will tend to rise over time since marked-to-market LTVs will increase. In a rising house price environment, the opposite effect occurs, and risk-based capital requirements for a given book will fall.

Exhibit 14 presents information on projected credit losses. As shown in the chart, credit losses increase dramatically between FY 2008 and FY 2011, from about \$2.2 billion in FY 2008 to \$10.1 billion in FY 2012. The dramatic increase in credit losses again reflects both the growth of the portfolio and the deteriorating economic environment. Losses as a percent of outstanding UPB almost double between FY 2008 and FY 2009 and continue to rise through FY 2011. While the loss rate begins to decline in FY 2012, dollar losses remain relatively high due to the ongoing growth of the FHA book.

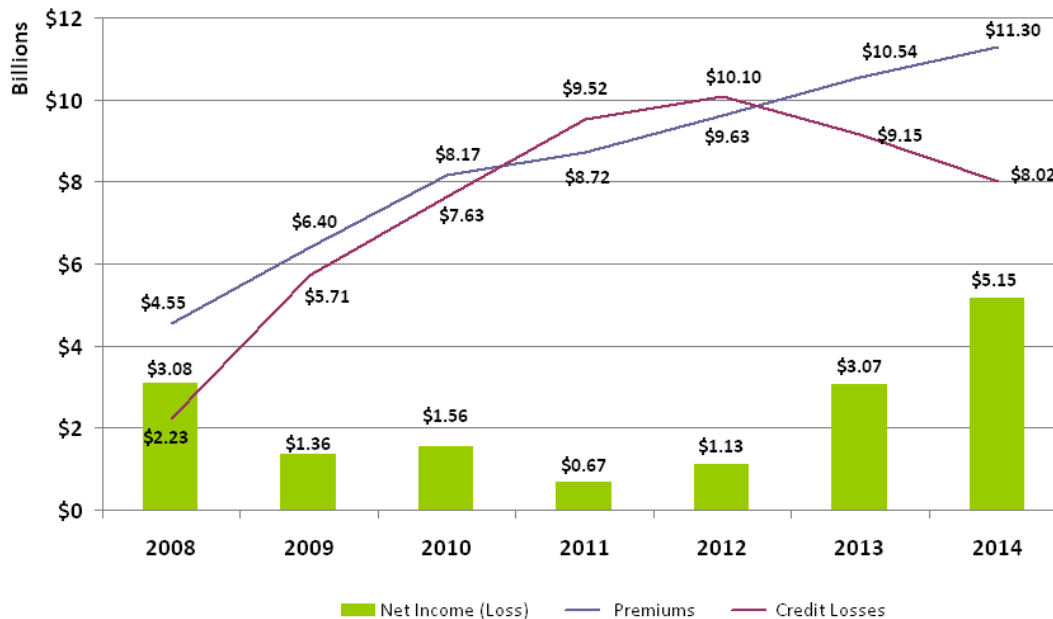
**Exhibit 14
Baseline Projection**

PROJECTED CREDIT LOSSES



While growing credit losses place considerable pressure on the Fund, projected net income continues to be positive due to the rapid increase in insurance premiums. Since a relatively large proportion of the fee is received up front, the continued flow of new endorsements generates sizable revenues to the Fund. As shown in Exhibit 15, while growing credit losses reduce the net income of the Fund from \$1,360 million in FY 2009 to \$670 million in FY 2011, net income recovers rapidly once housing prices begin to rise. (While not shown, investment income from capital reserves also serves to offset to credit losses and prevent the Fund from losing money in 2011 and 2012, when annual credit losses are projected to exceed total income from insurance premiums.)

Exhibit 15
Baseline Projections
NET INCOME TRENDS



3.5 Impact of Slower Growth

To assess the sensitivity of our estimates to assumptions regarding the future growth of FHA endorsements, we repeated our simulations assuming that future FHA origination volumes falls in half to about \$125,000 million each year—either because of a reduction in market share, a decline in overall lending volume or some combination of the two. All other aspects of our simulations remain the same, including future movements in housing prices. The results are presented in Exhibit 16.

Exhibit 16
Projected MMI Fund Performance Assuming Low Growth¹
(\$ Millions)

	2008	2009	2010	2011	2012	2013	2014
Total Capital Resources	\$28,443	\$28,108	\$27,244	\$26,219	\$25,774	\$26,760	\$29,247
Economic Value of Fund²	\$16,733	\$14,643	\$16,817	\$20,751	\$25,057	\$29,424	\$33,995
Capital Ratio³	3.40	2.70	2.79	3.10	3.40	3.67	3.95
Risk-Based Capital	\$28,341	\$41,364	\$45,256	\$39,560	\$39,964	\$39,989	\$35,730
Excess Capital	\$102	(\$13,069)	(\$17,577)	(\$12,791)	(\$13,517)	(\$12,429)	(\$5,575)

¹All values are for end of fiscal year

²The economic value for future years (FYs 2009 through 2014) is equal to the economic value of the Fund at the end of the previous year, plus the current year's interest earned on the previous fund balance, plus the economic value of the new book of business.

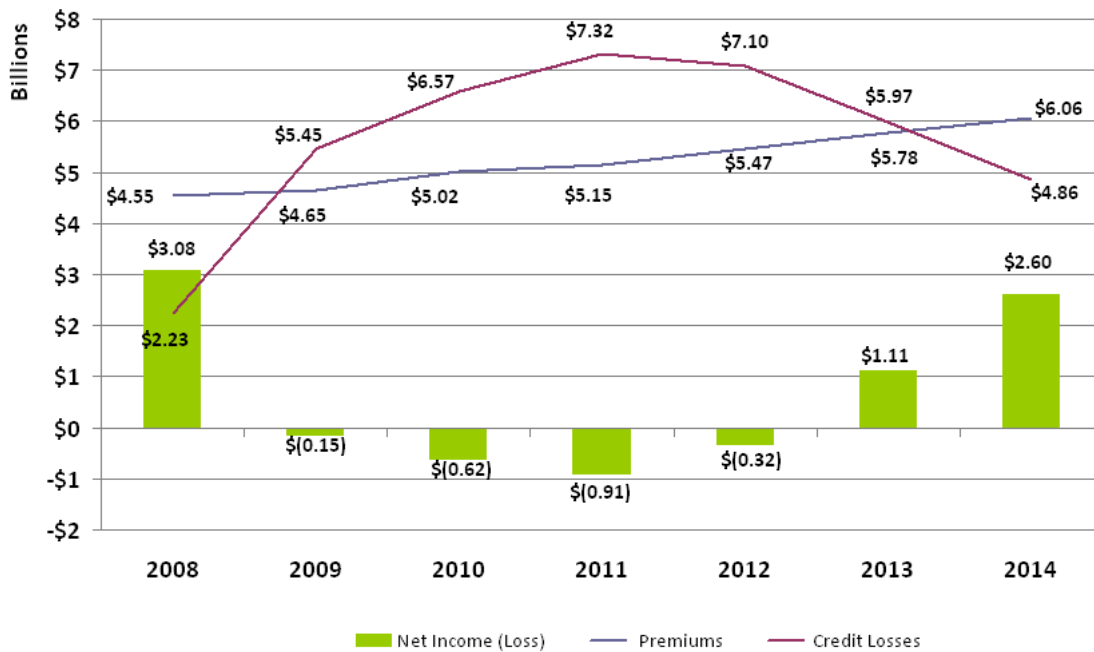
³Based on unamortized insurance-in-force

⁴Reflects NPV of existing book at end of FY 2008. Other values refer to NPV of specific book years.

All else equal, slower growth will reduce the pressures on the capital resources of the Fund. While the capital ratio again declines in FY 2009, it remains above the 2 percent minimum and increases steadily from FY 2010 onwards. However, as before, the MMI Fund would consistently fail to meet GSE capital standards. Although the risk-based capital deficits are considerably smaller than they are in the baseline scenario, they nevertheless range from \$13 to \$18 billion in most years.

While the slow growth scenario would lead to smaller risk-based capital deficits, it would also reduce income from insurance premiums. In fact, as shown in Exhibit 17, net income to the Fund would become negative in FY 2009, grow to a net loss of \$0.9 billion in 2011, and not recover until 2013. While slower growth would expose the Fund to lower credit losses, it would have a proportionately larger impact on premium income. Since a relatively large share of the insurance premium is received upfront, higher growth will help to shield the Fund from the mounting credit losses that are projected for the next few years.

Exhibit 17
Slow Growth Scenario
NET INCOME TRENDS



Economic considerations aside, slower growth would also be inconsistent with public policy. Given the pressing needs of the housing and mortgage markets, any retreat on FHA's part could conceivably accelerate the decline in housing prices, leading to further pressures on the Fund. Thus, the results of this alternative scenario are hardly reassuring. Indeed, our findings illustrate the fact that FHA's active participation in the mortgage market in the next few years will subject the agency to significantly higher risk. Unless that risk is appropriately priced and reserved for, taxpayers could be exposed to large contingent liabilities.

3.6 Important Caveats

In general, we believe that the financial projections presented in this paper are relatively optimistic, i.e., if anything, the performance of the Fund is likely to be worse than the forecasts presented here. There are a number of reasons to expect this to be the case. The first relates to the models that are used to generate the forecasts; the second relates to the continued uncertainty that characterizes the housing market and the overall economy; and the third relates to the management and resource constraints currently facing FHA. Each suggests that a relatively conservative approach be used in assessing the capital adequacy of the Fund.

Modeling Errors

The projections presented in this paper are based on the default and prepayment models developed for HUD's FY 2007 Actuarial Analysis. These models reflect the performance of FHA loans over a generally benign economic environment. However, models based on the performance of loans in recent years may be inappropriate for the housing conditions that exist today. For example, there is mounting evidence to suggest that credit scores are less predictive of loan performance in a declining housing market, particularly when borrowers are faced with negative equity. Thus, while credit scores may be increasing for newly originated FHA loans, this increase may prove less beneficial than HUD's default and prepayment models would predict.

In addition, HUD's models are generally less sensitive to the types of severe house price declines that have been observed in the past two years. For example, mortgages with a probability of negative equity of 30 percent are assigned the same probability of default as otherwise similar mortgages with a probability of negative equity of 50 percent or more. While this simplification would have little impact on projected performance in a more typical economic environment, in today's housing market, it may significantly underestimate the potential exposure of the Fund to its shifting geographic base.

Continued Economic Uncertainty

At the time of this writing, there is also considerable uncertainty regarding the future direction of housing markets and the overall economy. Such uncertainty has inevitably affected our projections. In preparing this report, we initially used house price projections released by Economy.com at the end of August, which assumed that housing prices would decline by 7.9 percent in FY 2009 and then recover. However, the numbers presented here are based on revised house price projections released on October 15th which assume that housing values will fall by 13.6 percent in FY 2009 and another 2 percent in FY 2010. Under the first set of assumptions, FHA exceeded its minimum capital requirements in every year. However, under the revised forecasts, the estimated capital ratio drops to the statutory minimum of 2 percent in both FY 2009 and FY 2010.

Given the current turmoil in financial markets, the current Economy.com forecasts may again prove optimistic. If housing prices do not recover in FY 2011—or if the recovery is not as strong as currently projected—the implications for the Fund could be profound.

Resource and Management Constraints

Finally, while not a part of this study, our analysis also ignores the ability of the FHA to manage its rapid growth while maintaining credit quality. The explosion of FHA lending—and the dramatic increase in the number of FHA-licensed lenders--would be difficult for any organization to absorb. For example, according to a recent Business Week article, some of the lenders that are fueling the emerging FHA “tsunami” are ex-subprime originators who have brought their aggressive (and sometimes fraudulent) practices to FHA lending.³⁴ Yet FHA has long been faced by resource, staffing, technical and political constraints that have limited its ability to effectively manage its risk. At the same time, FHA has been called upon to play an important role in helping troubled borrowers refinance into more affordable FHA loans. The Agency’s ability to navigate these difficult waters will obviously have a large and significant effect on the future health of the MMI Fund.

³⁴ FHA Loans: The New Subprime, BusinessWeek, Nov. 19, 2008

4.0 Implications and Conclusions

Instability in housing and credit markets and the economy at large makes any effort to project the likely health of FHA an extremely difficult task. Conditions could change within a matter of days or weeks in ways that would quickly make our projections obsolete. Likewise, models that performed well in the past may be less predictive today. However, at this point in time, we believe that, if anything, our projections for the Fund are optimistic.

Despite the uncertainties involved, several broad conclusions can be drawn from our analysis. The first relates to the vulnerability of the MMI Fund to unanticipated downturns in the housing market. Under the existing approach for determining capital, our forecasts suggest that any excess capital of the Fund is likely to be exhausted by FY 2009. As a result, the Fund will have little, if any ability to sustain larger-than-expected losses going forward. If a risk-based capital standard were employed, the Fund would face large capital deficits in FY 2009 and beyond—a finding that again underscores the vulnerability of the Fund to continued weakness in the housing market.

Whether or not the Fund should be recapitalized to OFHEO (or any other risk-based) standard is a matter for some debate. Conventional wisdom assumes that government insurance programs do not require capital in the traditional sense, i.e., to guard against unanticipated losses, or risk. While reserves are typically required to meet expected losses, if a catastrophic event occurs, the Government can either turn to the printing press or federal taxpayers to cover the necessary losses.

However, the experience of the past three months suggests that the conventional wisdom should be reconsidered, particularly with respect to loan-level mortgage insurance. In our view, risk-based capital requirements are desirable because they would make the potential exposure of the taxpayer more transparent and the flow of federal subsidies, more explicit. Our analysis has shown that the downside risks are currently relatively large. At a minimum, ignoring these risks could lead to an inappropriate allocation of resources. At worse, it could threaten the continued operations of FHA.

Risk-based capital requirements would also be more consistent with the cyclical nature of the housing market and the long-term (or “long-cycle”) risk that is inherent in mortgage lending. Applying a risk-based approach would subject the Fund to the capital and operating principles that are applied in the private sector. Given the federal government’s increased involvement in financial markets, the distinction between private and public entities is rapidly eroding. If the government is ultimately on the hook, why should capital standards be any different?

Some might question the appropriateness of the OFHEO standard in light of recent developments at Fannie Mae and Freddie Mac. However, in considering the adequacy of the OFHEO standard, it is important to recognize that the stress-tests applied to the GSEs cover both interest rate risk and credit risk, which tend to be off-setting, i.e., the capital requirements for the investment portfolio are relatively low when the capital requirements for the guarantee business are relatively high, and visa versa. In our analysis, we subjected the MMI Fund to a stand-alone credit stress test evaluated in two extreme economic environments (i.e., the “up rate” and “down

rate” scenarios.) The resulting capital standard represents the amount required by the Fund to survive either situation. This is a much more difficult threshold to meet than that applied to the GSEs. While alternative approaches are clearly possible, we believe that our approach represents a reasonably conservative way of measuring the potential exposure of the Fund to an unexpectedly adverse economic environment.

Unfortunately, there is no easy way of addressing the large risk-based capital deficits that are projected for FY 2009 and beyond. For example, in order to meet close the gap by FY 2014, HUD would have to raise the upfront premium on newly originated mortgages by an *additional* 1.80 percent, for example, from 1.75 percent to 3.85 percent for purchase money mortgages. Meeting risk-based capital requirements over a shorter time horizon would require upfront fees of more than 10 percent, making FHA mortgages unaffordable to the very families the program was designed to serve.

However, a more incremental approach could be adopted that would help to rebuild the capital base with minimal impact on affordability. For example, one could increase the upfront premium (which is typically financed) by 25 or 50 basis points (bps) with only a minor impact on mortgage payments. Likewise, one could increase the ongoing premium by a small amount (e.g., 10 or 15 bps.) While pricing changes of this magnitude would not eliminate capital deficits, they would help to ensure the longer term viability of the Fund by beginning to rebuild its capital cushion.

Alternatively, FHA could engage in risk-sharing programs with the private sector (and other agencies) to reduce the demands on its capital resources. Given the precarious state of the industry at this point in time, significant initiatives of this kind would probably not be possible in the near term. However, as the situation improves, collaborative risk-sharing arrangements would not only enable to the Agency to leverage its capital resources, it would also give FHA access to the expertise, resources and technologies of private sector firms and provide a “second set of eyes” for evaluating credit risk.

In the absence of steps to rebuild the capital resources of the Fund, FHA could find itself in a precarious position in the upcoming years. While our analysis suggests that there is no immediate need for an infusion of Treasury funds, this situation could easily change if the economy continues to deteriorate. If the past three months has taught us anything, it is better to error on the conservative side in accounting for mortgage risk.

FHA will clearly play a critical role in stabilizing the housing and mortgage markets in the coming months. While the FY2008 audit may produce a traditional capital ratio that once again meets or exceeds the two percent standard, the alternative perspective presented in this report suggests that the Fund--while it has been protected from many of the excesses of the recent housing boom--will face a very difficult road in the years ahead, particularly if economy continues to deteriorate. Although not part of this report, our concerns over the continued financial health of the MMI Fund are only magnified by the numerous managerial, technical, resource and political constraints that are currently facing FHA. These issues will add to the challenges that lie ahead for FHA as it expands its presence in the mortgage market.

Appendix A

Sample Analysis

This Appendix assesses the extent to which McDash data can be used to characterize the existing book of FHA loans at the end of FY 2008. McDash is a national data service provider that collects loan-level performance data from most of the country's largest servicers.

The McDash data used in this analysis consist of roughly 2.5 million active FHA mortgages with a first payment date on or before August 31, 2008 (the date that the sample was drawn.) While the data do not identify the actual origination date, assuming that it takes 30 days before an initial payment is received, the McDash can be assumed to cover active loans originated on or before July 31, 2008.

The unpaid principle balance (UPB) on the FHA loans included in the McDash data was \$290,527 million. According to our estimates, this represents about 64 percent of the estimated size of the total FHA book at the end of the fiscal year (\$450,995 million). Data used in this analysis have been weighted accordingly to create estimates for the entire FHA book.

To test the representativeness of the sample, one would ideally want to compare the characteristics of the McDash sample to the characteristics of the existing FHA book at the end of FY 2008. However, data on the current stock of FHA mortgages are not readily available. As a result, we based our comparisons on the characteristics of FY 2007 originations as reported in the FY 2007 MMI audit. Unfortunately, these comparisons are imprecise. Data presented in the FY 2007 Audit are *preliminary* estimates, while the McDash data for the FY 2007 book excludes loans that either prepaid or foreclosed before the sample was drawn.

With these caveats in mind, the following charts compare key characteristics of the McDash sample on FY 2007 loans to characteristics reported in the FY 2007 audit. All data are weighted by the original loan amount. While the comparisons are admittedly imperfect, the McDash data set looks reasonably representative of the broader universe of FHA loans.

Exhibit A.1
Percent Distribution by State: 2007 Originations

State	HUD Audit	McDash
Texas	11.19	12.65
Georgia	6.05	5.66
Florida	4.59	5.09
New Jersey	4.40	5.00
Illinois	4.24	4.66
New York	3.46	4.33
Ohio	4.62	4.34
Colorado	3.49	3.36
N. Carolina	3.24	3.36
Michigan	3.81	2.88
% of Total	49.09	51.33
California	1.74	1.85
% of Total	50.83	53.13

Exhibit A.2
Percent Distribution by LTV: 2007 Originations

Original LTV	HUD Audit	McDash
Blank/0	0.01	0.2
≤ 80%	7.52	7.38
>80%, ≤ 90%	11.52	12.54
>90%, ≤ 95%	12.99	17.06
>95%, ≤ 97%	25.7	22.66
>97%	42.27	40.16

Exhibit A.3
Percent Distribution by FICO Score: 2007 Originations

Original FICO	HUD Audit	McDash
Blank / 0	5.08	5.43
300-539	4.43	11.4
540-579	11.12	13.6
580-619	24.35	21.3
620-679	39.98	29.26
680-850	15.05	19.01

Exhibit A.4
Percent Distribution by Loan Type: 2007 Originations

	HUD Audit	McDash
Loan Type		
FIXED	98.58	97.8
ARM	1.42	2.2

Exhibit A.5
Percent Distribution by Loan Purpose: 2007 Originations

	HUD Audit	McDash⁴
Purchase	93.98	88.7
Refinance	6.02	11.35

⁴Missing values represent 30% of sample and are assumed to be purchase loans

Appendix B Technical Approach

This Appendix provides additional details on our forecasting procedures and the assumptions that we used in preparing the data and generating our projections. For the most part, we followed a methodology that was similar to the one used in HUD's FY 2007 actuarial analysis. Key differences and similarities are summarized in Exhibit B.1 below.

Exhibit B.1 Key Differences in Methodology

	FY 2007 Actuarial Analysis	Our Approach
Loan Data		
	Entire portfolio	Representative sample of 50,000 loans benchmarked to selected HUD data
Economic Forecasts		
• Source	2007 Global Insight	Economy.com
• House Price Drift & Volatility	Drift and volatility forecasted at national level; volatility based on OFHEO estimates but increased to account for regional and individual differences	Drift at the MSA level based on house price projections from Economy.com. Volatility at MSA level based on OFHEO 2Q2008 estimates of average volatility at the state level.
Mark-to-Market Approach		
	OFHEO Index	OFHEO Index
Default & Prepayment Models		
	HUD models	HUD models
Loss Severity Rates		
	Constant rates which vary by state and product types	OFHEO loss severity model with modifications for differences in the average time to foreclosure by state based on Genworth data.
Future Lending Volume		
	HUD estimates	Genworth estimates

B.1 Overview

Our simulations were generated using the Credit Facilitator Model, a proprietary software tool developed by Credit Facilitator Solutions to assess the credit risk associated with mortgages and mortgage-backed securities. The CF model generates forecasts of future cash flows, revenues, losses, and capital requirements based on the users' projections of house price appreciation and interest rates. While CF has its own proprietary default and prepayment models, it can also evaluate loans based on the User's models. The forecasts presented here use the default and prepayment models that were developed for the FY 2007 audit.

B.2 Data Preparation and Sampling

Sample Weights. The McDash data contains roughly 2.5 million FHA mortgages with an unpaid principal balance of \$291 billion at the end of August. FHA reports that its total single family insurance-in-force was \$453 billion at this point in time. Assuming that about 95 percent of these loans are covered by the MMI Fund, we estimate that the McDash data cover roughly 64 percent of all MMI loans. This ratio was used to weight the sample data to generate estimates for the entire MMI Fund.

Analysis Files. The financial simulations are based on two randomly generated samples drawn from the larger McDash data base. The first sample was used to estimate the performance of FHA's existing book; it includes 51,882 loans with an Original Loan Balance of \$6,307 million and a current unpaid principle balance (UPB) of \$5,793 million. The second sample was used to estimate the performance of future books. It was drawn from the subset of mortgages with a first payment date after April 30, 2008³⁵ and includes 52,061 loans with an Original Loan Balance of \$9,211 million and a current UPB of \$9,159 million.

Missing and Incomplete Data. While the McDash data includes most of the data elements that appear in HUD's default and prepayment models, this is not always the case. Our treatment of missing or incomplete data is described below:

- The Documentation Type field was consistently blank. We assumed that all loans were underwritten with Full Documentation
- The Loan Purpose field had a relatively high incidence of missing data. We assumed that loans with missing data were Purchase loans
- The code for Property Type also had a relatively high incidence of missing data. We assumed that such loans were for single-family detached homes.
- The McDash data provides information on both current and original FICO scores. If the original score was missing, we used the current score instead. Otherwise, we assumed that loans with missing FICO scores were not submitted for scoring.³⁶
- If the MSA identifier was missing, loans were marked-to-market based on the appreciation rate of the state.³⁷
- The McDash data do not identify loans with non-profit provided downpayment assistance. We assumed that 20 percent of the FY 2008 book has this form of assistance, and that the share drops to zero in FY 2009 and subsequent years.
- The HUD default model included a variable that measured loan size relative to average-sized FHA loan in state. For purposes of this analysis, we assumed that every loan was in the median-sized category.

³⁵ Assuming that the first payment date comes 30 days after closing, the sample represents loans originated in the second half of FY 2008.

³⁶ The HUD default model distinguishes between borrowers with missing scores and borrowers with no credit score, i.e., little, if any credit. However, the McDash data do not make this distinction.

³⁷ The FY 2007 audit marked loans with missing MSA identifiers to the Census Division as opposed to the State.

House Price Appreciation Rates. Annual house price appreciation (HPA) forecasts were obtained from Economy.com. The forecasts were updated on October 15, 2008, and project annual increases in housing prices at the national, state and MSA levels from 2008 through 2013. Whenever possible, we used the property’s MSA-level forecast to project future house price appreciation; however, if the MSA identifier was unavailable, we used average appreciation rate across MSAs. Since the forecasts are based on calendar years, we weighted the annual rates to create estimates for each fiscal year. For example, the house price appreciation rate for FY 2009 was derived by weighting the 2008 annual rate by 25 percent and the 2009 rate by 75 percent.

The HUD Audit assumed no uncertainty regarding the HPA forecasts, but did assume volatility around the HPA to represent deviations of individual property values from the regional average value. We made comparable assumptions.

House Price Volatility. In the HUD statistical model, one of the key determinants of mortgage default is a variable (PNEQ) designed to measure the likelihood that the borrower’s mortgage balance exceeds the value of their property. The probability of negative equity variable is a function of the current loan balance, projected and past house price appreciation, and deviations of *individual* house prices from these trends. In calculating PNEQ, housing prices were first adjusted (i.e., marked to market) based on the applicable house price appreciation index. An estimate of house price volatility, $\sigma(t)$ was then used to generate deviations in the appreciation rates of *individual* properties around the projected mean. Past house price trends were computed directly from OFHEO’s published indexes. Volatility was estimated according to the following formula:

$$\sigma(t) = (at + bt^2)^{.5}$$

where “a” and “b” are parameters are published by OFHEO, and t represents the age in quarters since mortgage origination.

In a spreadsheet, we compared volatility estimates for Census Region and State with the OFHEO assumptions for the West South Central (WSC) Census Region. To perform this comparison, we averaged all the a- and b-factors and then computed volatility. We compared the results with the average of the annualized volatility reported by OFHEO after one year. The numbers were extremely close. The volatility decreases the more local the index.

<i>Index</i>	OFHEO-Q208	OUR ESTIMATE
Census Region	8.87%	8.90%
State	8.14%	8.17%
Stress WSC		10.73%

The FY 2007 audit developed a methodology to estimate dispersion around the national average. Such an approach is unnecessary for our analysis, since our forecasts are made at the MSA level. Ideally, we would have liked to have used a volatility estimate for the MSA level. However, since OFHEO only publishes volatility down to the State level, we derived volatility parameters based on the average of the a- and b-factors of the states. Although our estimate of volatility may

be slightly high as a result, this probably compensates somewhat for the lack of volatility in the HPI Index changes.

Interest Rate Forecasts. Model runs were based on interest rate forecasts from Economy.com for yield curve variables and projected mortgage note rates. Since the data refer to calendar year, they were translated into fiscal year estimates following the same procedures that were used to generate the house price forecasts. A new yield curve was derived at the beginning of each fiscal year, and was assumed to remain constant throughout the year. As with house price appreciation, the interest rate forecasts are assumed to be nonstochastic, i.e., we made no attempt to model the impact of dispersion around these forecasts.

Loss Severity. Our baseline forecast of loss severity is based on OFHEO's loss severity model that is a component of their risk-based capital standard. However, we modified the model to allow for differences in time to foreclosure by state. We also assumed that FHA made claim payments four months after foreclosure, and discounted their payments on this basis. Estimates of average time to foreclosure were based on Genworth data describing the average time from "attorney referral for foreclosure" to "completion of the foreclosure process" in every state. In order to estimate total time to foreclosure as defined by OFHEO, we added 5 additional months to account for the time it typically takes to go from the "Last Paid Installment" date to the attorney referral date.³⁸

Risk-based Capital. In every period modeled, we subjected the projected insurance-in-force to a stress test designed to replicate the OFHEO risk-based capital standard. This stress test, which has been applied to the GSEs on a quarterly basis since 2002, begins by marking every loan to market, and then subjecting the loans to the default and loss rates experienced by 1982-1983 originations in the oil-patch states (i.e., Oklahoma, Louisiana, Mississippi, and Arkansas.) The test was designed to ensure that GSEs hold enough capital to survive a 10-year period characterized by extreme interest rate and house price movements.

The OFHEO stress test captures the interest rate risk on the GSEs' investment portfolios as well as the credit risk on their guaranteed loans and securities. The test applied in this analysis is based solely on the OFHEO credit-risk stress test. The OFHEO standard estimates the capital required to withstand a severe interest rate decrease or increase, whichever is worse. Based on a representative sample of loans, the interest rate decrease proved to be more binding in measuring credit risk and was used to determine the capital requirements presented here.

The OFHEO standard assumes a 30 percent surcharge for operations and management risk. That surcharge has been applied in our analysis as well. The OFHEO standard also requires inputs for operating expenses, the dividend rate and income taxes. While we set both the dividend rate and income taxes to zero, we assumed that administrative expenses were 8 bps of UPB. While administrative costs were excluded from our cash flow projections, we included them in our capital estimates to capture the potential exposure of the Fund. However, since the OFHEO standard puts the existing book in run-off mode and assumes a dramatic scaling down of

³⁸ See Amy Crews Cutts and William Merrill, "Interventions in Mortgage Default: Policies and Practices to Prevent Home Loss and Lower Costs," March 2008, Table 5

operating expenses, the effect of including administrative costs is very small, resulting in less than a 2.5 percent increase in risk-based capital requirements.

Insurance Premiums. FHA's pre-FY 2009 annual premium rates were used to project revenues for the existing book of business. The new schedule that became effective on October 1, 2008 was used for all loans originated in FY 2009 and thereafter. FHA policies allow for the annual premium to be cancelled when the amortized balance is less than 78 percent of the original value for loans as long as they have made five annual payments and a time to maturity (TTM) that is greater than 15 years. In addition, ongoing premiums on 15-year mortgages with an original LTV above 90 percent can be cancelled whenever they get to an amortized balance of 78 percent or less. However, in estimating future revenues to the Fund, we made a number of simplifications that may have a small effect on projected revenues:

- In calculating premium payments, HUD excludes any portion of the original or current loan balance that was used to finance the upfront fee. However, the McDash data do not enable us to make this distinction. As a result, we estimated the upfront insurance fee based on the initial loan amount, and the on-going insurance premiums based the unpaid principle balance (UPB) at a given point in time. The resulting error should be small, and generally overstate revenues to the Fund.
- Refunds for the upfront premiums were available before December 8, 2004, but now only occur when the borrower refinances from one FHA loan into another within three years of origination. However, like the FY 2007 audit, we ignore any refunds from the Fund. Again, this would tend to overstate revenues to the Fund.
- FHA currently charges a lower annual premium for 15-year product. In fact, there are no annual premiums for 15 year product with an original LTV that is less than 90 percent. However, since such loans represent only about 2 percent of the existing and future books, we have treated these loans like 30 year product. The resulting measurement error should again be negligible and generally favor the MMI Fund.
- FHA's new pricing schedule entails that the upfront premium rate will be 1.75 percent for Purchase money loans, 1.50 percent for streamline refinancings, and 3.0 percent for FHA Secure. The annual premium on 30-year loans with an LTV greater than 95 percent will also be raised to 55 bps. While our projections reflect most of these price adjustments, the McDash data do not identify loans that were financed through FHA Secure and we did not attempt to project their volume going forward. As a result, we ignored the additional premiums that would be applicable to these loans.

Estimates for the Existing Book. Although the McDash loans sample was drawn at the end of August and consists of loans that were originated on or before July 31, 2008, we assume that these loans can be used to characterize the existing book at the end of FY 2008. Based on data available from the HUD website, we estimate that the total size of the book (i.e., UPB) was \$450,955 million at the end of the FY 2008.

The Fund's Capital Resources as of the end of FY2008 were estimated based on the level of resources at the end of FY2007 adjusted to reflect FY 2008 endorsements, prepayments, and claims as reported by HUD. We project that the Total Capital Resources of the Fund was \$28,443 million at the end of FY 2008.

Cash Flow Projections. Cash flows were modeled over a 10 year time horizon for both the existing and future books. In making these projections, we assumed that new business would be generated continuously throughout each fiscal year. However, instead of running the model quarterly, we made the equivalent assumption that all the loans arrived at the mid-point of the year. As a result, in projecting revenues from ongoing premiums, we allocated half of the cash flows to the initial year, and remaining half to the following fiscal year. However, in estimating revenues from upfront premiums, we assumed that 100 percent would be received in the year the origination year. In the case of risk-based capital, we treated this variable as a stock and required capital at the beginning of the year against all the new originations even though they arrived throughout the year.

One-year Treasury rates from the Economy.com forecast were used to calculate the present value (PV) of future cash flows and to estimate returns to Fund investments. In contrast, the 2007 HUD Audit used the official Federal credit subsidy PV conversion factors to estimate the present value of future cash flows, and the implied forward rate from these schedules to generate interest income on the MMI Funds assets. However, a simple analysis of these conversion factors shows that they are approximately the same as the projected rates

Appendix C Financial Projections

TABLE C.1 - PRO FORMA INCOME STATEMENTS (BASELINE SCENARIO) BY FISCAL YEAR

Item:	Fiscal Year						
	2008	2009	2010	2011	2012	2013	2014
Insurance in Force (unamortized)	\$ 491,527.75	\$636,904.45	\$817,060.09	\$994,362.99	\$ 1,167,229.75	\$1,336,450.89	\$1,489,279.21
Current UPB	\$ 450,955.28	\$597,171.29	\$773,609.42	\$943,175.43	\$ 1,105,810.42	\$1,262,980.65	\$1,402,065.63
Endorsements	\$ 181,000.00	\$231,500.00	\$254,500.00	\$252,250.00	\$ 255,500.00	\$ 260,750.00	\$ 261,000.00
<i>Revenues:</i>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Premiums	\$ 4,547.38	\$ 6,403.46	\$ 8,166.20	\$ 8,716.33	\$ 9,625.97	\$ 10,537.84	\$ 11,295.18
Interest	\$ 762.82	\$ 668.60	\$ 1,020.83	\$ 1,468.08	\$ 1,598.13	\$ 1,680.31	\$ 1,873.80
Total Revenues	\$ 5,310.20	\$ 7,072.06	\$ 9,187.03	\$ 10,184.41	\$ 11,224.10	\$ 12,218.15	\$ 13,168.97
<i>Expenses:</i>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Credit Losses	\$ 2,231.67	\$ 5,713.52	\$ 7,631.99	\$ 9,517.65	\$ 10,097.15	\$ 9,152.10	\$ 8,018.94
Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses	\$ 2,231.67	\$ 5,713.52	\$ 7,631.99	\$ 9,517.65	\$ 10,097.15	\$ 9,152.10	\$ 8,018.94
Net Income (Loss)	\$ 3,078.53	\$ 1,358.54	\$ 1,555.04	\$ 666.76	\$ 1,126.95	\$ 3,066.05	\$ 5,150.03
MMI Fund Assets	\$ 28,443.00	\$ 29,801.54	\$ 31,356.58	\$ 32,023.35	\$ 33,150.30	\$ 36,216.35	\$ 41,366.38
MMI/IIF	5.79%	4.68%	3.84%	3.22%	2.84%	2.71%	2.78%
HUD Economic Value	\$ 16,733.23	\$ 12,955.90	\$ 16,809.10	\$ 23,937.36	\$ 31,809.75	\$ 39,901.93	\$ 48,381.41
HUD Cap Ratio (EV/IIF)	3.40%	2.03%	2.06%	2.41%	2.73%	2.99%	3.25%
Risk-based Capital	\$ 28,340.76	\$ 49,785.32	\$ 67,751.48	\$ 64,872.00	\$ 68,324.08	\$ 72,450.63	\$ 67,408.48
MMI Fund - RBC	\$ 102.24	\$ (19,983.78)	\$ (36,394.90)	\$ (32,848.65)	\$ (35,173.79)	\$ (36,234.29)	\$ (26,042.11)
HUD Economic Value - RBC	\$ (11,607.53)	\$ (36,829.41)	\$ (50,942.38)	\$ (40,934.64)	\$ (36,514.33)	\$ (32,548.71)	\$ (19,027.07)

TABLE C.2 - KEY PERFORMANCE STATISTICS (BASELINE SCENARIO)

Loans	PV Cash Flows (EOY) (\$ millions)	Cumulative Default Rate	Cumulative Loss Rate	Cumulative Loss Severity	Capitalization Rates		
					BOY	BOY + 1	BOY + 2
BOB o/s	\$ (11,981.70)	10.7%	5.3%	50.8%	6.3%	7.9%	5.9%
New Business 2009	\$ (4,165.96)	13.2%	7.1%	56.5%	9.0%	12.4%	7.3%
New Business 2010	\$ 3,413.30	7.8%	3.7%	48.8%	9.3%	6.8%	5.2%
New Business 2011	\$ 6,331.10	5.7%	2.4%	42.8%	9.3%	4.8%	3.6%
New Business 2012	\$ 6,668.90	5.6%	2.3%	42.1%	9.3%	5.6%	3.0%
New Business 2013	\$ 6,512.80	5.8%	2.4%	42.9%	9.3%	5.8%	3.4%
New Business 2014	\$ 6,504.30	5.8%	2.4%	42.9%	9.3%	6.3%	3.4%

TABLE C.3 - PRO FORMA INCOME STATEMENTS (SLOW GROWTH SCENARIO) BY FISCAL YEAR

Item:	Fiscal Year						
	2008	2009	2010	2011	2012	2013	2014
Insurance in Force (unamortized)	\$ 491,527.75	\$543,154.45	\$601,869.86	\$669,262.38	\$ 736,860.61	\$ 801,833.73	\$ 860,683.87
Current UPB	\$ 450,955.28	\$503,421.29	\$559,458.01	\$621,553.16	\$ 682,642.83	\$ 740,533.80	\$ 791,685.54
Endorsements	\$ 181,000.00	\$137,750.00	\$125,000.00	\$125,000.00	\$ 125,000.00	\$ 125,000.00	\$ 125,000.00
<i>Revenues:</i>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Premiums	\$ 4,547.38	\$ 4,652.15	\$ 5,023.68	\$ 5,151.72	\$ 5,469.04	\$ 5,778.06	\$ 6,056.71
Interest	\$ 762.82	\$ 651.30	\$ 934.29	\$ 1,261.18	\$ 1,304.93	\$ 1,308.27	\$ 1,393.98
Total Revenues	\$ 5,310.20	\$ 5,303.46	\$ 5,957.97	\$ 6,412.90	\$ 6,773.97	\$ 7,086.33	\$ 7,450.69
<i>Expenses:</i>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Credit Losses	\$ 2,231.67	\$ 5,451.68	\$ 6,574.34	\$ 7,322.21	\$ 7,095.58	\$ 5,973.29	\$ 4,855.48
Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses	\$ 2,231.67	\$ 5,451.68	\$ 6,574.34	\$ 7,322.21	\$ 7,095.58	\$ 5,973.29	\$ 4,855.48
Net Income (Loss)	\$ 3,078.53	\$ (148.22)	\$ (616.37)	\$ (909.31)	\$ (321.61)	\$ 1,113.04	\$ 2,595.21
MMI Fund Assets	\$ 28,443.00	\$ 28,294.78	\$ 27,678.41	\$ 26,769.10	\$ 26,447.49	\$ 27,560.53	\$ 30,155.74
MMI/IIF	5.79%	5.21%	4.60%	4.00%	3.59%	3.44%	3.50%
HUD Economic Value	\$ 16,733.23	\$ 14,642.98	\$ 16,816.61	\$ 20,751.44	\$ 25,057.41	\$ 29,423.67	\$ 33,995.25
HUD Cap Ratio (EV/IIF)	3.40%	2.70%	2.79%	3.10%	3.40%	3.67%	3.95%
Risk-based Capital	\$ 28,340.76	\$ 41,363.62	\$ 45,255.85	\$ 39,559.94	\$ 39,964.15	\$ 39,989.39	\$ 35,730.34
MMI Fund - RBC	\$ 102.24	\$ (13,068.84)	\$ (17,577.44)	\$ (12,790.84)	\$ (13,516.66)	\$ (12,428.86)	\$ (5,574.60)
HUD Economic Value - RBC	\$ (11,607.53)	\$ (26,720.64)	\$ (28,439.24)	\$ (18,808.50)	\$ (14,906.74)	\$ (10,565.72)	\$ (1,735.09)

TABLE C.4 - KEY PERFORMANCE STATISTICS (SLOW GROWTH SCENARIO)

Loans	PV Cash Flows (\$ millions EOY)	Cumulative Default Rate	Cumulative Loss Rate	Cumulative Loss Severity	Capitalization Rates		
					BOY	BOY + 1	BOY + 2
BOB o/s	\$ (11,981.70)	10.7%	5.3%	50.8%	6.3%	7.9%	5.9%
New Bus 2009	\$ (2,478.88)	13.2%	7.1%	56.5%	9.0%	12.4%	7.3%
New Bus 2010	\$ 1,676.49	7.8%	3.7%	48.8%	9.3%	6.8%	5.2%
New Bus 2011	\$ 3,137.31	5.7%	2.4%	42.8%	9.3%	4.8%	3.6%
New Bus 2012	\$ 3,262.69	5.6%	2.3%	42.1%	9.3%	5.6%	3.0%
New Bus 2013	\$ 3,122.16	5.8%	2.4%	42.9%	9.3%	5.8%	3.4%
New Bus 2014	\$ 3,155.10	5.8%	2.4%	42.9%	9.3%	6.3%	3.4%