Appendix B – Demand Model

Introduction

The actuarial review of the MMI Fund includes projections of the economic value of future fiscal year's endorsements. The economic value is based on the volume of endorsements written and the projected performance of these endorsements. We must therefore forecast the volume of FHA endorsements for fiscal years 2004-2010.

Our procedure for projecting future levels of demand for this year's Review is the same as last year. Prior to the FY 2000 Review, the demand model consisted of a series of regressions intended to predict the overall level of endorsements and the allocation of those endorsements to the various loan categories. It is now generally accepted that the past models yielded less than satisfactory results. Furthermore, the models were sufficiently complicated to have little explanatory power.

The approach used for the last three years, described in more detail below, is intended to be simpler, easier to follow, and to rely on available information in a way that makes the projections more defensible and consistent, and that makes the driving factors behind the projections more identifiable. The critical feature of the current method is to base the projections of future endorsements for the MMIF on DRI projections of sales on new and existing homes for the whole market. We can then estimate the MMIF's share of the market and the allocation to loan categories based on actual proportions in recent years.

Forecast Methodology

We forecast the overall level of demand for MMIF mortgages based on the DRI projections of the number of sales and the average sale price on new and existing homes. The size of the MMIF market share (number of loans) and loan size relative to the DRI projections are summarized in Table B.1 below. We also show the expected number of Streamline Refinancings relative to the number of purchase originations each year.

Table B.1

	New Homes	Existing Homes	Streamline Refinancings	Source
MMIF Loan Size Relative to Market	58%, 2004 60%, 2005-2010	58%, 2004 60%, 2005-2010	N / A	FHA Plan
MMIF Market Share (Number of Loans)	13.5%, 2004 14.0%, 2005-2010	12.1%, 2004 14.0%, 2005-2010	N / A	FHA Plan
Refinance Rate Relative to Purchase Originations	N / A	N / A	35%, 2004 25%, 2005 15%, 2006-2010	FHA Plan

Note that these market share estimates, refinance percentages, and average house price assumptions are consistent with FHA's own internal five-year plan working estimates.

In summary, therefore, the total number of originations projected for a given endorsement year is:

$$\underbrace{\left(\left[\#ofsales\_new \cdot MMIFshare\_new\right]\right.}_{\#new\_MMIF} + \underbrace{\left.\left[\#ofsale\_existing \cdot MMIFshare\_existing\right]\right)}_{\#existing\_MMIF} \cdot \left(1 + refi\_rate\right)$$

Similarly, the dollar volume of originations is:

$$\left(\left[\#new\_MMIF \cdot new\_price \cdot \frac{MMIFnew\_price}{new\_price}\right] + \left[\#existing\_MMIF \cdot exist\_price \cdot \frac{MMIFexist\_price}{exist\_price}\right]\right) \cdot \left(1 + refi\_rate\right)$$

Projected Demand

We project overall MMIF endorsement volume for all loan categories in future endorsement years to be as follows:

Table B.2

Endorsement Year	Endorsement Volume ($ millions)
2004	143,521
2005	145,163
2006	140,864
2007	145,289
2008	151,967
2009	156,990
2010	162,740

Note that all the calculations described above are performed on the basis of fiscal origination year data. We estimate the endorsement year volume by assuming a three-month lag, that is, by prorating the origination year estimates. Therefore, $V_{EY} = 0.75 \cdot V_{OY} + 0.25 \cdot V_{OY-1}$, where V_{OY} is the volume of endorsements for origination year *OY*, and V_{EY} is the volume of endorsements for endorsement year *EY*.

Allocation Process

The process outlined above results in a projection of total demand for MMIF mortgages for fiscal endorsement years 2004-2010. The final step in the demand model is to split the overall endorsement volume to the loan type and loan-to-value categories considered in the regression analysis underlying the conditional claim rate and conditional prepayment rate models. This allocation is selected on the basis of the distribution of FHA endorsements seen in the most recent year, as well as the DRI projection of streamline versus purchase loans. The projected distribution is as follows for each fiscal endorsement year from 2004-2010:

Table B.3

	30-Year Fixed Rate Loans				15-Year Fixed Rate Loans							
EY	High LTV	Mid LTV	Investor LTV	Low LTV	High LTV	Mid LTV	Investor LTV	Low LTV	ARM	SRF30	SRF15	SRARM
2003*	37.5%	4.7%	3.5%	1.9%	0.3%	0.2%	0.3%	0.5%	3.7%	40.1%	3.7%	3.8%
2004	46.2%	5.7%	4.3%	2.3%	0.4%	0.2%	0.3%	0.6%	4.5%	29.8%	2.7%	2.8%
2005	55.0%	6.8%	5.1%	2.8%	0.5%	0.2%	0.4%	0.7%	5.4%	19.5%	1.8%	1.8%
2006	61.2%	7.6%	5.7%	3.1%	0.5%	0.3%	0.4%	0.8%	6.0%	12.1%	1.1%	1.1%
2007	62.8%	7.8%	5.8%	3.2%	0.6%	0.3%	0.4%	0.8%	6.1%	10.3%	0.9%	1.0%
2008	62.8%	7.8%	5.8%	3.2%	0.6%	0.3%	0.4%	0.8%	6.1%	10.3%	0.9%	1.0%
2009	62.8%	7.8%	5.8%	3.2%	0.6%	0.3%	0.4%	0.8%	6.1%	10.4%	0.9%	1.0%
2010	62.7%	7.8%	5.8%	3.2%	0.6%	0.3%	0.4%	0.8%	6.1%	10.4%	0.9%	1.0%

*Note: Figures in EY 2003 represent actuals as of March 31, 2003.

Data Sources

We used the MMIF forecast to project the total loan volume endorsed for 2004-2010. We also used the MMIF forecast to estimate the proportion of FHA endorsement volume that will streamline refinance.