

# The Quarterly Review of Interest Rate Risk

Office of Examinations, Supervision, and Consumer Protection  
Risk Modeling and Analysis Division



### Special points of interest:

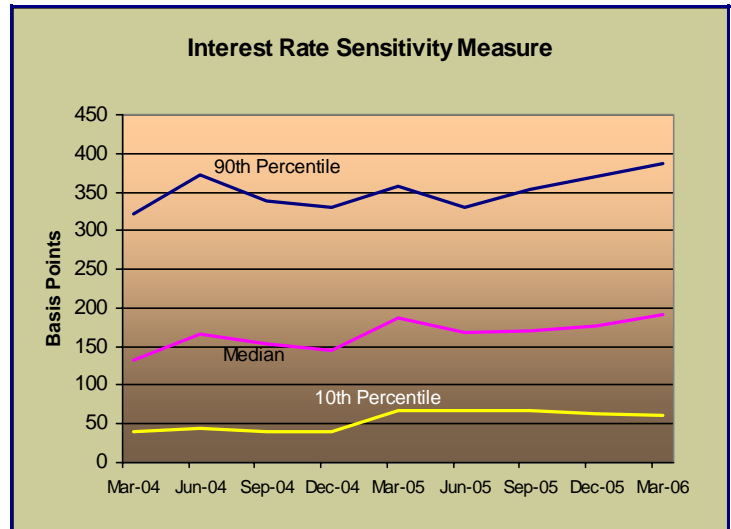
- 30-yr mortgage commitment rate rises
- Treasury yield curve rises in the first quarter
- First quarter median interest rate sensitivity rises
- Asset duration rises
- Comparative Regional Analysis
- Feature Article on The NPV Model: The Next 15 Years

## First Quarter Sees Modest Increase in Sensitivity

First quarter median interest rate sensitivity rose 14 basis points. The increase in median sensitivity was due to an upward shift in the yield curve in the first quarter that increased the duration gap between assets and liabilities for the industry.

Both the median pre-shock Net Portfolio Value (NPV) ratio and the median post-shock NPV ratio were essentially unchanged from last quarter.

The first quarter saw the Treasury yield curve shift upward in an approximately parallel manner. Between December 2005 and the first quarter of this year, rates rose



along the yield curve for all maturities. For example, the six-month yield rose by 45

basis points, the 10-year yield rose by 46 basis points, while

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## The NPV Model: The Next 15 Years

In the previous issue of this publication, we discussed the development of the Net Portfolio Value (NPV) Model, how it works currently, and the different types of interest rate risk related reports it generates. We showed how the NPV Model is still, 15 years after its introduction, an important supervisory tool for assessing interest rate risk management practices in the thrift industry.

However, as pointed out in last quarter's feature article, the development of new financial products, such as option ARMs and structured FHLB advances, along with new fi-

ancial modeling methodologies, have started to outpace the capabilities of the NPV Model. In order to remain relevant for the next 15 years, the NPV Model needs to be updated and enhanced.

In this article, we will discuss the steps that OTS currently is taking to modernize the NPV Model. In particular, we will discuss OTS's partnership with Dr. Thomas Ho and his company, THC, Ltd., and we will describe major enhancements to the NPV Model planned over the next three years.

These model enhancements include: (1) greater

model transparency and accessibility, (2) expanded interest rate risk reports, (3) more accurate pricing routines for single-family mortgages and financial derivatives, (4) the addition of customized stress scenarios, including non-parallel interest rate shifts, and (5) new pricing routines for a variety of financial instruments with embedded options.

Also, we will briefly discuss a pilot program that would give a small number of OTS-regulated institutions direct access to the *Enhanced NPV Model*.

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## The NPV Model: The Next 15 Years (continued)

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We believe that the soon-to-be released *Enhanced NPV Model* will represent the state-of-the-art in off-site interest rate risk models used by the federal banking agencies. As a result, the *Enhanced NPV Model* will greatly expand OTS's off-site monitoring abilities and make on-site examinations more efficient.

### The Enhanced NPV Model: An Overview

In just a few months, OTS will begin producing interest rate risk reports with a new model developed exclusively for OTS by respected finance expert, Dr. Thomas Ho, and his team at THC, Ltd., a New York-based financial engineering company.

Dr. Ho is extremely accomplished, both academically and professionally. He has a Ph.D. in mathematics from the University of Pennsylvania and served as a finance professor at New York University's Stern School of Business. He is an associate editor of several academic journals and has co-authored or edited eight finance-related textbooks and published more than 60 articles. He is most widely known for his development of the Ho-Lee Model, the first arbitrage-free interest rate model, and key rate durations, which are useful for interest rate risk management.

In 1987, Dr. Ho and his partner founded Global Advanced Technology (GAT).

At its peak, GAT provided advanced, fixed-income valuations systems to more than 250 financial institutions around the world.

In 1997, GAT was acquired by BARRA, Inc., a Berkeley, California-based financial systems development firm. In 1999, Dr. Ho founded THC, a small financial engineering firm that provides financial systems and consulting services to several *Fortune 500* firms.

Switching from the old NPV Model to the *Enhanced NPV Model* will be seamless. Initially, the individual Interest Rate Risk Reports produced each quarter will look the same as the old reports and will use the same information reported on Schedule CMR. As such, the *Enhanced NPV Model* is based on many of the same valuation algorithms and model assumptions contained in the current NPV Model Handbook.

It is important to note, however, that the *Enhanced NPV Model* is not merely the old NPV Model on a new software platform. The *Enhanced NPV Model* is both technically and analytically superior to the current NPV Model.

When it goes into production later this year, the new model will immediately start producing more accurate results. The *Enhanced NPV Model* represents the first comprehensive analytical upgrade since 1993, and more importantly, it will enable OTS to incorporate many new capabilities in the future.

### Technical Model Enhancements

From a technical perspective, the *Enhanced NPV Model* offers several advantages over the current Fortran-based NPV Model. It takes advantage of certain financial engineering techniques and methods that have been developed in recent years.

The *Enhanced NPV Model* is written in C++ and is designed so that modifications to the system can be accomplished more easily and efficiently than with the existing NPV Model. The new user-friendly interfaces allow OTS staff to select from a variety of different analytical methods with the click of a mouse.

For example, in the version of the *Enhanced NPV Model* currently being tested, it is possible to choose between two interest rate processes and two types of prepayment models. In addition, the new system can value products on an instrument-by-instrument basis, and it can produce detailed, Excel-based output reports that show a complete listing of all assumptions and cash flows used to generate the results. These features will greatly enhance the transparency of the OTS risk modeling process.

The *Enhanced NPV Model* also uses a *distributed processing* technology that allows for the simultaneous processing of multiple Interest Rate Risk Reports. This technology greatly speeds up model computations, and it allows OTS to

move away from the highly restrictive price table valuation approach of the current NPV Model.

When the NPV Model was first developed, computer resources were such that it was not possible to directly price the various mortgage-related products reported on Schedule CMR on an individual basis. In running the NPV Model currently, it is necessary to create about 30 multidimensional price tables (or lookup tables) corresponding to each single-family mortgage-related instrument reported on Schedule CMR. These price tables contain pricing estimates for a variety of coupons, margins, caps, floors, and maturities and are used to price the various single-family mortgage-related instruments reported on individual Schedule CMR reports.

Frequently, the single-family mortgage positions reported by institutions do not perfectly match the characteristics of the loans and securities in the price tables. Because of this, the NPV Model uses an interpolation process that may reduce the overall accuracy of the valuation results. This interpolation process can be problematic when pricing extremely high or low coupon mortgage instruments.

In the *Enhanced NPV Model*, all mortgage-related calculations will be done "on the fly," using the characteristics of the positions actually reported on Schedule CMR, thus ensuring greater valuation accuracy.

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## The NPV Model: The Next 15 Years (continued)

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### Analytical Model Enhancements

From an analytical perspective, many of the initial valuation improvements will stem from using the Generalized Ho-Lee interest rate model for pricing fixed-income securities with embedded options, including single-family mortgage loans and securities, and for pricing certain financial derivatives, such as swaptions, caps, and floors.

The Generalized Ho-Lee Interest Rate (GHL) Model is an arbitrage-free, term structure model developed by Tom Ho and San Bin Lee, a professor of finance at Hanyang University in Seoul, Korea. The GHL Model is calibrated to both the level of rates and swaption volatilities, and represents the state-of-the-art in term structure modeling.

The single-family mortgage pricing routines in the current NPV Model use a two-factor interest rate process that has not recently been updated. A term structure model is an important component of any sophisticated mortgage pricing process. Among other things, the term structure model produces a probabilistic distribution of future mortgage rates—a key driver in single-family mortgage prepayment models.

Because the GHL Model is calibrated to the current level of interest rates and volatilities, the Enhanced NPV Model will

produce a distribution of future mortgage rates that is more consistent with that used by the capital markets. This, in turn, will produce effective duration estimates that are consistent with Wall Street dealer estimates.

In addition, the single-family mortgage pricing routines will benefit from replacing the current Monte Carlo process involving 200 paths with a structured sampling process, designed by Dr. Ho, called *Linear Path Space* (LPS). With LPS, it is possible to dramatically reduce the number of paths required to produce option-adjusted spreads without sacrificing accuracy. Dr. Ho's research shows that a 200-path simulation in LPS is equivalent to a 2,000-path simulation using standard Monte Carlo analysis.

With respect to financial derivatives, such as caps, floors, and swaptions, the current NPV Model uses a pricing model developed by Fischer Black (i.e., Black's 1976 formula). Although this pricing model is computationally efficient, our current process uses *historical* interest rate volatility estimates instead of *implied* volatility estimates. As a result, valuation estimates are frequently produced that are not consistent with those used in the capital markets.

In the *Enhanced NPV Model*, caps, floors, and swaptions are priced using a latticed-based version of the GHL Model, which incorporates market-implied volatilities. Because of this, we expect cap, floor, and swaption prices produced by the

*Enhanced NPV Model* to be consistent with third-party price marks.

Besides improving the accuracy of the existing pricing routines, the *Enhanced NPV Model* is also capable of producing a variety of analytical measures not currently available in the legacy NPV Model. The current NPV Model only produces the standard net portfolio value (i.e., market value of equity (MVE)) analysis report based on parallel yield curve shifts of +/- 100, 200, and 300 basis points.

The *Enhanced NPV Model*, however, is capable of producing MVE analysis based on any interest rate scenario, including parallel shocks as small as 25 and 50 basis points, and non-parallel shocks involving yield curve steepening and flattening scenarios.

At present, the *Enhanced NPV Model* is also capable of producing net interest income analysis, Earnings-at-Risk analysis, and interest rate Value-at-Risk analysis. Although reports with this information will not be immediately available to OTS-regulated institutions, we expect to provide this type of analysis in the future.

Additional reports and capabilities that we expect to make available in the future include a risk decomposition report and customized "what-if" analysis. The risk decomposition report will give thrift executives greater insight into why their institution's interest rate risk results change from quarter to

quarter. For example, executives and OTS analysts will be able to see how changes in interest rates and balance sheet composition affect an institution's net portfolio value.

Initially, "what-if" analysis will be made available on a case-by-case basis. Using this capability, thrift executives will be able to estimate how balance sheet restructurings or movements in certain market rate assumptions will affect their interest rate risk results.

The current NPV Model is capable of producing certain types of "what-if" analyses, but because of technical limitations involving off-site access, it is not widely used. We expect this new feature, however, to be very popular, especially among those smaller, OTS-regulated thrifts that do not currently have internal asset/liability models.

### Rolling Out the Enhanced NPV Model

At present, OTS is close to completing the validation process for the *Enhanced NPV Model*. As part of this process, we have been running the current NPV Model in parallel with the *Enhanced NPV Model* to make sure that the coding of the new model's valuations are accurate, and that there are no large discrepancies in the results of the two models. We expect the *Enhanced NPV Model* to produce results that are close to those produced by the

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## The NPV Model: The Next 15 Years (continued)

(Continued from page 3)

current NPV Model.

To the extent that the results of the two models are not close, we intend to explain why they differ. Any remaining differences will be attributable to model enhancements and will be fully supportable. Also, we are developing new documentation for the NPV Model Handbook and a replacement for the *Selected Assets and Liability Price Tables* that are posted each quarter on the OTS website.

The price tables are produced in the front-end process of the current NPV Model and were described in last quarter's feature article. As noted above, however, the *Enhanced NPV Model* does not use price tables in its pricing routines, so a replacement set of price tables needs to be generated.

Currently, the target date to switch from the legacy NPV Model to the *Enhanced NPV Model* is September 2006. Shortly thereafter, we plan to release interest rate risk reports that incorporate some of the additional analytical information generated by the new model.

Most likely, the first reports will include an expanded Interest Rate Risk Report, displaying results for different stress scenarios and showing valuations at a more granular level (e.g., the price profile of each reported swap position and single-family, fixed-rate mortgage bucket will be displayed individually as opposed to one aggregated line item). Reports reflecting net interest income

analysis, Value-at-Risk analysis, and Earnings-at-Risk analysis will not occur until the industry has had some time to review and comment on the proposed methodologies and guidelines for interpreting the results.

Currently, we are testing a new routine for pricing structured FHLB advances in the *Enhanced NPV Model* and are exploring a process for pricing single-family mortgage loans at a more granular level (e.g., single-family ARMs using the MTA lagging index). These two pricing routines, however, will require that changes be made to Schedule CMR in order to collect the additional, more granular data.

Until the necessary changes can be made to Schedule CMR, OTS will give OTS examiners and analysts on a temporary basis the ability to input the necessary information into the *Enhanced NPV Model* using an XML data extraction process. This could occur during an on-site examination, or as part of an off-site analysis process. With this XML data extraction process, new information can be fed into the model via an Excel spreadsheet without collecting any more information on Schedule CMR.

Finally, we are considering a pilot study that would give a small number of OTS-regulated institutions direct access to a version of the *Enhanced NPV Model*. Under this

pilot arrangement, thrift executives could take advantage of these new pricing routines and generate a host of customized reports themselves.

Although the details of the pilot study are still being worked out, we are looking for institutions to take part in this program. All OTS-regulated institutions that are interested in participating should contact their capital markets specialists listed at the bottom of the *Interest Rate Risk-Executive Summary Reports*.

### Conclusion

OTS is excited about its partnership with Thomas Ho and his firm, THC, Ltd. Through this partnership, we have developed a new NPV Model that ultimately will provide OTS employees and thrift executives at OTS-regulated firms much greater insight into a thrift's interest rate risk exposure. The *Enhanced NPV Model* not only will help thrift executives better manage the risks their institutions confront, but its expanded capabilities will greatly enhance the overall supervisory process.

In the future, OTS examiners will have a better understanding of a particular thrift's risk profile before arriving on-site. It is expected that this will lead to a more efficient and effective examination process. ■



## First Quarter Sees Modest Increase in Sensitivity (continued)

(Continued from page 1)

the 30-year yield rose by 36 basis points.

During the first quarter, the Federal Reserve increased the target rate for federal funds twice. As a result, the yield curve remained flat. The flat yield curve kept downward pressure on net interest margins at individual institutions, but did not adversely affect aggregate measures. Average net interest margin rose to 277 basis points in the first quarter, up one basis point from the previous quarter.

The first quarter saw total thrift earnings fall to \$4.22 billion, down from \$4.34 billion at year-end 2005. Although net income fell two percent from the previous quarter's level, it represents the fifth consecutive quarter where industry earnings were \$4.00 billion or higher.

Along with the decrease in net income, thrift profitability fell from the previous quarter. The average return on assets (ROA) for the industry fell to 1.14 percent in the first quarter, down from 1.19 percent in the previous quarter. The decline in ROA in the first quarter was due largely to lower fee income and other noninterest income and higher noninterest expense. Partially offsetting these negative impacts to profitability were a higher net interest margin and higher mortgage loan servicing fee income and lower loan loss provisions and taxes.

Total fee income, which includes mortgage loan servicing fee income and other

fee income, decreased to 1.27 percent of average assets from 1.38 in the previous quarter. In the first quarter, other noninterest income was 0.44 percent of average assets, down from 0.53 percent in the previous quarter. Other noninterest income includes income generated from the sales of assets and leasing of office space.

The 30-year mortgage rate, as measured by the contract interest rate on Freddie Mac commitments for fixed-rate 30-year mortgages, rose to 6.35 percent at the end of the first quarter, up from 6.22 percent from the prior quarter.

With the rise in mortgage rates, the volume of mortgage originations fell in the first quarter. Total mortgage originations by thrifts were \$164.6 billion, down 12 percent from \$187.1 billion in the previous quarter. First-quarter 1-4 family mortgage originations by thrifts fell to \$142.6 billion, down from \$163.9 billion in the previous quarter. This represents a 13 percent decline. Also, the ARM share of total thrift mortgage originations fell to 44 percent, down from 50 percent in the prior quarter.

Mortgage refinancing volume was \$58.2 billion in the first quarter, down 9 percent from fourth quarter 2005. While the volume of mortgage refinancings fell, mortgage refinancing activity accounted for 35.4 percent of total mortgage originations in the first quarter, up from 34.3 percent in the previous quarter. This increase in mortgage refinanc-

ing activity for thrifts is different from the mortgage refinancing activity of all lenders, where the proportion fell to 45 percent from 48 percent.

With regard to thrift mortgage pipeline activity, the notional amounts of optional and firm commitments to originate both fixed- and adjustable-rate mortgages in the first quarter were \$76.8 billion and \$5.8 billion, respectively. The notional amount for firm commitments and optional commitments rose 23.7 percent and 13.7 percent, respectively, from the previous quarter.

Despite the rise in the ARM share of mortgage originations, the ARM share of total 1-4 family mortgages held by thrifts in their portfolios declined slightly to 64.3 percent in the first quarter, down from 64.4 percent in the prior quarter. Consistent with this fall in portfolio holdings of adjustable-rate single-family mortgages and MBS over this period, thrifts increased their holdings of fixed-rate single-family mortgages to \$277 billion from \$269.4 billion.

In addition to the percentage decline in portfolio holdings of adjustable-rate mortgages, the portfolio mix of adjustable-rate mortgages also shifted. Between December 2005 and March 2006, thrift portfolio holdings of teaser, lagging index ARMs with a reset frequency of one-month fell 33.4 percent. Over the same period, thrift portfolio holdings of non-teaser CMT in-

dex ARMs with a reset frequency of seven months to two years rose 19.2 percent.

The liabilities side of the balance sheet for thrifts also saw some changes between December 2005 and March 2006. Total variable-rate borrowings rose from \$238.4 billion to \$243.9 billion. Over the same period, total fixed-rate, fixed-maturity deposits rose from \$360.4 billion to \$368.6 billion. Also, balances in MMDA accounts rose to \$191.9 billion in the first quarter, up 8.6 percent from \$176.7 billion in the prior quarter.

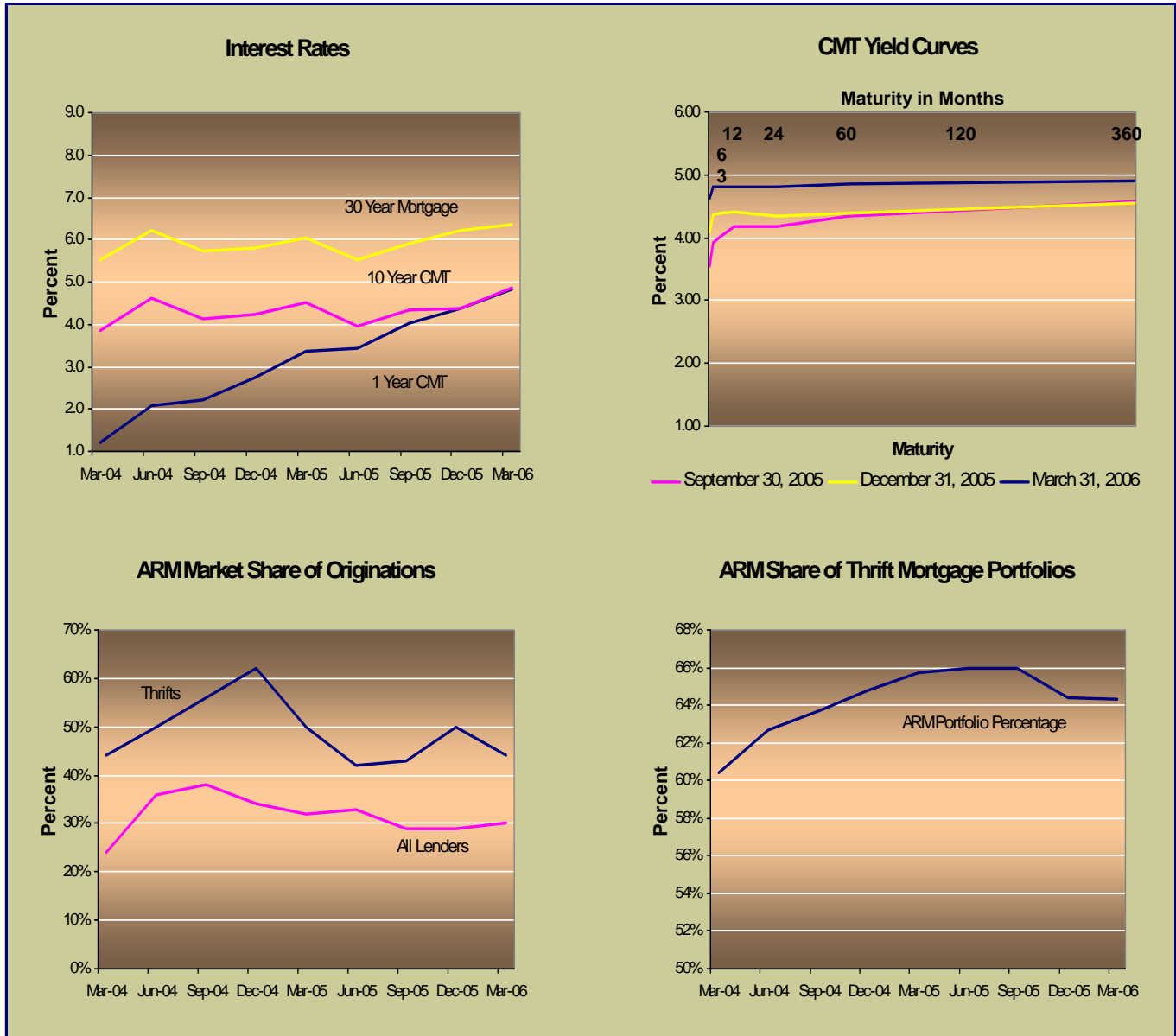
The industry's median effective duration of assets rose from 1.97 to 2.09 between December 2005 and March 2006. This represents the third consecutive quarterly increase in the effective duration of assets. With the increase in longer-term interest rates during the first quarter, the rate of projected one-to-four-family mortgage prepayments fell. As a result of the fall in prepayments, the durations of both single-family mortgages and total assets rose.

With the rise in the volume of refinancings into mortgage loans with lower coupon rates, the industry can probably expect to see additional increases in asset duration in the future as prepayment speeds slow due to a weaker incentive to refinance. This would be especially true if interest rates continue to rise.

In a recent *Prepayment Report and Commentary*, Bear, Stearns & Co. ob-

(Continued on page 6)

### Interest Rates and ARM Market Share



#### First Quarter Sees Modest Increase in Sensitivity (continued)

(Continued from page 5) serves that prepayments on Fannie Mae (FNMA) and Freddie Mac (FHLMC) mortgage collateral posted significant declines in April 2006.

Aggregate prepayments on 30-year FNMA collateral fell 16 percent, from 13.6 to 11.4 CPR. Likewise, prepayments on 30-year FHLMC collateral fell by 15 percent, falling from 11.8 CPR in

March 2006 to 10.0 CPR in April 2006. The decline in prepayment speeds was 0.5 to 1.0 CPR more than expected. As Bear, Stearns & Co. notes, the flat yield curve today provides borrowers with few options to refinance into other mortgage products. Bear, Stearns notes that, as of April 2006, only five percent of single-family mortgages are refinaneable. Indeed, the flat

yield curve combined with the cooling housing market suggests that prepayments in the second half of 2006 will most likely be slower than they have been since prior to the 2003 refinancing boom.

As a result of the slowdown in prepayments, interest rate sensitivity for thrifts can be expected to continue to rise over the next several quarters. The increase could

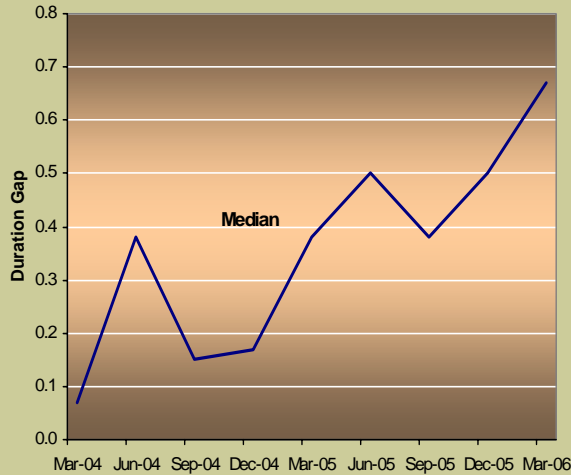
be quite pronounced if interest rates also continue to increase.

The industry's median effective duration of liabilities fell from 1.48 to 1.41 in the first quarter due to the increase in interest rates. The increase in the effective duration of assets and the decrease in the effective duration of liabilities resulted in an in-

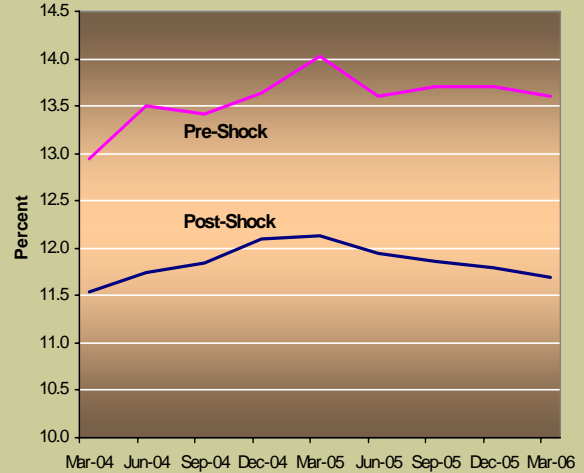
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## Duration and NPV Sensitivity Measures

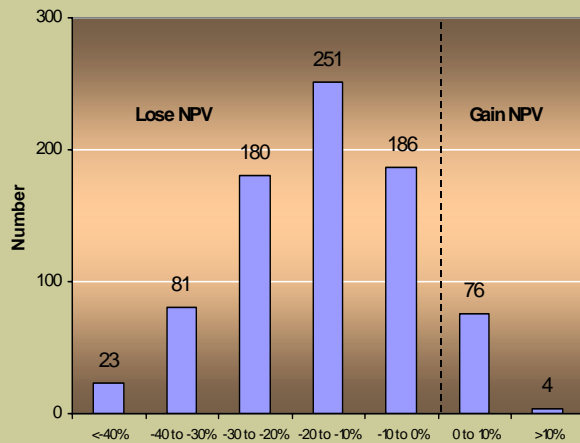
**Median Effective Duration Gap**



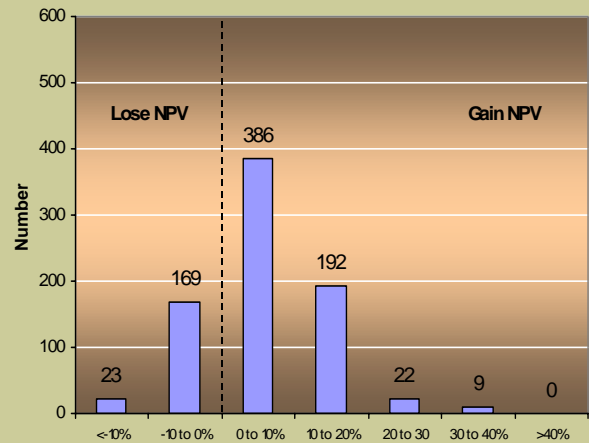
**Median Pre- and Post-Shock NPV Ratios**



**Estimated Change in NPV:  
+200bp Rate Change**



**Estimated Change in NPV:  
-200bp Rate Change**



### First Quarter Sees Modest Increase in Sensitivity (continued)

(Continued from page 6)  
crease in the duration gap for the thrift industry in the first quarter. The median effective duration gap rose to 0.67 in the first quarter, up from 0.50 in the prior quarter.

Both the median pre- and post-shock NPV ratios were essentially unchanged between the fourth quarter of

last year and the first quarter of this year. The median pre-shock NPV ratio fell to 13.6 percent in the first quarter, down from 13.7 percent in the previous quarter.

The median post-shock NPV ratio dropped, falling from 11.8 percent in the previous quarter to 11.7 percent in the first quarter. Median

sensitivity increased from 177 basis points to 191 basis points.

The number of thrifts with a post-shock NPV ratio below 4 percent remained unchanged at three institutions between year-end 2005 and March 2006.

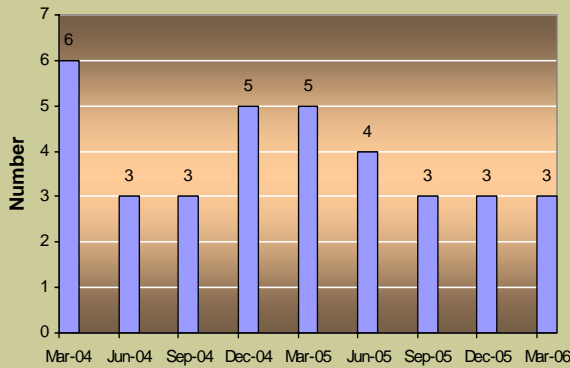
Of the 801 thrifts that submitted Schedule CMR

data in the first quarter, about 90 percent would have experienced a loss of net portfolio value if rates rose by 200 basis points. In contrast, if rates fell by 200 basis points, about 76 percent of thrifts would have experienced increases in their net portfolio values.

The thrift industry would  
*(Continued on page 8)*

## Interest Rate Risk Measures

**Thriffs with Post-Shock NPV Ratios Under 4 Percent**



Interest Rate Risk Measures Industry Aggregates Last Two Quarters				
	NPV as % of PV of Assets		% Change in NPV	
	Dec-05	Mar-06	Dec-05	Mar-06
<b>+300</b>	8.14%	7.89%	-30%	-33%
<b>+200</b>	9.37%	9.21%	-18%	-20%
<b>+100</b>	10.35%	10.31%	-8%	-9%
<b>Base</b>	11.09%	11.18%	0%	0%
<b>-100</b>	11.44%	11.72%	4%	6%
<b>-200</b>	11.31%	11.75%	3%	7%
<b>-300</b>	N/A	N/A	N/A	N/A

**Post-Shock NPV Ratio and Sensitivity Measure Matrix December 2005**

	Under 100bp	101-200bp	201-400bp	Over 400bp	Total
<b>Over 10%</b>	150	191	190	39	570
<b>6% to 10%</b>	32	73	105	11	221
<b>4% to 6%</b>	0	2	4	4	10
<b>Below 4%</b>	0	0	1	2	3
<b>Total</b>	182	266	300	56	804

Minimal   Moderate   Significant   High

**Post-Shock NPV Ratio and Sensitivity Measure Matrix March 2006**

	Under 100bp	101-200bp	201-400bp	Over 400bp	Total
<b>Over 10%</b>	160	163	190	41	554
<b>6% to 10%</b>	31	63	114	22	230
<b>4% to 6%</b>	0	0	9	5	14
<b>Below 4%</b>	0	0	1	2	3
<b>Total</b>	191	226	314	70	801

Minimal   Moderate   Significant   High

### First Quarter Sees Modest Increase in Sensitivity (continued)

(Continued from page 7) have lost 20.0 percent of its net portfolio value if rates rose by a 200 basis points in the first quarter. On the other hand, the industry would have gained seven percent if rates fell by 200 basis points.

The number of thrifts with a post-shock NPV ratio below 6 percent rose to 17

institutions in the first quarter, up from 13 in the prior quarter. The number of thrifts with interest rate sensitivity of 100 basis points or below rose to 191 thrifts in the first quarter, up from 182 thrifts in the previous quarter.

The number of thrifts with over 400 basis points in interest rate sensitivity rose to

70 thrifts in the first quarter, up from 56 thrifts in the prior quarter. These results are consistent with an overall increase in the interest rate sensitivity of the industry in the first quarter.

Based on TB 13a guidance for the “S” rating, 607 thrifts (75.8 percent) initially would be assigned a minimal

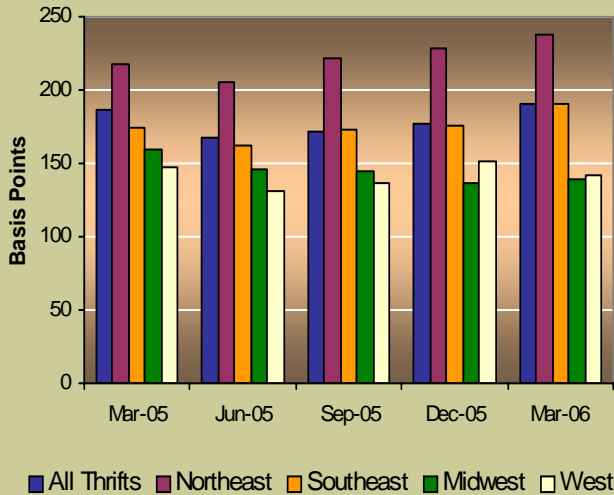
interest rate risk rating, 155 thrifts (19.4 percent) a moderate rating, 31 thrifts (3.9 percent) a significant rating, and eight thrifts (0.9 percent) a high rating in the first quarter.

The number of thrifts with significant or high interest rate risk rose to 39 in the first quarter, up from 22 in the prior quarter. ■

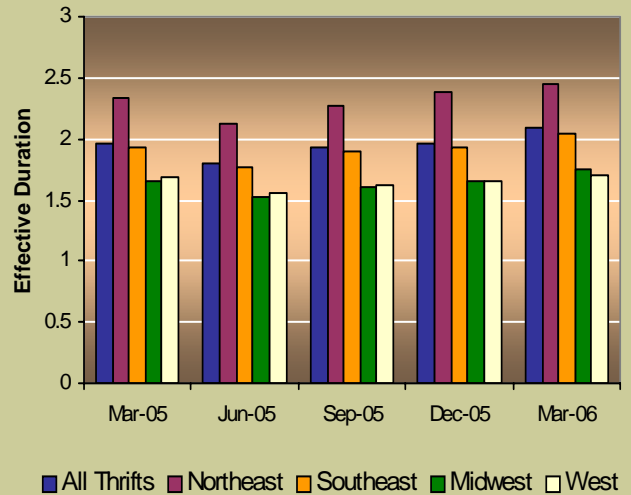


### Comparative Trends in the Four OTS Regions

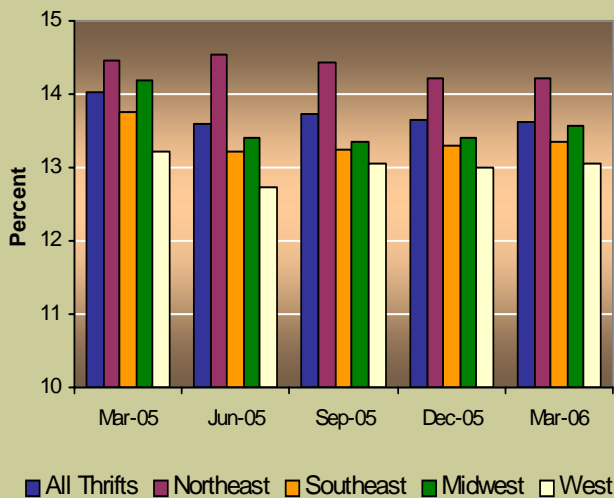
Median Sensitivity by OTS Region



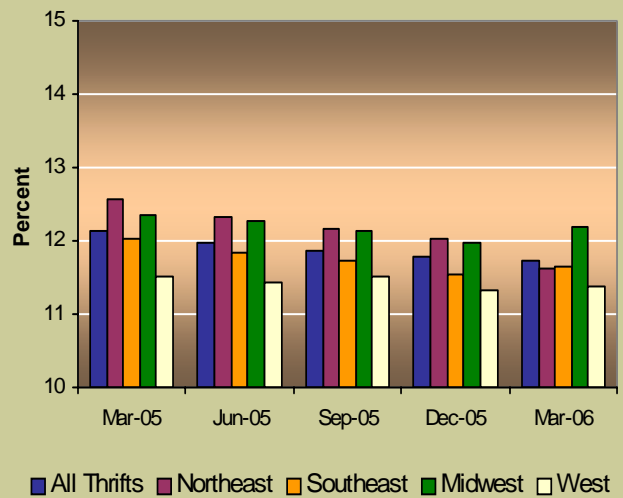
Median Assets Duration by OTS Region



Median Pre-Shock NPV Ratio by OTS Region



Median Post-Shock NPV Ratio by OTS Region



### Regional Comparisons

At the end of the first quarter, the Northeast Region had the highest median sensitivity at 238 basis points, while the Midwest Region had the lowest median sensitivity at 139 basis points.

Three of the four OTS regions experienced an increase in their median sensi-

activities. The Northeast, Southeast, and Midwest Regions saw their median sensitivities rise by 9, 15, and 2 basis points, respectively, while the West Region saw its median sensitivity fall by 11 basis points.

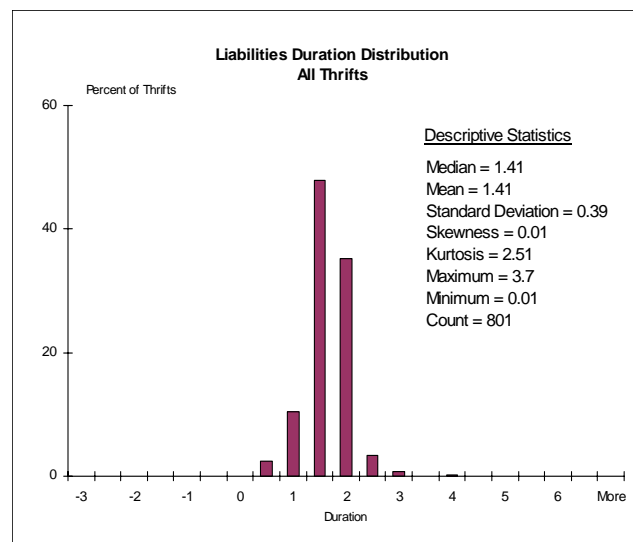
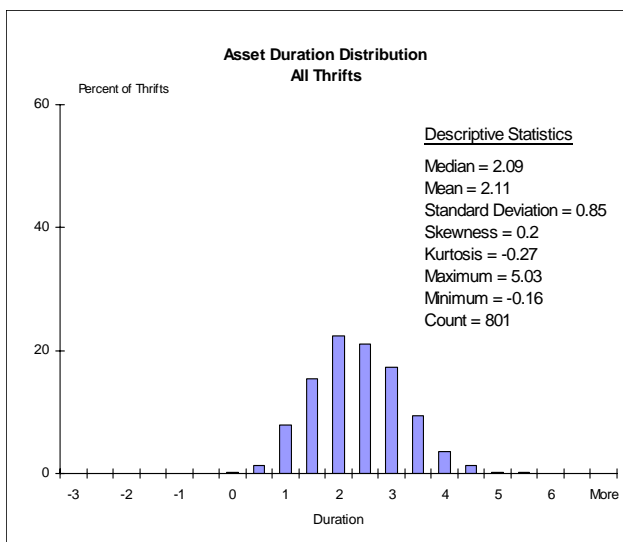
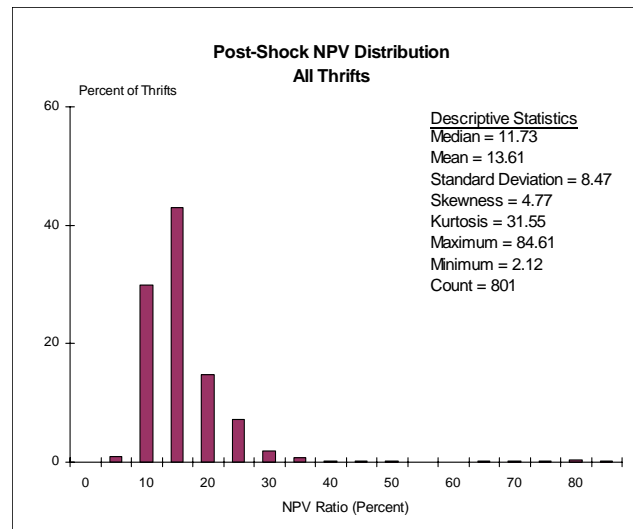
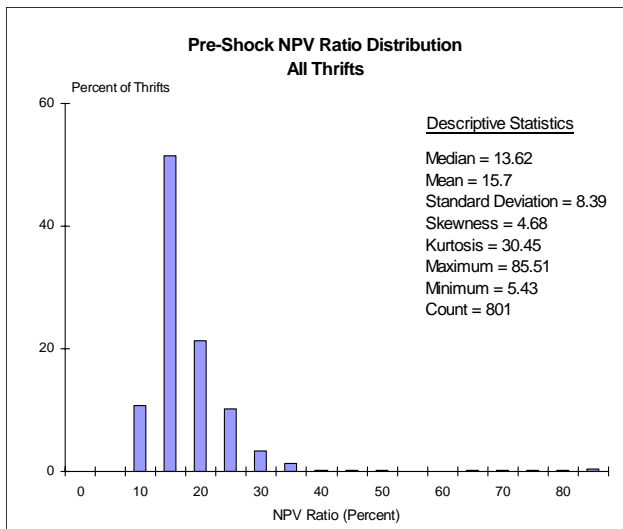
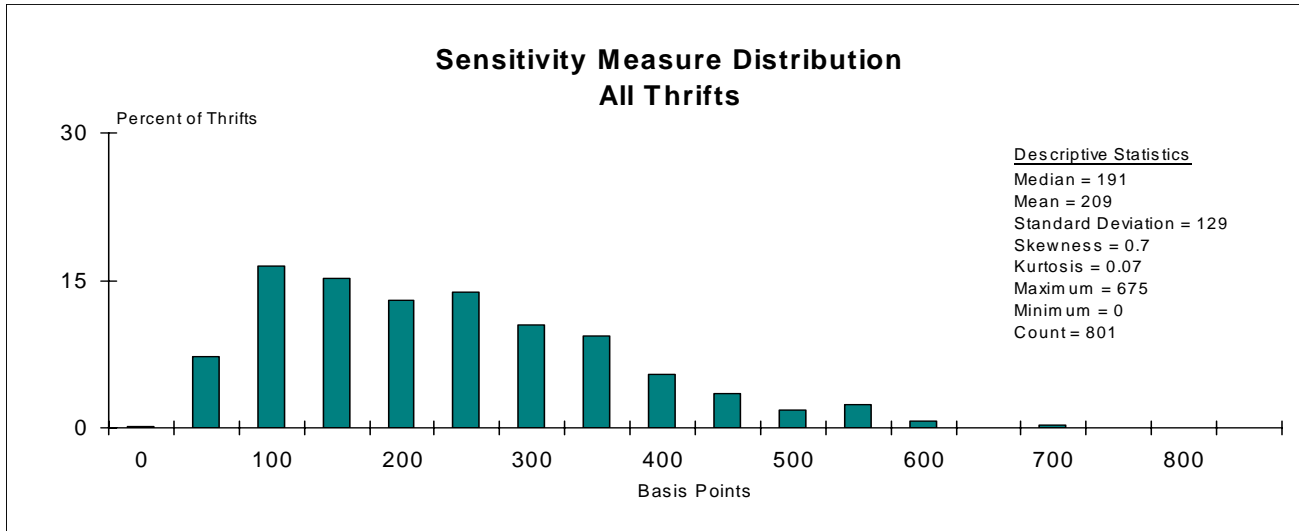
The Northeast Region had the highest median pre-

shock NPV ratio at 14.2 percent, while the West Region had the lowest median pre-shock NPV ratio at 13.1 percent. The Midwest Region also had the highest median post-shock NPV ratio, while the West Region had the lowest.

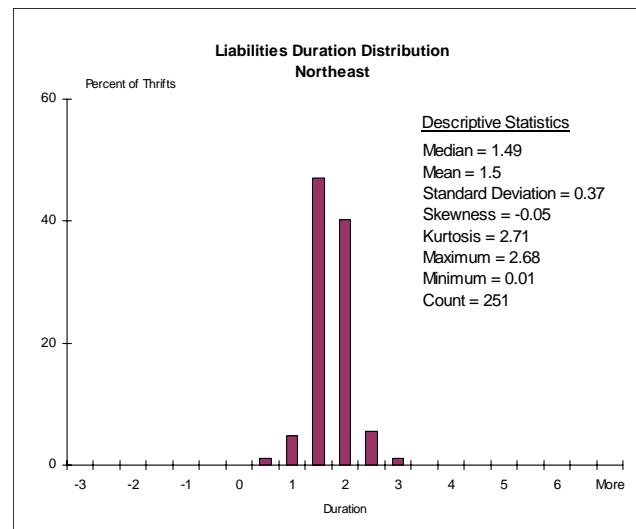
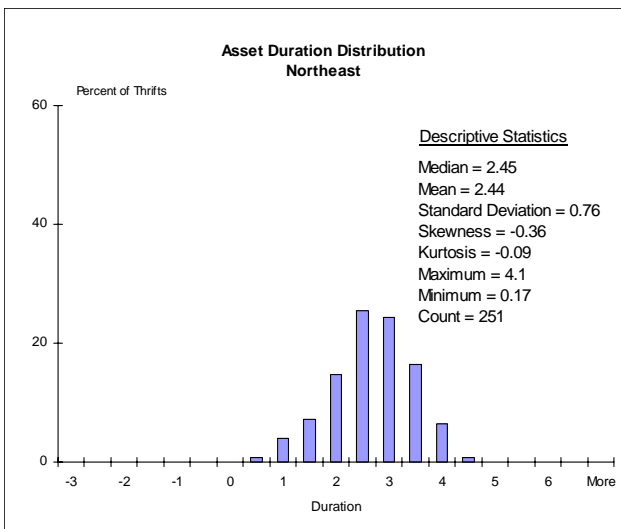
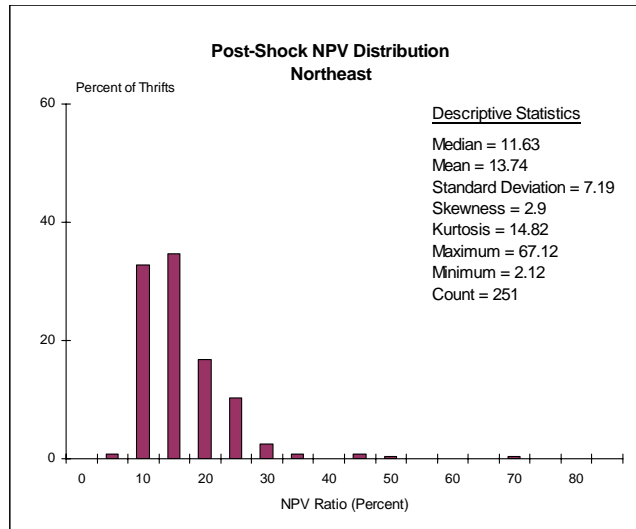
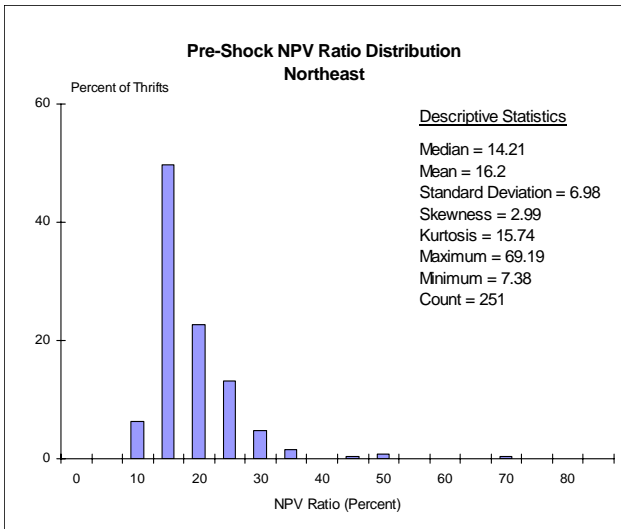
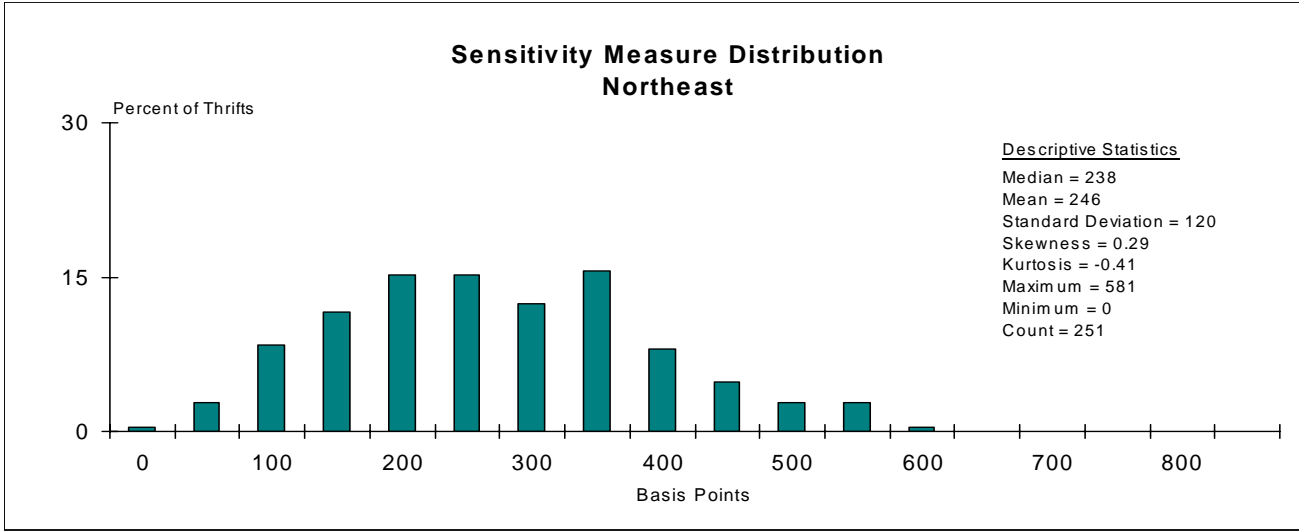
All four OTS regions

saw their median asset durations rise. The Northeast Region had the highest asset duration, at 2.45, while the West Region had the lowest at 1.71 at the end of the first quarter. All four OTS regions experienced a decrease in their median liability durations in the first quarter. ■

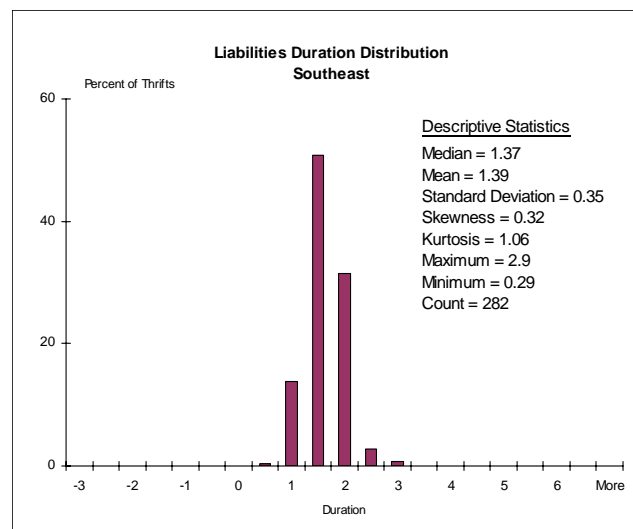
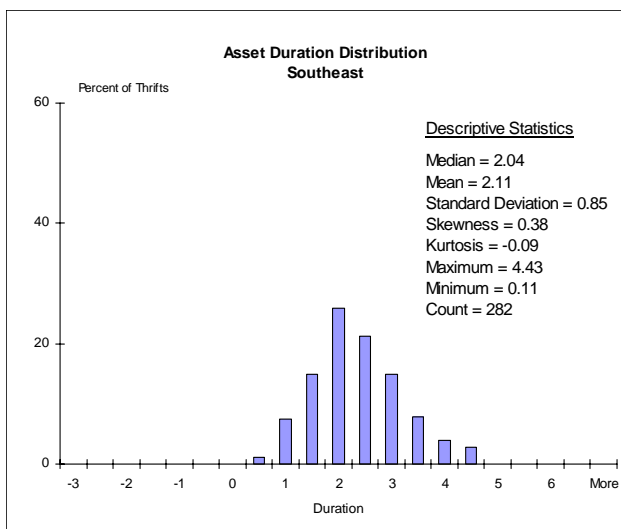
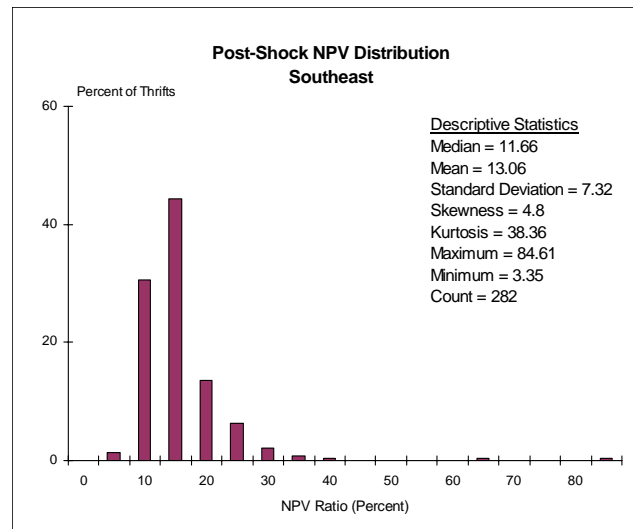
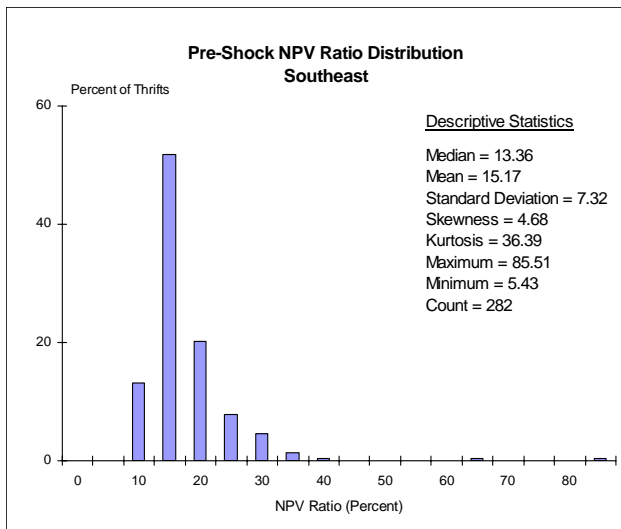
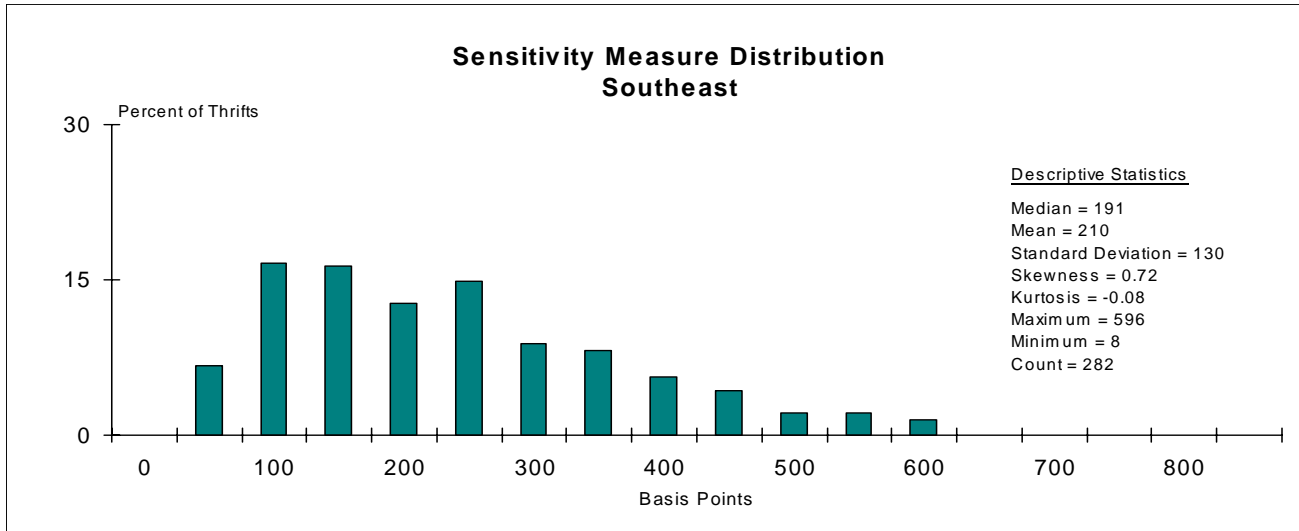
## Appendix A – All Thrifts



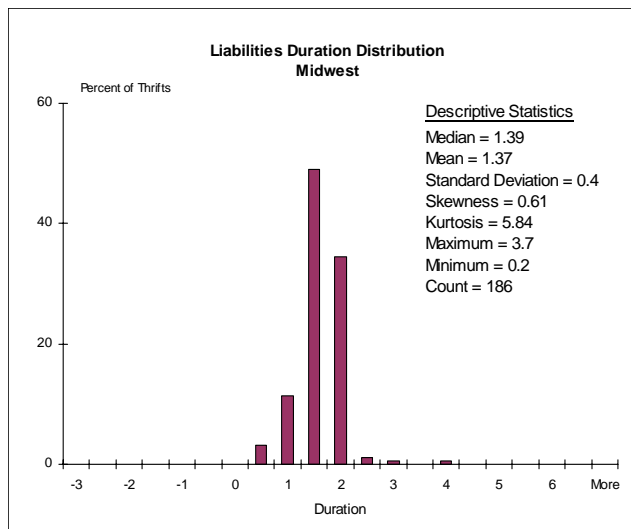
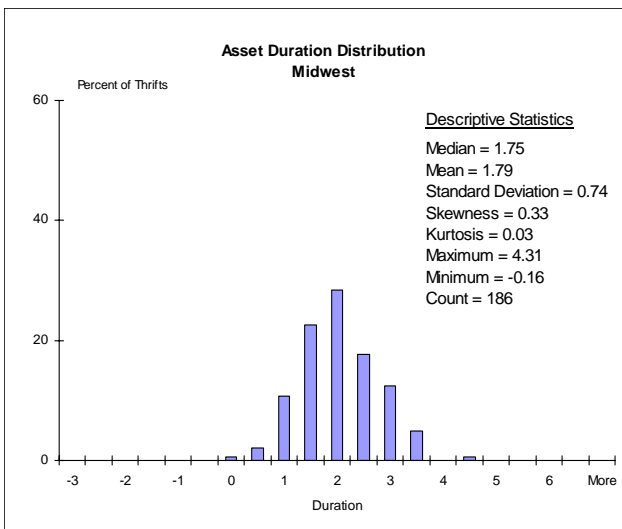
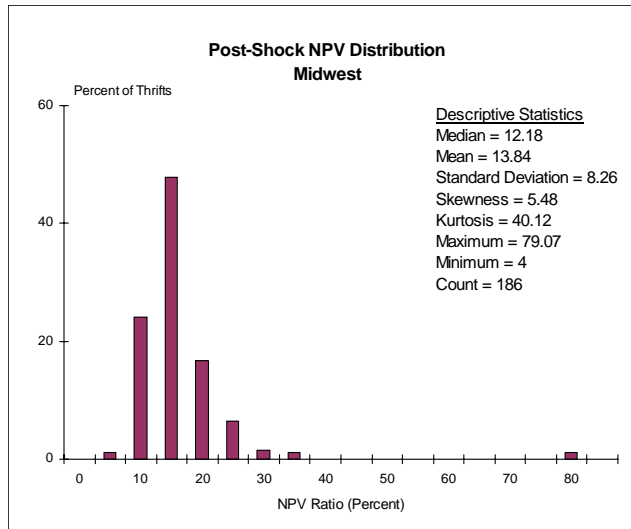
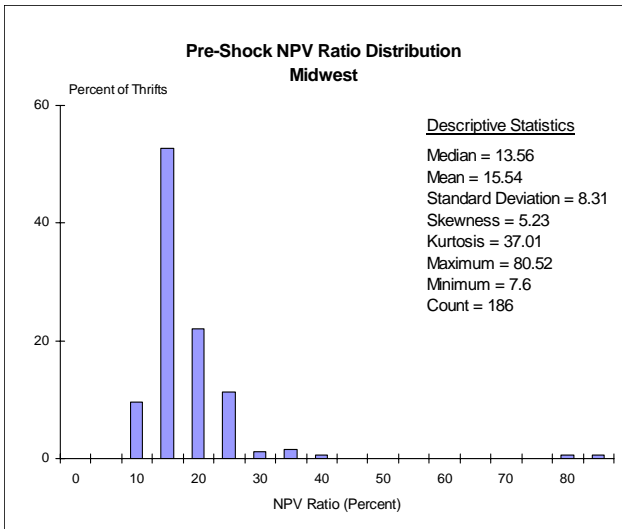
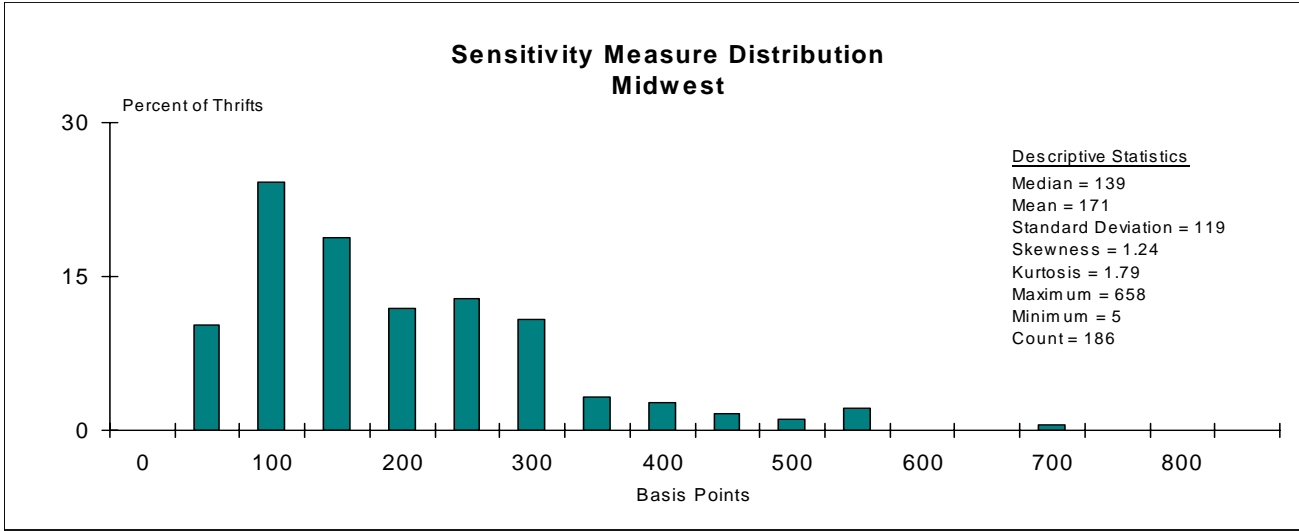
## Appendix B – Northeast Region



## Appendix C – Southeast Region

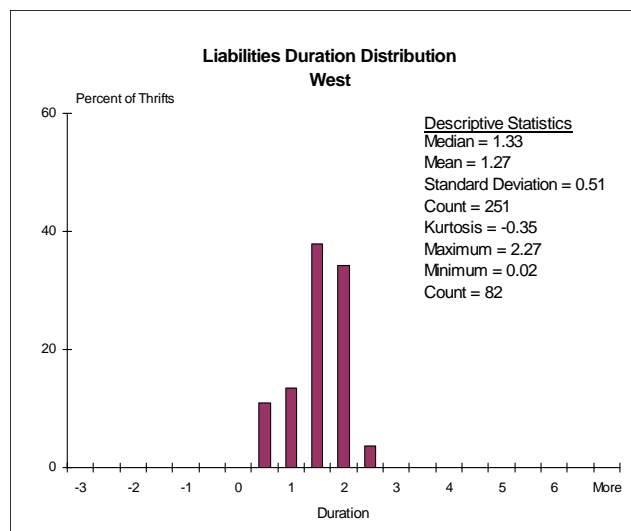
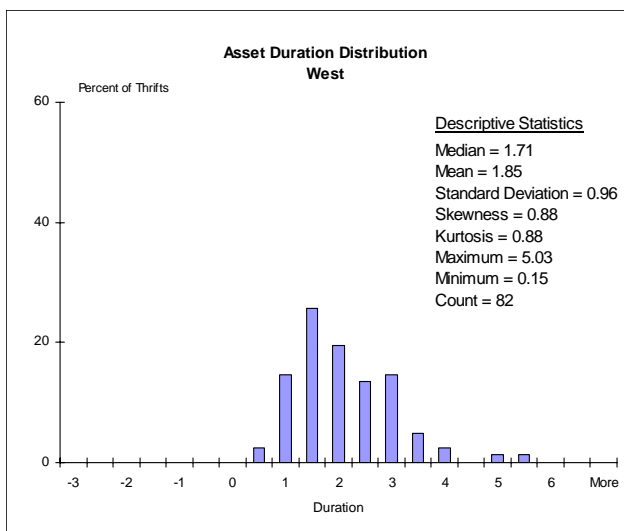
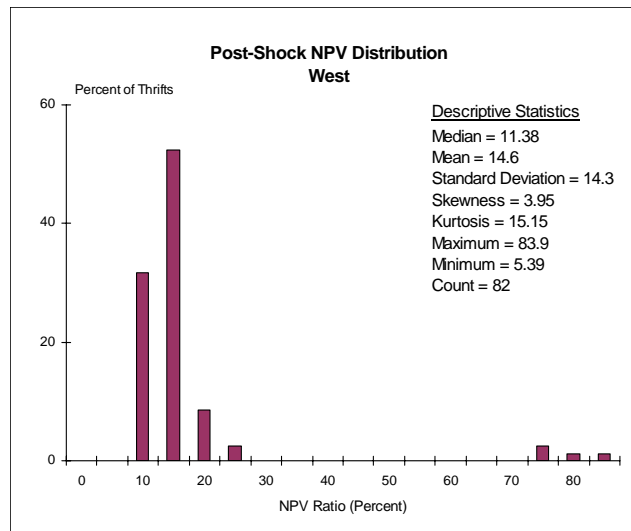
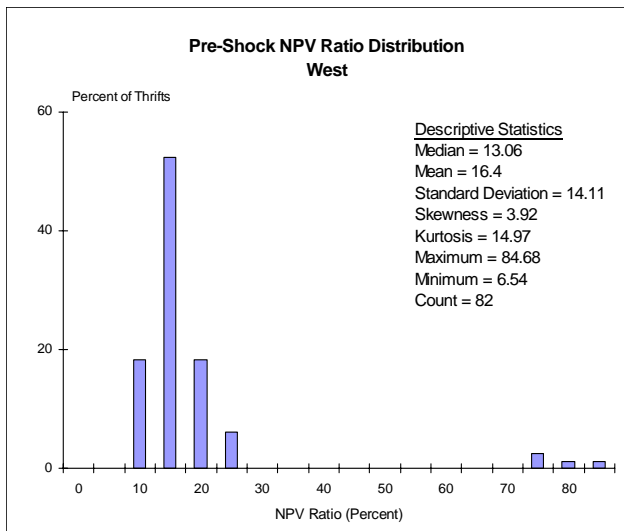
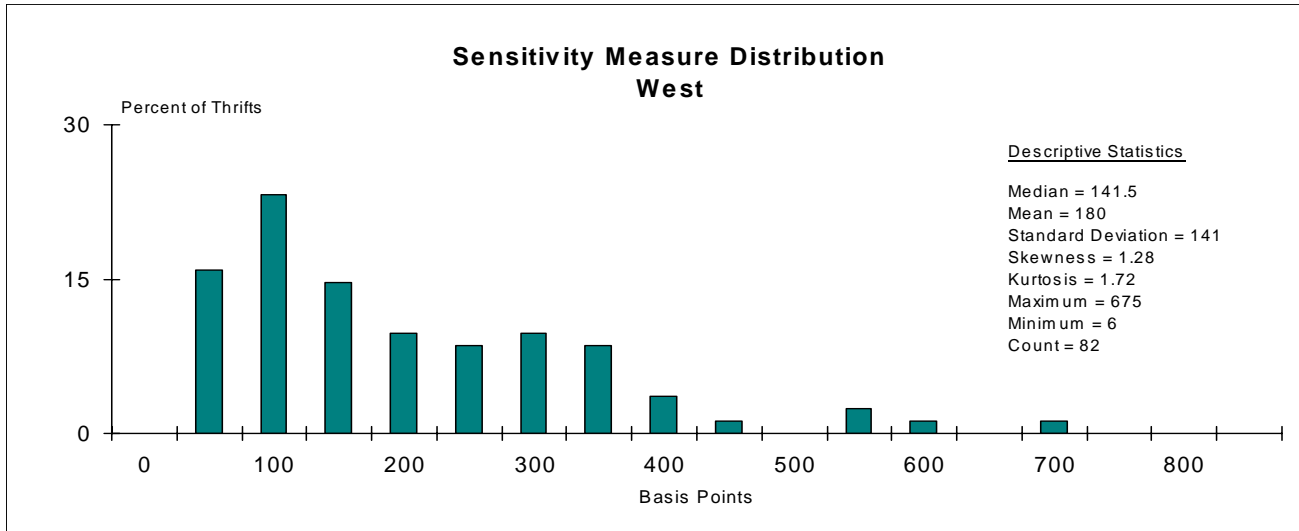


## Appendix D – Midwest Region





## Appendix E – West Region



## *Glossary*

**Duration:** A first-order approximation of the price sensitivity of a financial instrument to changes in yield. The higher the duration, the greater the instrument's price sensitivity. For example, an asset with a duration of 1.6 would be predicted to appreciate in value by about 1.6 percent for a 1 percent decline in yield.

**Effective Duration:** The average rate of price change in a financial instrument over a given discrete range from the current market interest rate (usually, +/-100 basis points).

**Estimated Change in NPV:** The percentage change in base case NPV caused by an interest rate shock.

**Kurtosis:** A statistical measure of the tendency of data to be distributed toward the tails, or ends, of the distribution. A normal distribution has a kurtosis statistic of three.

**NPV Model:** Currently measures how five hypothetical changes in interest rates (three successive 100 basis point increases and two successive 100 basis point decreases ) affect

the estimated market value of a thrift's net worth.

**Post-Shock NPV Ratio:** Equity-to-assets ratio, following an adverse 200 basis point interest rate shock (assuming a normal interest rate environment), expressed in present value terms (i.e., post-shock NPV divided by post-shock present value of assets). Also referred to as the exposure ratio.

**Pre-Shock NPV Ratio:** Equity-to-assets expressed in present value terms (i.e., base case NPV divided by base case present value of assets).

**Sensitivity Measure:** The difference between Pre-shock and Post-shock NPV Ratios (expressed in basis points).

**Skewness:** A statistical measure of the degree to which a distribution is more spread out on one side than the other. A distribution that is symmetric will have a skewness statistic of zero.

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