

The Quarterly Review of Interest Rate Risk

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



Special points of interest:

- Treasury yield curve flattens in the second quarter
- Second quarter median interest rate sensitivity falls
- 30-yr mortgage commitment rate falls
- Asset duration falls
- Comparative Regional Analysis
- Feature Article on Option ARMs

Second quarter median interest rate sensitivity fell to 168 basis points, down from 187 basis points in the first quarter. The decrease in sensitivity was due to a shift in the yield curve in the second quarter that narrowed the duration gap between assets and liabilities for the industry.

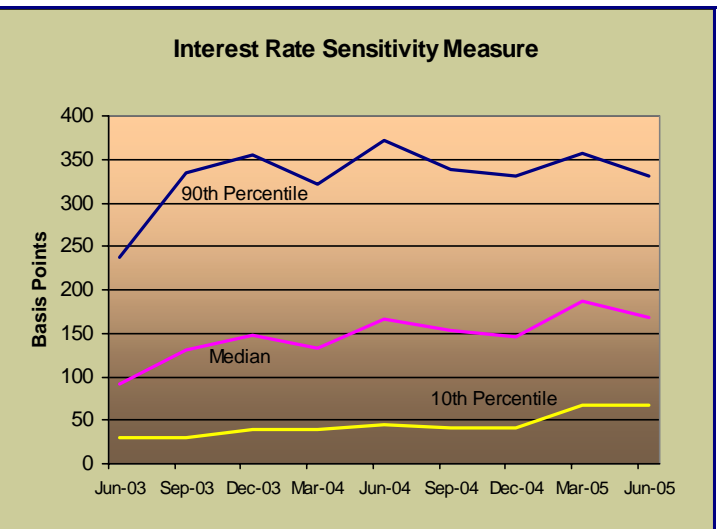
Both the median pre-shock and post-shock Net Portfolio Value (NPV) ratios fell slightly in the second quarter. Despite the decrease in the median post-shock NPV ratio, the number of thrifts with post-shock NPV ratios below 4.0 percent fell to four institutions in the second quarter.

Option ARMs: Part One

Option ARMs have received a lot of attention in recent months. Press reports dealing with this non-traditional mortgage product are often accompanied by provocative headlines.

To cite just a few: *“Crazy Loans: Is This How the Boom Ends?”* *“Banks Bulking Up With Exotic Mortgages,”* *“A Growing Tide of Risky Mortgages,”* and *“Regulators May Warn About New Mortgages.”*

Are option ARMs really crazy or exotic loans? Are they inherently more risky than traditional fixed- and adjustable-rate mortgages? Do



The second quarter saw the Treasury yield curve continue to flatten. Between the first and second quarter of this

year, rates rose at the short end but fell substantially at the long end of the yield curve.

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they present any new risks? Should consumers, regulators, and banking officials be concerned?

This article examines the option ARM and discusses its growing popularity among consumers. We discuss the option ARM's origins and the extent to which it is a new mortgage product.

We also address the implications of this mortgage product for risk management at financial institutions, including the extent to which there might be new, or unusual, challenges related to credit risk, systemic risk, geo-

graphic and portfolio concentration risk, and underwriting practices.

In the next issue of this publication, we will discuss risk management and supervisory concerns and several regulatory initiatives related to the widespread use of option ARMs.

Financial Innovation in the U.S. Mortgage Market

Financial innovation is often triggered by the need to address a fundamental shift in the economic environment or a

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Option ARMs (continued)

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major change in consumer attitudes. Particularly within the mortgage market, innovation often has been driven by the need to deal with unusually high interest rate environments, skyrocketing home prices, or the desire on the part of some consumers to assume more risk in managing their debt.

Up until the late 1970s, traditional level-payment, fully amortizing fixed-rate mortgages were the mortgage product most widely used by borrowers seeking to buy a home.

This mortgage product seemed to meet the needs of both borrowers and lenders. Borrowers found comfort in the certainty of a fixed payment over the life of their mortgage. Lenders, who often finance mortgage loans with lower costing, short-term funds, found the product attractive because it offered an attractive spread with little risk.

The record high interest rates experienced in the 1970s, however, served as a catalyst for the development of the first adjustable-rate mortgage. At the time, soaring interest rates presented a substantial challenge to both borrowers and lenders. With fixed-rate mortgages approaching 15 percent at the time, potential homebuyers found it prohibitively expensive to purchase a home.

Similarly, lenders were having a difficult time attracting customers and earning a spread because the cost of borrowing often exceeded what they were earning on loans. Accordingly, the in-

troduction of the ARM product seemed to fit the need of both borrowers and lenders.

For bankers, ARMs brought in additional customers and offered a way to deal with interest rate risk since the rates earned on this product more closely track their cost of funds. From a borrower's perspective, ARMs are attractive because they allow for lower initial monthly payments compared to those associated with traditional fixed-rate mortgages, thereby making home ownership more affordable.

With ARMs, however, the lower initial payment burden comes at a price because borrowers who want a lower monthly payment initially also incur the risk of higher monthly payments in the future if interest rates increase.

In fact, it was the prospect of these rising payments during periods of rising interest rates that prompted consumer advocates to view the new ARM loans as dangerous. This criticism, in turn, led to the development of periodic and lifetime caps on rate increases—thus reducing the prospect of payment shock.

Further innovation occurred in the 1990s when bankers introduced the hybrid ARM as a way to deal with the flat yield curves that were prevalent at the time. Hybrid ARMs are an innovation that involved modifying the basic characteristics of the standard amortizing ARM.

These mortgages have coupon rates that are fixed for a given number of years,

after which the rates adjust each year based on an underlying index. Typically, these adjustable-rate mortgages are indexed to various Treasury rates, with the fixed-rate period being three, five, seven, or 10 years.

The most recent wave of financial innovation began in earnest in 2004 and the first half of 2005, when mortgage lenders began mass marketing a variety of “affordable” mortgage products, such as interest-only ARMs and option ARMs, as a way to deal with skyrocketing home prices.

Both interest-only ARMs and option ARMs provide borrowers with lower monthly mortgage payments compared to other mortgage products available in today's market. This fact may explain the growing popularity of these mortgage products, especially the option ARM, which offers the lowest monthly payment option.

Option ARM Basics

Option ARMs provide borrowers with the flexibility to select one of four different mortgage payment options each month. The borrower can choose between amortizing payments based on a 15- or 30-year amortization schedule, an interest-only payment, or a minimum payment tied to an initial start, or teaser, rate.

Under the terms of the option ARM note, the borrower is obligated only to make the minimum monthly payment. The monthly mort-

gage statement, however, provides the borrower with the other three payment options for debt management purposes.

Like some lagging index ARM loans, such as those tied to the 11th-District Cost of Funds Index, option ARMs can experience *negative amortization*. Negative amortization occurs frequently when borrowers opt to make just the minimum payment. When this occurs, the difference between the payment based on the fully indexed rate and the minimum payment is *added* to the outstanding loan balance, making it larger.

While there are many variations offered in the market today, all option ARMs share the same basic features. Option ARMs typically carry a 1.0% to 2.0% teaser rate for the first one to three months. After the teaser period, the interest rate on the loan changes monthly and is based on a rate associated with an underlying index plus a margin.

Payment adjustments, however, are subject to an annual payment cap of 7.5 percent of the prior year's payment. As noted above, however, making just the minimum payment will typically result in negative amortization (Neg Am).

Option ARMs' indices include “current” indices, such as the one-month LIBOR rate, or “lagging” indices, such as the Moving Treasury Average Index (MTA) and the 11-th Dis-

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Option ARMs (continued)

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 trict Cost of Funds Index (COFI.) The typical margin for a prime loan is about 275 basis points.

Option ARMs have negative amortization ceilings that range from between 110% and 125% of the original principal balance. Furthermore, the loans will usually recast to the fully amortizing payment every 5 years, or if the negative amortization ceiling is hit, whichever comes first.

Finally, most option ARMs have 1- or 3-year prepayment penalties.

In most respects, the option ARM is very similar to the traditional COFI ARM that many large West Coast savings institutions have offered for many years. Both of these loan types have payment caps that can lead to negative amortization, and most of these loans are tied to a lagging index of some kind.

One difference is that the option ARM also offers an interest-only payment option, whereas the traditional COFI loan does not. In addition, the bulk of option ARMs are tied to the MTA index, whereas most COFI loans are tied to the 11th-District Cost of Funds Index.

The shift to using the MTA index has improved lenders' ability to securitize option ARMs. In the past, investors had little appetite for COFI-based securities, due to the difficulty associated with hedging these securities.

The most noticeable

difference between the COFI ARM and the option ARM, however, is the tremendous popularity of the option ARM product. A change in consumer attitudes may largely explain this trend.

Changing Consumer Attitudes

In the past year or so, option ARMs have undergone a major transformation, changing from a niche to a mainstream mortgage product. The tremendous growth in popularity of option ARMs is striking. Standard & Poor's reports that for the first five months of 2005, option ARMs made up 25 percent of the prime and Alt-A mortgage securitizations that it rated. In contrast, option ARMs accounted for less than 5 percent of these same markets in the first five months of 2004.

Option ARMs were originally used by wealthier, financially sophisticated consumers as a financial planning tool to earn a higher return on capital through better monthly cash flow management. However, many commentators argue that option ARMs today are being used largely by consumers that they could not afford otherwise.

For the most part, the immense growth in popularity of option ARMs is due to that fact that these mortgages provide consumers with the lowest possible monthly payment and a way to defer paying down principal.

Also, there appears to have been a fundamental shift in the way that consumers in general view mortgage debt. Instead of viewing mortgage debt as closed-end, many consumers now seem to consider a mortgage as revolving debt, much like credit card debt. Indeed, a recent *American Banker* article on mortgage markets makes the same observation.

Option ARMs are definitely attractive mortgages to consumers who have a "minimum-monthly-payment" mind set. Only time will tell, however, if this change in consumer attitude may prove harmful.

As an indication of the greater credit risk posed by option ARMs, Standard & Poor's implemented increased credit support requirements in August 2005 for mortgage-backed securities issued against pools of option ARMs. These changes are designed to provide investors with additional protection against the increased probability of default for these mortgages. Standard & Poor's estimates that option ARM borrowers may experience a monthly payment increase of between 50% and 90% in different stress scenarios.

In order to address the greater potential for default and loss severity inherent in option ARMs, Standard & Poor's decided to impose the same foreclosure frequency adjustments that are in effect for IO ARMs. These adjustments are based on FICO scores. No adjustment to a loan's foreclosure

frequency is made if the FICO score is equal to or greater than 695. If the FICO score is between 660 and 695, there is a 10% adjustment, while there is a 20% adjustment if the FICO score is less than 660.

In addition, option ARMs are subject to an additional 20% adjustment to foreclosure frequency to adjust for the potential for very large payment shocks.

The Benefits and Risks of Option ARMs

Like all financial innovations, there are benefits and risks associated with option ARMs. First, option ARMs provide more choices to consumers in purchasing a house or refinancing an existing residential mortgage.

Second, financially sophisticated consumers can use the payment flexibility afforded by these mortgages to better manage their monthly cash flows, and thereby earn a higher return on capital. Third, option ARMs also make owning a house more affordable for many consumers.

There are also risks, however, that consumers, lenders, and regulators need to recognize. First, payment shock can occur if interest rates stay the same or rise and the borrower has only been making the minimum monthly payment. As a result, credit risk will be higher for these mortgages due to the higher probability of default. This can be of

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Option ARMs (continued)

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particular concern if interest rates are rising, since the payment shock will be substantial.

Second, option ARMs will negatively amortize when the minimum payment is made, resulting in a build-up of accrued interest. This will also result in greater credit risk due to the potential for greater losses because loan balances are higher.

Third, there is systemic risk that cannot be diversified away by lenders that hold option ARMs on their balance sheets.

Since option ARMs have the potential for large payment shocks, if interest rates have risen substantially by the time the loans are recast, a large proportion of borrowers will see their

monthly payments go up by a lot. This raises the possibility that a substantial number of borrowers could default on their mortgages at the same time.

Fourth, option ARMs confront lenders with geographic and portfolio concentration risk. Lenders with a large concentration of option ARMs on their books will be exposed to systemic risk, and those with heavy concentrations of option ARMs in areas with the sharpest rises in home prices will be exposed to credit risk in the event that housing prices decline or price appreciation slows.

Fifth, lenders that hold option ARMs that negatively amortize in their portfolios will report noncash income on their books due to the build-up of accrued interest

that may provide a false signal of profitability.

Finally, there is a risk associated with loosening underwriting standards in originating option ARMs as mortgage rates rise and lenders are forced to compete for dwindling loan originations.

Conclusion

Option ARMs are the newest type of affordability mortgage product in the market today. This mortgage product meets the affordability requirements, cash flow needs, and risk tolerances of a wide range of borrowers today.

As is true for all financial innovations, however, there are benefits and risks. Given the potential for substantial payment shock and negative amortization in

conjunction with changing consumer attitudes toward mortgage debt, option ARMs probably present risks that have not been confronted with other types of mortgage products in the past.

In the next issue of this publication, we will address risk management and supervisory issues surrounding negatively amortizing mortgages. We will discuss what lenders should be aware of in underwriting and marketing this type of mortgage product. In addition, we will also provide a summary of Section 212 of the OTS Examination Handbook that deals with non-traditional mortgages. ■

Second Quarter Sees Fall in Sensitivity (continued)

Second quarter median interest rate sensitivity fell to 168 basis points, down from 187 basis points in the first quarter. The decrease in sensitivity was due to a shift in the yield curve in the second quarter that narrowed the duration gap between assets and liabilities for the industry.

Both the median pre-shock and post-shock Net Portfolio Value (NPV) ratios fell slightly in the second quarter. Despite the decrease in the median post-shock NPV ratio, the number of thrifts with post-shock NPV ratios below 4.0 percent fell to four institutions in the second quarter.

The second quarter saw the Treasury yield curve continue to flatten. Between the first and second quarter of this year, rates rose at the short end but fell substantially at the long end of the yield curve. For example, the three-month yield rose by 35 basis points, while the 30-year yield fell by 56 basis points.

Further evidence of a considerably flatter yield curve is provided by the difference between the two-year and 10-year yields. In March 2005, this difference was 70 basis points. By the end of June 2005, this difference fell to only 29 basis points.

The flat yield curve environment continued to be a challenge to thrifts and put downward pressure on net interest margins. Average net interest margin fell by two basis points to 285 basis points in the second quarter, down from 287 basis points in the prior quarter. This drop in margins was due primarily to higher short-term liability costs.

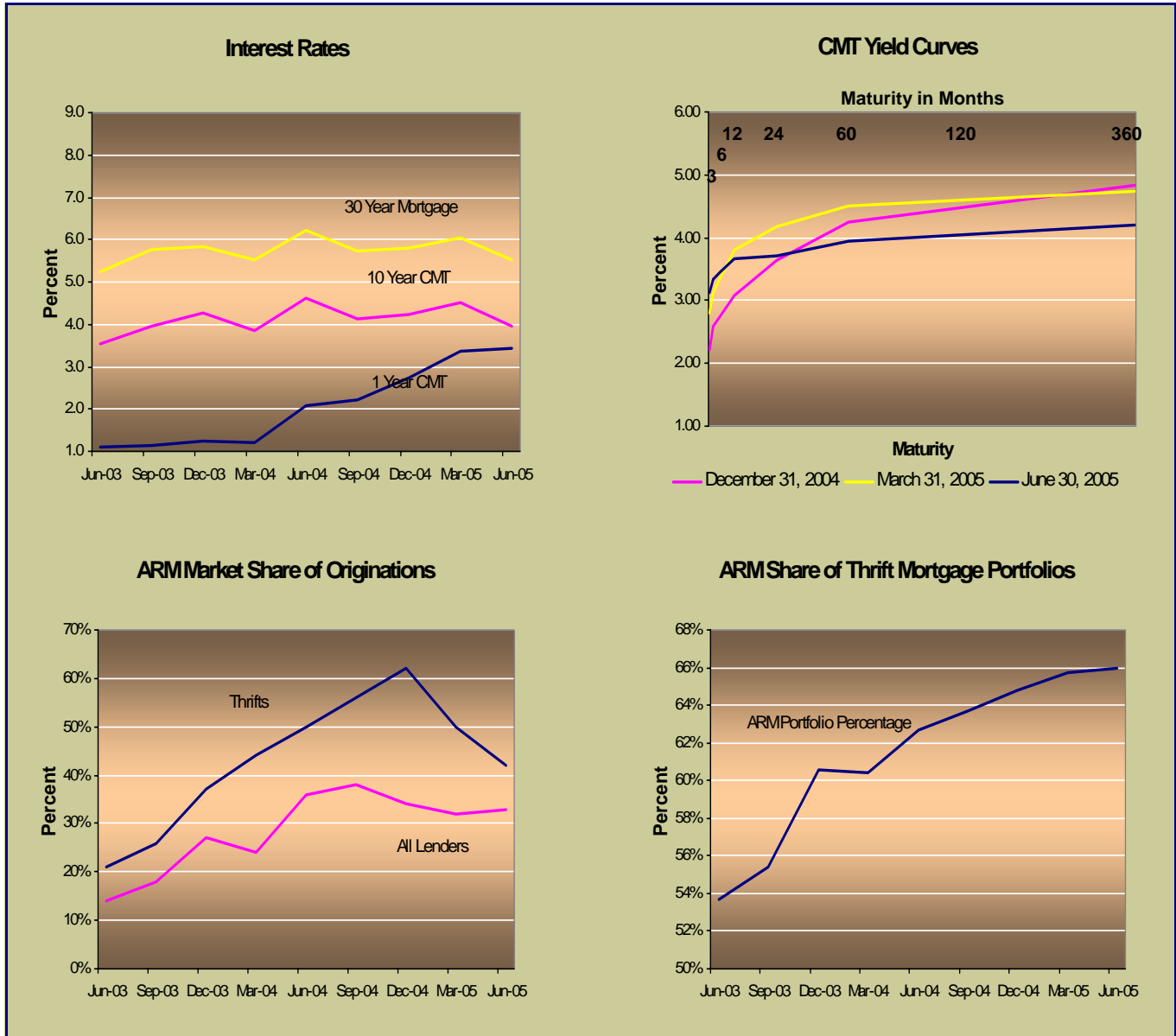
Total thrift industry earnings reached a new record level in the second quarter. Net income rose to \$4.03 billion, up from \$4.00 billion in the first quarter. This represents the second consecutive quarter where industry earnings were

\$4.00 billion or higher.

Thrift profitability fell slightly from the previous quarter. The average return on assets (ROA) for the industry dropped to 1.18 percent in the second quarter, down from 1.22 percent in the first quarter. The second quarter fall in ROA was due to lower net interest margin and mortgage loan servicing income and higher loan loss provisions and non-interest expense.

The 30-year mortgage rate, as measured by the contract interest rate on Freddie Mac commitments for fixed-rate 30-year mortgages, fell to 5.53 percent at the end of the second quarter.

Interest Rates and ARM Market Share



Second Quarter Sees Fall in Sensitivity (continued)

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 the ARM share of total thrift mortgage originations fall to 42 percent, down from 50 percent in the prior quarter. Despite the fall in the ARM share of mortgage originations, the ARM share of total 1-4 family mortgages held by thrifts in their portfolios rose to 66.0 percent in the second quarter, up from 65.7 percent

in the prior quarter.

Between March 2005 and June 2005, thrifts increased their portfolio holdings of single-family adjustable-rate mortgages and mortgage-backed securities from \$470.9 billion to \$486.8 billion.

There was also a change in the portfolio mix of adjustable-rate mortgages. Between first and second quarter, thrift

portfolio holdings of teaser, lagging index ARMs with a reset frequency of one-month rose 19.8 percent. Over the same period, thrift portfolio holdings of non-teaser lagging index ARMs with a reset frequency of one-month rose 3.76 percent.

The liabilities side of the balance sheet for thrifts witnessed some changes between

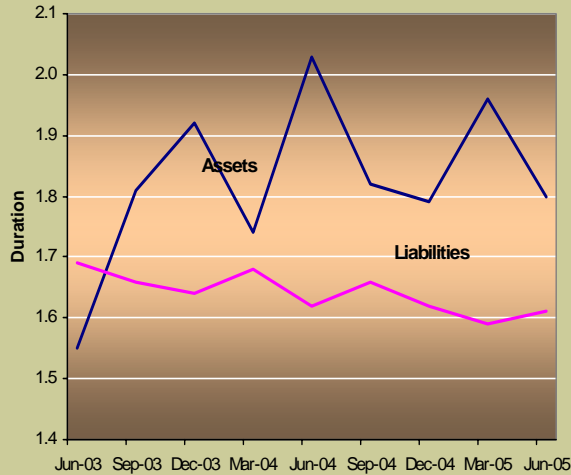
the first and second quarter. Total variable-rate borrowings rose from \$186.1 billion to \$204.8 billion. Over the same period, total fixed-rate, fixed-maturity deposits brokered deposits rose from \$299.8 billion to \$319.4 billion.

The industry's median effective duration of assets

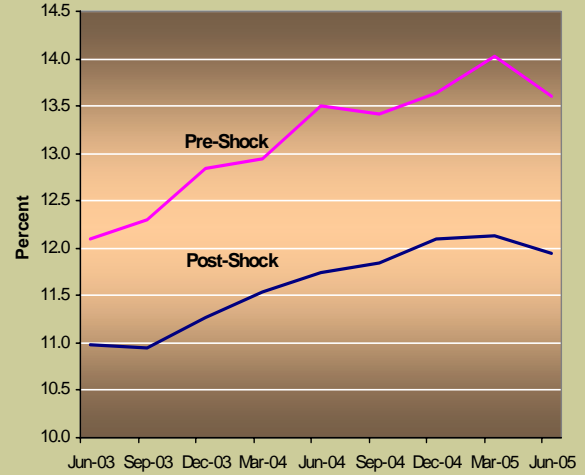
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Duration and NPV Sensitivity Measures

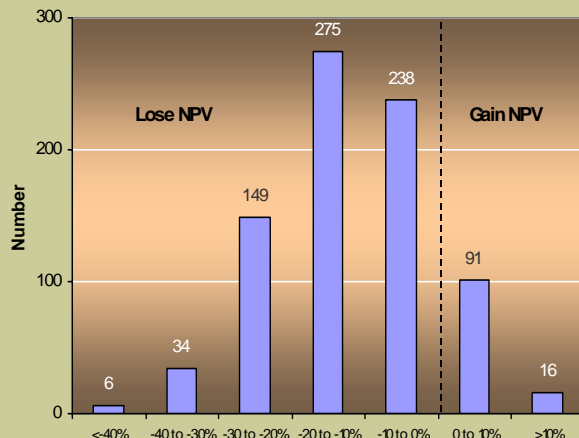
Median Effective Duration



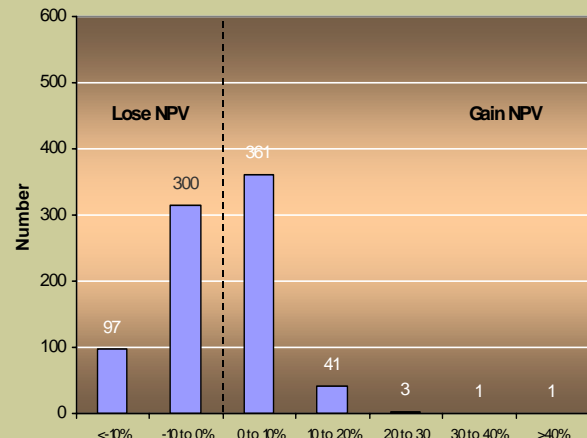
Median Pre- and Post-Shock NPV Ratios



Estimated Change in NPV:
+200bp Rate Change



Estimated Change in NPV:
-200bp Rate Change



Second Quarter Sees Fall in Sensitivity (continued)

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fell from 1.96 to 1.80 between March 2005 and June 2005. With the decrease in longer-term interest rates during the second quarter, the rate of projected mortgage prepayments rose. As a result of the rise in prepayments, the durations of both mortgages and total assets fell.

The industry's median effective duration of liabilities rose from 1.59 to 1.61 in the second quarter.

The median pre-shock NPV ratio for the industry fell to 13.6 percent in the second quarter, down from 14.0 percent in the prior quarter. The median post-shock NPV ratio dropped slightly, falling from

12.1 percent in the previous quarter to 12.0 percent in the second quarter. And the number of thrifts with a post-shock NPV ratio below 4 percent fell from five to four institutions.

In the second quarter, the thrift industry would have lost 15 percent, or \$24.7 billion, of its net portfolio value

if rates rose by a 200 basis points. The industry would have lost one percent, or \$2.0 billion, in value if rates fell by 200 basis points.

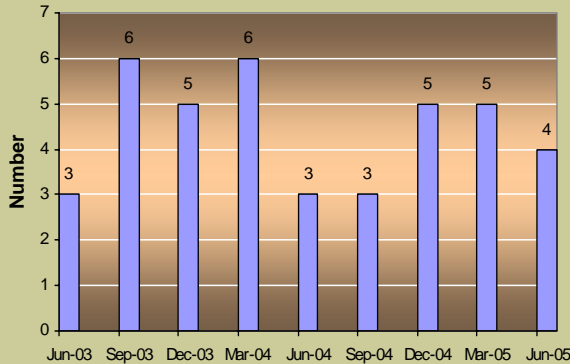
The percentage of thrifts with a post-shock NPV ratio over 6 percent fell in the second quarter.

These thrifts made up

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Interest Rate Risk Measures

Thrifts 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	
	Mar-05	Jun-05	Mar-05	Jun-05
+300	9.11%	9.00%	-25%	-25%
+200	10.13%	10.08%	-15%	-15%
+100	10.98%	10.95%	-7%	-6%
Base	11.60%	11.56%	0%	0%
-100	11.80%	11.65%	2%	1%
-200	11.43	11.32	-1%	-1%
-300	N/A	N/A	N/A	N/A

Post-Shock NPV Ratio and Sensitivity Measure Matrix March 2005

	Under 100bp	101-200bp	201-400bp	Over 400bp	Total
Over 10%	150	215	211	36	612
6% to 10%	29	61	94	9	193
4% to 6%	0	1	11	2	14
Below 4%	0	1	2	2	5
Total	179	278	318	49	824

Minimal Moderate Significant High

Post-Shock NPV Ratio and Sensitivity Measure Matrix June 2005

	Under 100bp	101-200bp	201-400bp	Over 400bp	Total
Over 10%	148	228	191	29	596
6% to 10%	40	81	81	5	207
4% to 6%	1	4	5	2	12
Below 4%	0	1	2	1	4
Total	189	314	279	37	819

Minimal Moderate Significant High

Second Quarter Sees Fall in Sensitivity (continued)

(Continued from page 6)
98.0 percent of the industry in the second quarter, compared to 97.7 percent in the previous quarter. The number of thrifts with a post-shock NPV ratio below 6 percent fell to 16 institutions, down from 19 in the prior quarter.

The percentage of thrifts with interest rate sensitivity

of 200 basis points or less increased in the second quarter, rising to 61.4 percent from 55.5 percent in the prior quarter.

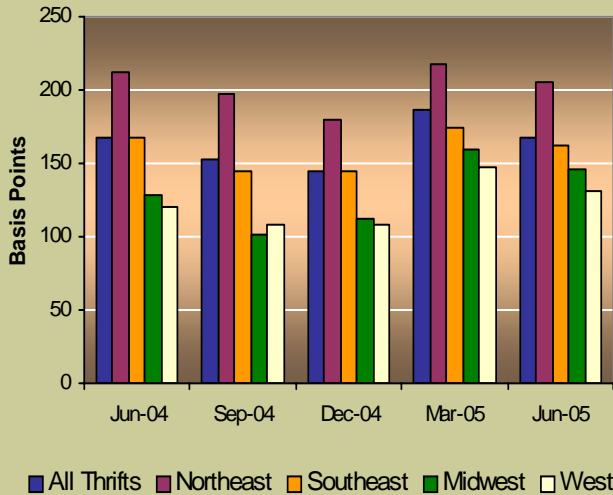
Finally, the percentage of thrifts with over 400 basis points in interest rate sensitivity fell to 4.5 percent (37 thrifts) from 5.9 percent (49 thrifts) in the prior quarter.

Based on TB 13a guidance for the "S" rating, 84.1 percent of thrifts would initially be assigned a minimal interest rate risk rating, 13.9 percent a moderate rating, 1.3 percent a significant rating, and 0.6 percent a high rating in the second quarter. The percentage of thrifts with significant or high interest rate

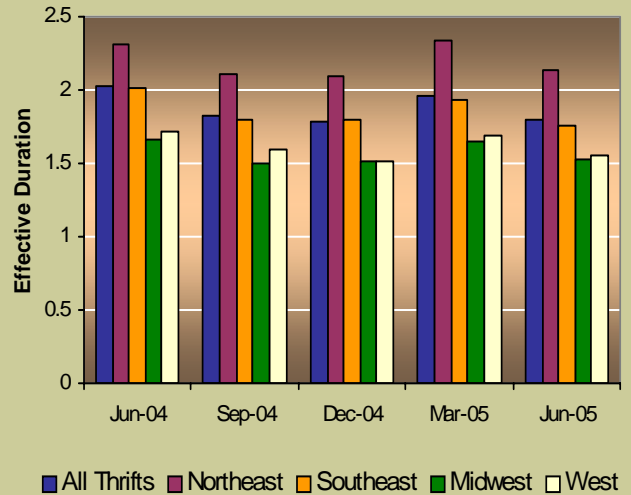
risk exposure was 1.9 percent in the second quarter, down from 3.3 percent in the first quarter. ■

Comparative Trends in the Four OTS Regions

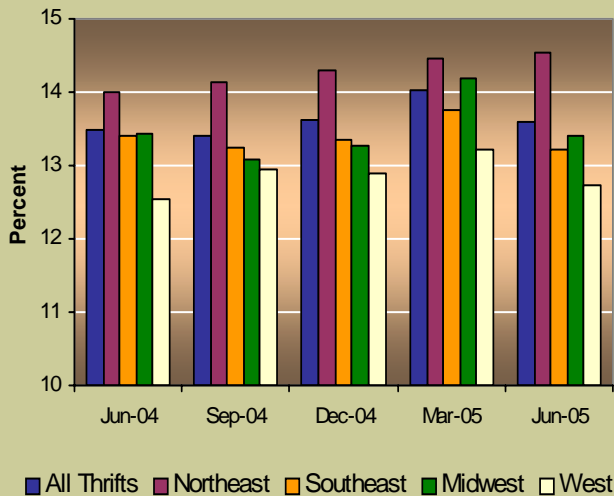
Median Sensitivity by OTS Region



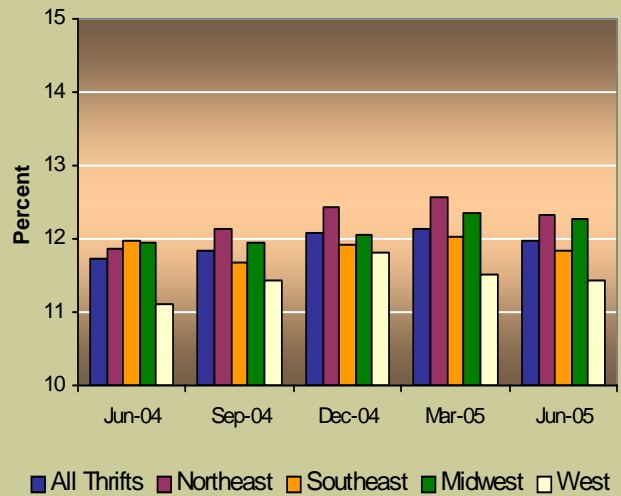
Median Assets Duration by OTS Region



Median Pre-Shock NPV Ratio by OTS Region



Median Post-Shock NPV Ratio by OTS Region



Regional Comparisons

The Northeast Region had the highest median sensitivity, at 206 basis points at the end of the second quarter, while the West Region had the lowest median sensitivity, at 131 basis points.

All OTS regions saw their median sensitivities decrease in the second quarter.

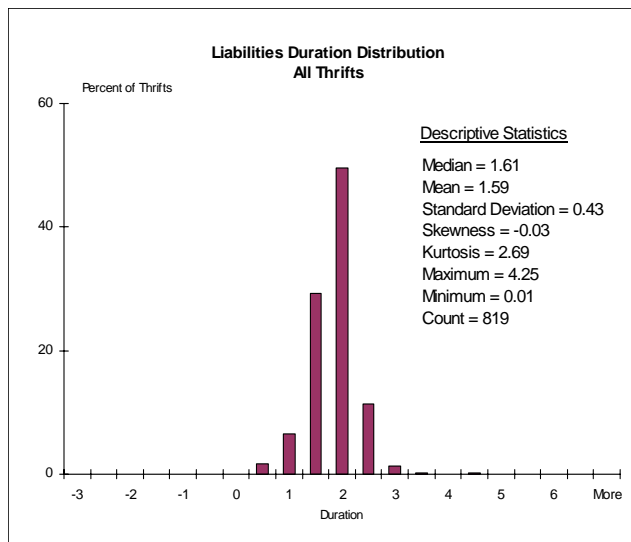
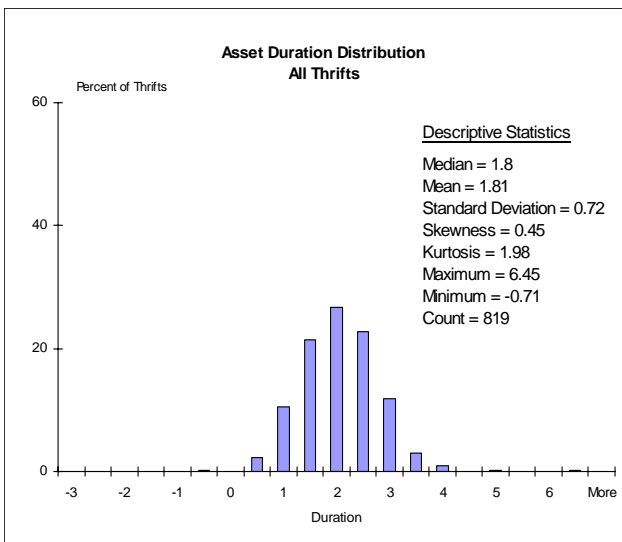
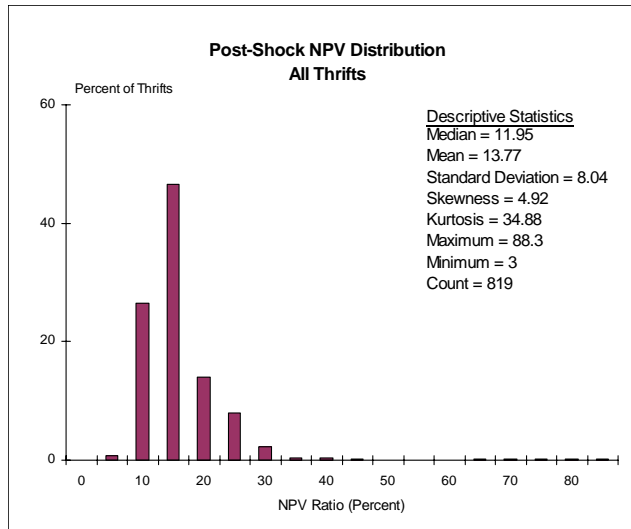
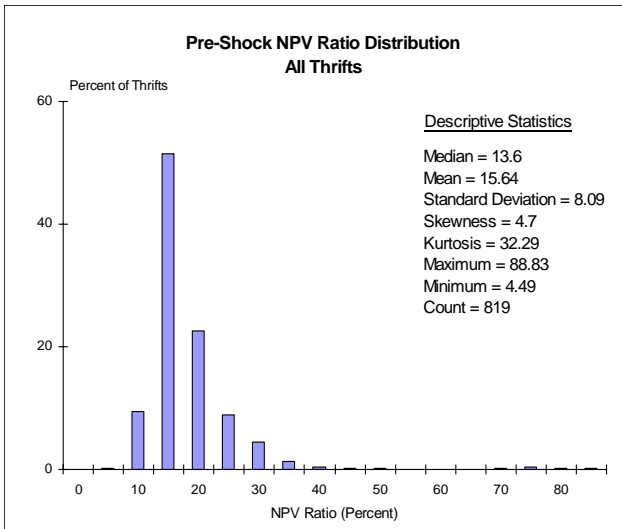
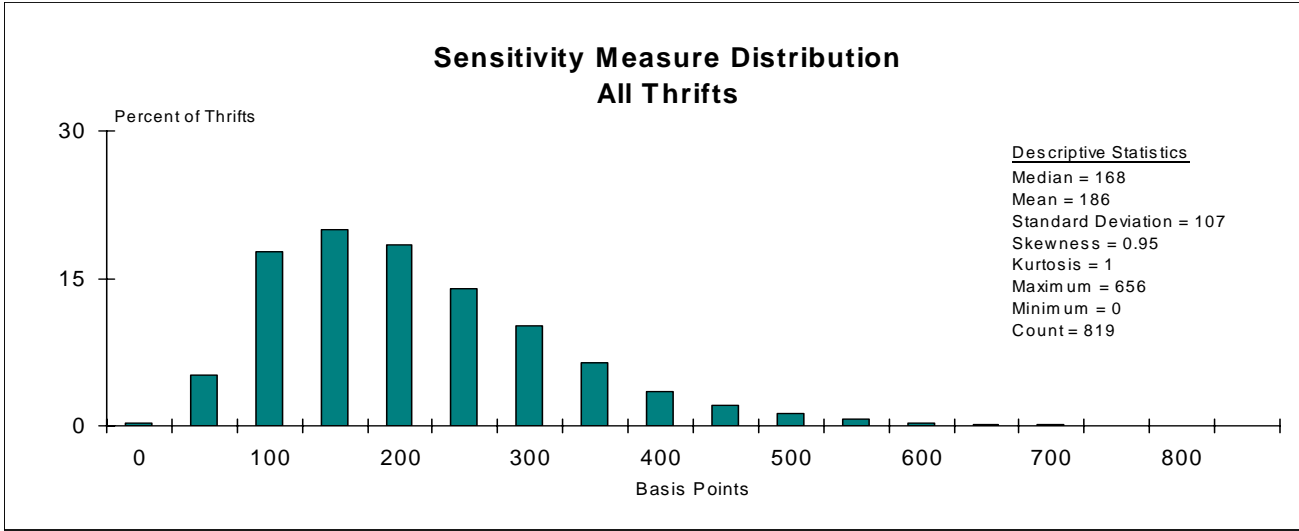
The Northeast, Southeast, Midwest, and West Regions saw their median sensitivities drop by 5.5 percent, 6.9 percent, 8.8 percent, and 10.9 percent, respectively.

The Northeast Region had the highest median asset duration, at 2.13 at the end of the second quarter. The

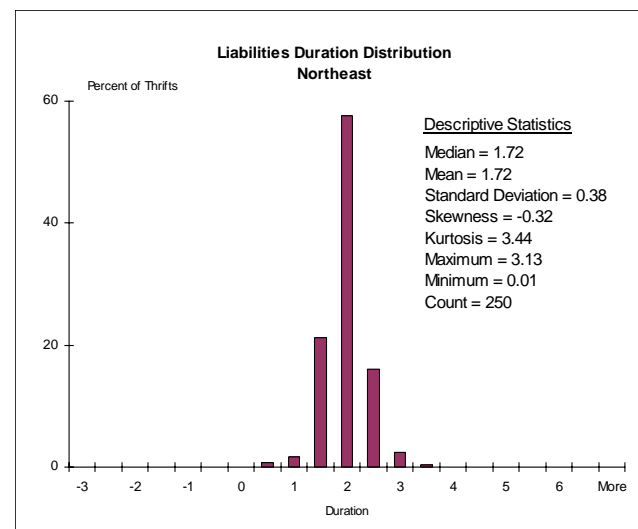
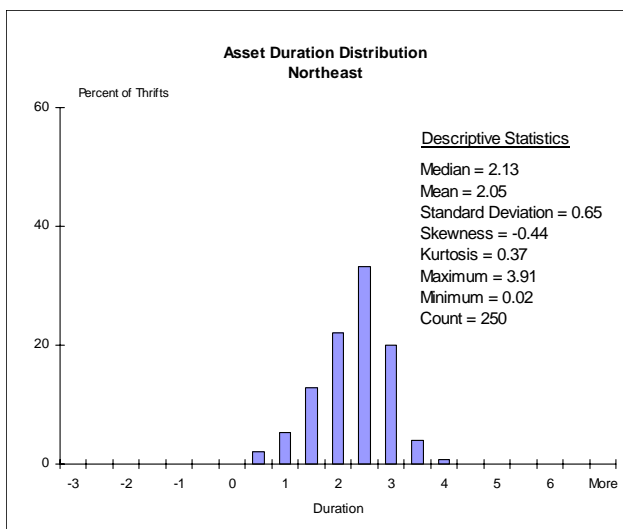
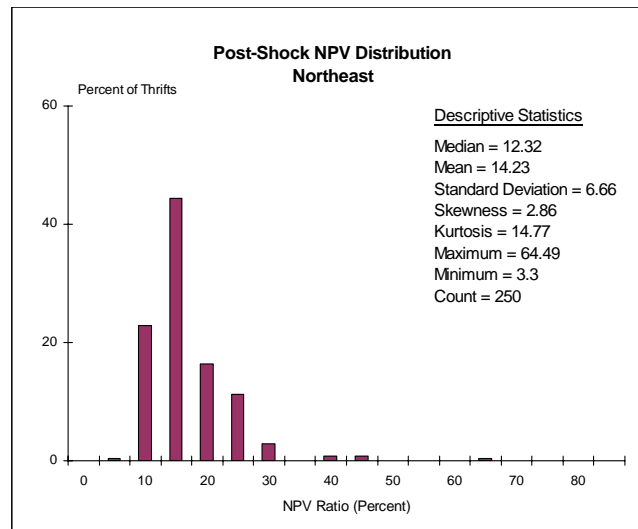
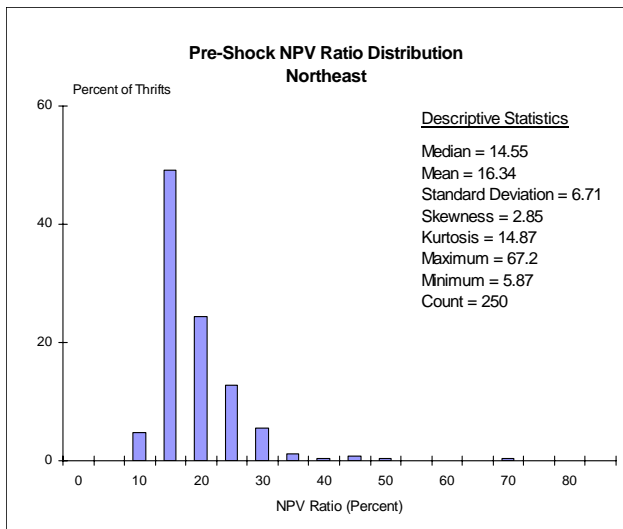
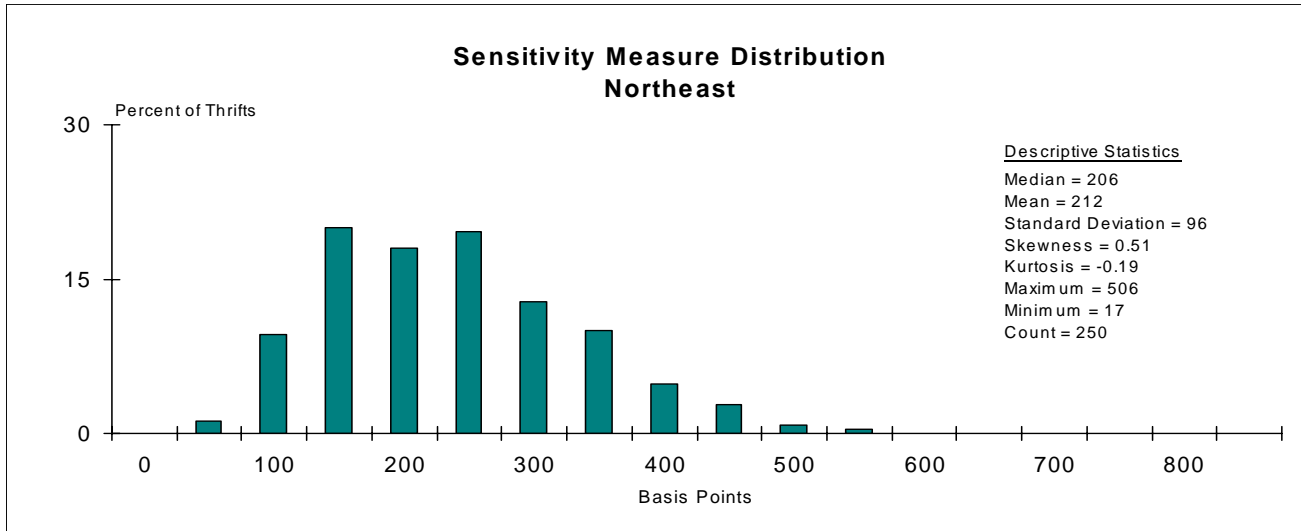
Southeast, Midwest, and West Regions had median asset durations of 1.76, 1.53, and 1.56, respectively. The median liability duration rose for the Northeast, Midwest, and West Regions, while the median liability duration fell for the Southeast Region in the second quarter.

For the second quarter, the Northeast Region had the highest pre-shock NPV ratio at 14.6 percent, while the West Region had the lowest pre-shock NPV ratio at 12.7 percent. All OTS regions saw their median post-shock NPV ratios decrease. ■

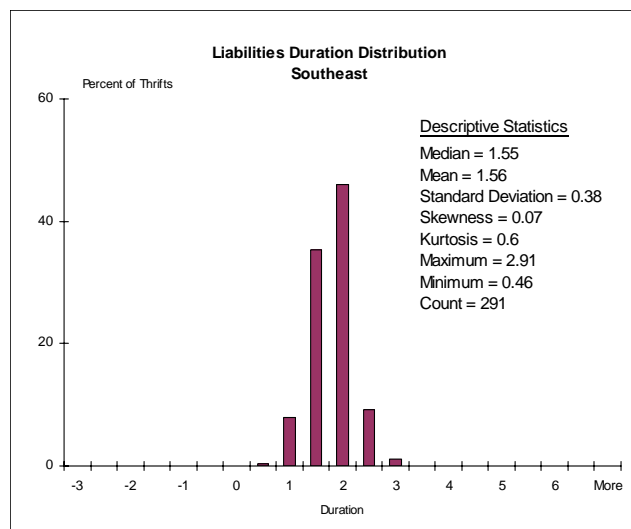
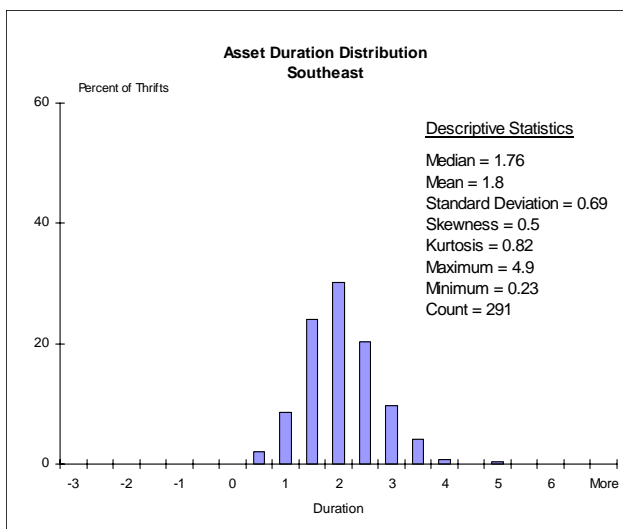
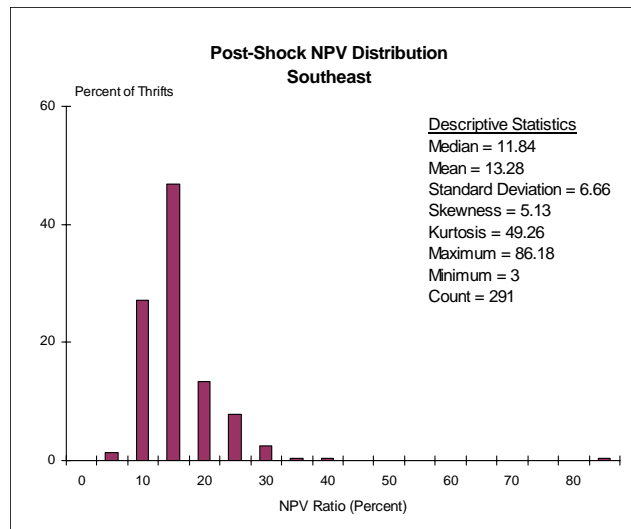
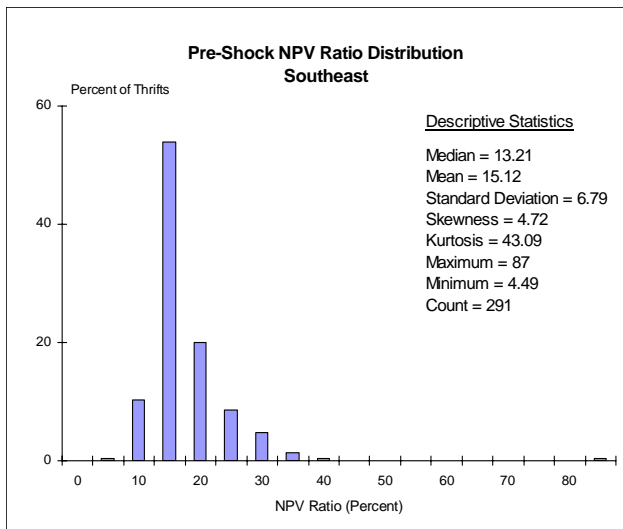
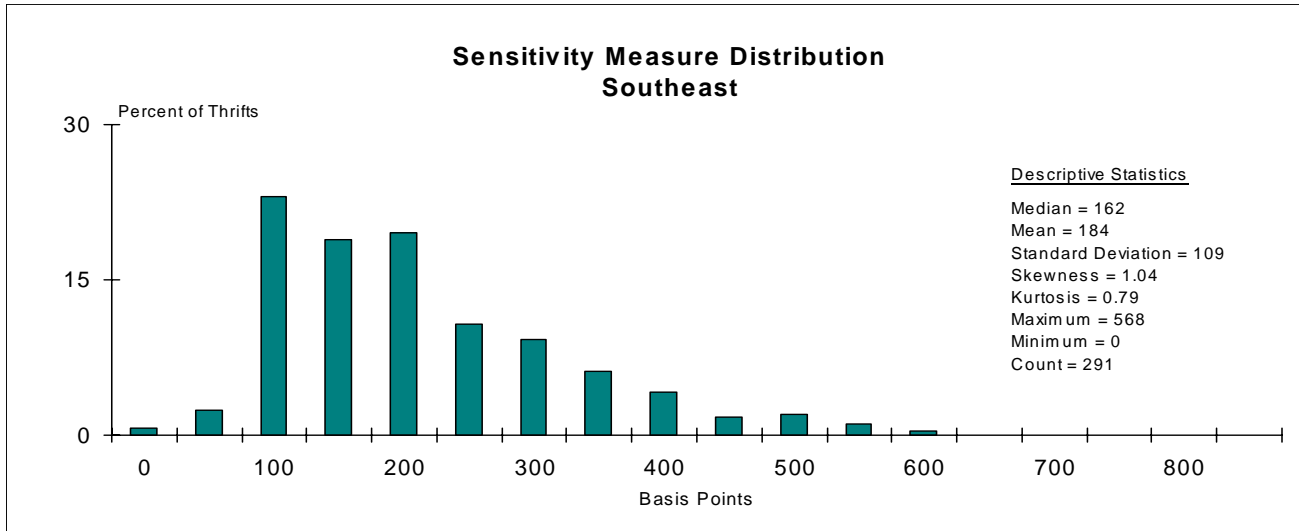
Appendix A – All Thrifts



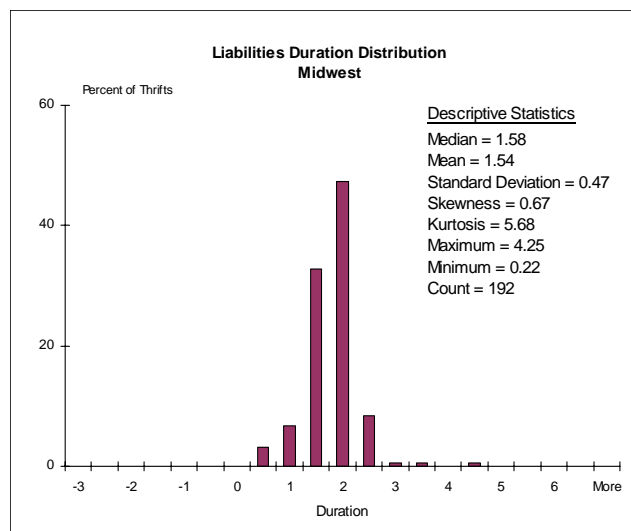
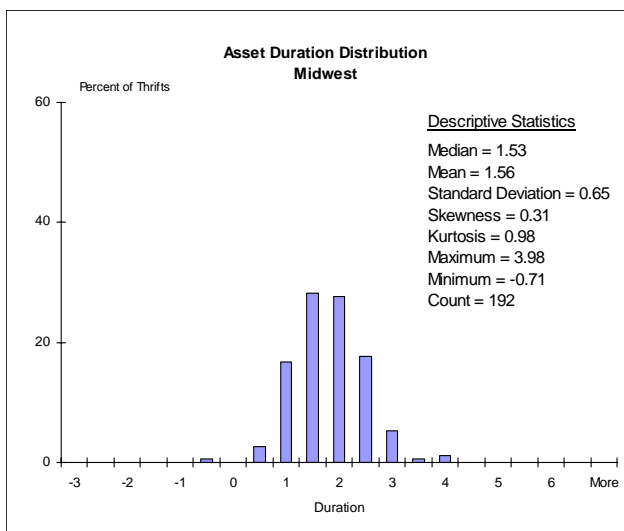
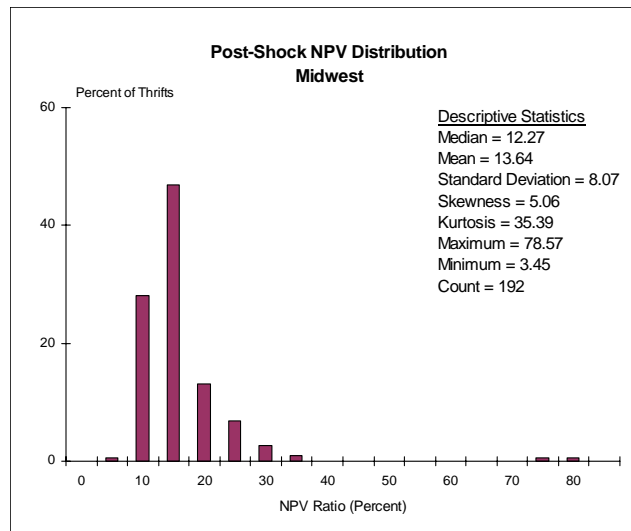
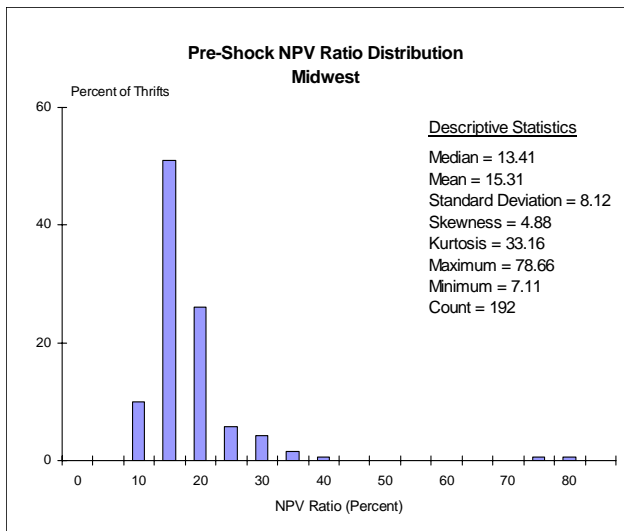
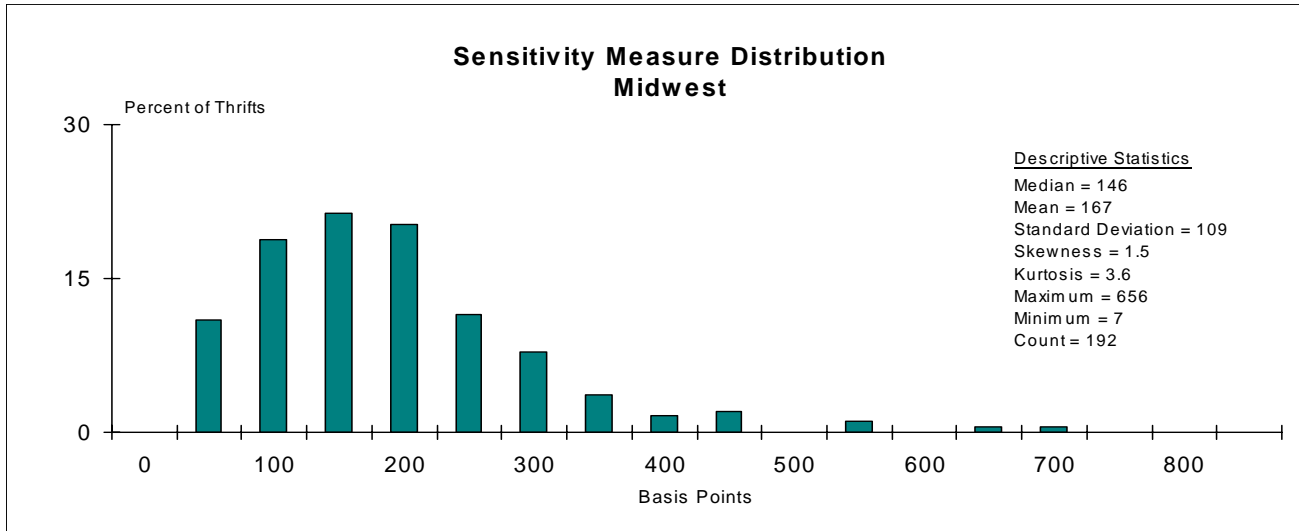
Appendix B – Northeast Region



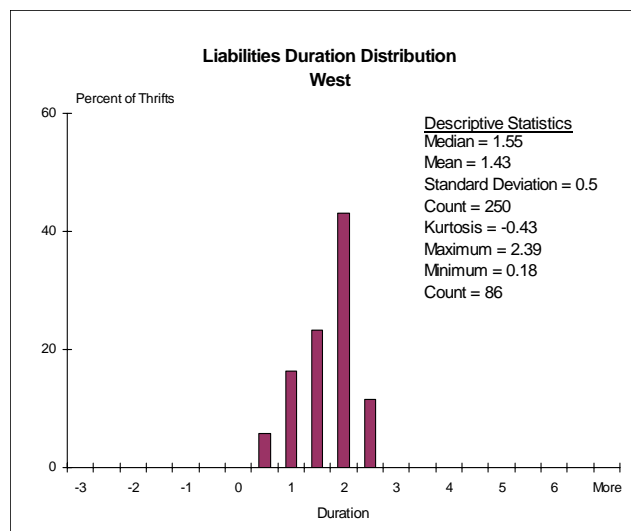
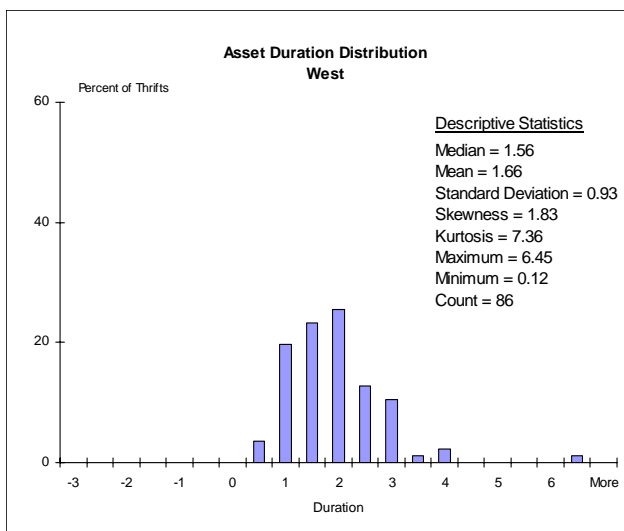
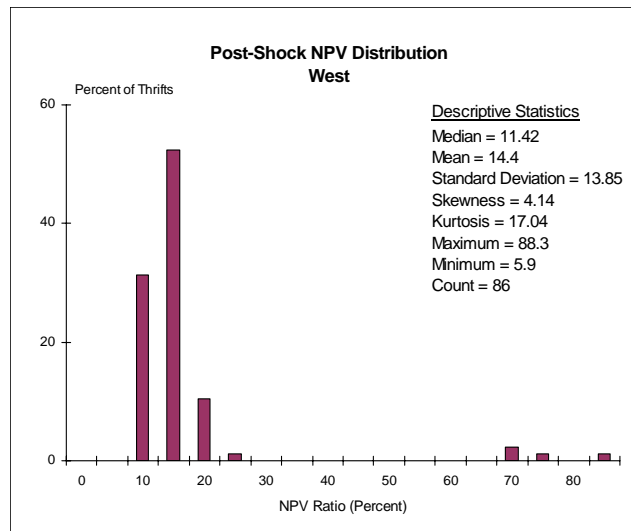
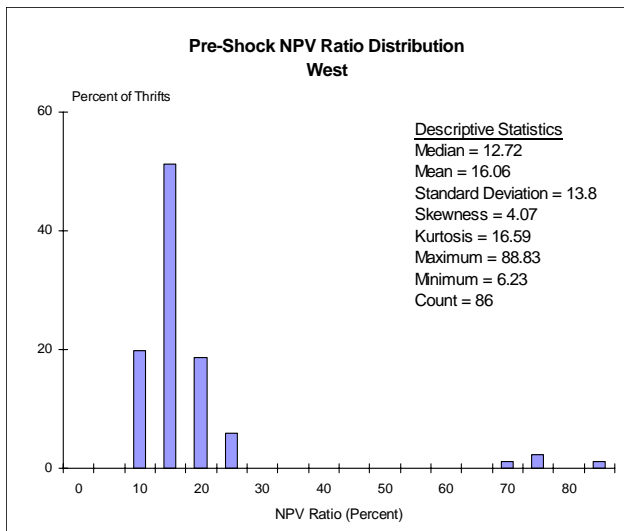
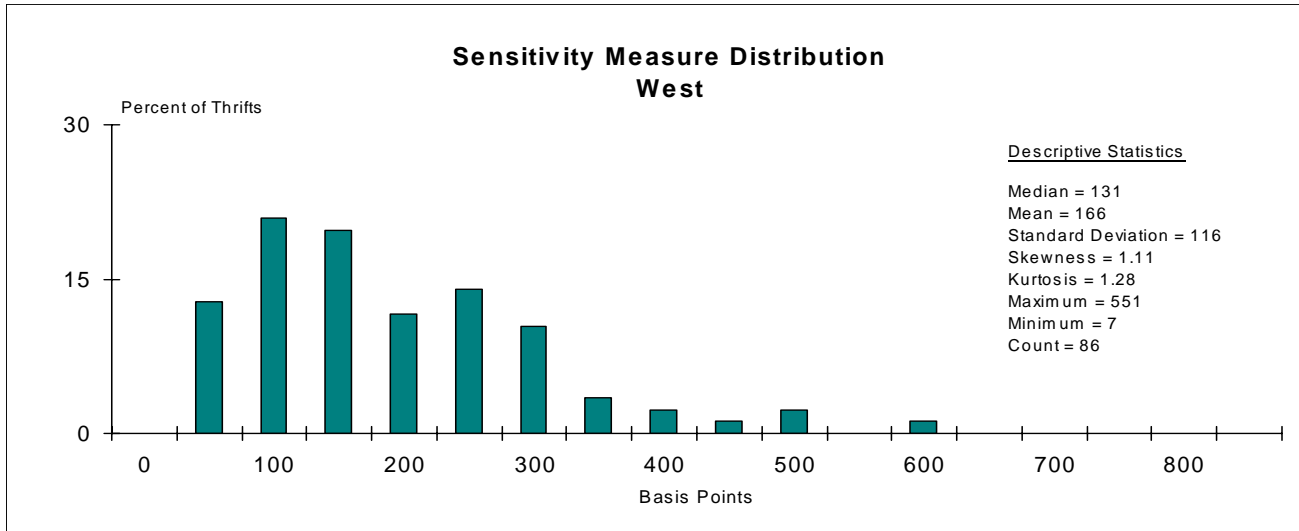
Appendix C – Southeast Region



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: Measures how six hypothetical changes in interest rates (three successive 100 basis point increases and three successive 100 basis point decreases, assuming a normal interest rate environment) 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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