

# The Quarterly Review of Interest Rate Risk

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



### Special points of interest:

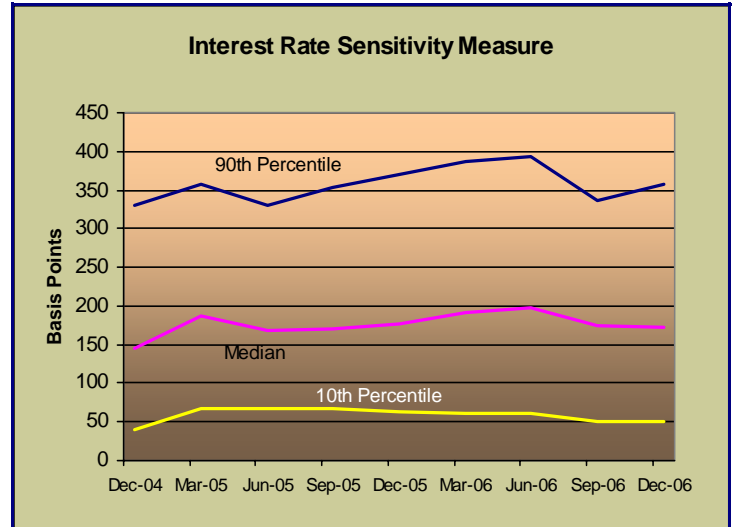
- 30-yr mortgage commitment rate falls
- Treasury yield curve rises in the fourth quarter
- Fourth quarter median interest rate sensitivity falls slightly
- Asset duration falls
- Comparative Regional Analysis
- Q & A with Ron Cathcart on Enterprise Risk Management

## Fourth Quarter Sees Sensitivity Fall Slightly

Fourth-quarter median interest rate sensitivity dropped to 172 basis points, down slightly from 175 basis points in the third quarter. Sensitivity decreased due to a narrowing of the effective duration gap between assets and liabilities.

Both the median pre-shock Net Portfolio Value (NPV) ratio and the median post-shock NPV ratio rose between the third and fourth quarters.

At the end of the fourth quarter, the Treasury yield curve shifted upward, continuing to display the pronounced humped, inverted shape similar to that in the



previous quarter. Between quarter-end September 2006 and quarter-end December

2006, rates rose along the yield curve for all maturities, (Continued on page 4)

### Charts in this issue:

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## Q & A with Ron Cathcart on Enterprise Risk Management

Ronald Cathcart is Executive Vice President and Chief Enterprise Risk Officer for Washington Mutual. In this role, he oversees all areas of risk within the company, including market, credit, operational, reputation, compliance and insurance risk. He also manages the Audit Services group and is a member of the bank's Executive Committee.

He has been published in the RMA journal and is a frequent speaker at risk management conferences including a conference in model validation jointly sponsored by the Philadelphia Federal Reserve and Wharton Business School. He

is a member of the Fair Isaac Advisory Board and is a member of the RMA Regulatory Relations Committee. He lives with his wife and three children in Seattle, Washington.

**OTS.** Tell us a little bit about your educational and professional background?

**RC.** Overall, I have had over 25 years of risk management experience including credit policy and governance, Basel II, modeling, compliance, risk review, and audit. I have developed and led risk management organizations as part of

Fortune 500 companies both in Canada and the United States.

Before I joined WaMu, I was the Executive Vice President, Retail Risk Management, for Canadian Imperial Bank of Commerce (CIBC), where I was responsible for retail risk management for the company's \$145 billion portfolio. I've also served in executive roles with Bank One, including Executive Vice President and Chief Risk Officer, Retail, and Royal Bank of Canada.

My bachelor's degree is from Dartmouth College, and I earned my Master's in

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## Q & A with Ron Cathcart on Enterprise Risk Management (continued)

(Continued from page 1)

Business Administration from the Richard Ivey School of Business in London, Ontario.

**OTS.** What prompted you to accept a position at WaMu? Would you discuss your current position and responsibilities?

**RC.** I chose to join WaMu because I'm very excited about the company's future. It has a solid five-year plan, a great leadership team, and an organization where the whole is greater than the sum of its parts. The company's innovation and devotion to the customer really rings true to me as do the company's culture and core values.

As Chief Enterprise Risk Officer, I manage a team of skilled professionals whose job is to measure, monitor and control risk across WaMu's business lines. We are responsible for preventing surprises, or avoiding unexpected losses. Our goal is to share in the businesses' growth and profitability objectives. We are an enabler for each business rather than the risk police.

**OTS.** We hear a lot about enterprise risk management today. What is enterprise risk management (ERM)? What are the key components of ERM? Does ERM differ from integrated risk management or holistic risk management? If so, how?

**RC.** At its highest level, Enterprise Risk Management guides and governs the iden-

tification and optimization of all risks incurred across the enterprise. These risks include credit, market, compliance and regulation, operational, reputational and strategic as well as other risks incurred by businesses in achieving their goals and objectives.

The critical components of ERM are well encapsulated in the Committee of Sponsoring Organizations (COSO II) Enterprise Risk Management framework, which emphasizes the need for a strong risk management and internal control culture, where ownership and accountability for incurring and managing risk is clearly assigned and risk appetites and limits are well defined.

It is also important that ERM be integrated with strategic planning and other corporate governance processes in order to ensure that the risks incurred are consistent with the strategic goals and objectives of the company. In addition, a company must be able to quickly evaluate the impact of emerging internal or external risk events on the company's desired risk profile and should maintain a robust monitoring and oversight infrastructure.

ERM is holistic in that it considers all risks. It is also integrated to the extent that it optimizes risks in support of the risk/return profile of all segments of the organization.

**OTS.** Why is ERM being recognized as the best practice standard or "holy grail"

of risk management today?

**RC.** ERM is recognized as the "holy grail" because managing risk at the enterprise level implies that both the risk types managed and the business units that incur them operate in an interrelated fashion.

A company can experience many best practices with this integration because tremendous value is realized as opportunities emerge to efficiently optimize risks across all risk types and business units. You can assume additional risk at higher returns while at the same time lowering capital costs. In a well functioning ERM environment, management is enabled to make faster and more reliable risk decisions.

**OTS.** It is frequently said that the ERM approach to risk management allows a financial institution to free up regulatory capital and make savings. Do you agree? What has been your experience at WaMu?

**RC.** We agree that capital requirements should scale to levels of risk. An institution with a strong ERM practice and comparably lower risk should be able to achieve a strong debt rating *with a lower capital base* than would a higher risk institution.

Economic capital is the universal language of risk and is our main tool for looking at capital requirements in comparison to risk levels. For example, economic capital has helped

us engage in discussions with rating agencies, allowing either a reduction in the capital requirements or an upgrade of our debt rating. The use of economic capital as a tool has been tremendously valuable effort from our perspective.

On the regulatory capital front, we have not seen the same success but we are optimistic about the future. Current regulatory capital requirements provide very little risk sensitivity and don't provide great incentives for strong ERM practices. We see Basel II, which represents a significant evolution in regulatory capital requirements, as a big step forward in aligning capital requirements with risk because in most cases there is a much stronger alignment between the capital requirements and risk.

A strong ERM foundation is fundamental to Basel II implementation and to realizing potential benefits. Of course, Basel II is still a work-in-progress in the United States, but we remain optimistic that the industry will see a positive outcome.

**OTS.** The path towards Basel II has been a long one for banking institutions. Would you summarize how WaMu is managing to meet the implementation deadline for the New Capital Accord?

**RC.** Basel II has been a business priority at WaMu for several years. Its success will be due to several factors, but most important is

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## Q & A with Ron Cathcart on Enterprise Risk Management (continued)

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having the support from our executive management team and board of directors. Like other Basel II institutions, we have a dedicated program management group overseeing the implementation and we have a large number of project teams all pulling in the same direction.

We continuously look for opportunities to align the Basel II requirements to our organizational needs and specifically to our internal economic capital modeling priorities. We view Basel II preparation as less of a compliance exercise and more of an opportunity to enhance our ERM foundation and business practices

**OTS.** With regard to Basel II implementation, what has been the most difficult part of the process overall at WaMu? Are there any issues that remain to be resolved, or concerns that you feel still need to be addressed?

**RC.** The biggest challenge we have run into with Basel II has been overall uncertainty with the numerous rounds of changes to the requirements combined with the still-changing final form of the rule. Going forward, we are concerned about the potential for additional changes to systems and processes that have been developed or are nearing completion.

Having said that, we believe that there are some fundamental policy-level concerns with the U.S. form of Basel II that still need to

be addressed. We continue to believe that the leverage ratio capital requirement at its current 5% level is inconsistent with the objectives of good risk management and Basel II, and that it will drive banks towards higher credit risks, rather than greater safety and soundness. This is particularly true for a bank such as ours with a high percentage of low risk real estate secured assets on its balance sheet. A fixed, risk insensitive leverage requirement effectively removes the incentive for banks to achieve a low capital requirement through prudent risk management.

We would also like to see greater alignment of the U.S. version of Basel II to the international version. This alignment is fundamental to cross border competitive equity and we are concerned with the multiple additional layers of conservatism that have been added to the U.S. version. There are also a few areas where we believe the capital model in Basel II can be improved for even greater alignment to risk.

While we have these concerns, let me reinforce that we wholeheartedly support the goals of Basel II of aligning capital requirements with risk and we are optimistic that it will be a big step forward for regulation in the industry.

**OTS.** Overall, do you think the Accord will be worth the money and resources it has taken to implement?

**RC.** We are cautiously optimistic that the Basel II Accord will be worth the effort. As I mentioned before, we will undoubtedly derive significant benefit from our Basel investment.

This shows up through improvements in economic capital models, portfolio-specific risk models, data repositories, reporting systems and governance processes; however, if we end up with a U.S. Basel II rule, which puts the company at a competitive disadvantage to our international competitors or one that is not well aligned to risk, we will have failed to fully benefit from the risk management foundation which is fundamental to the accord. ■

## Fourth Quarter Sees Sensitivity Fall Slightly (continued)

(Continued from page 1)

but more for short-term and medium-term maturities. For example, the three-month yield rose by 13 basis points, the six-month yield rose by eight basis points, the 10-year yield rose by seven basis points, and the 30-year yield rose by five basis points.

The target rate for federal funds remained unchanged at the September, October, and December 2006 meetings of the Federal Open Market Committee. The continuing inverted-humped shape of the yield curve kept downward pressure on net interest income.

Despite the unfavorable yield curve environment, average net interest margin rose to 271 basis points in the fourth quarter, up six basis points from the previous quarter. Net interest income rose for the industry because liability costs rose slower than asset yields. Over the quarter, interest income rose 11 basis points, while interest expense rose five basis points.

In contrast to the rise in net income in the fourth quarter, thrift profitability fell from the previous quarter. The average return on assets (ROA) for the industry fell to 0.91 percent in the fourth quarter, down from 1.08 percent in the previous quarter.

The decline in ROA in the fourth quarter was driven by lower other non-interest income and higher loan loss provisions and non-interest expense. Partially offsetting these nega-

tive impacts to fourth-quarter profitability were higher fee income and aggregate net interest margin, along with lower taxes. The ROA in the fourth quarter represents the lowest quarterly ROA since the fourth quarter of 2000.

Total thrift earnings for the fourth quarter were \$3.19 billion, down 26 percent from \$4.29 billion in the previous quarter. This represents the first quarter in two years that quarterly net income has not exceeded the \$4 billion level. The two Citibank charters that exited the industry during the fourth quarter account for 55 percent of the fall in net income.

The 30-year mortgage rate, as measured by the contract interest rate on Freddie Mac commitments for fixed-rate, 30-year mortgages, fell to 6.18 percent at the end of the fourth quarter, down from 6.31 percent from the prior quarter.

Total thrift mortgage originations were \$134.1 billion, down 22 percent from \$172.1 billion in the previous quarter. The Citibank charter exits accounted for \$31 billion, or 83 percent, of the decline in total thrift originations from the previous quarter.

Fourth-quarter 1-4 family mortgage originations fell to \$112.1 billion, down 25 percent from \$149.9 billion in the previous quarter. The Citibank charter exits accounted for \$30.7 billion of the \$37.8 billion decline in single-family originations.

While the yield curve

shifted upward between the end of the third and fourth quarters, the yield curve shifted downward in both October and November. As a result of the fall in rates for the first two months of the fourth quarter, mortgage refinancing volume was \$52.4 in the fourth quarter, up 13 percent from \$46.6 billion in the previous quarter.

Consistent with the rise in the volume of mortgage refinancings, mortgage refinancing activity accounted for 39 percent of total mortgage originations in the fourth quarter, up from 27.1 percent in the previous quarter.

This increase in mortgage refinancing activity for thrifts is consistent with the mortgage refinancing activity of all lenders, where the proportion rose to 46 percent from 40 percent in the previous quarter.

The notional amounts of optional and firm commitments to originate both fixed- and adjustable-rate mortgages in the fourth quarter were \$76.1 billion and \$3.4 billion, respectively. Optional commitments to originate mortgages fell \$7 billion, and firm commitments fell \$3.3 billion from the previous quarter's levels.

The ARM share of total thrift mortgage originations fell to 12 percent in the fourth quarter, down from 26 percent in the prior quarter. Despite the relative fall in ARM originations by thrifts, the ARM share of total 1-4 family mortgages held by thrifts in their port-

folios rose to 63.8 percent in the fourth quarter, up from 61.7 percent in the prior quarter.

Between September 2006 and December 2006, thrift portfolio holdings of single-family mortgages relative to total assets were down over the quarter and year to 51.5 percent of assets. Mortgage-backed securities fell to 11.8 percent of assets in the fourth quarter, down from 12.9 percent at the end of the previous quarter.

On the liabilities side of the balance sheet, deposits and escrows as a percentage of total assets were 62.1 percent at the end of the fourth quarter, up from 57.2 percent in the previous quarter. Total variable-rate borrowings dropped substantially from \$271.5 billion to \$185.9 billion.

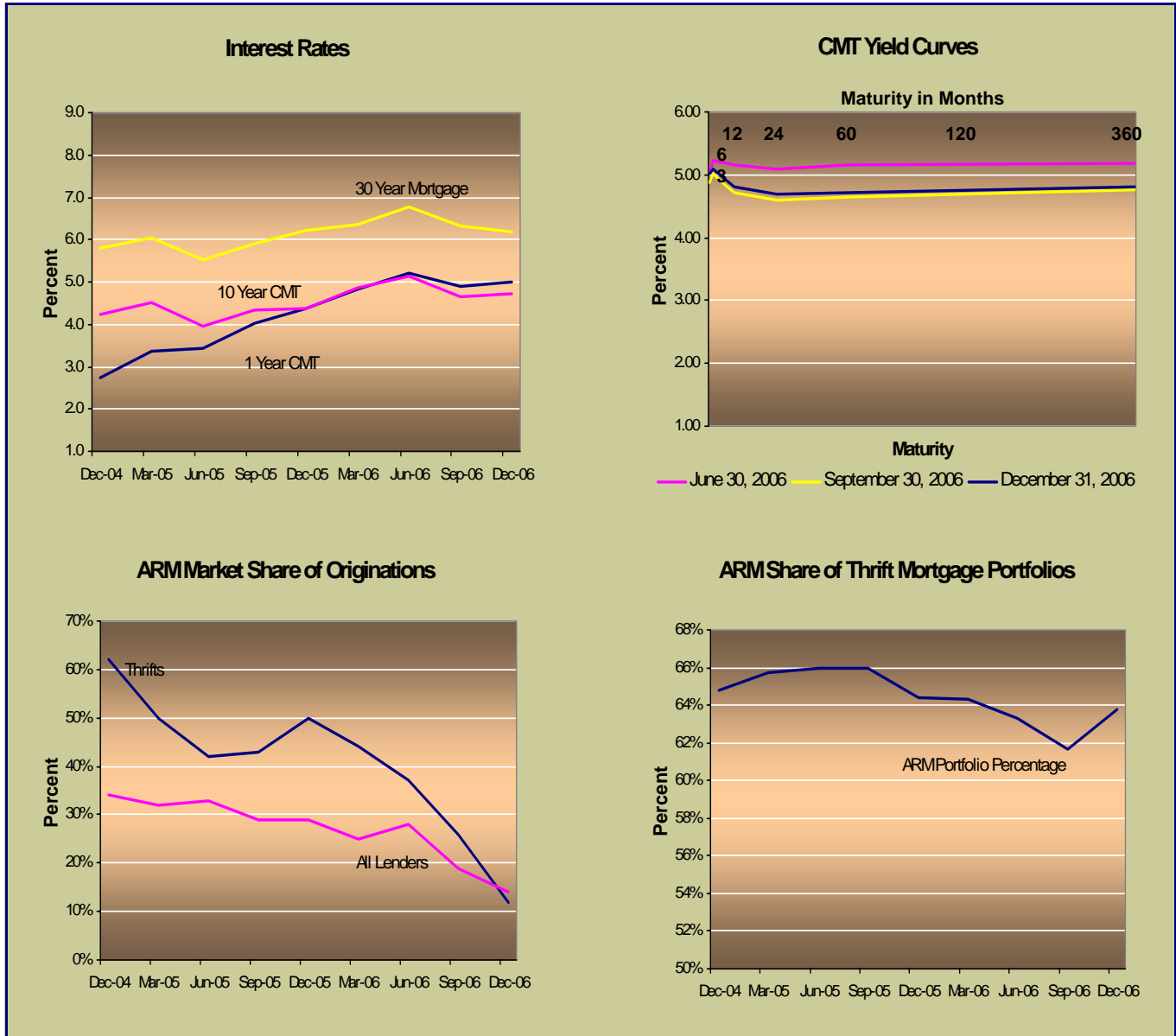
Over the same period, total fixed-rate, fixed-maturity deposits fell from \$417.9 billion to \$411.2 billion. Also, balances in MMDA accounts fell to \$184.3 billion in the fourth quarter, down from \$197.7 billion in the prior quarter.

The industry's median effective duration of assets fell from 1.96 to 1.84 between September 2006 and December 2006. This represents the second quarterly decrease in the effective duration of assets.

In its March 2007 *Short-Term Prepayment Estimates*, Bear, Stearns & Co. observes that the average fixed-rate borrower now holds an at-the-money mortgage. Because of this, the

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## Interest Rates and ARM Market Share



### Fourth Quarter Sees Sensitivity Fall Slightly (continued)

(Continued from page 4)  
 mortgage universe would become fully refinaneable if rates rallied 50 to 75 basis points.

Under that scenario, the expected prime-based surge in refinancing volumes would likely provide significant support to the housing and mortgage market through improved affordability, cash-out refinancing, partial mitigation

of future reset payment shock, and de-leveraging of credit risk.

According to Bear, Stearns, although an average of \$27 billion per month of subprime loans will be resetting in 2007, most of these borrowers have seen double digit home price appreciation and should be able to refinance with minimal price shock. These borrowers have

mortgages with rates in the 7 percent to 8 percent range, and current subprime rates are in the 8 percent to 8.5 percent range.

However, borrowers scheduled to reset in 2008 are more likely to confront significant constraints to refinancing, given the lack of home price appreciation and tighter underwriting conditions that currently exist.

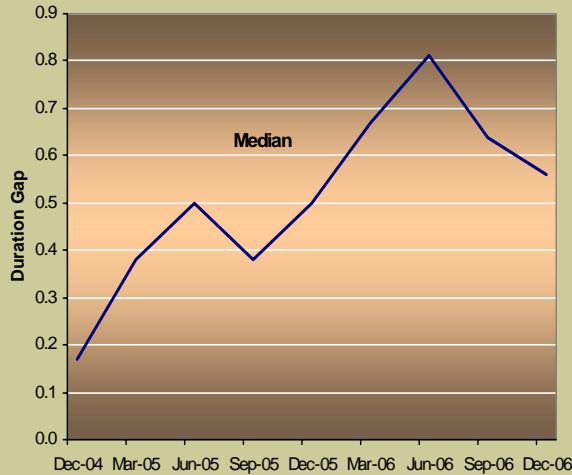
The fourth quarter saw the industry's median effective duration of liabilities fall from 1.29 to 1.25. The sharp drop in the effective duration of assets compared to that of the duration of liabilities resulted in a decrease in the duration gap for the thrift industry in the fourth quarter.

The median effective duration gap declined to 0.56 in

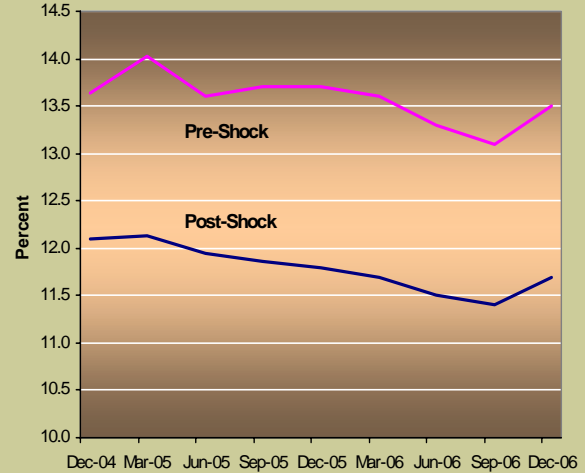
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## Duration and NPV Sensitivity Measures

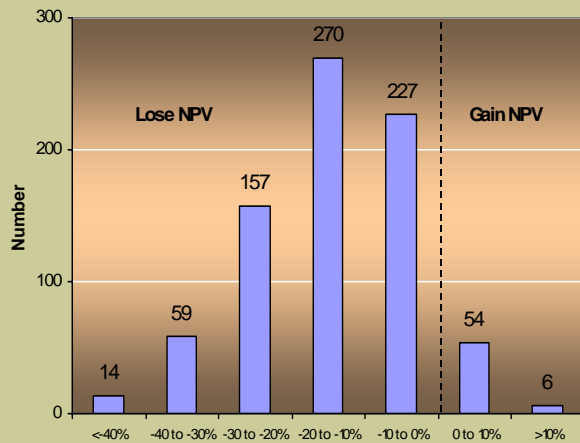
**Median Effective Duration Gap**



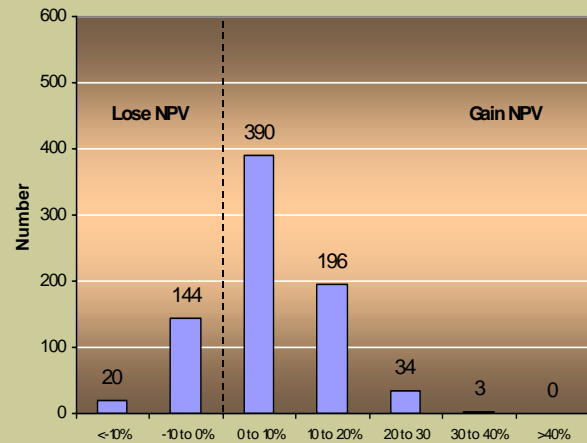
**Median Pre- and Post-Shock NPV Ratios**



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



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



### Fourth Quarter Sees Sensitivity Fall Slightly (continued)

(Continued from page 5)  
the fourth quarter, down from 0.62 in the prior quarter.

Both the median pre- and post-shock NPV ratios rose between the third and fourth quarters. The median pre-shock NPV ratio rose to 13.5 percent in the fourth quarter, up from 13.1 percent in the previous quarter.

The median post-shock NPV ratio increased, rising from 11.4 percent in the previous quarter to 11.7 percent in the fourth quarter.

The number of thrifts with a post-shock NPV ratio below four percent fell to three in the fourth quarter, down from six institutions in the prior quarter.

Of the thrifts that submitted Schedule CMR data in the fourth quarter, about 92 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 79 percent of thrifts would have experienced increases in the their net portfolio values.

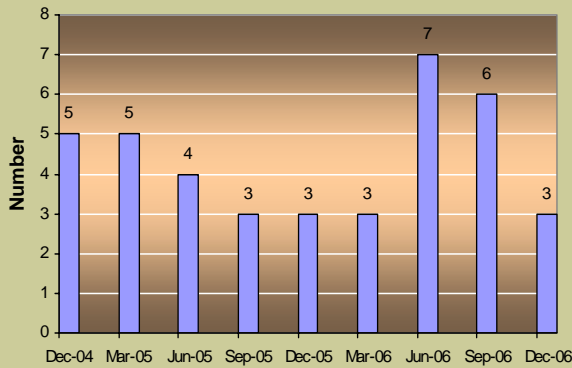
The thrift industry would have lost 17 percent of its net portfolio value if rates rose by 200 basis points in the third quarter. On the other hand, the industry would have gained five percent if rates fell by 200 basis points.

The number of thrifts with a post-shock NPV ratio

(Continued on page 7)

### Interest Rate Risk Measures

Thrifty 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	
	Sep-06	Dec-06	Sep-06	Dec-06
+300	7.47%	8.74%	-31%	-28%
+200	8.60%	9.94%	-19%	-17%
+100	9.55%	10.90%	-9%	-7%
Base	10.29%	11.60%	0%	0%
-100	10.76%	11.94%	6%	4%
-200	10.93%	12.00%	8%	5%
-300	N/A	N/A	N/A	N/A

Post-Shock NPV Ratio and Sensitivity Measure Matrix September 2006

	Under 100bp	101-200bp	201-400bp	Over 400bp	Total
Over 10%	175	147	170	21	513
6% to 10%	36	90	114	12	252
4% to 6%	2	6	10	2	20
Below 4%	0	2	3	1	6
<b>Total</b>	<b>213</b>	<b>245</b>	<b>297</b>	<b>36</b>	<b>791</b>

Minimal Moderate Significant High

Post-Shock NPV Ratio and Sensitivity Measure Matrix December 2006

	Under 100bp	101-200bp	201-400bp	Over 400bp	Total
Over 10%	181	168	178	27	554
6% to 10%	29	70	106	15	220
4% to 6%	0	1	7	2	10
Below 4%	0	1	1	1	3
<b>Total</b>	<b>210</b>	<b>240</b>	<b>292</b>	<b>45</b>	<b>787</b>

Minimal Moderate Significant High

#### Fourth Quarter Sees Sensitivity Fall Slightly (continued)

(Continued from page 6) below six percent fell to 13 institutions in the fourth quarter, down from 26 in the prior quarter. The number of thrifty with interest rate sensitivity of 100 basis points or below fell to 210 in the fourth quarter, down slightly from 213 in the previous quarter.

The number of thrifty

with over 400 basis points in interest rate sensitivity rose to 45 in the fourth quarter, up from 36 in the prior quarter.

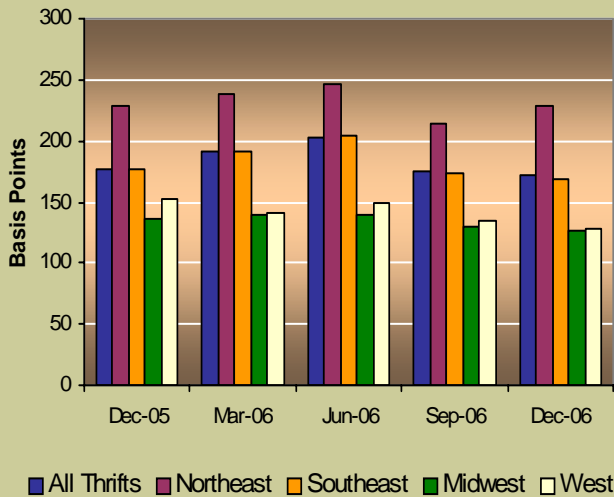
Based on TB 13a guidance for the “S” rating, 626 thrifty (79.5 percent) initially would be assigned a minimal interest rate risk rating, 134 thrifty (17 percent) a moderate rating, 23 thrifty (2.9 percent)

a significant rating, and 4 thrifty (0.5 percent) a high rating in the fourth quarter.

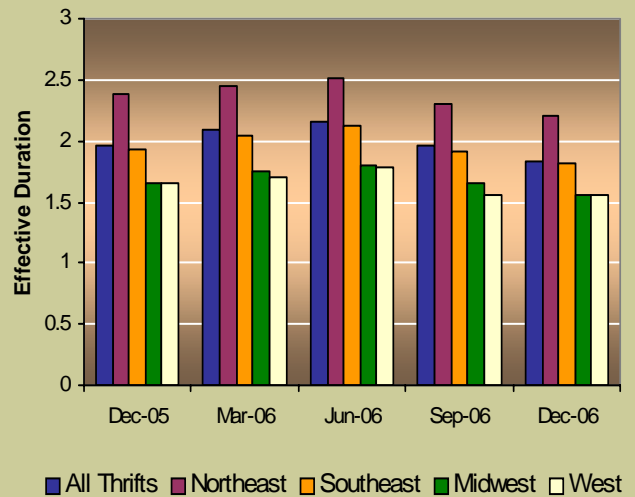
The number of thrifty with significant or high interest rate risk fell to 27 in the fourth quarter, down from 30 in the prior quarter. ■

### Comparative Trends in the Four OTS Regions

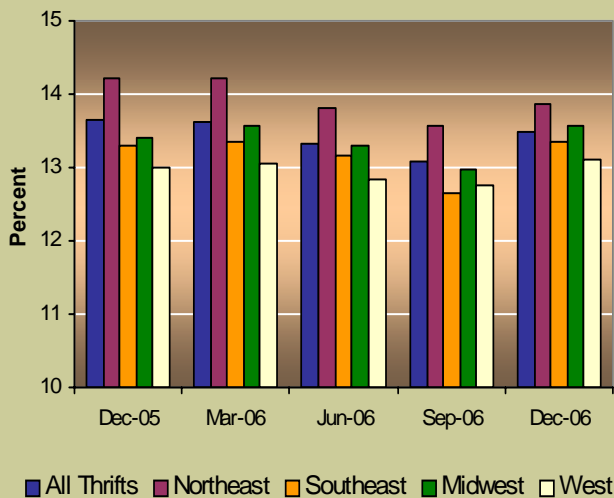
Median Sensitivity by OTS Region



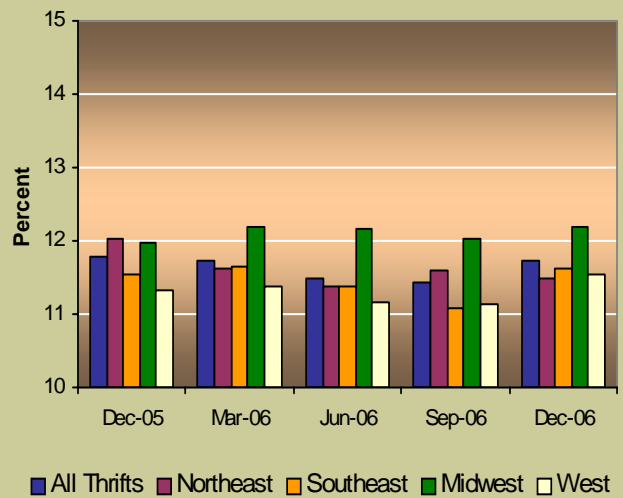
Median Assets Duration by OTS Region



Median Pre-Shock NPV Ratio by OTS Region



Median Post-Shock NPV Ratio by OTS Region



### Regional Comparisons

At the end of the fourth quarter, the Northeast Region had the highest median sensitivity at 228 basis points, while the Midwest Region had the lowest median sensitivity at 127 basis points.

The Southeast, Midwest, and West Regions saw their median sensitivities drop by

five, two, and seven basis points, respectively. In sharp contrast, the Northeast Region saw its median sensitivity rise by 14 basis points.

The Northeast Region had the highest median pre-shock NPV ratio at 13.9 percent, while the West Region had the lowest median pre-

shock NPV ratio at 13.1 percent. The Midwest Region had the highest median post-shock NPV ratio at 12.2 percent, while the Northeast Region had the lowest at 11.5 percent.

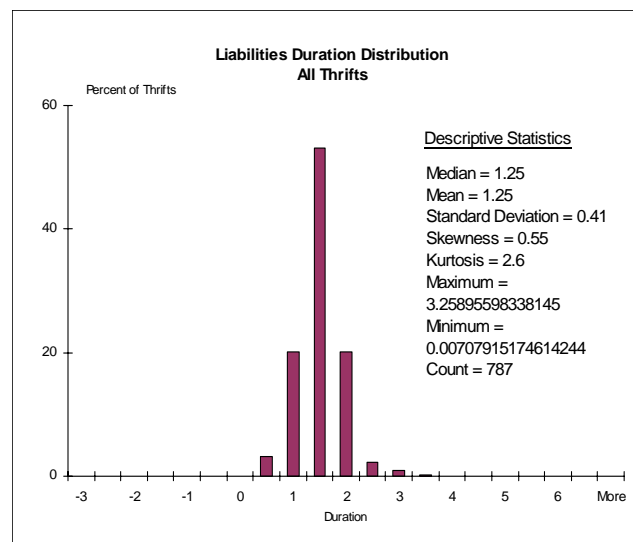
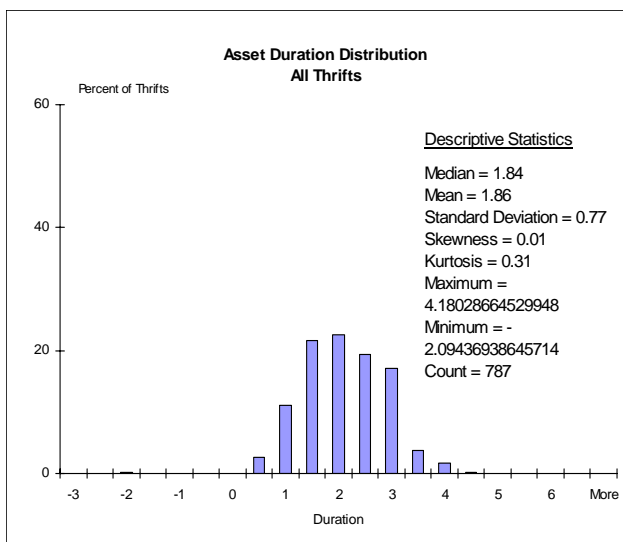
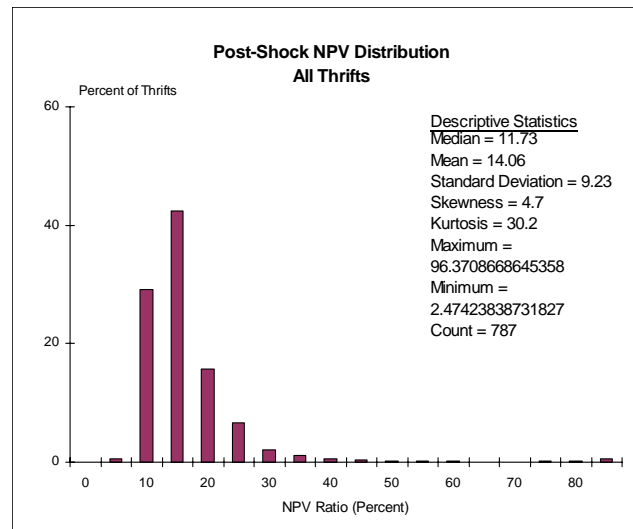
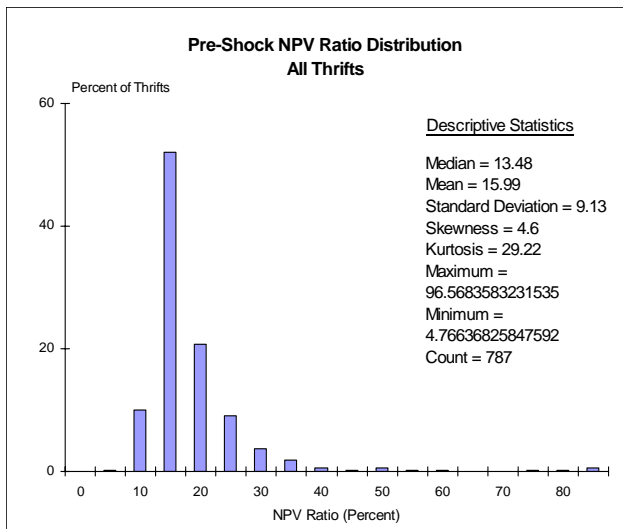
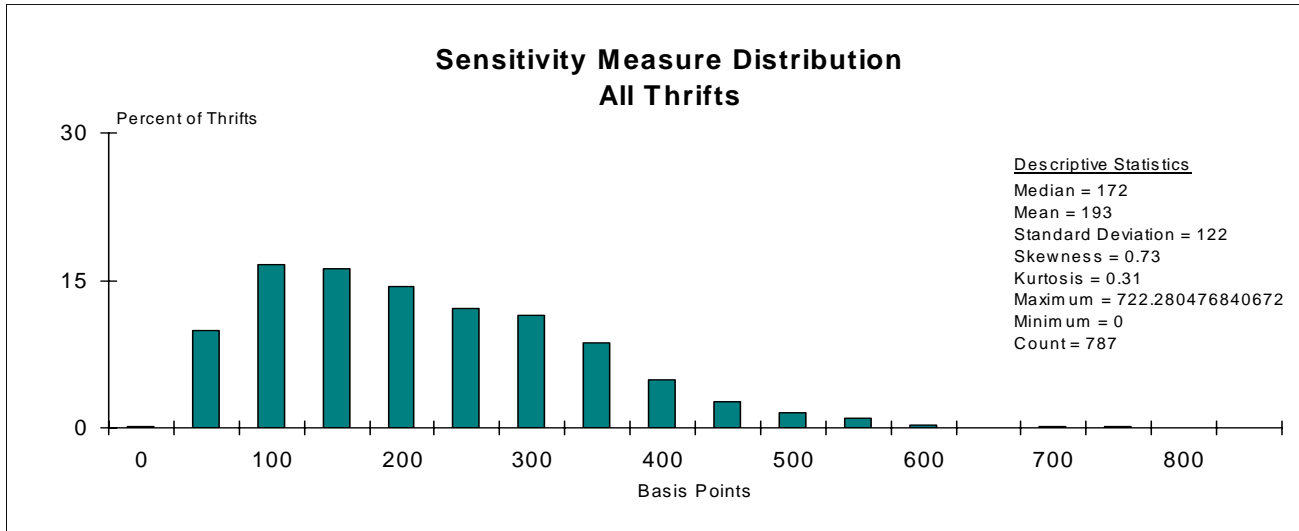
All four OTS regions saw their median asset durations fall. The Northeast Re-

gion had the highest asset duration, at 2.2, while the West Region had the lowest, at 1.55, at the end of the fourth quarter.

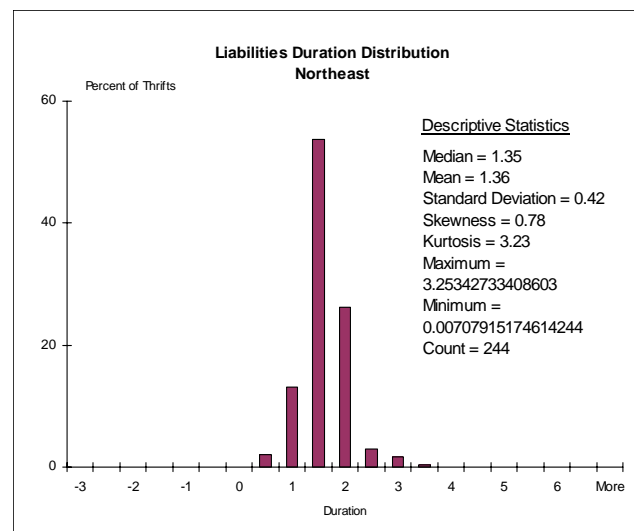
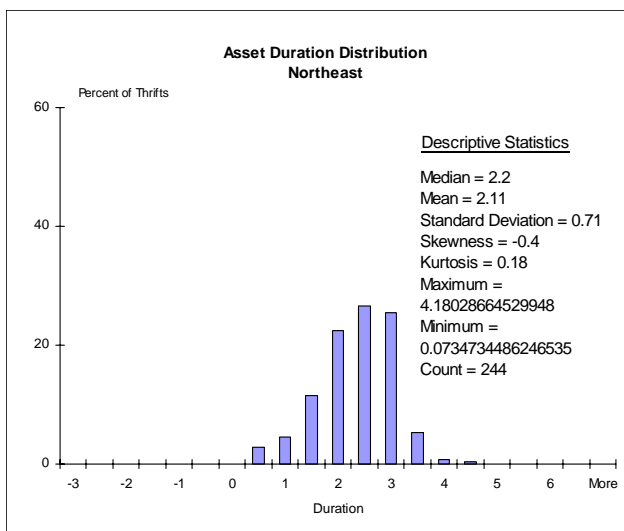
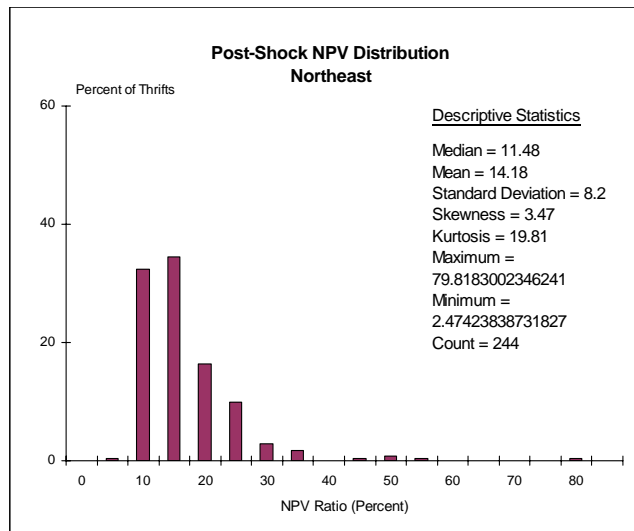
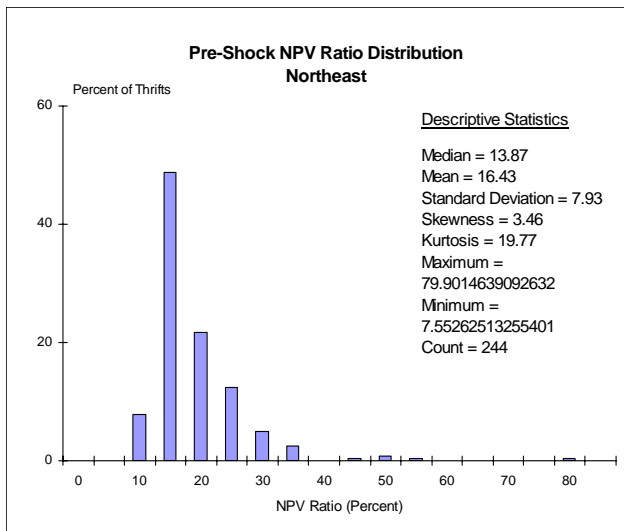
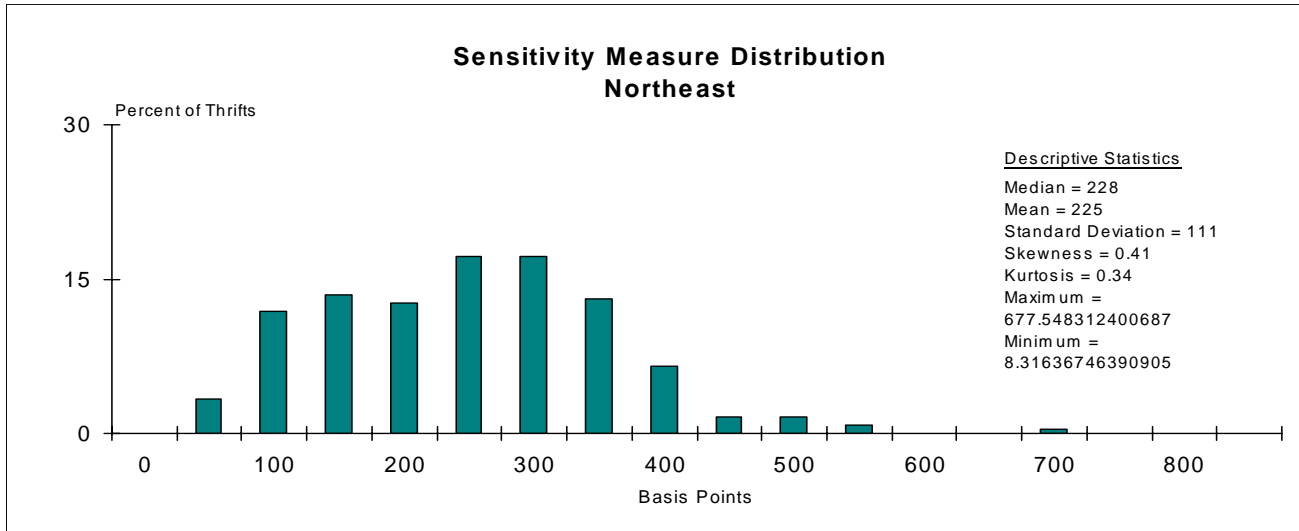
All four OTS regions saw their median liability durations fall in the fourth quarter. ■



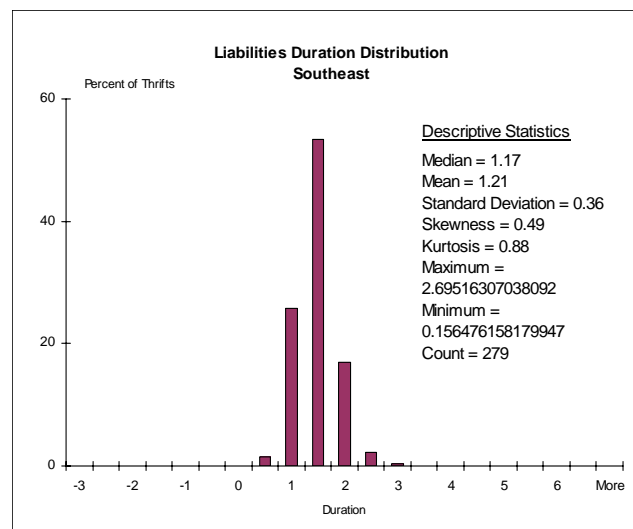
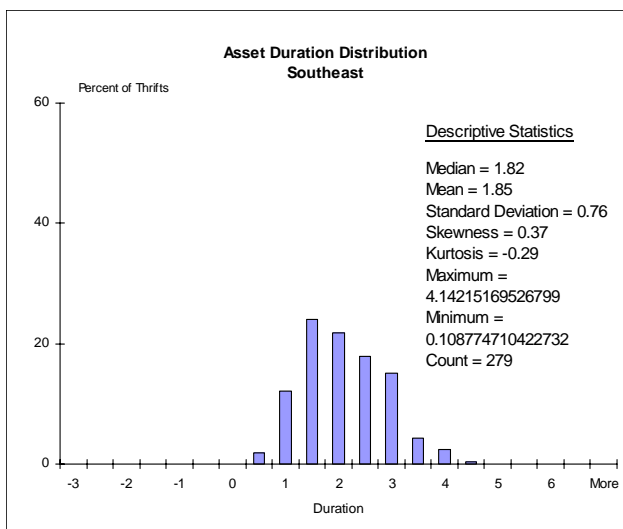
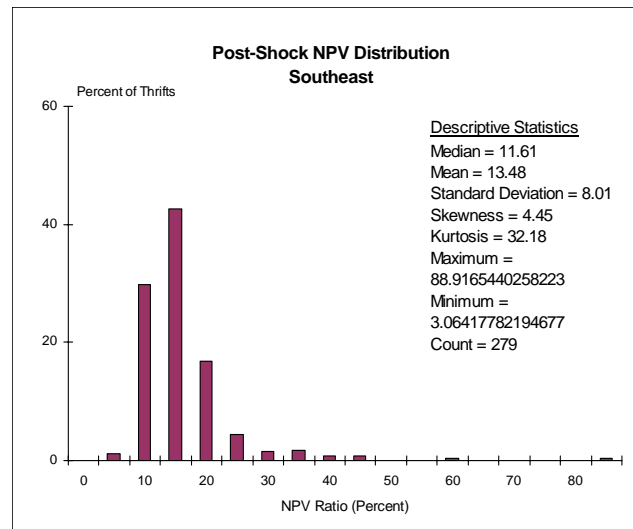
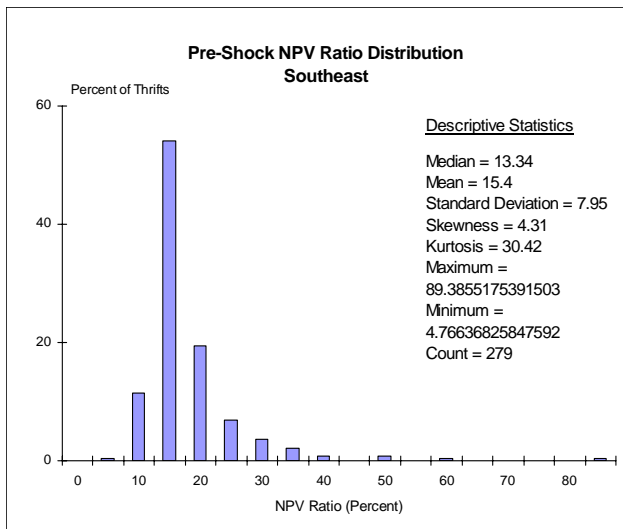
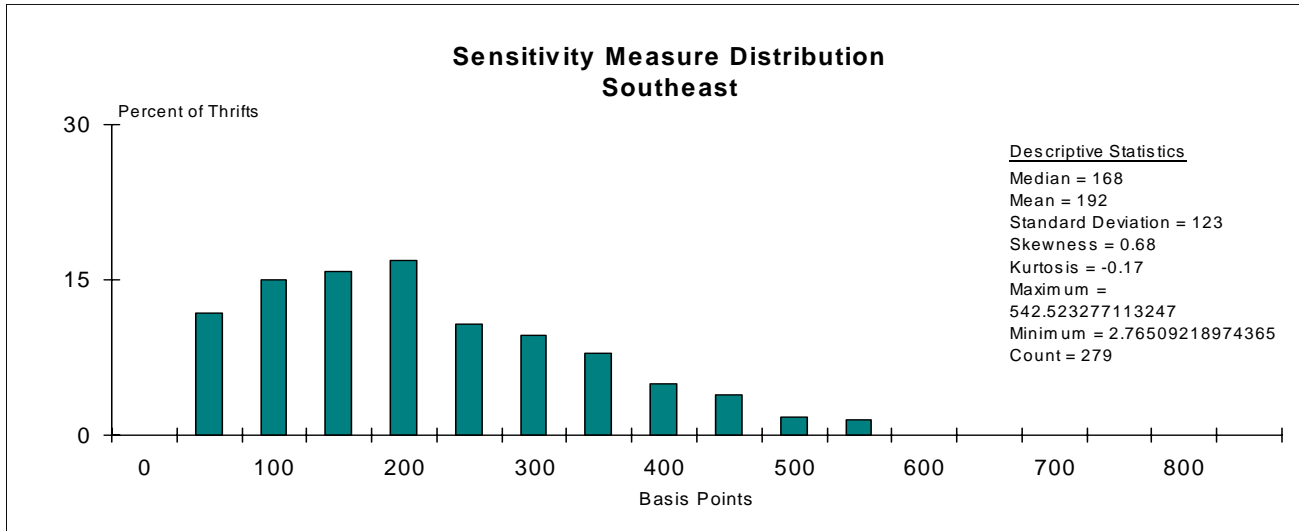
## Appendix A – All Thrifts



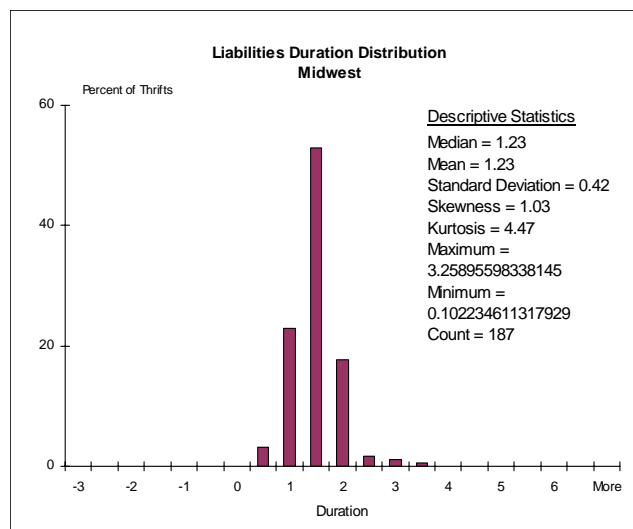
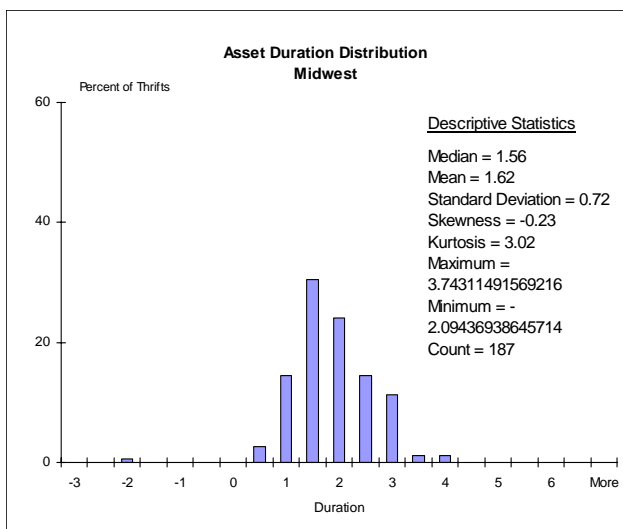
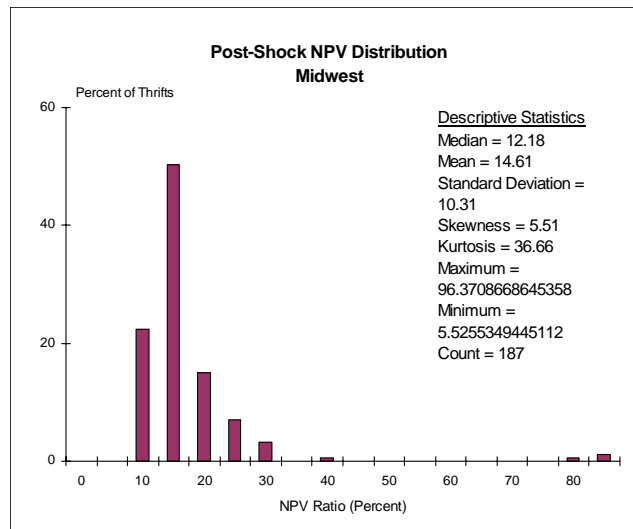
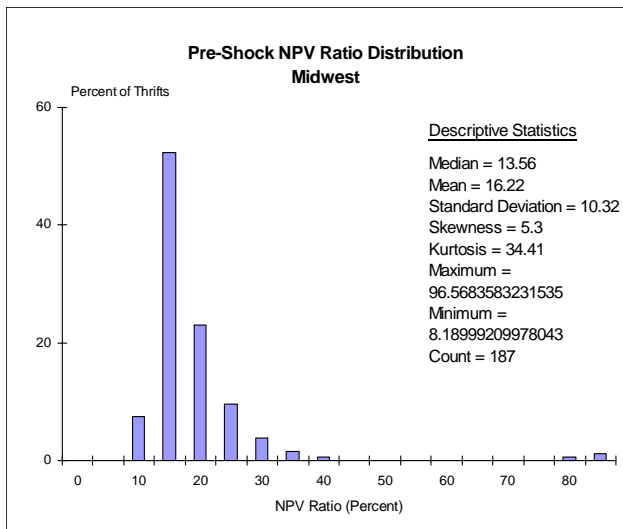
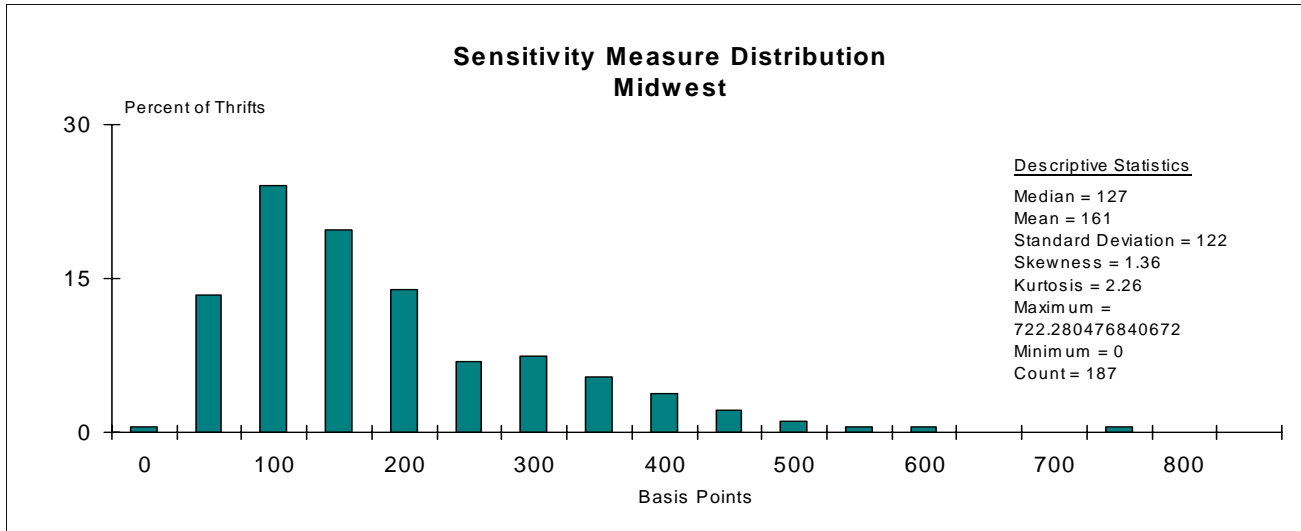
## Appendix B – Northeast Region



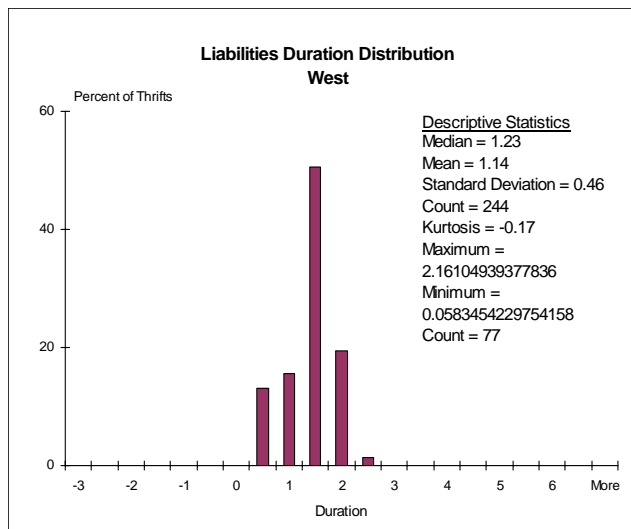
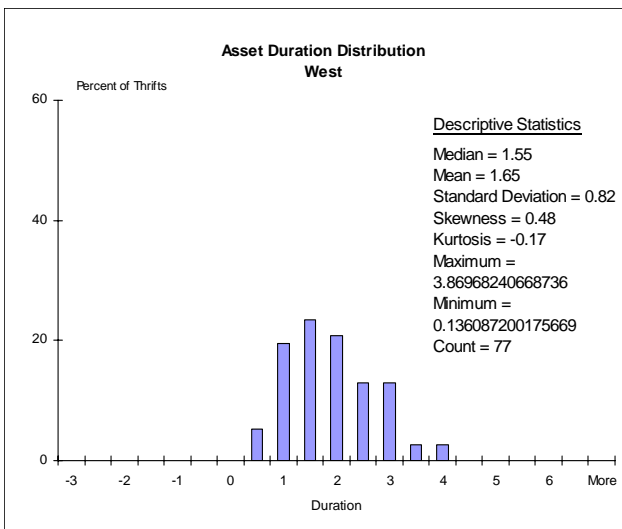
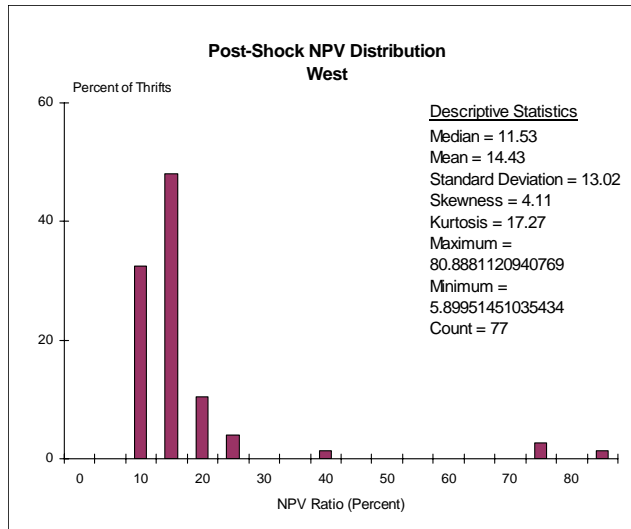
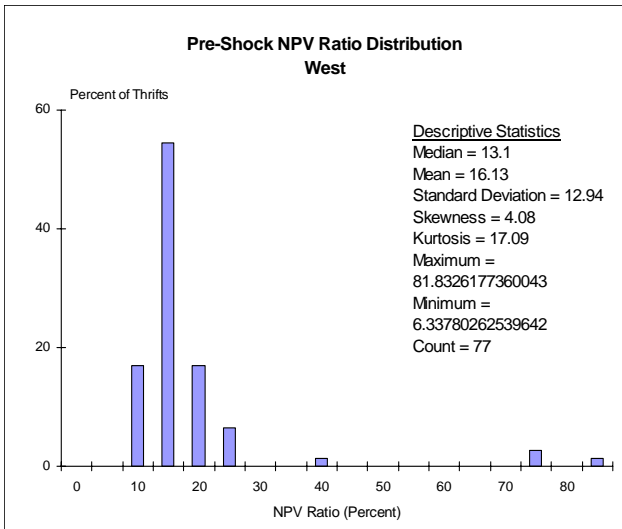
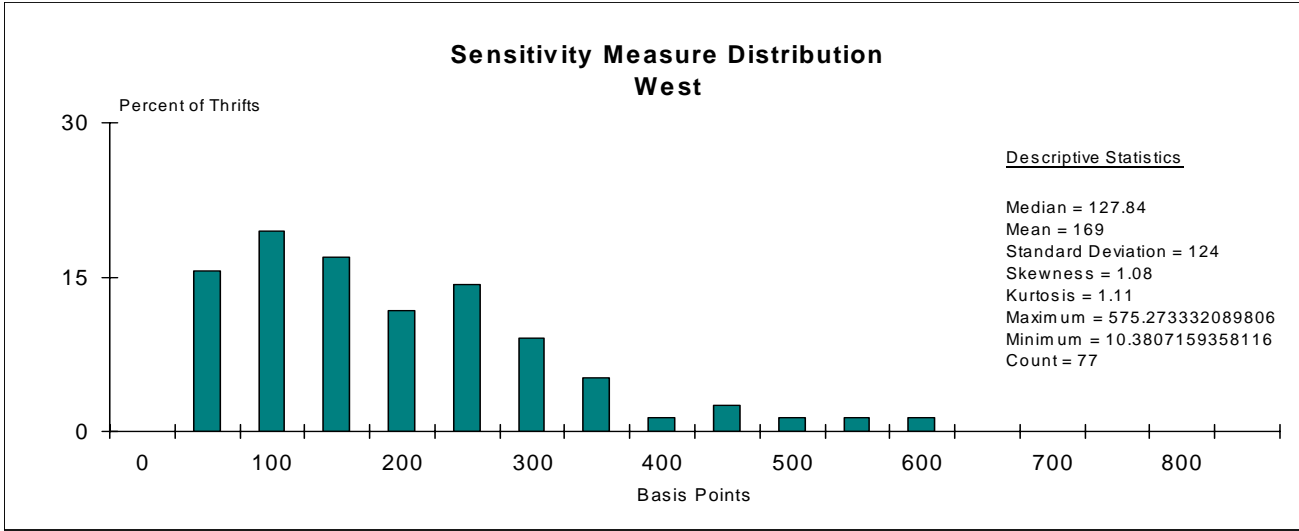
## Appendix C – Southeast Region



## 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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## *Risk Modeling and Analysis Division*

**Scott Ciardi**

Director

Phone: 202-906-6960

Email: [scott.ciardi@ots.treas.gov](mailto:scott.ciardi@ots.treas.gov)

**Jonathan D. Jones**

Senior Financial Economist

Phone: 202-906-5729

Email: [jonathan.jones@ots.treas.gov](mailto:jonathan.jones@ots.treas.gov)

**John R. Preisel**

Financial Analyst

Phone: 202-906-6973

Email: [john.preisel@ots.treas.gov](mailto:john.preisel@ots.treas.gov)

**Haranath Chadive**

IT Specialist, NPV Model

Phone: 202-906-6898

Email: [chadive.haranath@ots.treas.gov](mailto:chadive.haranath@ots.treas.gov)

**Neelima Choppala**

IT Specialist

Phone: 202-906-7742

Email: [choppala.neelima@ots.treas.gov](mailto:choppala.neelima@ots.treas.gov)

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