

The Quarterly Review Of Interest Rate Risk

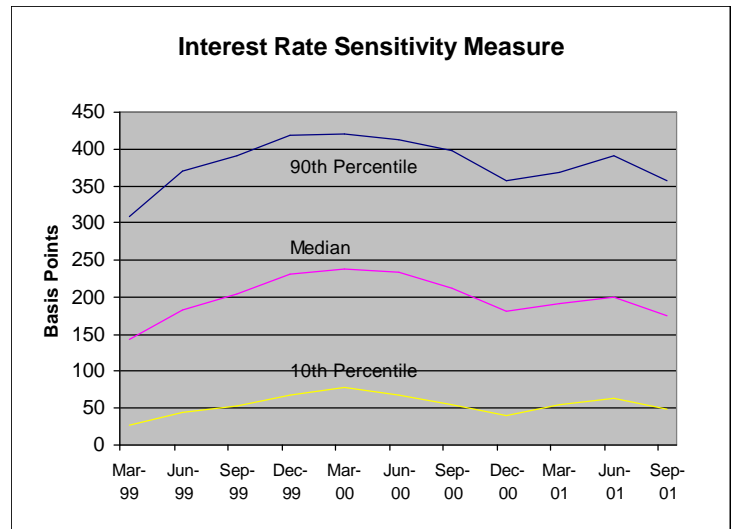
Economic Analysis Division,
Office of Thrift Supervision



Third Quarter Sees Fall in Sensitivity

Median thrift sensitivity fell to 174 basis points in the third quarter, down from 199 basis points in June. This decrease reflects the fall in interest rates between the second and third quarters.

As was the case with median sensitivity, both the median pre- and post-shock Net Portfolio Value (NPV) ratios fell between the second and third quarters. In addition, the third quarter saw the number of thrifts with high interest rate risk fall to 15, down from 25 thrifts in the previous quarter.



See details inside, starting on page 3.

Special points of interest:

- Third quarter sees Interest rate sensitivity fall
- Yield curve becomes more steeply sloped
- Use of Structured FHLB Advances by Thrifts
- Median pre- shock NPV ratio falls slightly
- Mortgage rates fall
- New Email Address for IRR Inquiries

Use of Structured FHLB Advances by Thrifts

As noted in the previous issue of this publication, thrifts use structured FHLB advances as a form of short-term borrowing to fund their loan demand. As of September 2001, thrifts held \$213.1 billion of FHLB advances in their portfolios (this means that 21.3 percent of total assets are funded by these liabilities). Given the sizable portfolio holdings of FHLB advances, it is useful to understand the linkages between thrifts' use of this funding source and their exposure to interest rate risk.

In this feature article, we look at the correlation

between the use of structured advances by thrifts and their post-shock NPV ratios and interest rate sensitivities. Our particular focus is on the different effects of puttable, callable, and convertible advances on these two measures of interest rate risk exposure.

The reader will recall from the previous issue of this publication that in the case of a puttable advance, a Federal Home Loan Bank effectively purchases a put option from the borrowing institution and pays for it in the form of a lower interest rate that it receives on the advance. With this type of contract, the Fed-

eral Home Loan Bank is likely to ask for early payoff of the advance when interest rates rise.

A callable advance, on the other hand, allows the borrowing savings association to call the loan contract back from the Federal Home Loan Bank and to prepay the advance under the terms of the contract without penalty. For such an advance, the member institution pays for the call option in the form of a higher interest rate on the advance.

Finally, a convertible advance allows the Federal Home Loan Bank to con-

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Use of Structured FHLB Advances by Thrifts (continued)

(Continued from page 1)

vert the advance from a fixed to floating rate. From a valuation standpoint, the behavioral characteristics of convertible advance valuations are much the same as those of puttable advances.

For the typical thrift, the callable advance is the one that should have the greatest benefits from the asset/liability management and safety and soundness perspectives. Intuitively, this follows from the fact that a callable advance allows the thrift to decide when the option associated with the advance should be exercised, not the Federal Home Loan Bank. This permits the thrift to determine the timing of repayment. As a result, one might reasonably expect, a priori, that various measures of a thrift's exposure to interest rate risk should be better for thrifts using callable advances versus thrifts using puttable or convertible advances.

However, we cannot know this with certainty because it could be that only those thrifts that would otherwise have very low interest rate risk or negative duration gaps are the ones that choose puttable or convertible advances as sources of funding. Similarly, it could be that only those thrifts that would otherwise have higher levels of interest rate risk and positive duration gaps use callable advances.

Thus, if all savings institutions that use structured FHLB advances are doing so only when it is prudent to do so, and only in moderation, then we

might find no connection between the use of callable or puttable advances and exposure to interest rate risk; or even the opposite result—thrifts that use callable advances tend to have worse interest rate risk exposure than those that use puttable advances. Ultimately then, it is an empirical issue as to whether institutions use structured advances in a prudent and safe and sound manner.

Table 1 reports the number of thrifts with and without puttable, callable, or convertible FHLB advances in their portfolios at the end of September 2001.

	Num Thrifts	Pre- (%)	Post- (%)	Sens (bps)	Size (\$Mil)
With	256	11	9	183	270
Without	695	13	11	170	107

In addition, the table also reports the median values of the pre-shock NPV ratio, the post-shock NPV ratio, the sensitivity measure, and asset size for each group.

Of the total number of thrifts reporting, 695 institutions held no puttable, callable, or convertible advances, while 256 institutions have some structured advances of the types discussed above. Of those that use these products, there are about six times as many using puttable or convertible advances as there are using callable advances at the end of September 2001. In addition, our data indicate larger thrifts are the ones that tend to use structured advances.

Table 2 reports median values for the pre- and post-shock NPV ratios and sensitivities for the top

Advance Type	Post- (%)	Sens (bps)
Puttable	7.7	213
Convertible	8.5	188
Callable	9.3	159

quartiles according to intensity of use of the particular type of structured advance. In other words, thrifts are ranked by the ratio of the value of the type of structured advance divided by the value of base case total assets. We use the top quartiles for the comparisons in order to focus on those thrifts most intensively using each type of structured advance.

When institutions are ranked by the intensity of their use of each type of FHLB advance, we find that differences in the interest rate risk measures are in accord with our a priori expectation. Thrifts holding the largest percentage of puttable advances have the biggest median sensitivity measure and the smallest median post-shock NPV ratio. In contrast, thrifts holding the largest percentage of callable advances have the lowest median sensitivity measure and the biggest median post-shock NPV ratio.

Similar to those thrifts with puttable advances, thrifts with the largest percentage holdings of convertible advances have a median sensitivity measure larger than those thrifts with callable advances, and a median post-shock NPV

ratio that is smaller.

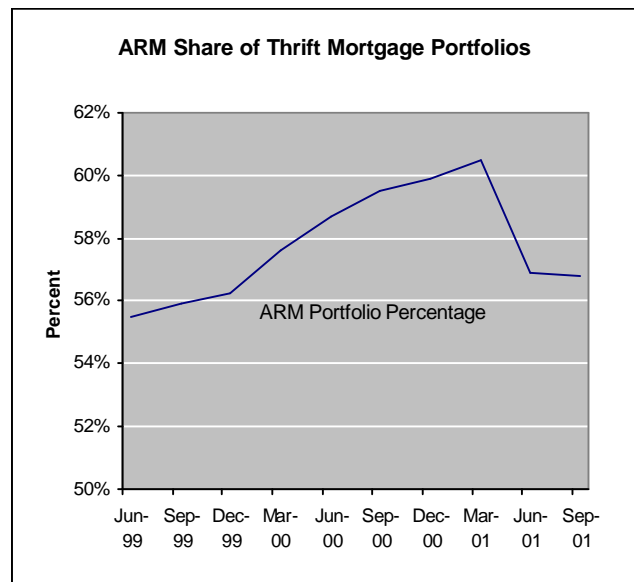
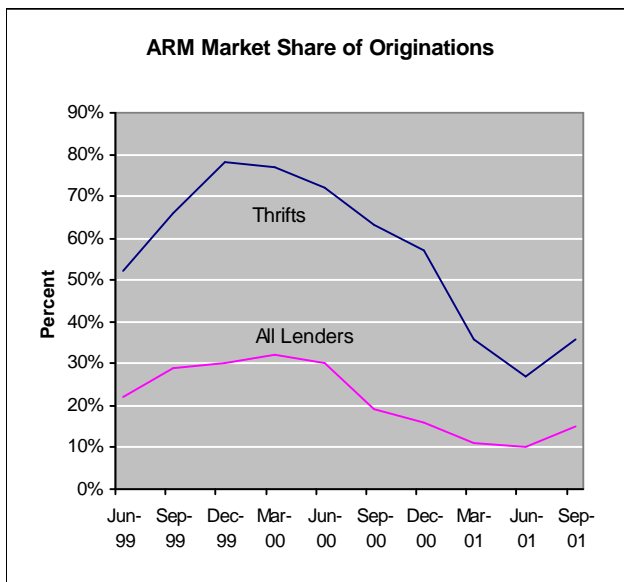
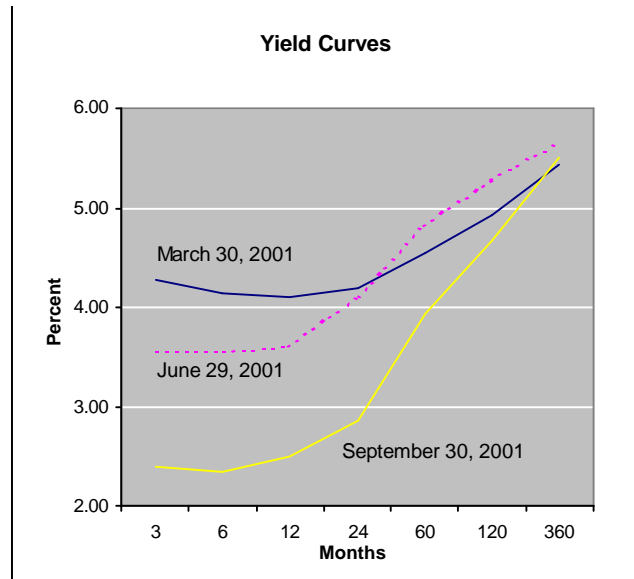
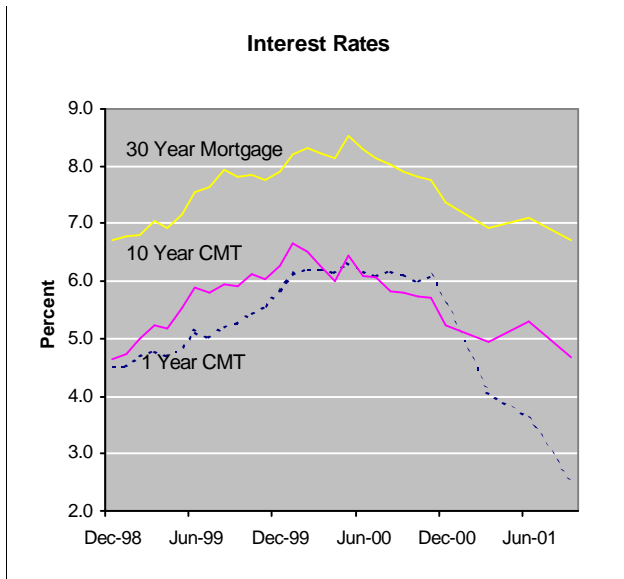
Looking at the top five thrifts when institutions are ranked by the intensity of their use of each type of FHLB advance, we find a substantial difference in the average preliminary "S" ratings according to guidance in TB 13a. The average "S" rating for the group using callable advances is 1.2, while the average "S" ratings for the groups using puttable and convertible advances are 2.0 and 2.4, respectively.

In addition, there are no thrifts with post-shock NPV ratios below 4 percent among the five thrifts most intensively using callable advances. In contrast, there are four thrifts (two of the five most intensively using puttable advances and two of the five most intensively using convertible advances) with post-shock NPV ratios below 4 percent.

In sum, our results suggest that some thrifts may be strongly averse to interest rate risk, and tend to be the heaviest users of callable advances. On the other hand, there appears to be another group of thrifts that are much less averse to interest rate risk, or even strongly inclined to take it on.

This latter group of institutions is the heaviest user of puttable and convertible advances. And, from a regulatory perspective, their use of these types of borrowing instruments is an area of potential concern based on the empirical findings reported above. |

Interest Rates and ARM Market Share



(Continued from page 1)

Although interest rates at all maturities fell between the second and third quarters, short-term rates fell relatively more. In addition, the 30-year mortgage rate fell to 6.72 percent at the end of the third quarter.

With the relatively greater fall in short-term rates, the yield curve became more steeply upward-sloping, improving the lending environment for the typical thrift. This resulted from the Federal Reserve's continued cuts in the target federal funds rate of 75 basis

points in the third quarter. As a result, thrifts saw their net interest margins rise. The industry's average net interest margin improved to 294 basis points in the third quarter, up from 282 basis points in the prior quarter.

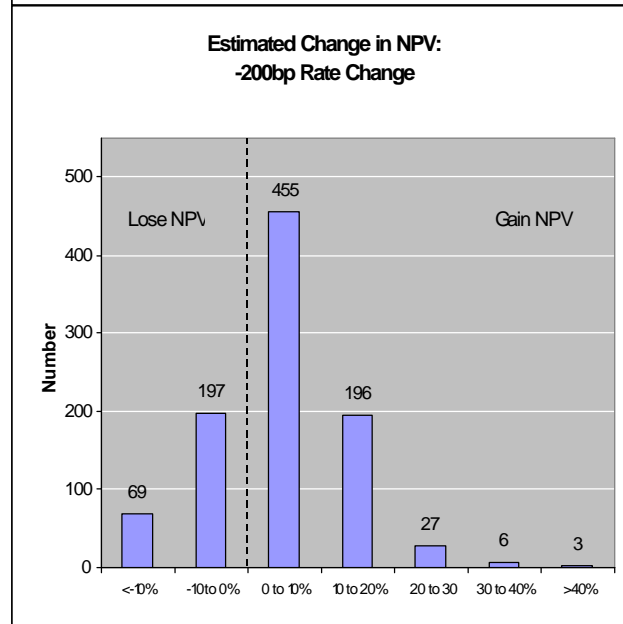
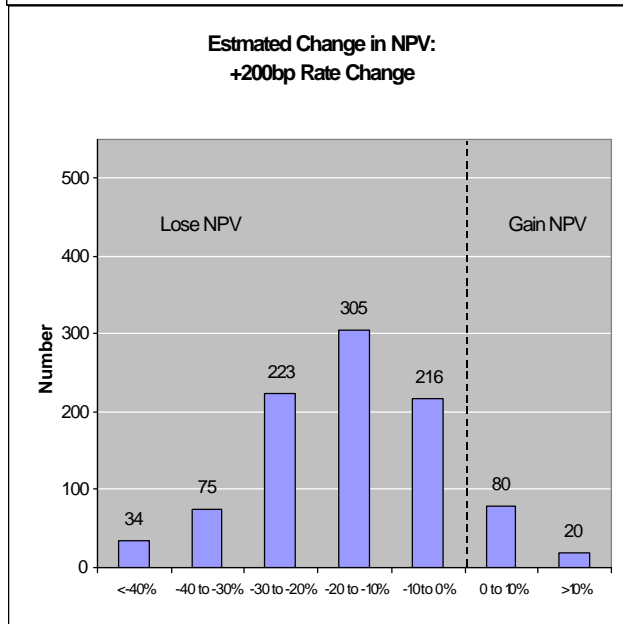
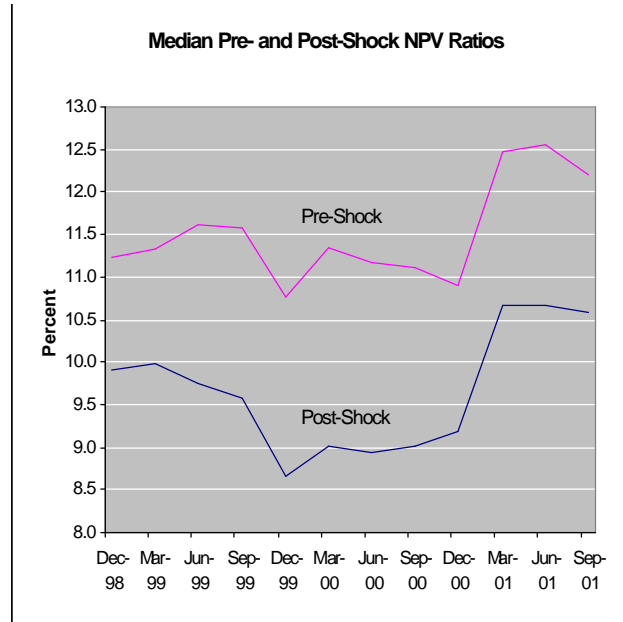
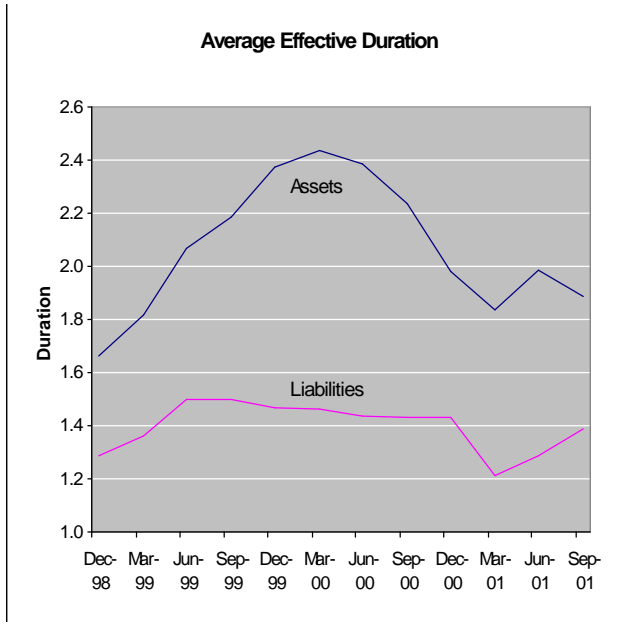
With the fall in the 30-year mortgage rate between the second and third quarters, the demand for long-term, fixed-rate mortgages remained strong in the third quarter. In addition, with the relatively greater fall in short-term rates, the third quarter saw an increase in ARM originations by thrifts. The

ARM share of total thrift mortgage originations rose to 36 percent, up from 28 percent in the prior quarter. Along with the relative rise in ARM originations, the share of ARM mortgages held in portfolio remained essentially unchanged in the third quarter.

Third-quarter 1-4 family mortgage originations by thrifts stood at \$103.8 billion, down five percent from \$109.6 billion in the second quarter. Total mortgage originations in the third quarter were at a level of \$118.7 billion, down from a

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Duration and NPV Sensitivity Measures



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record \$125.0 billion in the second quarter.

Thrifts' share of all 1-4 family originations was 23.4 percent in the third quarter, up from 22.9 percent in the second quarter. The third quarter witnessed a new record rate of 68.1 percent in U.S. home ownership.

Refinancing activity of all mortgages accounted for 28.8 percent of thrift originations in the third quarter, up from 22.2 percent in the second quarter. This

increase stands in contrast to refinancing activity of mortgages for all lenders, with the rate for all lenders falling to 45 percent in the third quarter, down from 50 percent in the prior quarter.

Third-quarter earnings rose to a new record \$2.61 billion, up from \$2.51 billion in the second quarter.

The industry's average effective duration of assets fell from 1.99 to 1.89 between the second and third quarters, due to the fall in interest rates. As rates fall, the NPV Model yields an increase in

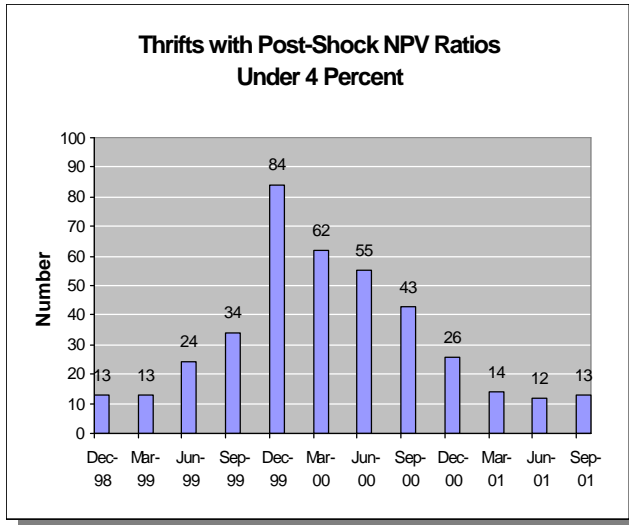
the predicted rate of mortgage prepayments. This increase in the predicted rate of mortgage prepayments causes, in turn, decreases in the durations of mortgage assets.

The industry's average effective duration of liabilities rose to 1.39 in the third quarter, up from 1.22 in the prior quarter. This decrease occurred as a result of a fall in the amount of short-term borrowings in thrifts' portfolios.

The median pre-shock NPV ra-

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Interest Rate Risk Measures



Interest Rate Risk Measures Industry Aggregates Last Two Quarters

	Ratio of NPV to Assets		% Change	
	Jun-01	Sep-01	Jun-01	Sep-01
+300	7.9	8.1	-30%	-26%
+200	9	9.3	-19%	-14%
+100	10	10	-8%	-8%
Base	10.7	10.5	0	0
-100	10.9	10.5	3%	1%
-200	10.9	10.5	4%	2%
-300	11.1	N/A	6%	N/A

Post-Shock NPV Ratio and Sensitivity Measure Matrix June 2001

	Under 100bp	101-200bp	201-400bp	Over 400bp	Total
Over 10%	163	148	208	39	558
6% to 10%	50	116	161	26	353
4% to 6%	0	8	22	13	43
Below 4%	0	0	9	3	12
Total	213	272	400	81	966

Post-Shock NPV Ratio and Sensitivity Measure Matrix September 2001

	Under 100bp	101-200bp	201-400bp	Over 400bp	Total
Over 10%	166	167	181	24	538
6% to 10%	90	111	139	19	359
4% to 6%	3	14	23	3	43
Below 4%	0	1	7	5	13
Total	259	293	350	51	953

Minimal Moderate Significant High

Minimal Moderate Significant High

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ratio for the industry fell from 12.6 percent to 12.2 percent between the second and third quarters. The median pre-shock NPV ratio fell due to the fall in assets duration and the rise in liabilities duration in the third quarter. The median post-shock NPV ratio fell slightly to 10.6 percent in the third quarter, down from 10.7 percent in the prior quarter.

At the end of the third quarter, a 200 basis point increase in

rates would result in a loss in net portfolio value for 858 thrifts, while 100 thrifts would see their net portfolio values rise.

In the unlikely event that rates fell by 200 basis points, 687 thrifts would see their net portfolio values rise, while 266 thrifts would see a decrease in their net portfolio values.

The number of thrifts with a post-shock NPV ratio below 4 percent rose to 13. This represents the first quarterly increase in the

number of thrifts that are highly exposed to fluctuations in interest rates in the past seven quarters.

With a 200 basis point increase in interest rates, the thrift industry would lose 14 percent of its net portfolio value. This net portfolio loss is down substantially from 19 percent in the previous quarter, and is consistent with the fall in median sensitivity.

The number of thrifts with a post-shock NPV ratio over 6 per-

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cent decreased between the second and third quarters. In the third quarter, the number of such thrifts was 897 compared to 911 in the prior quarter.

The number of thrifts with a post-shock NPV ratio below 6 percent rose to 56 in the third quarter, up from 55 in the second quarter. The number of thrifts with a sensitivity of 200 basis points or less increased to 552 in the third quarter, up from 485 in the second quarter. The number of thrifts with over 400 basis points in sensitivity fell to 51 in the third quarter, down sharply from 81 in the second quarter. As a result, the number of thrifts with high interest rate risk fell from 25 to 15 between the second and third quarters. †

New Email Address for IRR Inquiries

If you have specific questions concerning OTS's NPV Model, or any other IRR-related report found on our website, you can now contact us directly at:

irr.questions@ots.treas.gov

OTS will try to respond to each question within two business days. As always, if you have specific questions about your institution's IRR Exposure Report or Executive Summary Report, you are encouraged to first contact the regional IRR representative listed at the bottom of your institution's Executive Summary Report. †



Glossary

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

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

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

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

Duration: A measure of the price sensitivity of a financial instrument to changes in yield. The higher the duration, the greater the price sensitivity. For example, an asset with duration of 1.6 will appreciate in value by about 1.6 percent for one percentage point (100 basis points) decline in yield.

NPV Model: Measures how six hypothetical changes in interest rates (three successive 100 basis point increases and three successive 100 basis point decreases) affect the model's estimate of a thrift's market value of net worth.

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 close to 0.

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 approximately symmetric has a skewness statistic close to 0.

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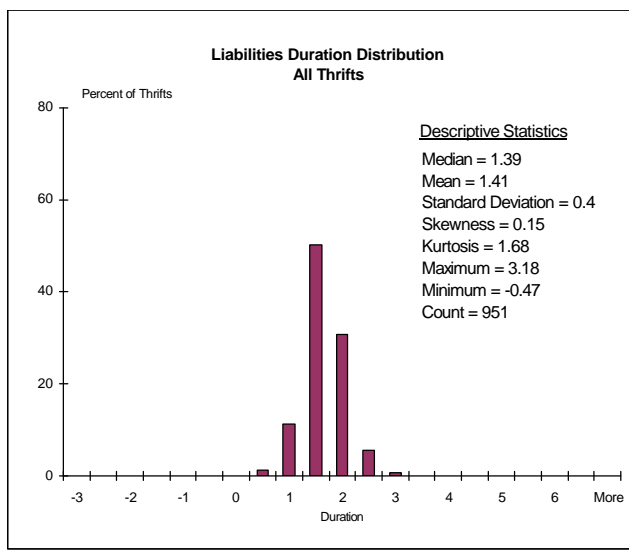
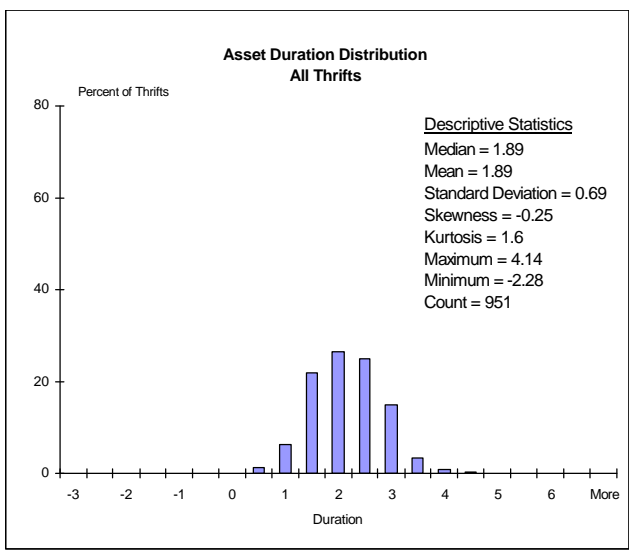
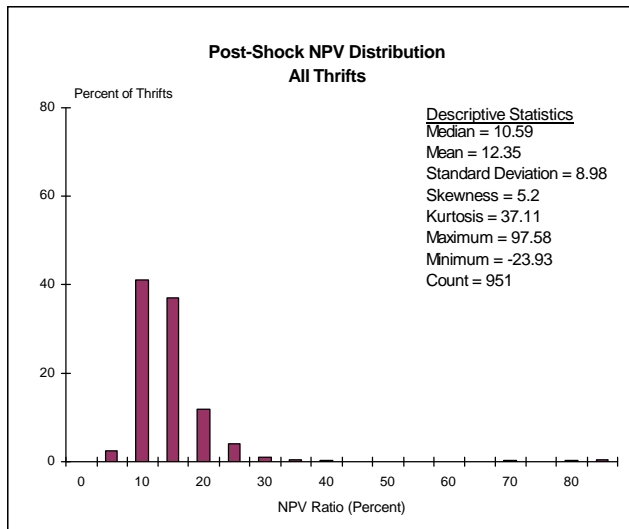
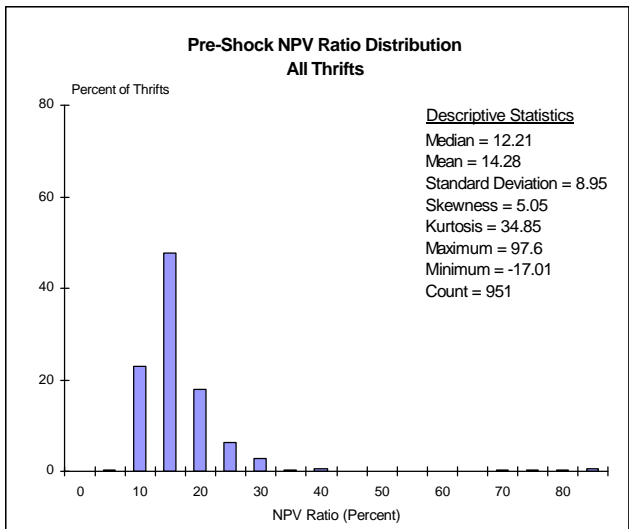
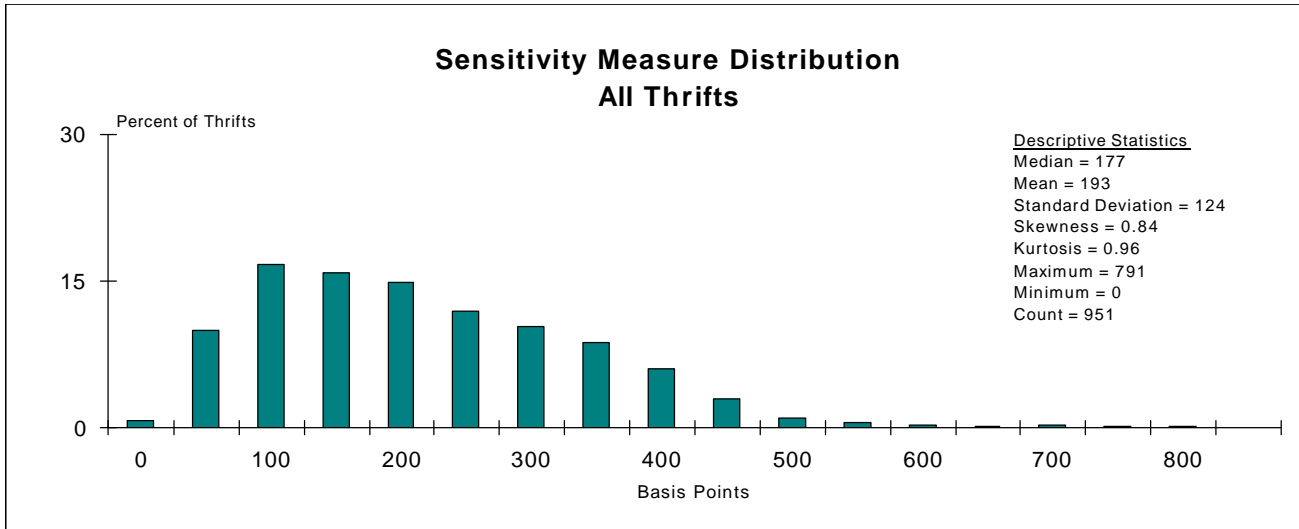
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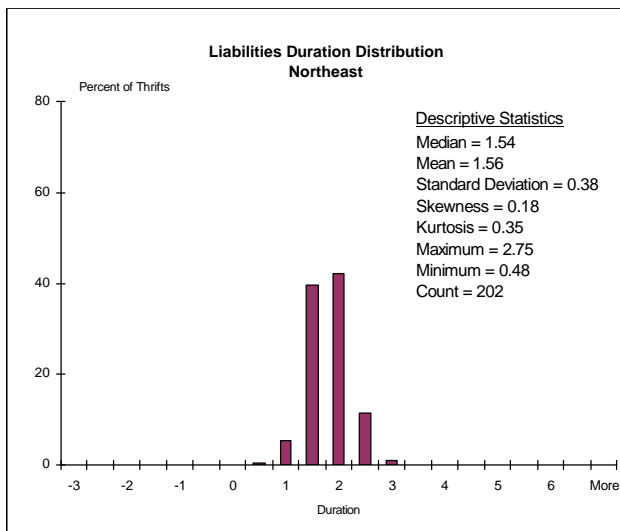
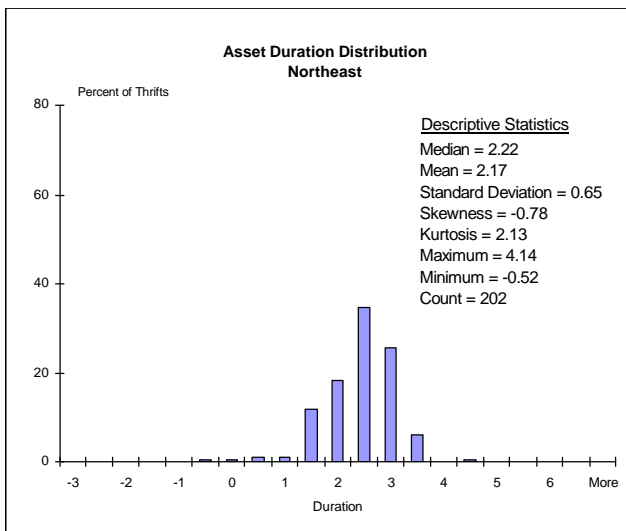
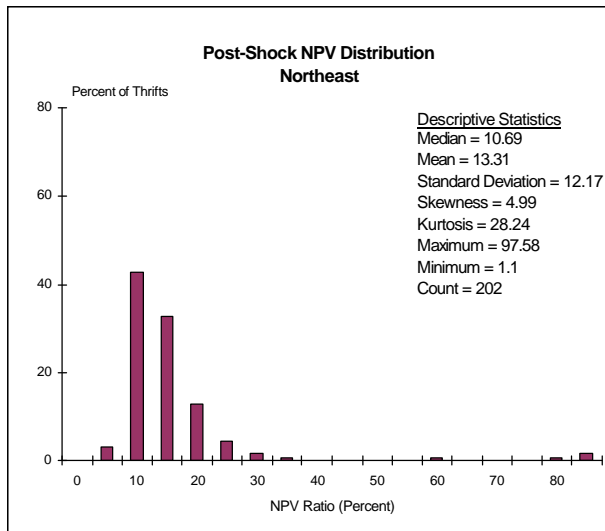
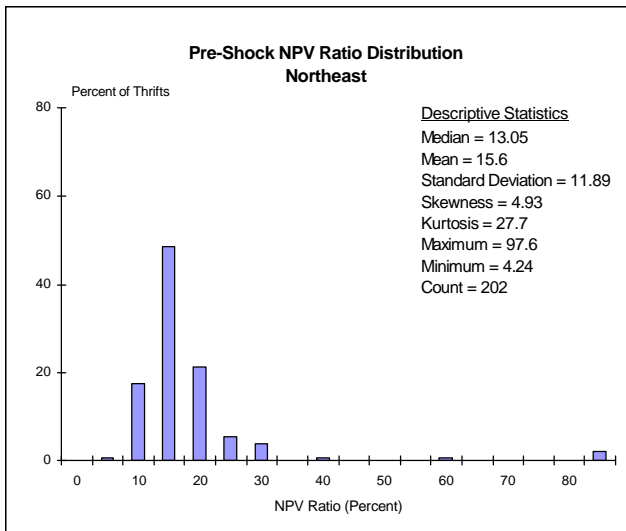
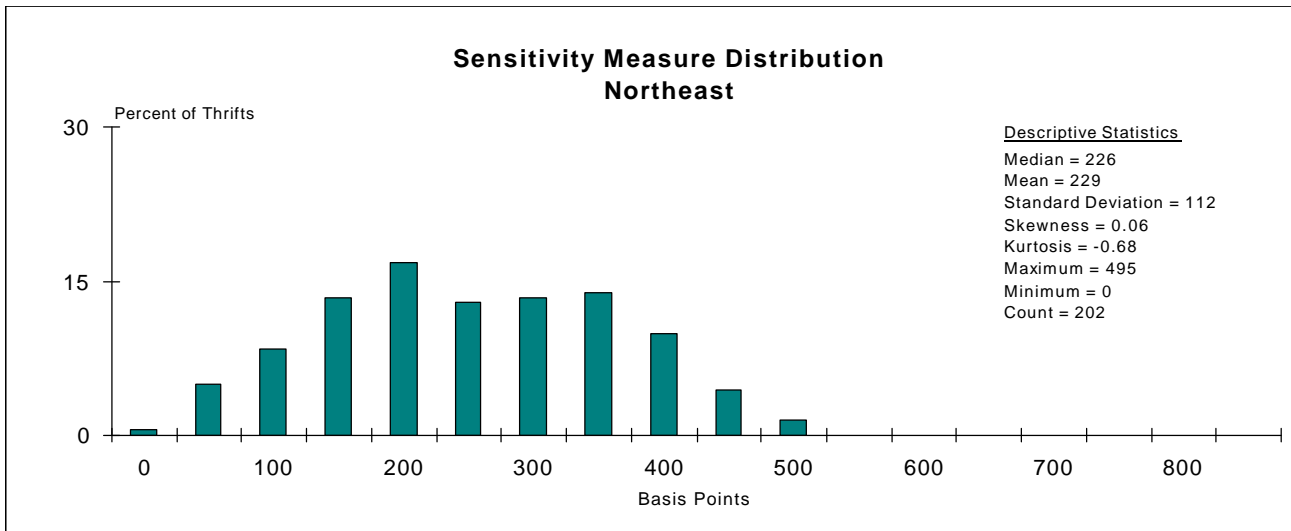
* Cezary Jednaszewski provided data assistance in preparing the special feature article.

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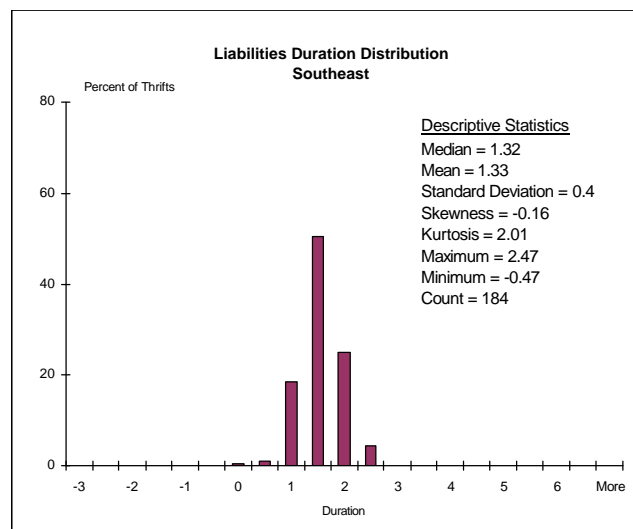
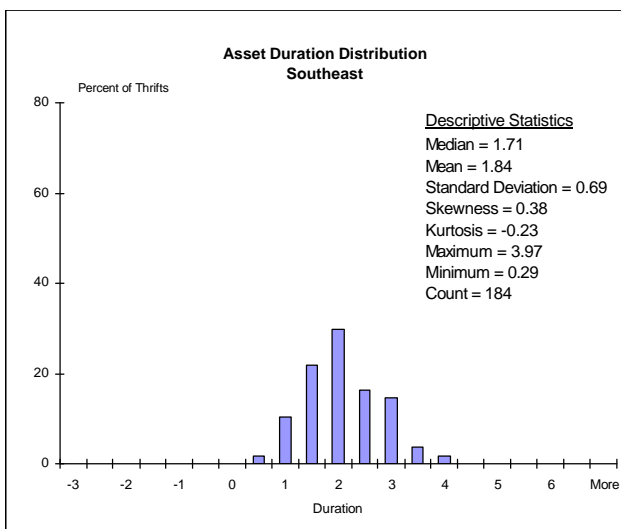
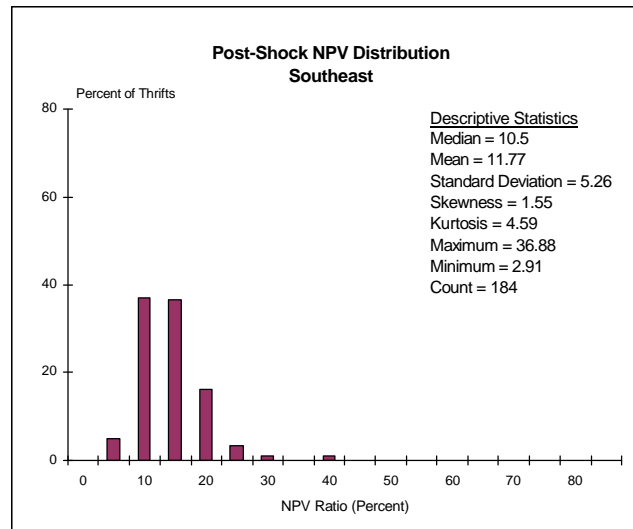
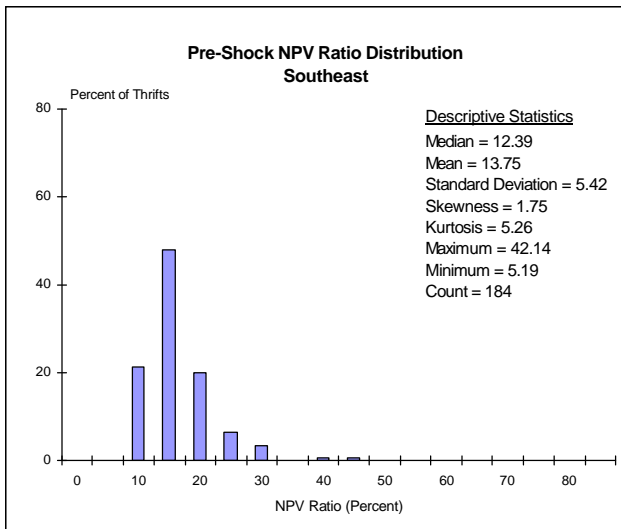
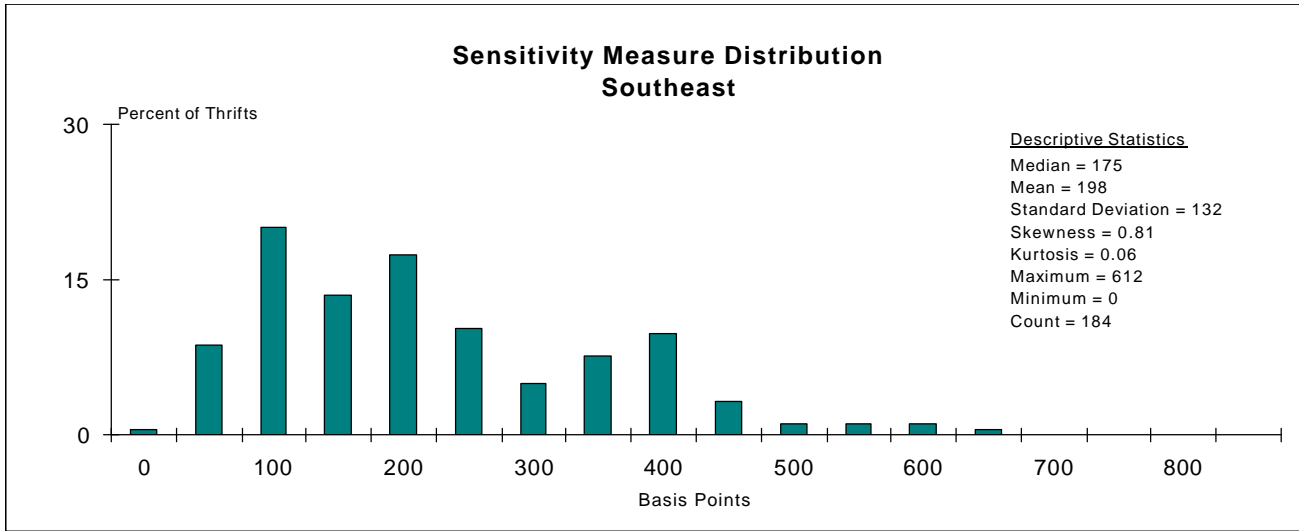
Appendix A – All Thrifts



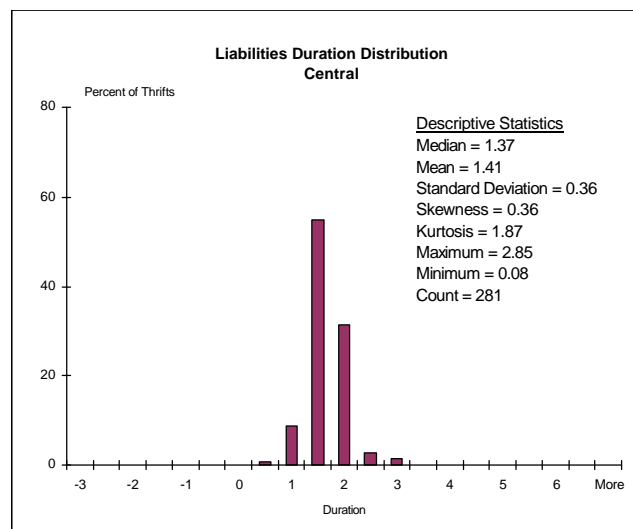
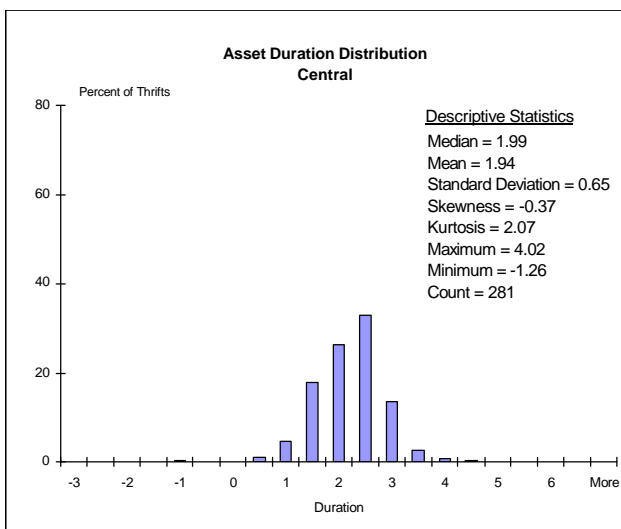
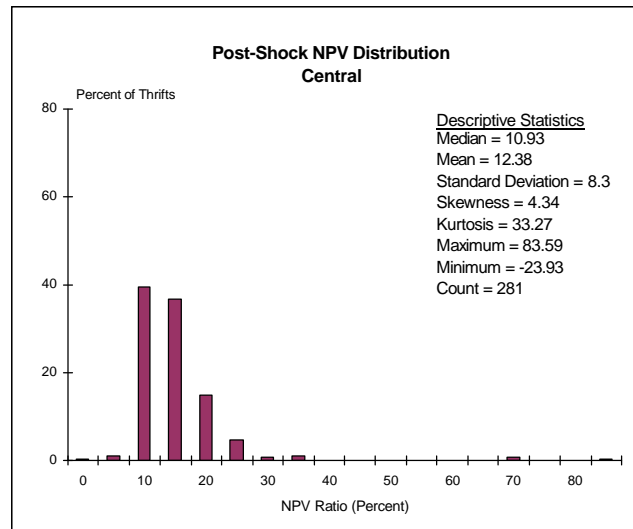
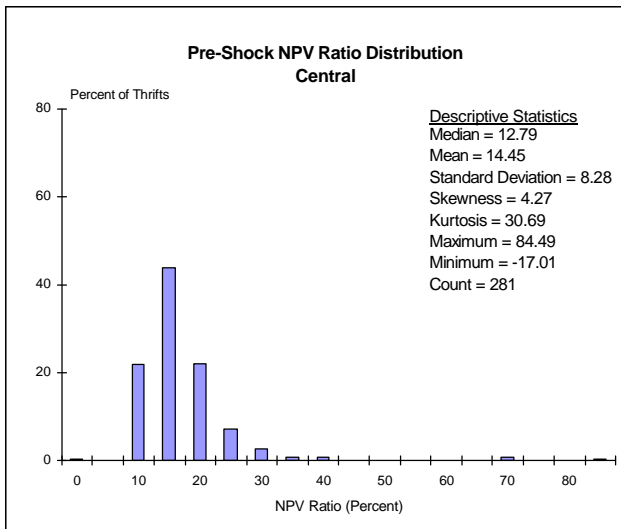
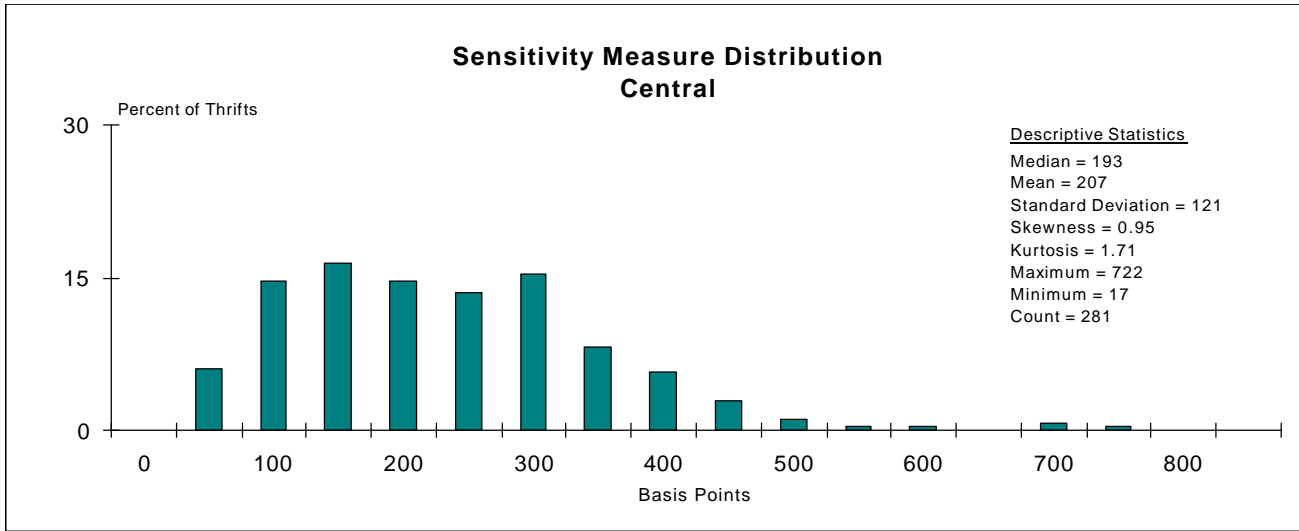
Appendix B – Northeast Region



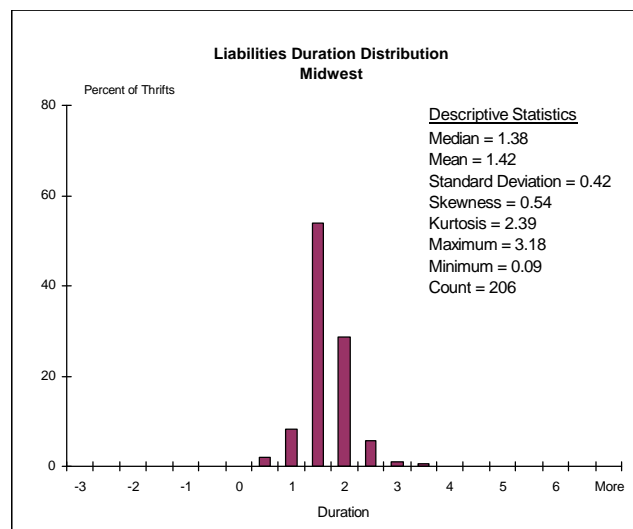
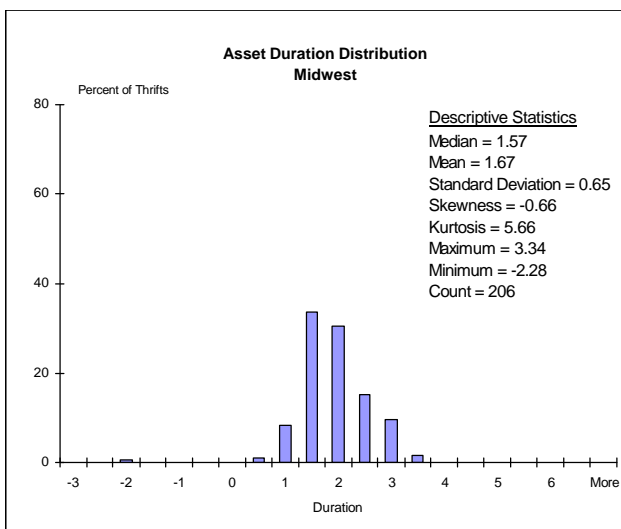
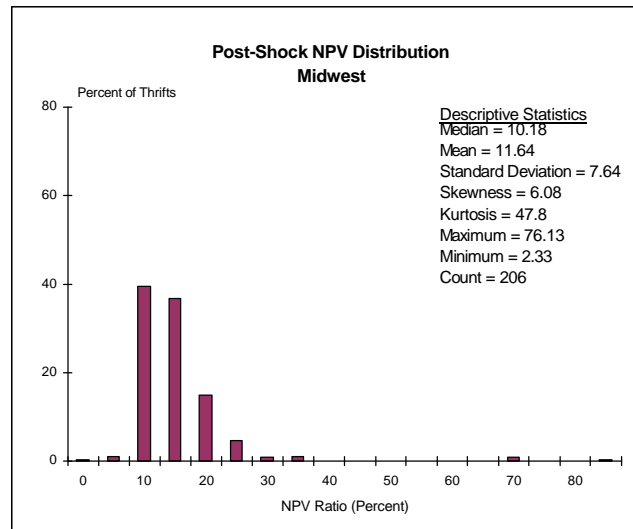
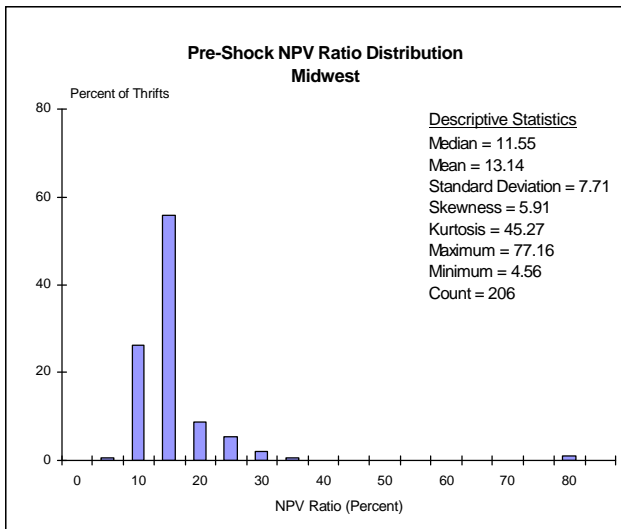
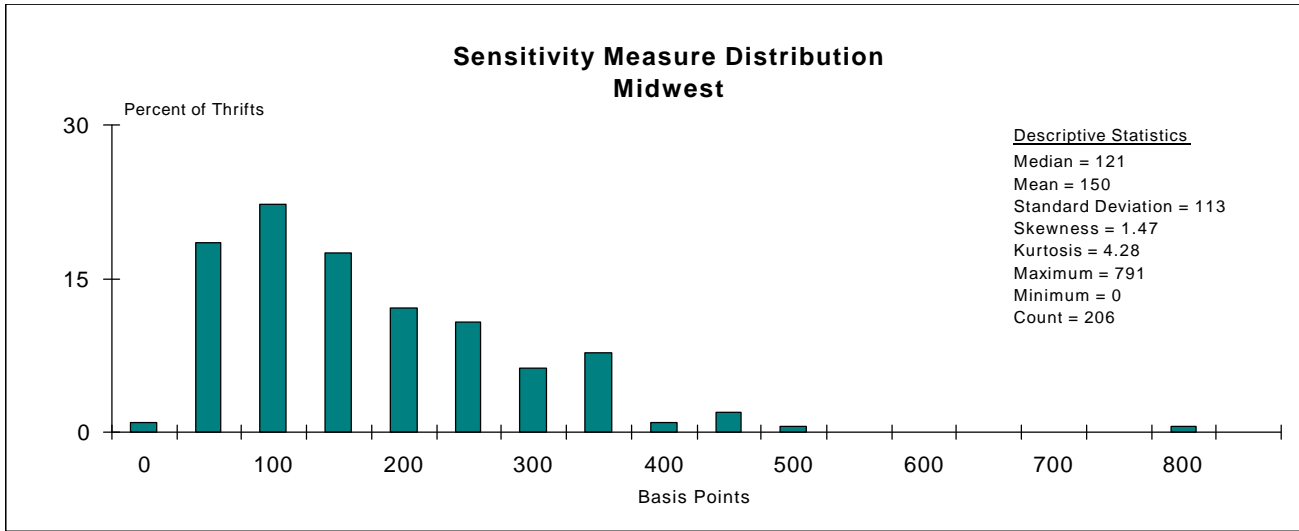
Appendix C – Southeast Region



Appendix D – Central Region



Appendix E – Midwest Region



Appendix F – West Region

