



The Quarterly Review of Interest Rate Risk

Volume 4, Number 1

First Quarter, 1999

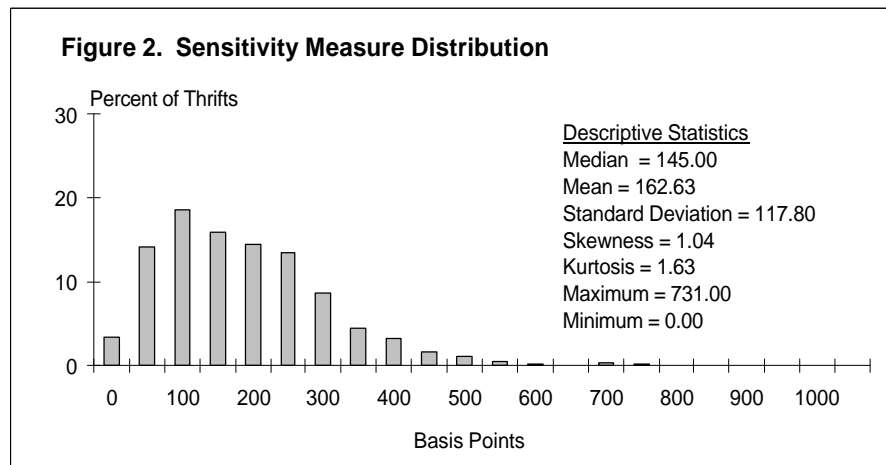
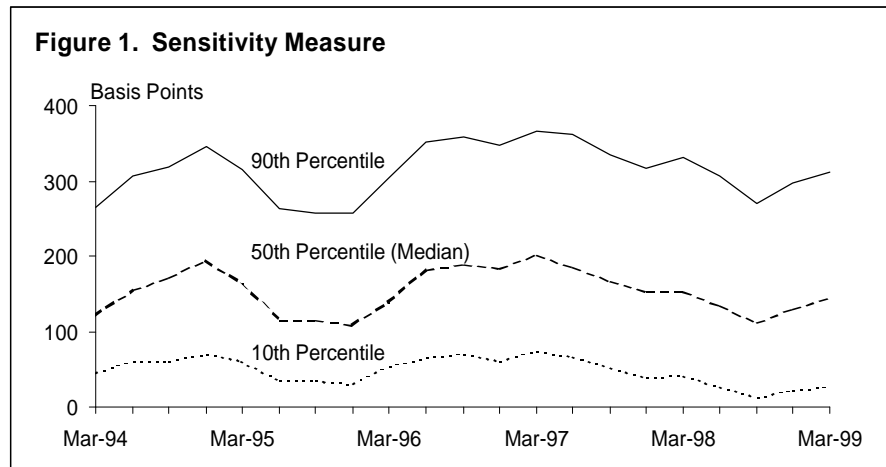
Sensitivity Increases for Second Consecutive Quarter

INDUSTRY TRENDS

The thrift industry's median sensitivity measure continued to rise for the second consecutive quarter. As shown in Figure 1, median sensitivity increased to 145 basis points in the first quarter of this year. Median sensitivity was 130 basis points in December and 112 basis points in September 1998. Prior to the recent increases in the past two quarters, the industry's median sensitivity had been steadily declining from its last peak of 201 basis points in March 1997.

Figure 2 shows the distribution of the sensitivity measure for the entire industry for the first quarter of 1999. Figure 2 also reports several key descriptive statistics for the distribution. Approximately 76 percent of the 1,019 reporting savings associations have a sensitivity measure between 50 and 250 basis points.

Similar to last quarter, an increase in interest rates in the first quarter and an increase in asset duration associated with the larger thrift holdings of 30-year fixed-rate mortgages



caused the increase in median sensitivity. Figure 3 shows that the yield curve shifted upward and steepened in the short-term maturity range between the fourth quarter of 1998 and the first quarter of 1999. The March 1999 yield curve is similar in shape to the March 1998 yield

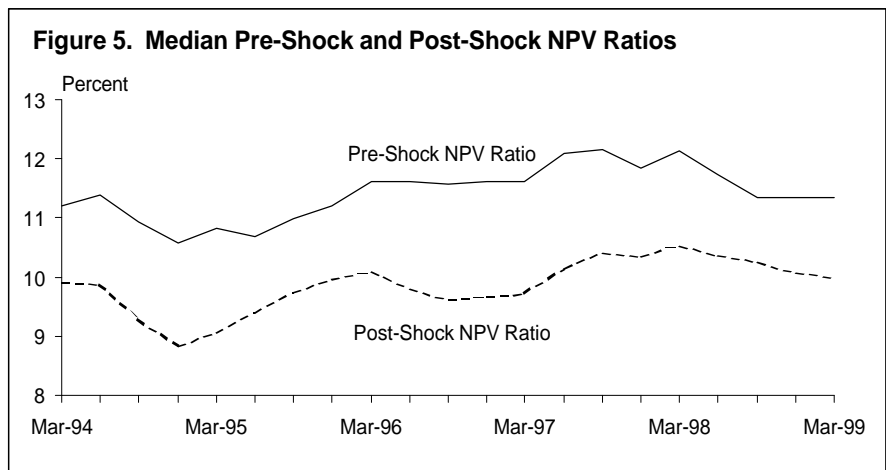
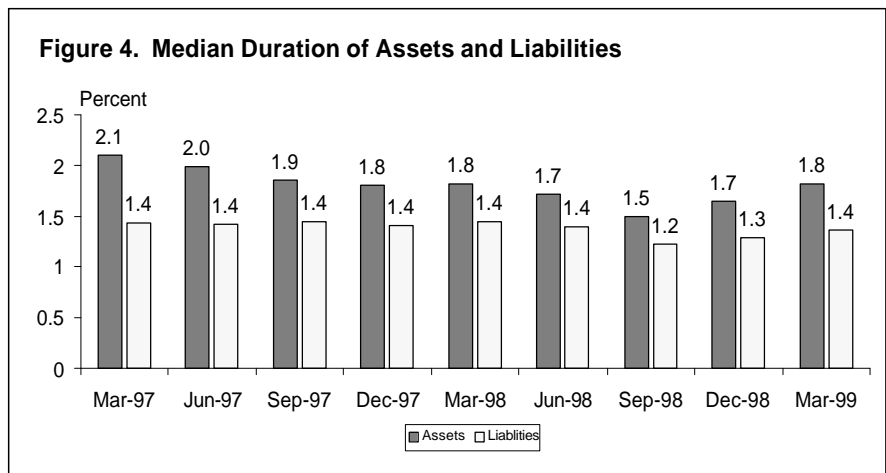
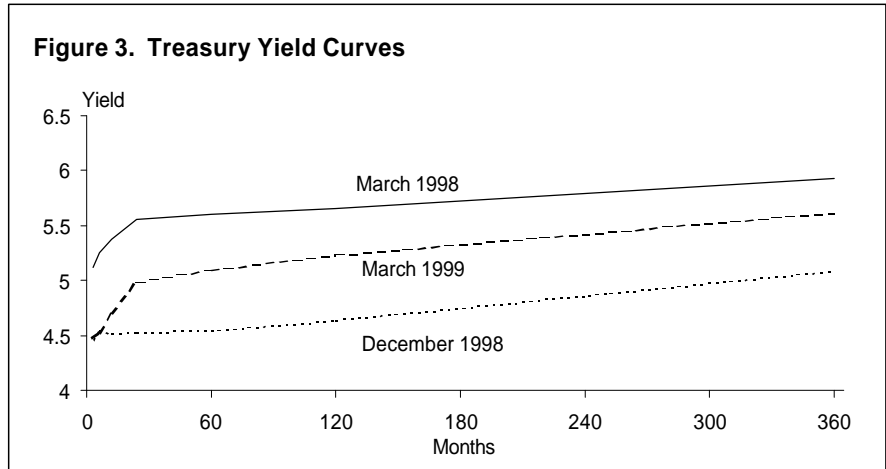
curve, although yields at all maturities are currently lower than they were one year ago. The flat and relatively low yield curves during the past several quarters generated the recent refinancing boom and increased homebuyer demand for long-term fixed rate mortgages.

Figure 4 shows that the median effective durations of the industry's assets and liabilities rose during the first quarter. The median effective duration for assets rose from 1.7 in the fourth quarter of 1998 to 1.8 in the first quarter of this year, while the median effective duration for liabilities rose from 1.3 to 1.4 during the same period. As was the case in the fourth quarter of last year, mortgage durations continued to increase as a result of recent refinancing activity and the strong demand for 30-year fixed rate mortgages. Similarly, the increase in liabilities duration appears to be due, once again, to the increased use of FHLB advances as a source of funding by savings associations.

As shown in Figure 5, the industry's median post-shock NPV ratio fell slightly to 10 percent in the first quarter, the fourth consecutive quarterly decline in this aggregate measure of the industry's ability to absorb additional interest rate shocks. Since the median pre-shock NPV ratio in the first quarter is virtually the same as it was during the past two quarters, the recent upward trend in the median sensitivity measure appears to be primarily responsible for this continued decline in the post-shock NPV ratio.

Gains and Losses

Table 1 reports the percentage change in the aggregate NPV and NPV ratio for the industry



under different interest rate scenarios. In the first quarter of 1999, the thrift industry would lose 19.7 percent of its net portfolio value if rates rose by 200 basis points, up from 16.3 per-

cent in the fourth quarter of last year. The industry would gain 6.6 percent in value if rates fell by 200 basis points. This measure demonstrates the high sensitivity of savings associations to

increases in interest rates. Historically, most thrift institutions are adversely affected by rising interest rates.

Figure 6 displays the impact of a 200 basis point increase in interest rates on the NPV of individual institutions. Of the 1,019 reporting savings associations, 86 percent would experience a loss of net portfolio value in this scenario, up from 82 percent in the fourth quarter of last year. About 30 percent of the industry would lose more than 20 percent of their economic value, if interest rates rose by 200 basis points, up from 20 and 25 percent in the third and fourth quarters of last year, respectively. This result is consistent with the increase in median interest rate sensitivity. Figure 7 displays the industry's distribution of gains and losses in net portfolio value for a decrease of 200 basis points in interest rates. Under this scenario, approximately 82 percent of reporting thrifts would experience increases in their net portfolio values, a 4 percentage point improvement from the fourth quarter of last year.

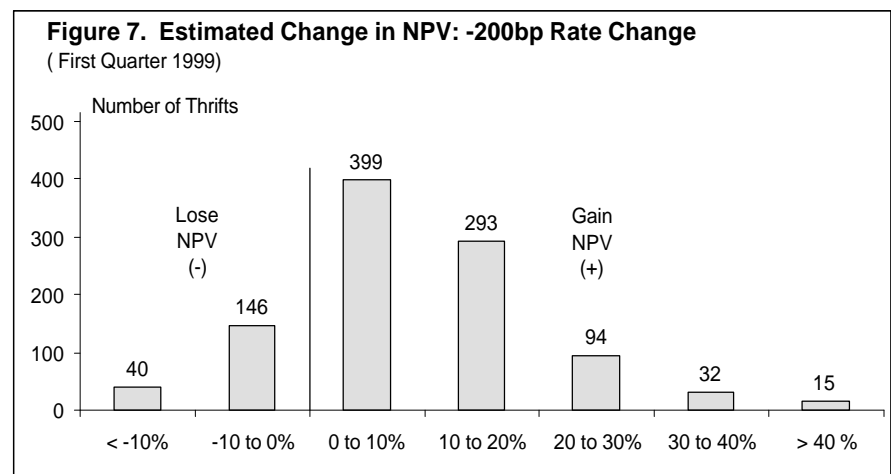
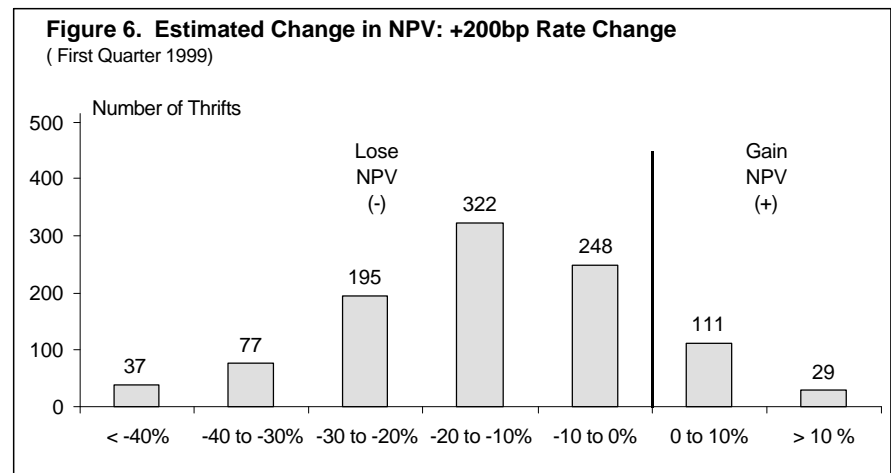
Figures 8 and 9 compare the distributions of gains and losses for the fourth quarter of 1998 with those for the first quarter of 1999 for both a 200 basis point decrease and increase in interest rates.

Highly Exposed Thrifts

As Figure 10 shows, the number of thrifts with post-shock NPV

Table 1. Interest Rate Risk Measures
(Industry Aggregate Data)

Change in Interest Rates (Basis Points)	Percentage Change in NPV			Ratio of NPV to Assets		
	Mar-98	Dec-98	Mar-99	Mar-98	Dec-98	Mar-99
+300	-27.6	-28.4	-33.7	8.0	7.0	6.4
+200	-16.1	-16.3	-19.7	9.1	8.1	7.5
+100	-6.6	-6.6	-8.2	10.0	8.9	8.5
Base Case	0.0	0.0	0.0	10.5	9.4	9.1
-100	3.2	2.7	3.9	10.8	9.5	9.3
-200	3.9	5.6	6.6	10.8	9.7	9.5
-300	5.9	11.2	11.1	10.9	10.1	9.8



ratios below 4 percent increased in the first quarter. The number of thrifts highly exposed to interest rate risk rose to fourteen, up from twelve in the fourth quarter and ten in the third

quarter of last year. This increase most likely reflects the continued decline in post-shock NPV ratios caused by the longer mortgage durations associated with recent refinancing activity.

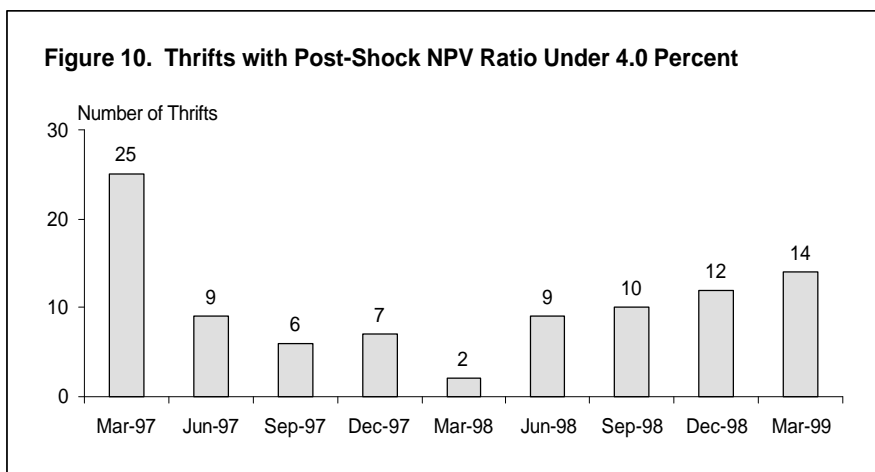
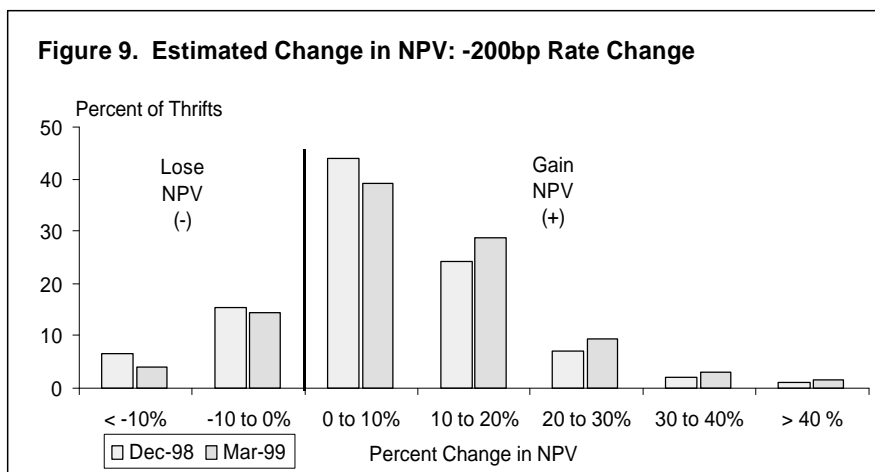
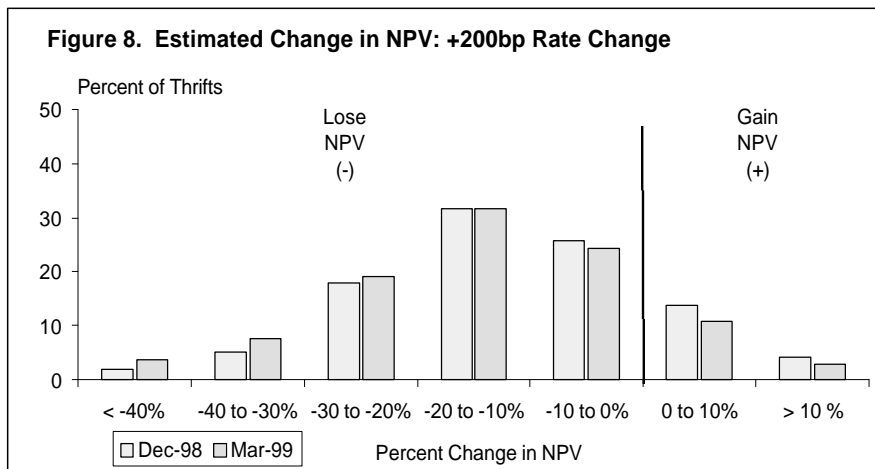
Figure 11 shows that the percent of thrifts with post-shock NPV ratios below 4 percent also increased to 1.37 percent of the industry. A thrift with a post-shock NPV ratio below 4 percent either has a relatively low level of capital, a high degree of NPV sensitivity, or both. These highly exposed thrifts are subject to heightened OTS supervision.

Regional Trends

Figure 12 shows the median sensitivity measures for the entire industry and for each OTS region for the fourth quarter of 1998 and the first quarter of 1999. The Northeast Region had the largest median sensitivity measure in the first quarter of 1999. The Midwest Region had the smallest in both quarters.

Figure 13 shows the median post-shock NPV ratio for the thrift industry and for each OTS region. For the industry, there was a decrease of 9 basis points in the post-shock NPV ratio between the fourth quarter of 1998 and first quarter of 1999. The West Region had the smallest post-shock NPV ratio in the first quarter of 1999. In addition, the West Region had the largest relative decline and its median post-shock NPV fell from 9.01 percent to 8.61 percent.

Appendices B1 to B5 present distributions for sensitivity, pre- and post-shock NPV ratios, and assets and liabilities durations for each OTS region.



CHARACTERISTICS OF NEW THRIFTS

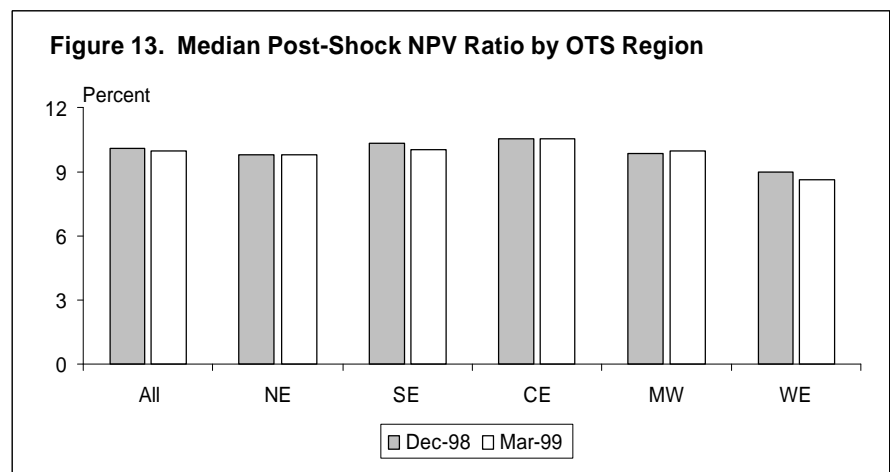
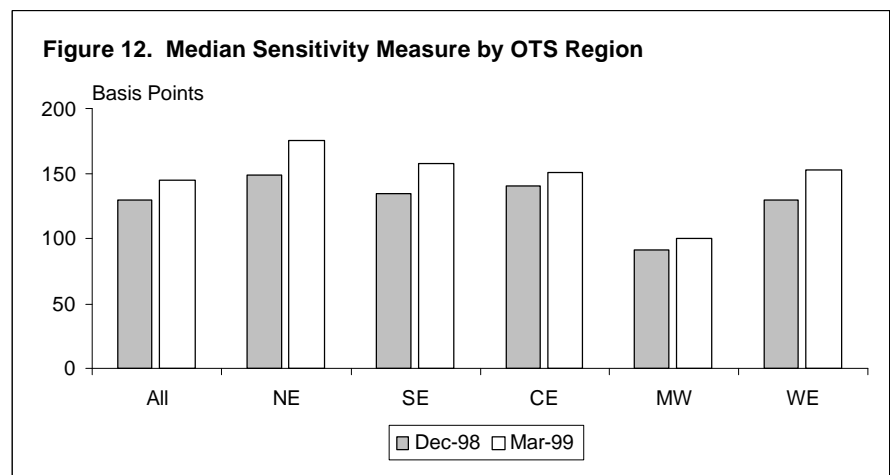
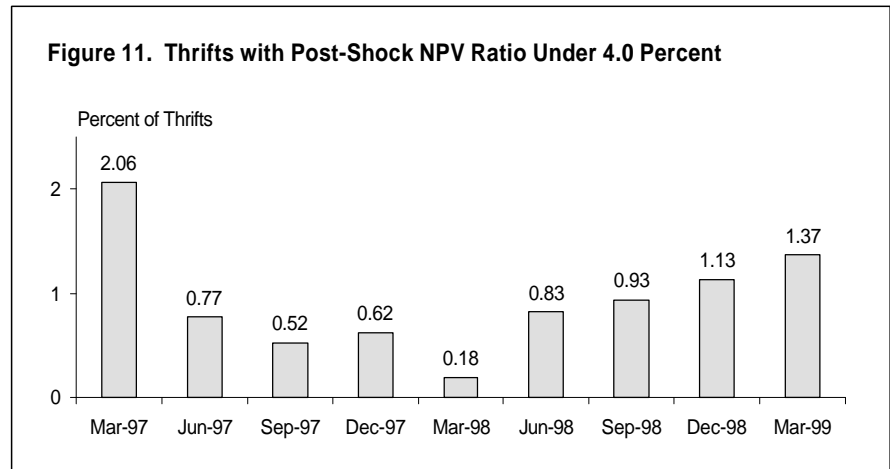
This section examines several characteristics of recent entrants into the thrift industry to assess

whether or not these new thrifts are different from older thrifts in terms of size, the composition of their portfolios, and their interest rate risk exposure. Given the recent increased demand for

new thrift charters, this empirical issue is particularly timely.

In conducting the analysis, March 1997 was set as the cut-off date for defining a new thrift versus an old thrift. Although 68 new thrifts were created during that period, only 34 of these were among the 1,019 savings associations reporting CMR data. Table 2 compares some standard financial characteristics for these new and existing CMR reporting thrifts. Not surprisingly, new thrifts are substantially smaller and less profitable than older thrifts. New thrifts also hold fewer mortgage assets.

Table 3 reports the median values for pre-shock and post-shock NPV ratios, sensitivity, asset and liabilities durations, and the dollar values of assets and liabilities for both new and old thrifts. Several important differences are evident between the two groups of thrifts. First, new thrifts have sensitivity that is almost one-half the size of sensitivity for old thrifts. Second, both the pre-shock and post-shock NPV ratios are considerably larger for new thrifts. This is particularly true for the post-shock NPV ratio. Finally, although liabilities duration is similar for both new and old thrifts, asset duration is much smaller. The substantially smaller duration mismatch between assets and liabilities no doubt accounts for the much smaller sensitivity of new thrifts.



To explore in more detail what lies behind the smaller asset duration of new thrifts, Table 4 reports the median percentage of fixed-rate and variable-rate mortgages held in portfolio for both new and old thrifts. The table reports median percentages for the various categories of mortgages and assets. There is a striking difference in the median

percentages between the two groups of thrifts. The percentage of 30- and 15-year fixed rate mortgages is much smaller for the new thrifts compared to the old thrifts, and new thrifts apparently hold very little in the way of adjustable-rate mortgages. These results are consistent with the much higher asset duration for old thrifts, since they hold many more mortgages with longer durations.

**THRIFT BULLETIN 13a
AND THE “S” RATING**

Table 5 shows the Summary of Guidelines for the “level of Interest Rate Risk” using post-shock NPV ratios and sensitivities produced by the NPV Model for the first quarter of 1999. For comparison, Table 6 presents results using the NPV Model for the fourth quarter of 1998. Each cell of the tables shows both the number of thrifts and the corresponding percent of thrifts with the various combinations of post-shock NPV ratio and sensitivity specified in Thrift Bulletin 13a.

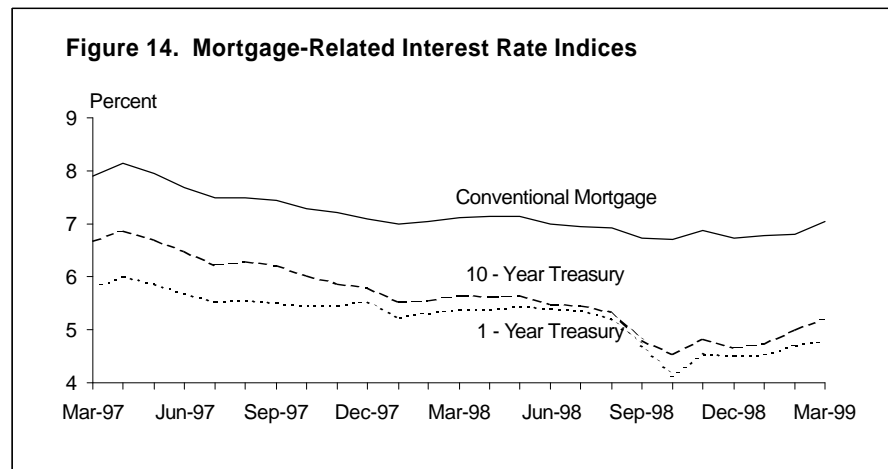
Of the 1,019 reporting thrifts in the first quarter of 1999, 50 percent had post-shock NPV ratios that exceeded 10 percent. With regard to interest rate sensitivity, 66.3 percent of thrifts had sensitivity measures of 200 basis points or less. Based on the “Level of Interest Rate Risk” guidance provided in Thrift Bulletin 13a, 77 percent of thrifts might initially be assigned a “1” risk rating, 15.7 percent a “2” rating, 5.6 percent

Table 2. Median of Assets, Liabilities and Capital - March 1999

Balance Sheet Category	Median Value (Totals in \$000)	
	New Thrifts	Old Thrifts
Total Assets	39,183	124,425
1-4 Family Mortgages	12,826	58,189
Mortgage-Pool Securities	673	4,804
Multifamily Mortgages	8	1,165
Nonresidential Mortgages	1,135	4,575
Construction Loans	479	1,379
Land Loans	127	353
Commercial Loans	819	490
Consumer Loans	2,486	3,557
Cash and Noninterest-Earning Deposits	1,032	1,357
Investment Securities	6,330	19,607
Repossessed Assets, Net	0	44
Real Estate Held for Investment, Net	0	0
Office Premises and Equipment	911	1,691
Other Assets	809	2,717
Less: Contra Assets & Valuation Allow.	245	525
<hr/>		
Total Liabilities and Capital	39,183	124,425
Total Deposits	34,433	95,719
Escrows	4	354
Borrowings	1,475	5,125
Other Liabilities	442	926
Equity Capital	4,568	13,154

Table 3. Interest Rate Sensitivity - March 1999

Measures	Median	
	New Thrifts	Old Thrifts
Pre-Shock NPV Ratio	11.65	11.32
Post-Shock NPV Ratio	11.40	9.98
Sensitivity	83	147
Asset Duration	1.42	1.83
Liability Duration	1.39	1.36



a “3” rating, and 1.6 percent a “4” or a “5” rating.

A comparison of Tables 5 and 6 reveals some differences between the fourth quarter of 1998 and the first quarter of 1999. First, there was an increase in the number of thrifts with post-shock NPV ratios below 4 percent in the first quarter. This point was discussed earlier. Second, there was a substantial decrease in the number of thrifts with sensitivity under 100 basis points in March 1999 (36 percent) compared to the previous quarter (40.9 percent).

Finally, there were noticeable increases in the number of thrifts with sensitivities in the 201 to 400 basis points and over 400 basis points categories by first quarter-end 1999. These results are consistent with the increase in median sensitivity and a decrease in the post-shock NPV ratio for the thrift industry in the first quarter of this year.

MORTGAGE-RELATED INTEREST INDICES

Figure 14 displays plots of two mortgage-related interest indices and the Freddie Mac commitment rate for 30-year fixed-rate mortgages, as reported by the Federal Reserve Board. The two interest indices are the one-year constant maturity Treasury (one-year CMT), which is representative of the various indices used to set one-year adjustable-rate mortgages (ARMs), and the ten-year constant maturity Treasury (ten-year CMT). The

Table 4. Median Percentage of FRMs and ARMs - March 1999

Asset Category	Median Percentage	
	% of Assets	% of Mortgages
New Thrifts		
30 year fix rate 1-4 family mortgage	2.11	5.45
30 year fix rate 1-4 family	0.00	0.00
15 year fix rate 1-4 family mortgage & M	4.02	12.68
Balloon 1-4 family mortgages & MBS	0.43	0.76
ARM 1-4 loans & MBS LE 6 mth current ind	0.00	0.00
ARM 1-4 loans & MBS GT 6 mth LE 2 yr cu	0.00	0.00
ARM 1-4 loans & MBS GT 2yr LE 5 yr curr	0.00	0.00
ARM 1-4 loans & MBS 1 mth lagging index	0.00	0.00
ARM 1-4 loans & MBS GE 2 mth LE 5 years	0.00	0.00
Old Thrifts		
30 year fix rate 1-4 family mortgage	6.42	9.61
30 year fix rate 1-4 family	0.16	0.24
15 year fix rate 1-4 family mortgage & M	14.43	20.96
Balloon 1-4 family mortgages & MBS	1.07	1.55
ARM 1-4 loans & MBS LE 6 mth current ind	0.10	0.15
ARM 1-4 loans & MBS GT 6 mth LE 2 yr cu	6.86	10.04
ARM 1-4 loans & MBS GT 2yr LE 5 yr curr	1.12	1.71
ARM 1-4 loans & MBS 1 mth lagging index	0.00	0.00
ARM 1-4 loans & MBS GE 2 mth LE 5 years	0.06	0.10

Table 5. Post-Shock NPV Ratio and Sensitivity Measure Matrix

March 1999	Sensitivity Measure				Total
	Under 100bp	101-200bp	201-400bp	Above 400bp	
Post-Shock NPV	# of Thrifts (% of Total)	# of Thrifts (% of Total)	# of Thrifts (% of Total)	# of Thrifts (% of Total)	
Over 10%	208 20.4%	139 13.6%	144 14.1%	19 1.9%	510
Risk	Minimal (1)	Minimal (1)	Minimal (1)	Moderate (2)	
6% to 10%	153 15.0%	137 13.4%	110 10.8%	12 1.2%	412
Risk	Minimal (1)	Minimal (1)	Moderate (2)	Significant (3)	
4% to 6%	5 0.5%	30 2.9%	42 4.1%	6 0.6%	83
Risk	Minimal (1)	Moderate (2)	Significant (3)	High (4 or 5)	
Below 4%	1 0.1%	3 0.3%	7 0.7%	3 0.3%	14
Risk	Moderate (2)	Significant (3)	High (4 or 5)	High (4 or 5)	
Total	367 36.0%	309 30.3%	303 29.7%	40 3.9%	1019 100%

plots show that the ten-year CMT index tracks the commitment rate for thirty-year fixed-rate mortgages (FRMs) well. Recent concerns about inflationary pressure associated with the ongoing economic expansion have fueled increases in the three series.

It is likely that the three interest rate series will continue to rise over the next several months as financial markets are bracing for the Federal Reserve Board to raise the Federal funds rate at the end of June and perhaps again before the end of the year.

Table 6. Post-Shock NPV Ratio and Sensitivity Measure Matrix

December 1998	Sensitivity Measure				Total
	Under 100bp	101-200bp	201-400bp	Above 400bp	
Post-Shock NPV	# of Thrifts (% of Total)	# of Thrifts (% of Total)	# of Thrifts (% of Total)	# of Thrifts (% of Total)	
Over 10% Risk	226 22.2% Minimal (1)	172 16.9% Minimal (1)	127 12.5% Minimal (1)	17 1.7% Moderate (2)	542 53.2%
6% to 10% Risk	182 17.9% Minimal (1)	146 14.3% Minimal (1)	105 10.3% Moderate (2)	11 1.1% Significant (3)	444 43.6%
4% to 6% Risk	9 0.9% Minimal (1)	24 2.4% Moderate (2)	26 2.6% Significant (3)	3 0.3% High (4 or 5)	62 6.1%
Below 4% Risk	0 0.0% Moderate (2)	2 0.2% Significant (3)	7 0.7% High (4 or 5)	3 0.3% High (4 or 5)	12 1.2%
Total	417 40.9%	344 33.8%	265 26.0%	34 3.3%	1060 100%

Tidbit for the Quarter

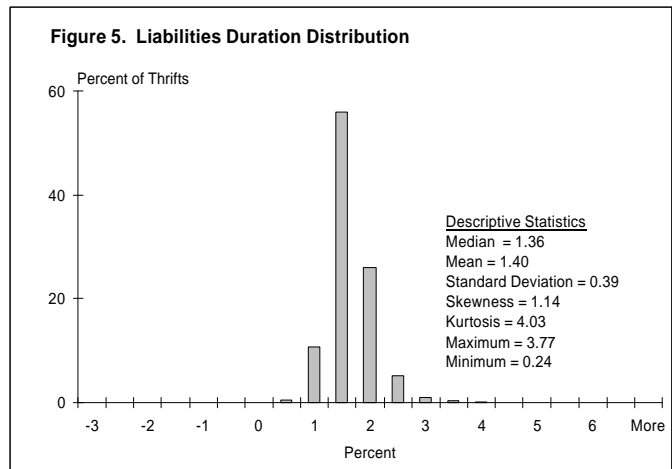
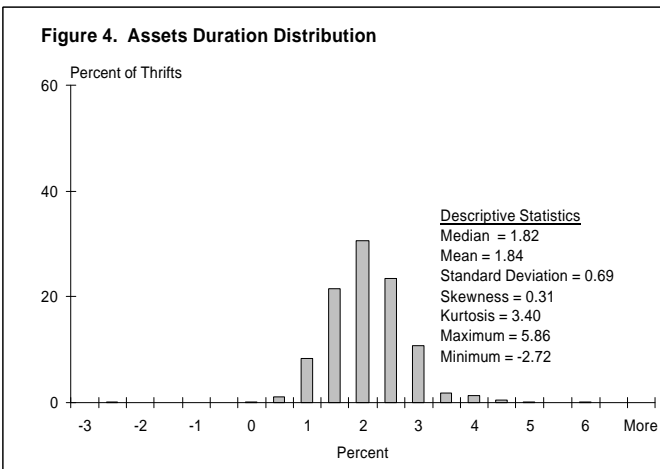
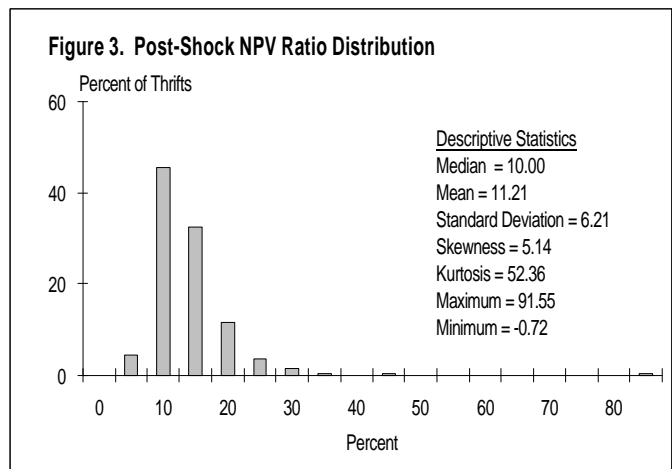
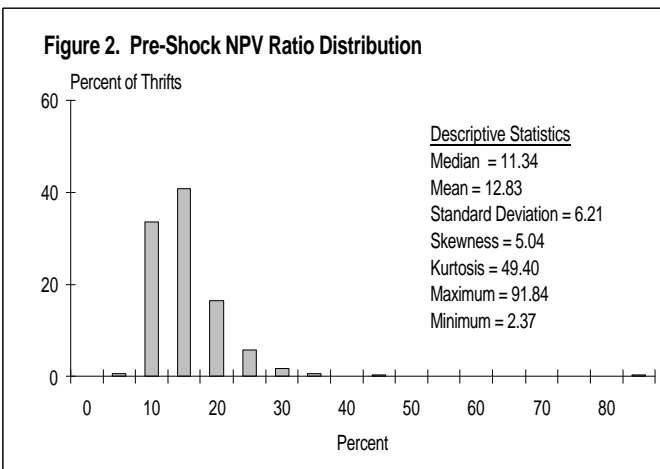
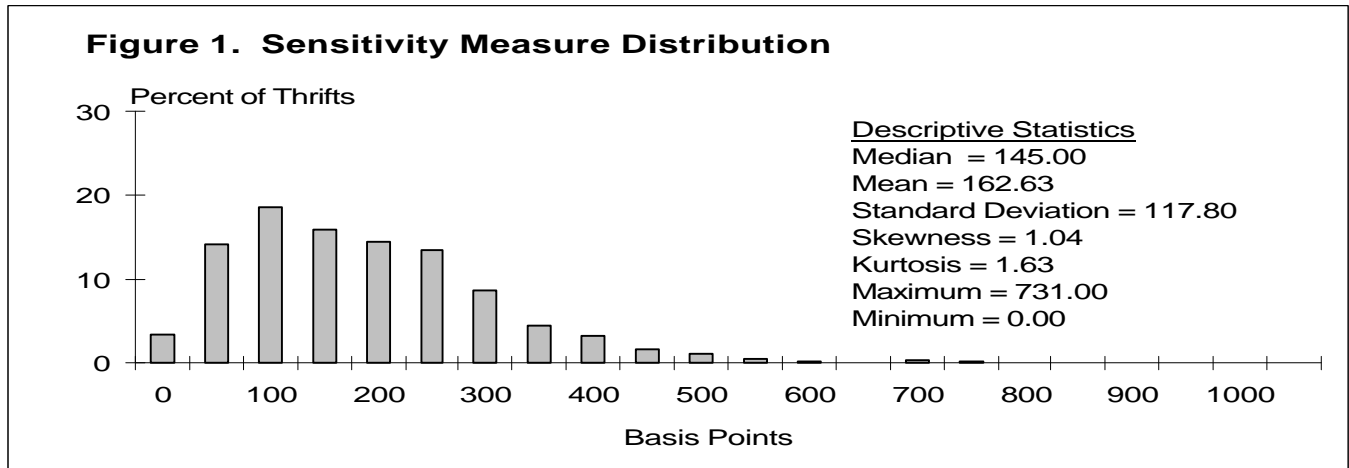
According to Donald van Deventer and Jonathan Levin, both of the Kamakura Corporation, the importance of a mark-to-market approach to risk management at financial institutions cannot be emphasized enough. Unfortunately, many major financial institutions continue to use net income modeling to assess their interest rate risk and to set risk limits. The use of net income modeling instead of a mark-to-market approach is fraught with perils:

- Between 1982 and 1992, there were 1,442 banks that went bankrupt in the U. S. according to the Federal Reserve Board. Clearly all of these banks were users of net income simulation, a standard tool, and it wasn't enough to prevent their demise.
- The entire savings and loan industry in the U. S. during the late 1970s was using net income simulation, but the view of the future was so short-typically one or two years ahead-that management never perceived interest rate risk as a serious problem until it was too late.
- Most net income forecasts miss the key risks in a bank balance sheet:
 - (1) credit risk
 - (2) long-term mismatches between assets and liabilities
 - (3) caps and floors out of the range of the typical up 200 basis points and down 200 basis points
 - (4) prepayment risk
 - (5) non-maturity deposit risk
- Reinvestment risk is a serious problem. A true net income simulation should take this into account, but almost none do.

Only a true mark-to-market risk management effort can avoid these problems. [This material was taken from "Kamakura Risk Manager, TSER/OAV, and Global Trader," Donald van Deventer and Jonathan Levin, Chap. 19, *Interest Rate Risk Models: Theory and Practice*, Anthony Cornyn and Elizabeth Mays, editors, 1997.

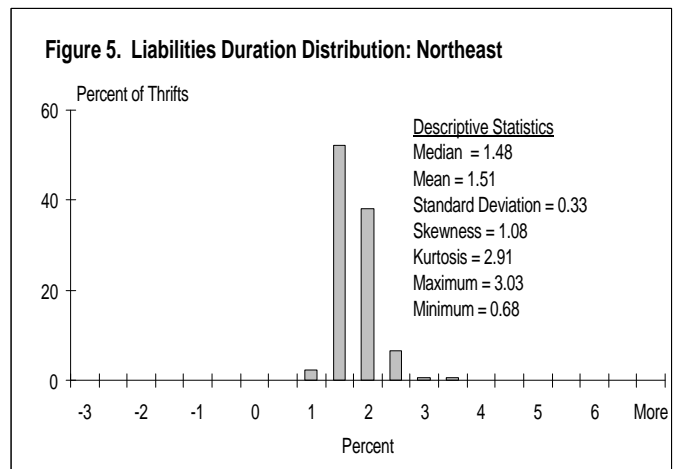
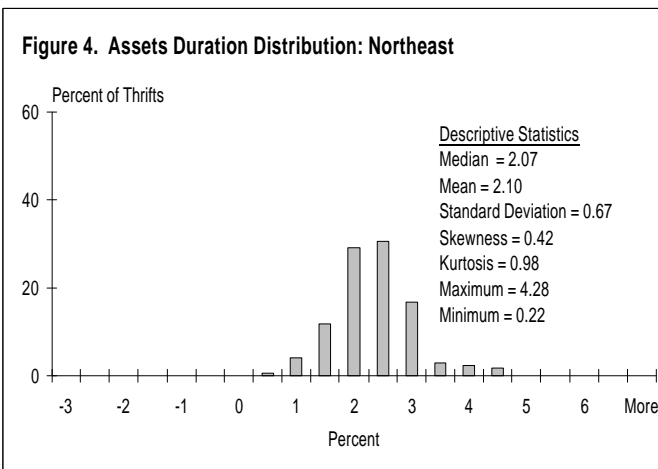
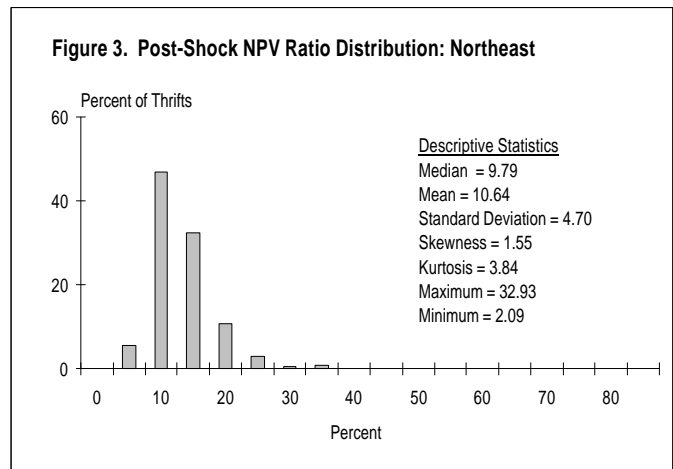
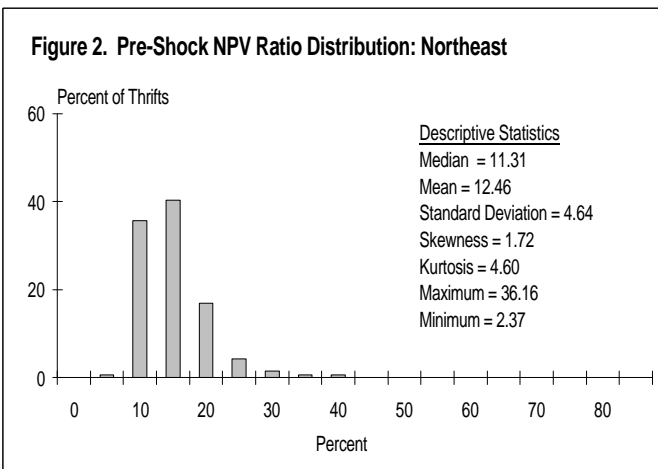
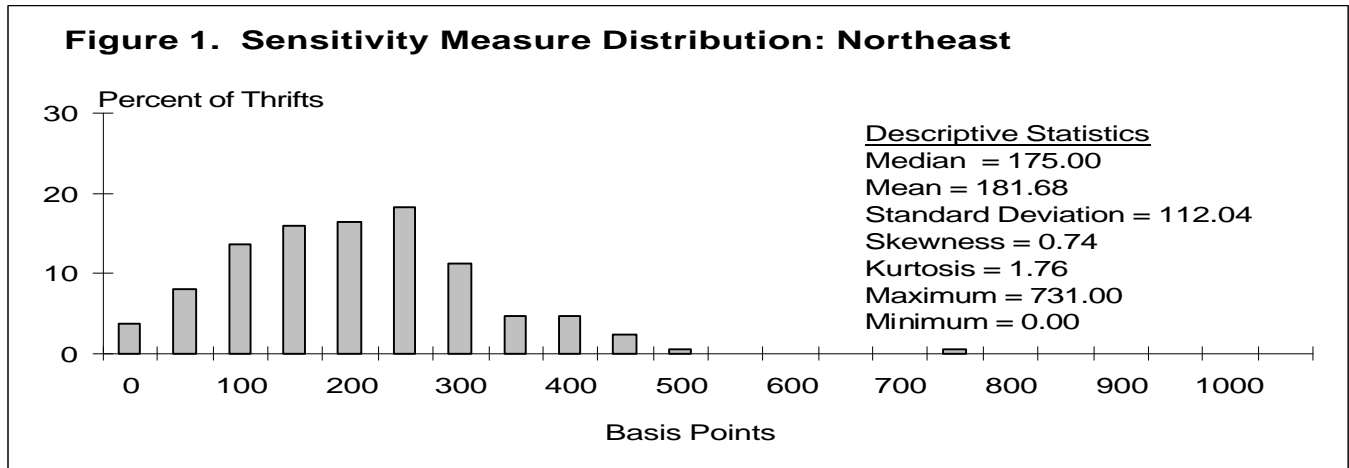
Appendix A (All Thrifts)

This appendix presents distributions for sensitivity, pre-shock and post-shock NPV ratios, and assets and liabilities duration for all reporting thrifts at first quarter end 1999. Also included in each figure are descriptive statistics.



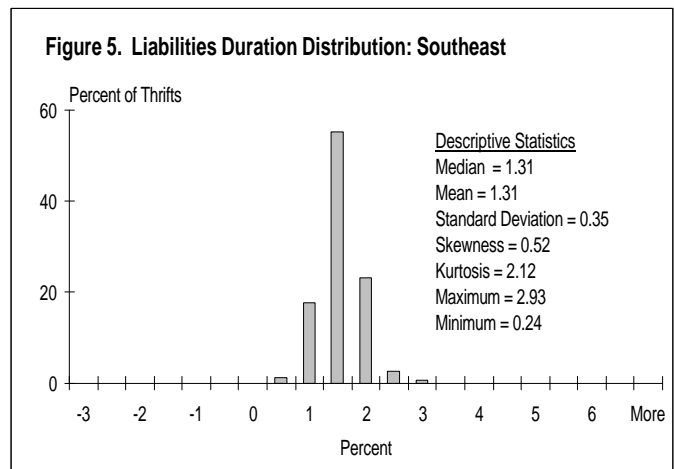
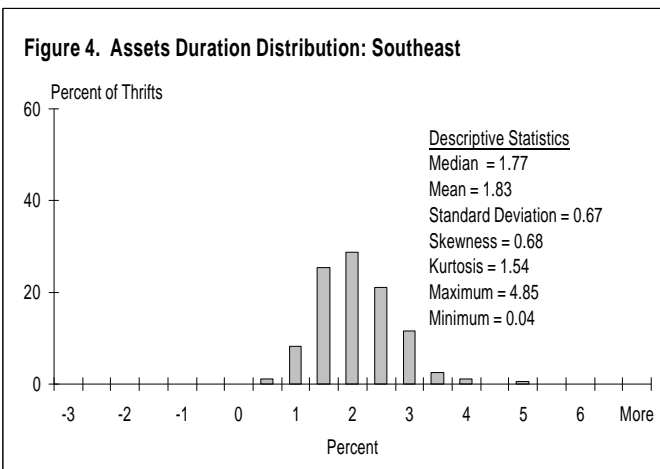
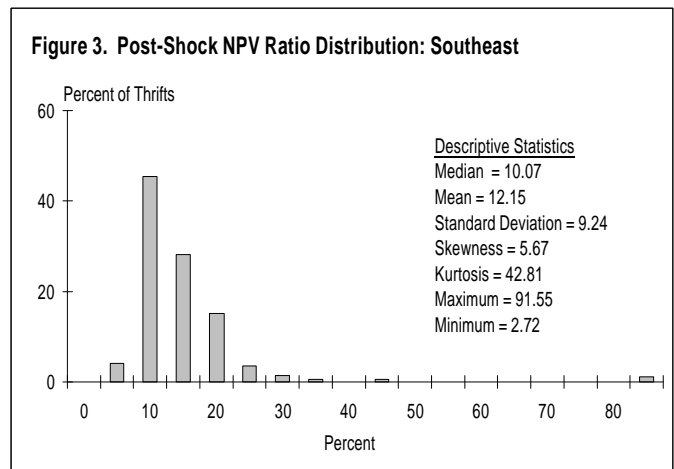
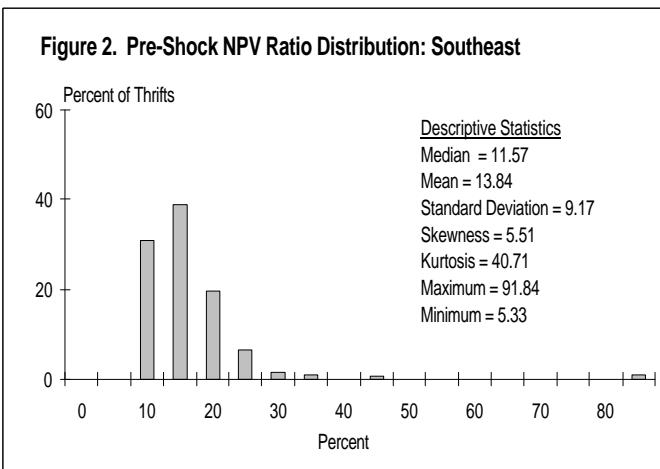
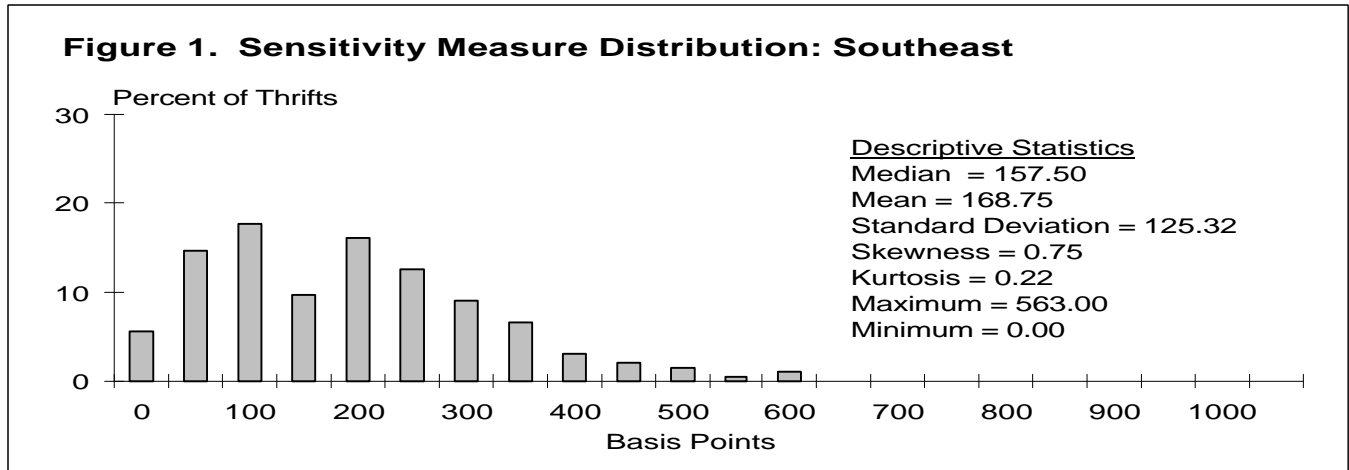
Appendix B 1 (Northeast Region)

This appendix presents distributions for sensitivity, pre-shock and post-shock NPV ratios, and assets and liabilities duration for reporting thrifts in the Northeast Region at first quarter end 1999. Also included in each figure are descriptive statistics.



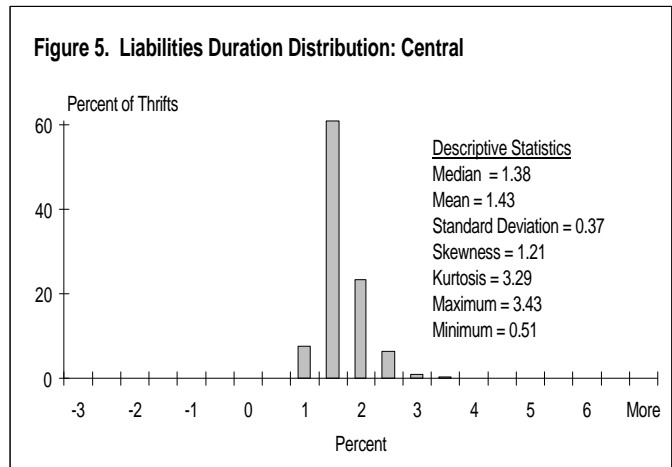
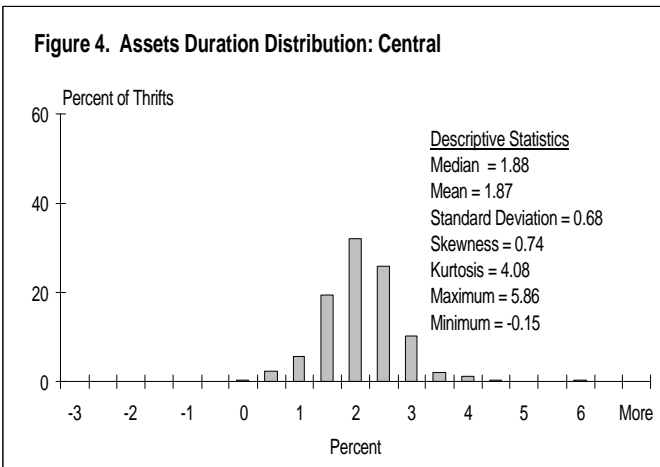
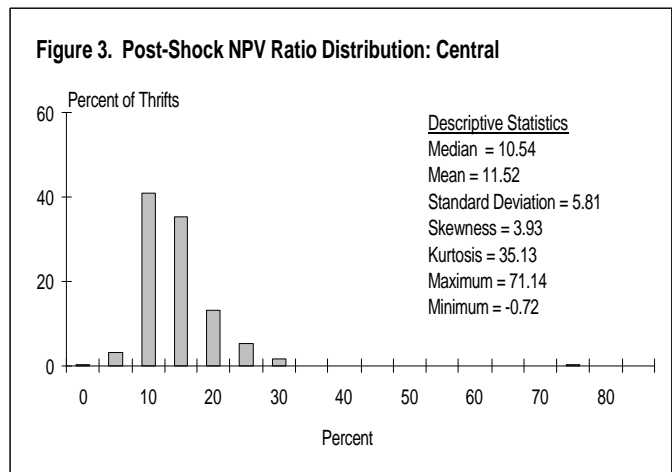
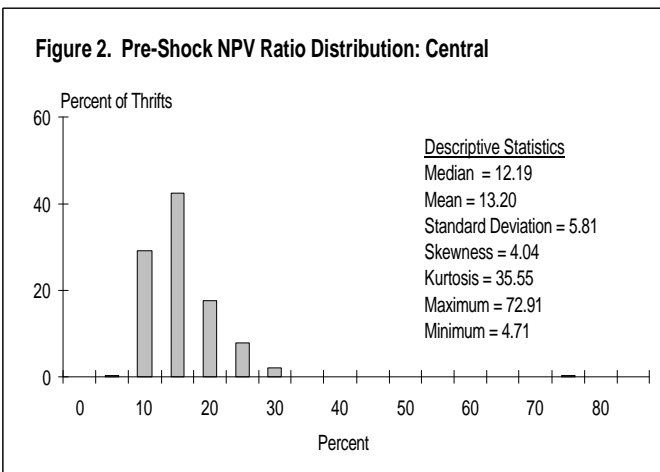
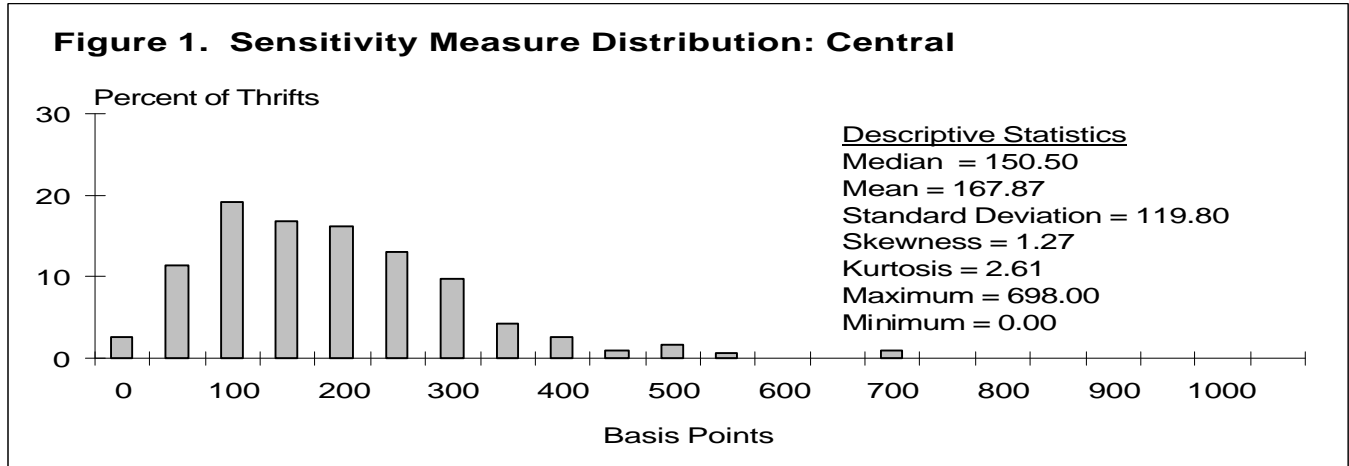
Appendix B 2 (Southeast Region)

This appendix presents distributions for sensitivity, pre-shock and post-shock NPV ratios, and assets and liabilities duration for reporting thrifts in the Southeast Region at first quarter end 1999. Also included in each figure are descriptive statistics.



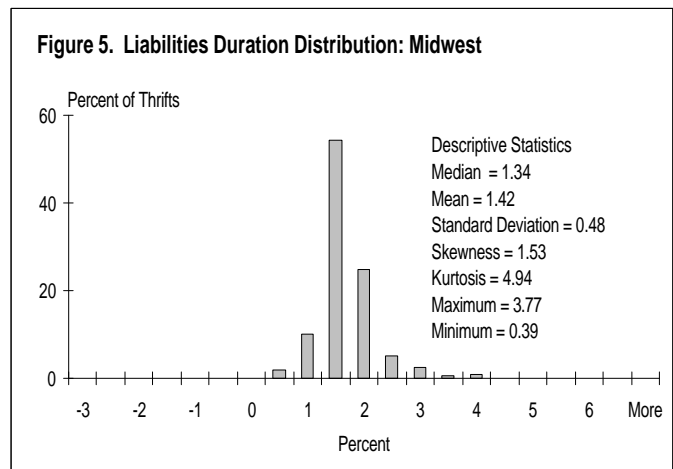
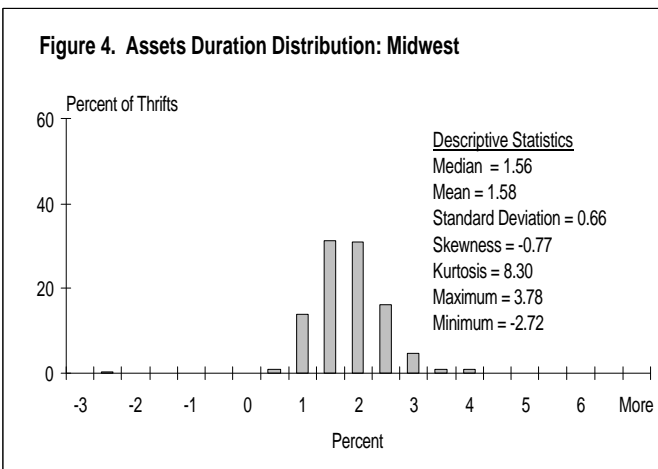
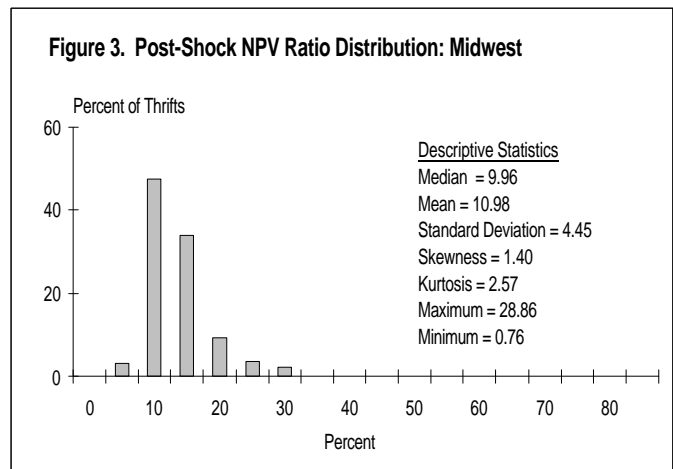
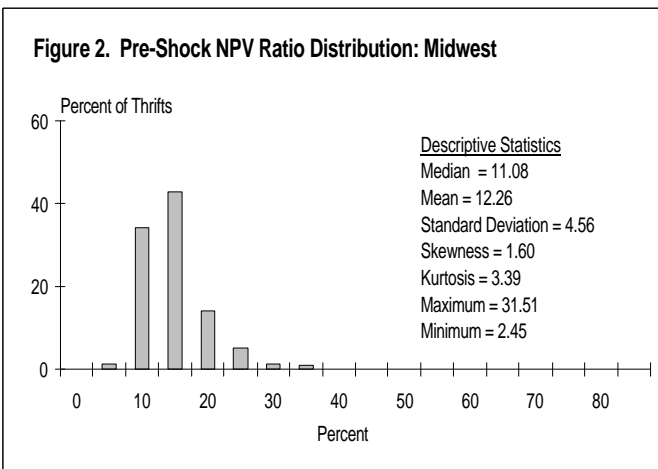
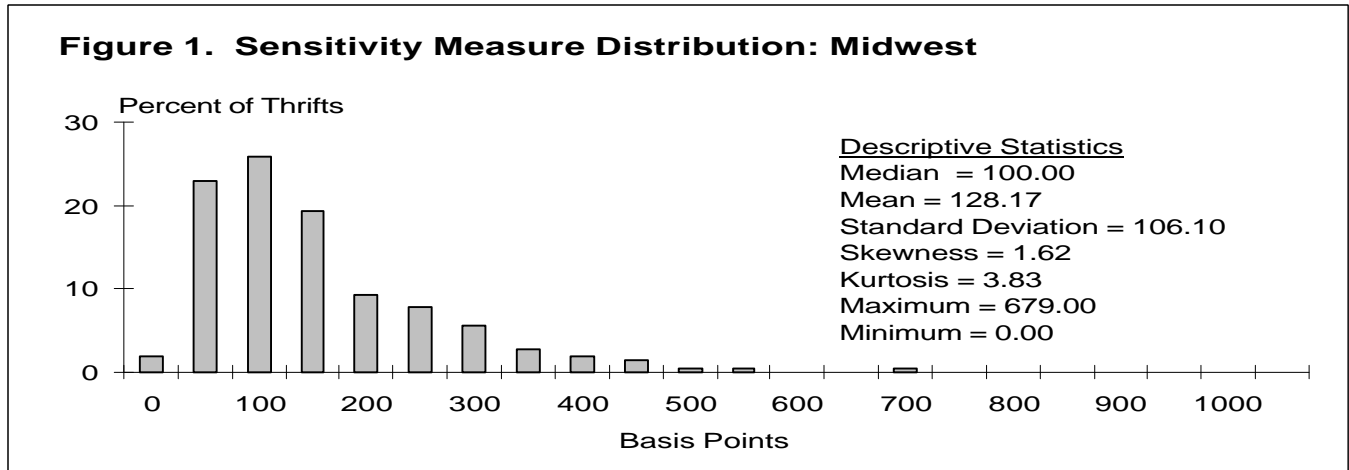
Appendix B 3 (Central Region)

This appendix presents distributions for sensitivity, pre-shock and post-shock NPV ratios, and assets and liabilities duration for reporting thrifts in the Central Region at first quarter end 1999. Also included in each figure are descriptive statistics.



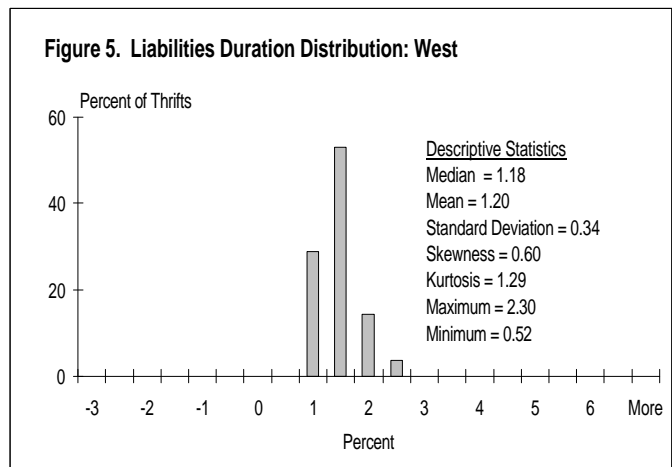
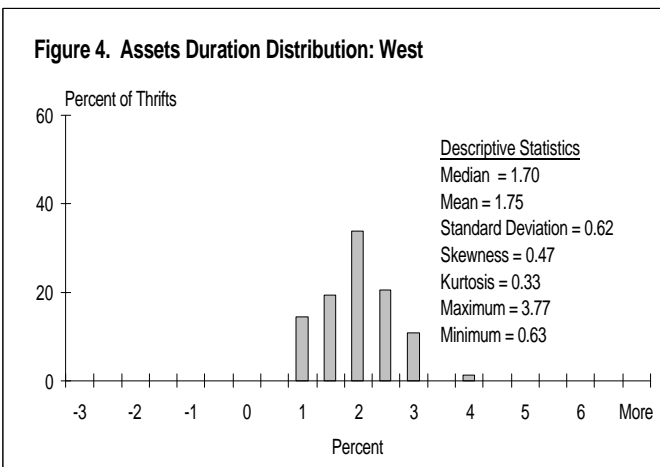
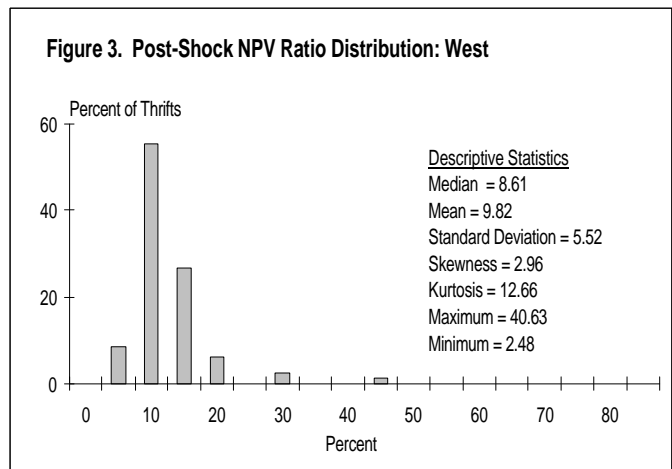
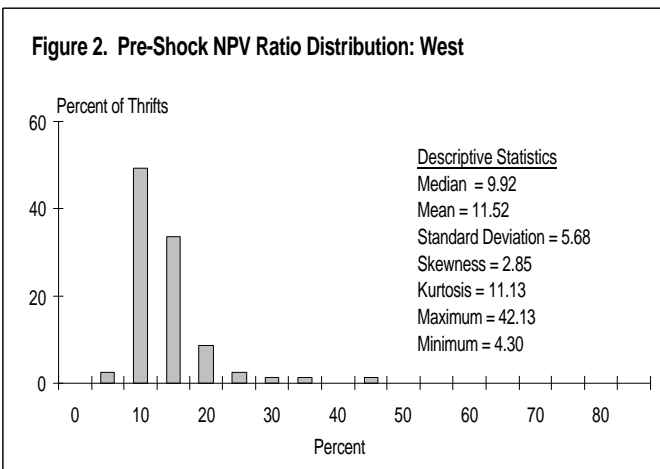
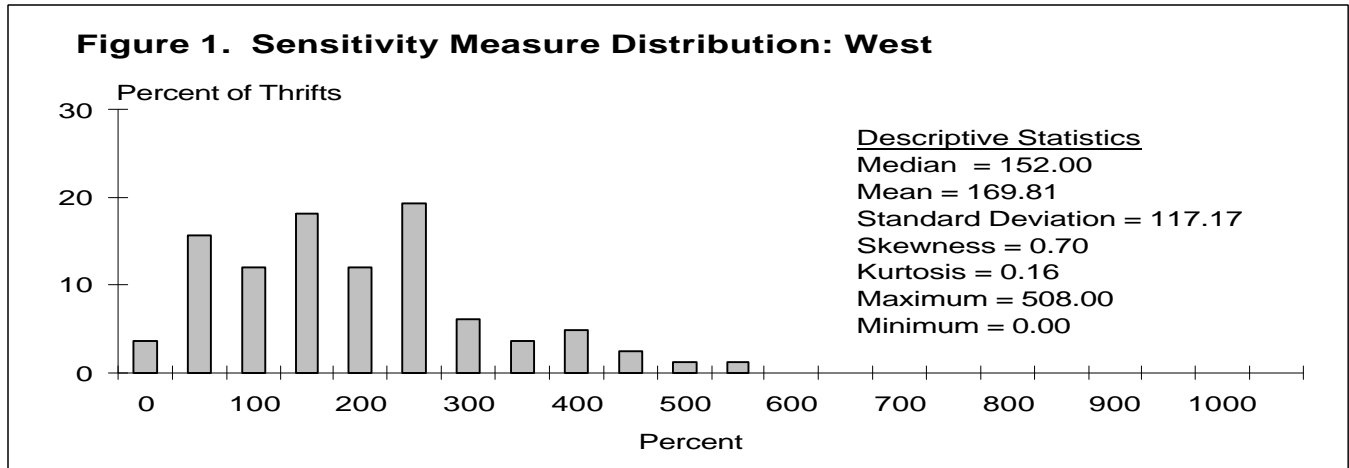
Appendix B 4 (Midwest Region)

This appendix presents distributions for sensitivity, pre-shock and post-shock NPV ratios, and assets and liabilities duration for reporting thrifts in the Midwest Region at first quarter end 1999. Also included in each figure are descriptive statistics.



Appendix B 5 (West Region)

This appendix presents distributions for sensitivity, pre-shock and post-shock NPV ratios, and assets and liabilities duration for reporting thrifts in the West Region at first quarter end 1999. Also included in each figure are descriptive statistics.



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 expressed in present value terms following an adverse 200 basis point interest rate shock. 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	Duration is a measure of the price sensitivity of a financial instrument for small changes in yield. The higher the duration of an instrument, the greater is its price sensitivity. For example, an asset with duration of 1.6 will appreciate in value by about 1.6 percent for a one percentage point (100 basis points) decline in yield. The reverse would hold if yields rose by one percent.
Kurtosis	The kurtosis statistic measures the tendency of data to be distributed toward the tails, or ends, of the distribution. A distribution that is approximately normal has a kurtosis statistic close to 0.
Skewness	The skewness statistic measures the degree to which the data of a distribution are 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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