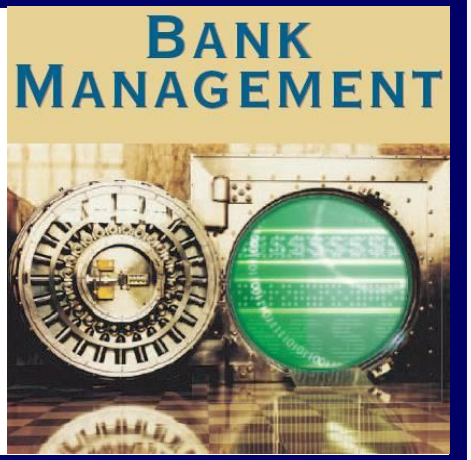
Managing Interest Rate Risk: GAP and Earnings Sensitivity

Lecture 5 and 6



Interest Rate Risk

- **Interest Rate Risk**
  - **The potential loss from unexpected changes in interest rates which can significantly alter a bank's profitability and market value of equity.**

Interest Rate Risk: GAP & Earnings Sensitivity

- When a bank's assets and liabilities do not reprice at the same time, the result is a change in net interest income.
  - The change in the value of assets and the change in the value of liabilities will also differ, causing a change in the value of stockholder's equity

Interest Rate Risk

- Banks typically focus on either:
  - Net interest income or
  - The market value of stockholders' equity
- GAP Analysis
  - A static measure of risk that is commonly associated with net interest income (margin) targeting
- Earnings Sensitivity Analysis
  - Earnings sensitivity analysis extends GAP analysis by focusing on changes in bank earnings due to changes in interest rates and balance sheet composition

Asset and Liability Management Committee (ALCO)

- The ALCO's primary responsibility is interest rate risk management.
- The ALCO coordinates the bank's strategies to achieve the optimal risk/reward trade-off.

Two Types of Interest Rate Risk

- **Spread Risk (reinvestment rate risk)**
  - **Changes in interest rates will change the bank's cost of funds as well as the return on their invested assets. They may change by different amounts.**
- **Price Risk**
  - **Changes in interest rates may change the market values of the bank's assets and liabilities by different amounts.**

Interest Rate Risk:
Spread (Reinvestment Rate) Risk

- If interest rates change, the bank will have to reinvest the cash flows from assets or refinance rolled-over liabilities at a different interest rate in the future.
  - An increase in rates, ceteris paribus, increases a bank's interest income but also increases the bank's interest expense.
- Static GAP Analysis considers the impact of changing rates on the bank's net interest income.

Interest Rate Risk:
Price Risk

- If interest rates change, the market values of assets and liabilities also change.
  - The longer is duration, the larger is the change in value for a given change in interest rates.
- Duration GAP considers the impact of changing rates on the market value of equity.

Measuring Interest Rate Risk with GAP

- **Example:**
  - **A bank makes a $10,000 four-year car loan to a customer at fixed rate of 8.5%. The bank initially funds the car loan with a one-year $10,000 CD at a cost of 4.5%. The bank's initial spread is 4%.**

4 year Car Loan	8.50%
1 Year CD	4.50%
	4.00%

  - **What is the bank's risk?**

Measuring Interest Rate Risk with GAP

- **Traditional Static GAP Analysis**

  $GAP_t = RSA_t - RSL_t$

  - RSA_t
    - Rate Sensitive Assets
      - Those assets that will mature or reprice in a given time period (t)
  - RSL_t
    - Rate Sensitive Liabilities
      - Those liabilities that will mature or reprice in a given time period (t)

Measuring Interest Rate Risk with GAP

- **Traditional Static GAP Analysis**
  - **What is the bank's 1-year GAP with the auto loan?**
    - RSA_{1yr} = $0
    - RSL_{1yr} = $10,000
    - GAP_{1yr} = $0 - $10,000 = -$10,000
      - The bank's one year funding GAP is -10,000
      - If interest rates rise (fall) in 1 year, the bank's margin will fall (rise)

Measuring Interest Rate Risk with GAP

- **Traditional Static GAP Analysis**
  - **Funding GAP**
    - **Focuses on managing net interest income in the short-run**
    - **Assumes a 'parallel shift in the yield curve,' or that all rates change at the same time, in the same direction and by the same amount.**
      Does this ever happen?

Traditional Static GAP Analysis

Steps in GAP Analysis

- Develop an interest rate forecast
- Select a series of “time buckets” or intervals for determining when assets and liabilities will reprice
- Group assets and liabilities into these “buckets ”
- Calculate the GAP for each “bucket ”
- Forecast the change in net interest income given an assumed change in interest rates

What Determines Rate Sensitivity (Ignoring Embedded Options)?

- An asset or liability is considered rate sensitivity if during the time interval:
  - It matures
  - It represents and interim, or partial, principal payment
  - It can be repriced
    - The interest rate applied to the outstanding principal changes contractually during the interval
    - The outstanding principal can be repriced when some base rate of index changes and management expects the base rate / index to change during the interval

What are RSAs and RSLs?

- Considering a 0-90 day "time bucket," RSAs and RSLs include:
  - Maturing instruments or principal payments
    - If an asset or liability matures within 90 days, the principal amount will be repriced
    - Any full or partial principal payments within 90 days will be repriced
  - Floating and variable rate instruments
    - If the index will contractually change within 90 days, the asset or liability is rate sensitive
    - The rate may change daily if their base rate changes.
      - *Issue: do you expect the base rate to change?*

Factors Affecting Net Interest Income

- Changes in the level of interest rates
- Changes in the composition of assets and liabilities
- Changes in the volume of earning assets and interest-bearing liabilities outstanding
- Changes in the relationship between the yields on earning assets and rates paid on interest-bearing liabilities

Factors Affecting Net Interest Income: *An Example*

- **Consider the following balance sheet:**

Expected Balance Sheet for Hypothetical Bank

	Assets	Yield	Liabilities	Cost
Rate sensitive	$ 500	8.0%	$ 600	4.0%
Fixed rate	$ 350	11.0%	$ 220	6.0%
Non earning	$ 150		$ 100	
			$ 920	
			Equity	
			$ 80	
Total	$ 1,000		$ 1,000	

NII = (0.08 x 500 + 0.11 x 350) - (0.04 x 600 + 0.06 x 220)
NII = 78.5 - 37.2 = 41.3
NIM = 41.3 / 850 = 4.86%
GAP = 500 - 600 = -100

Examine the impact of the following changes

- A 1% increase in the level of all short-term rates?
- A 1% decrease in the spread between assets yields and interest costs such that the rate on RSAs increases to 8.5% and the rate on RSLs increase to 5.5%?
- Changes in the relationship between short-term asset yields and liability costs
- A proportionate doubling in size of the bank?

1% increase in short-term rates

Expected Balance Sheet for Hypothetical Bank

	Assets	Yield	Liabilities	Cost
Rate sensitive	$ 500	9.0%	$ 600	5.0%
Fixed rate	$ 350	11.0%	$ 220	6.0%
Non earning	$ 150		$ 100	
			$ 920	
			Equity	
			$ 80	
Total	$ 1,000		$ 1,000	

NII = (0.09 x 500 + 0.11 x 350) - (0.05 x 600 + 0.06 x 220)

NII = 83.5 - 43.2 = 40.3

NIM = 40.3 / 850 = 4.74%

GAP = 500 - 600 = -100

With a negative GAP, more liabilities than assets reprice higher; hence NII and NIM fall

1% decrease in the spread

Expected Balance Sheet for Hypothetical Bank

	Assets	Yield	Liabilities	Cost
Rate sensitive	$ 500	8.5%	$ 600	5.5%
Fixed rate	$ 350	11.0%	$ 220	6.0%
Non earning	$ 150		$ 100	
			$ 920	
			Equity	
			$ 80	
Total	$ 1,000		$ 1,000	

NII = (0.085 x 500 + 0.11 x 350) - (0.055 x 600 + 0.06 x 220)

NII = 81 - 46.2 = 34.8

NIM = 34.8 / 850 = 4.09%

GAP = 500 - 600 = -100

NII and NIM fall (rise) with a decrease (increase) in the spread.

Why the larger change?

Changes in the Slope of the Yield Curve

- If liabilities are short-term and assets are long-term, the spread will
  - widen as the yield curve increases in slope
  - narrow when the yield curve decreases in slope and/or inverts

Proportionate doubling in size

Expected Balance Sheet for Hypothetical Bank

	Assets	Yield	Liabilities	Cost
Rate sensitive	$ 1,000	8.0%	$ 1,200	4.0%
Fixed rate	$ 700	11.0%	$ 440	6.0%
Non earning	$ 300		$ 200	
			$ 1,840	
			Equity	
			$ 160	
Total	$ 2,000		$ 2,000	

NII = (0.08 x 1000 + 0.11 x 700) - (0.04 x 1200 + 0.06 x 440)

NII = 157 - 74.4 = 82.6

NIM = 82.6 / 1700 = 4.86%

GAP = 1000 - 1200 = -200

NII and GAP double, but NIM stays the same.

What has happened to risk?

Changes in the Volume of Earning Assets and Interest-Bearing Liabilities

- **Net interest income varies directly with changes in the volume of earning assets and interest-bearing liabilities, regardless of the level of interest rates**

RSAs increase to $540 while fixed-rate assets decrease to $310 and RSLs decrease to $560 while fixed-rate liabilities increase to $260

Expected Balance Sheet for Hypothetical Bank

	Assets	Yield	Liabilities	Cost
Rate sensitive	$ 540	8.0%	$ 560	4.0%
Fixed rate	$ 310	11.0%	$ 260	6.0%
Non earning	$ 150		$ 100	
			$ 920	
			Equity	
			$ 80	
Total	$ 1,000		$ 1,000	

NII = (0.08 x 540 + 0.11 x 310) - (0.04 x 560 + 0.06 x 260)

NII = 77.3 - 38 = 39.3

NIM = 39.3 / 850 = 4.62%

GAP = 540 - 560 = -20

Although the bank's GAP (and hence risk) is lower, NII is also lower.

Changes in Portfolio Composition and Risk

- To reduce risk, a bank with a negative GAP would try to increase RSAs (variable rate loans or shorter maturities on loans and investments) and decrease RSLs (issue relatively more longer-term CDs and fewer fed funds purchased)
- Changes in portfolio composition also raise or lower interest income and expense based on the type of change

Changes in Net Interest Income are directly proportional to the size of the GAP

- If there is a parallel shift in the yield curve:

$$\Delta NII_{exp} = GAP \times \Delta i_{exp}$$

- It is rare, however, when the yield curve shifts parallel
  - If rates do not change by the same amount and at the same time, then net interest income may change by more or less.

Summary of GAP and the Change in NII

GAP Summary					
GAP	**Change in Interest Income**	**Change in Interest Income**		**Change in Interest Expense**	**Change in Net Interest Income**
Positive	Increase	Increase	>	Increase	Increase
Positive	Decrease	Decrease	>	Decrease	Decrease
Negative	Increase	Increase	<	Increase	Decrease
Negative	Decrease	Decrease	<	Decrease	Increase
Zero	Increase	Increase	=	Increase	None
Zero	Decrease	Decrease	=	Decrease	None

Rate, Volume, and Mix Analysis

- Banks often publish a summary of how net interest income has changed over time.
  - They separate changes over time to:
    - shifts in assets and liability composition and volume
    - changes associated with movements in interest rates.
  - The purpose is to assess what factors influence shifts in net interest income over time.

Measuring Interest Rate Risk: Synovus

	2004 Compared to 2003 Change Due to *			2003 Compared to 2002 Change Due to *		
Interest earned on:	Volume	Yield/Rate	Net Change	Volume	Yield/Rate	Net Change
Taxable loans, net	$ 149,423	(117,147)	32,276	161,222	36,390	197,612
Tax-exempt loans, net†	1,373	(586)	787	1,108	(450)	658
Taxable investment securities	(5,313)	(916)	(6,229)	4,507	2,570	7,077
Tax-exempt investment securities†	2,548	74	2,622	2,026	(206)	1,820
Interest earning deposits with banks	223	(176)	47	28	48	76
Federal funds sold and securities purchased under resale agreements	406	(1,745)	(1,339)	1,447	1,410	2,857
Mortgage loans held for sale	7,801	(1,680)	6,121	(113)	549	436
Total interest income	156,461	(122,176)	34,285	170,225	40,311	210,536
Interest paid on:						
Interest bearing demand deposits	6,074	(12,517)	(6,443)	1,537	5,433	6,970
Money market accounts	21,380	(36,244)	(14,864)	4,654	13,888	18,542
Savings deposits	(369)	(3,307)	(3,676)	(660)	(67)	(727)
Time deposits	32,015	(22,545)	9,470	38,824	32,812	71,636
Federal funds purchased and securities sold under repurchase agreements	(6,165)	(29,744)	(35,909)	23,148	15,870	39,018
Other borrowed funds	21,318	(4,272)	17,046	21,960	3,361	25,321
Total interest expense	74,253	(108,629)	(34,376)	89,463	71,297	160,760
Net interest income	82,208	(13,547)	68,661	80,762	(30,986)	49,776

Interest Rate-Sensitivity Reports

Classifies a bank's assets and liabilities into time intervals according to the minimum number of days until each instrument is expected to be repriced.

- **GAP values are reported a periodic and cumulative basis for each time interval.**
  - **Periodic GAP**
    - **Is the Gap for each time bucket and *measures the timing of potential income effects from interest rate changes***
  - **Cumulative GAP**
    - **It is the sum of periodic GAP's and *measures aggregate interest rate risk over the entire period***
    - **Cumulative GAP is important since it directly measures a bank's net interest sensitivity throughout the time interval.**

Measuring Interest Rate Risk with GAP

	1-7 Days	8-30 Days	31-90 Days	91-180 Days	181-365 Days	Over 1 year	Not Rate Sensitive	Total
Assets								
U.S. Treas & ag		0.7	3.6	1.2	0.3	3.7		9.5
MM Inv			1.2	1.8				3.0
Municipals			0.7	1.0	2.2	7.6		11.5
FF & Repo's	5.0							5.0
Comm loans	1.0	13.8	2.9	4.7	4.6	15.5		42.5
Install loans	0.3	0.5	1.6	1.3	1.9	8.2		13.8
Cash							9.0	9.0
Other assets							5.7	5.7
Total Assets	6.3	15.0	10.0	10.0	9.0	35.0	14.7	100.0
Liabilities and Equity								
MMDA		5.0	12.3					17.3
Super NOW	2.2							2.2
CD's < 100,000	0.9	2.0	5.1	6.9	1.8	2.9		19.6
CD's > 100,000	1.9	4.0	12.9	7.9	1.2			27.9
FF purchased								-
NOW				9.6				9.6
Savings						1.9		1.9
DD							13.5	13.5
Other liabilities							1.0	1.0
Equity							7.0	7.0
Total Liab & Eq.	5.0	11.0	30.3	24.4	3.0	4.8	21.5	100.0
Periodic GAP	1.3	4.0	-20.3	-14.4	6.0	30.2		
Cumulative GAP	1.3	5.3	-15.0	-29.4	-23.4	6.8		

Advantages and Disadvantages of Static GAP Analysis

- Advantages
  - Easy to understand
  - Works well with small changes in interest rates
- Disadvantages
  - Ex-post measurement errors
  - Ignores the time value of money
  - Ignores the cumulative impact of interest rate changes
  - Typically considers demand deposits to be non-rate sensitive
  - Ignores embedded options in the bank's assets and liabilities

Measuring Interest Rate Risk with the GAP Ratio

- GAP Ratio = RSAs/RSLs
  - A GAP ratio greater than 1 indicates a positive GAP
  - A GAP ratio less than 1 indicates a negative GAP

What is the ‘Optimal GAP’

- There is no general optimal value for a bank's GAP in all environments.
- Generally, the farther a bank's GAP is from zero, the greater is the bank's risk.
- A bank must evaluate its overall risk and return profile and objectives to determine its optimal GAP

GAP and Variability in Earnings

- Neither the GAP nor GAP ratio provide direct information on the potential variability in earnings when rates change.
  - Consider two banks, both with $500 million in total assets.
    - Bank A: $3 mil in RSAs and $2 mil in RSLs.
      GAP = $1 mil and GAP ratio = 1.5 mil
    - Bank B: $300 mil in RSAs and $200 mil RSLs.
      GAP equals $100 mill and 1.5 GAP ratio.
    - Clearly, the second bank assumes greater interest rate risk because its net interest income will change more when interest rates change.

Link Between GAP and Net Interest Margin

- **Many banks will specify a target GAP to earning asset ratio in the ALCO policy statements**

$$\frac{\text{Target Gap}}{\text{Earning assets}} = \frac{(\text{Allowable \% Change in NIM})(\text{Expected NIM})}{\text{Expected \% change in interest rates}}$$

Establishing a Target GAP: An Example

- Consider a bank with $50 million in earning assets that expects to generate a 5% NIM.
- The bank will risk changes in NIM equal to plus or minus 20% during the year
  - Hence, NIM should fall between 4% and 6%.

Establishing a Target GAP: An Example (continued)

- If management expects interest rates to vary up to 4 percent during the upcoming year, the bank's ratio of its 1-year cumulative GAP (absolute value) to earning assets should not exceed 25 percent.
  - Target GAP/Earning assets
    = (.20)(0.05) / 0.04 = 0.25
- Management's willingness to allow only a 20 percent variation in NIM sets limits on the GAP, which would be allowed to vary from $12.5 million to $12.5 million, based on $50 million in earning assets.

Speculating on the GAP

- Many bank managers attempt to adjust the interest rate risk exposure of a bank in anticipation of changes in interest rates.
- This is speculative because it assumes that management can forecast rates better than the market.

Can a Bank Effectively Speculate on the GAP?

- Difficult to vary the GAP and win as this requires consistently accurate interest rate forecasts
- A bank has limited flexibility in adjusting its GAP; e.g., loan and deposit terms
- There is no adjustment for the timing of cash flows or dynamics of the changing GAP position

Earnings Sensitivity Analysis

- **Allows management to incorporate the impact of different spreads between asset yields and liability interest costs when rates change by different amounts.**

Steps to Earnings Sensitivity Analysis

- Forecast future interest rates
- Identify changes in the composition of assets and liabilities in different rate environments
- Forecast when embedded options will be exercised
- Identify when specific assets and liabilities will reprice given the rate environment
- Estimate net interest income and net income
- Repeat the process to compare forecasts of net interest income and net income across different interest rate environments.

Earnings Sensitivity Analysis and the Exercise of Embedded Options

- Many bank assets and liabilities contain different types of options, both explicit and implicit:
  - Option to refinance a loan
  - Call option on a federal agency bond the bank owns
  - Depositors have the option to withdraw funds prior to maturity
  - Cap (maximum) rate on a floating-rate loan

Earnings Sensitivity Analysis Recognizes that Different Interest Rates Change by Different Amounts at Different Times

- It is well recognized that banks are quick to increase base loan rates but are slow to lower base loan rates when rates fall.

Recall the our example from before:

4 year Car Loan	8.50%
1 Year CD	4.50%
	4.00%

- GAP_{1Yr} = \$0 - \$10,000 = -\$10,000
- What if rates increased?

1 year GAP Position

Change in Rates			Base	Change in Rates		
-3	-2	-1	GAP_{1yr}	+1	+2	+3
-1,000	-2,000	-8,000	-10,000	-10,000	-10,000	-10,000
Re-finance the auto loans				All CD's will mature		

What about the 3 Month GAP Position?

- Base GAP_{3m} = $10,000 - $10,000 = 0

3 Month GAP Position

Change in Rates			Base	Change in Rates		
-3	-2	-1	GAP_{3m}	+1	+2	+3
+8,000	+6,000	+2,000	0	-1,000	-3,000	-6,000
Re-finance auto loans, and less likely to "pull" CD's				People will "pull" the CD's for higher returns		

The implications of embedded options

- Does the bank or the customer determine when the option is exercised?
  - How and by what amount is the bank being compensated for selling the option, or how much must it pay to buy the option?
  - When will the option be exercised?
    - This is often determined by the economic and interest rate environment
- Static GAP analysis ignores these embedded options

Earnings Sensitivity Analysis (Base Case) Example

Assets

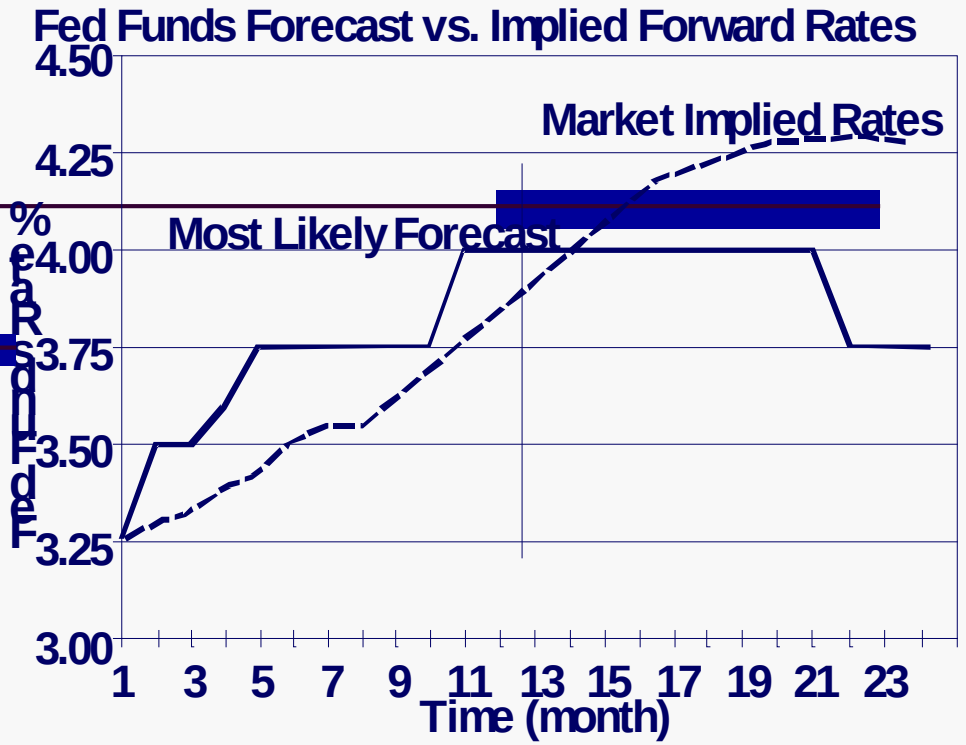
	Total	3 Months or Less	>3-6 Months	>6-12 Months	>1-3 Years	>3-5 Years	>5-10 Years	>10-20 Years	>20 Years
Loans									
Prime Based	100,000	100,000							
Equity Credit Lines	25,000	25,000							
Fixed Rate >1 yr	170,000	18,000	18,000	36,000	96,000	2,000			
Var Rate Mtg I Yr	55,000	13,750	13,750	27,500					
30-Yr Fix Mortgage	250,000	5,127	5,129	9,329	32,792	28,916	116,789	51,918	
Consumer	100,000	6,000	6,000	12,000	48,000	28,000			
Credit Card	25,000	3,000	3,000	6,000	13,000				
Investments									
Eurodollars	80,000	80,000							
CMOs FixRate	35,000	2,871	2,872	5,224	13,790	5,284	4,959		
US Treasury	75,000		5,000	5,000	25,000	40,000			
Fed Funds Sold	25,000	25,000							
Cash & Due From Banks	15,000								15,000
Loan Loss Reserve	-15,000								-15,000
Non-earning Assets	60,000								60,000
Total Assets	1,000,000	278,748	53,751	101,053	228,582	104,200	121,748	51,918	60,000

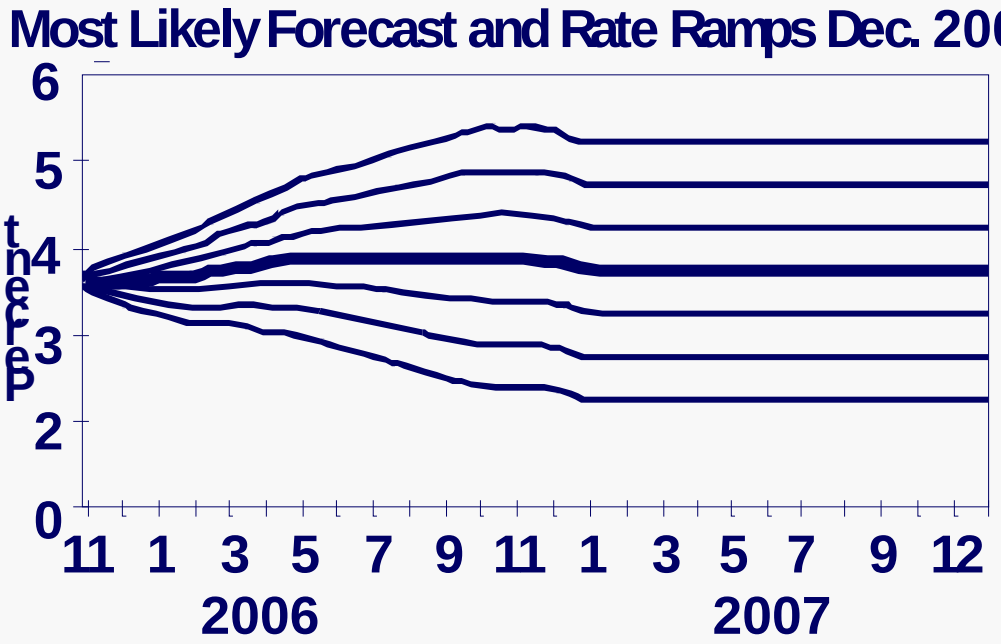
Earnings Sensitivity Analysis (Base Case) Example

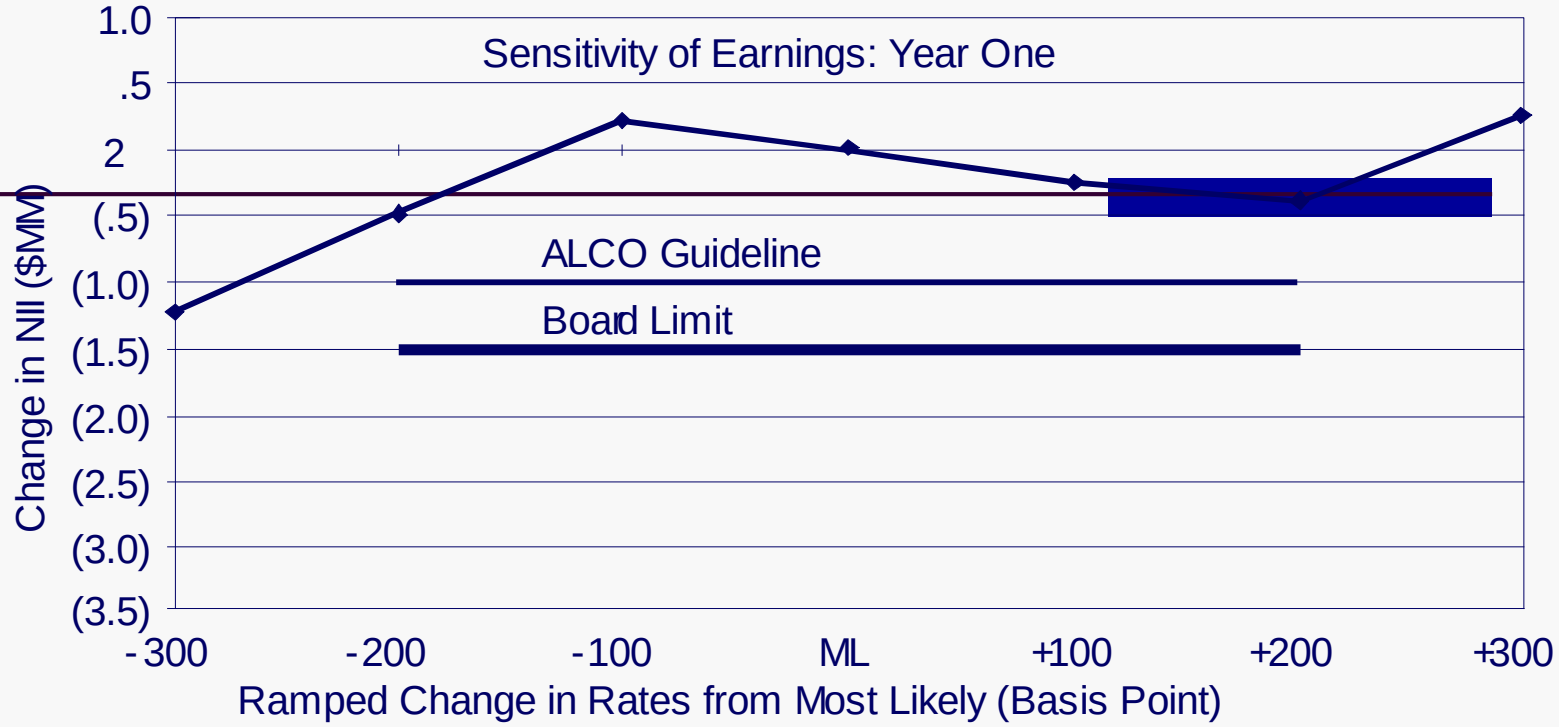
Liabilities and GAP Measures

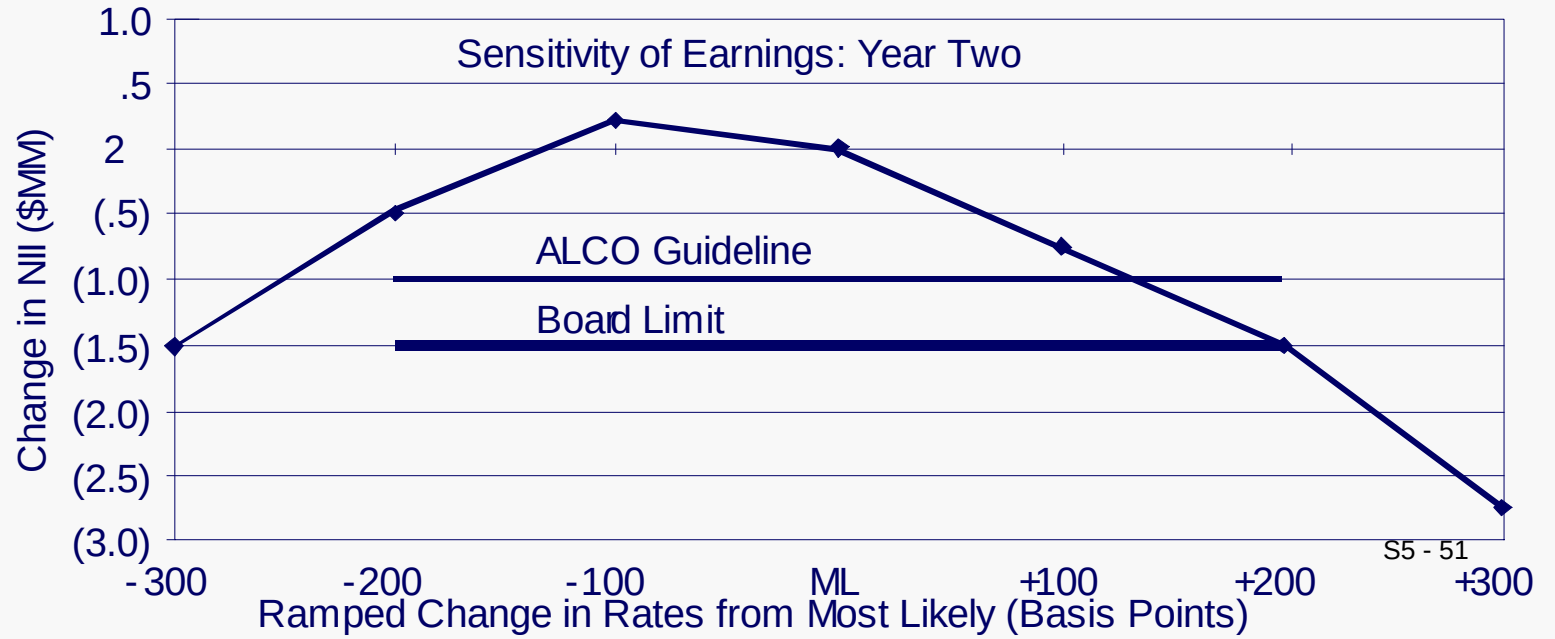
	Total	3 Months or Less	>3-6 Months	>6-12 Months	>1-3 Years	>3-5 Years	>5-10 Years	>10-20 Years	>20 Years
Deposits									
MMDAs	240,000	240,000							
Retail CDs	400,000	60,000	60,000	90,000	160,000	30,000			
Savings	35,000								35,000
NOW	40,000								40,000
DDA Personal	55,000								55,000
Comm'l DDA	60,000	24,000							36,000
Borrowings									
TT&L	25,000	25,000							
L-T notes FR	50,000						50,000		
Fed Funds Purch							0		
NIR Liabilities	30,000								30,000
Capital	65,000								65,000
Tot Liab & Equity	1,000,000	349,000	60,000	90,000	160,000	30,000	50,000	0	261,000
Swaps- Pay Fixed		50,000			-25,000	-25,000			
GAP		-20,252	-6,249	11,053	43,582	49,200	71,748	51,918	-201,000
CUMULATIVE GAP		-20,252	-26,501	-15,448	28,134	77,334	149,082	201,000	0

Interest Rate Forecasts






Sensitivity of Earnings: Year One
1.0
.5
2
(.5)
(1.0)
(1.5)
(2.0)
(2.5)
(3.0)
(3.5)
Change in NII ($MM)
ALCO Guideline
Board Limit
-300
-200
-100
ML
+100
+200
+300
Ramped Change in Rates from Most Likely (Basis Point)


Sensitivity of Earnings: Year Two
1.0
.5
2
(.5)
(1.0)
(1.5)
(2.0)
(2.5)
(3.0)
Change in NII ($MM)
ALCO Guideline
Board Limit
-300
-200
-100
ML
+100
+200
+300
Ramped Change in Rates from Most Likely (Basis Points)

Earnings Sensitivity Analysis Results

- For the bank:
  - The embedded options can potentially alter the bank's cash flows
  - Interest rates change by different amounts at different times
- Summary results are known as Earnings-at-Risk or Net Interest Income Simulation

Earnings Sensitivity Analysis

- **Earnings-at-Risk**
  - **The potential variation in net interest income across different interest rate environments, given different assumptions about balance sheet composition, when embedded options will be exercised, and the timing of repricings.**
    - **Demonstrates the potential volatility in earnings across these environments**
    - **The greater is the potential variation in earnings (earnings at risk), the greater is the amount of risk assumed by a bank , or**
    - **The greater is the maximum loss, the greater is risk**

Income Statement GAP

- **Income Statement GAP**
  - **Forecasts the change in net interest income given a 1% rise or fall in the bank's benchmark rate over the next year.**
  - **It converts contractual GAP data to figures evidencing the impact of a 1% rate movement.**
  - **Income statement GAP is also know in the industry as Beta GAP analysis**

Income Statement GAP Adjusts the Balance Sheet GAP to Incorporate the Earnings Change Ratio

- **The Earnings Change Ratio**
  - **This ratio indicates how the yield on each asset and rate paid on each liability is assumed to change relative to a 1 percent move in the benchmark rate.**

Income Statement GAP

Amounts In Thousands	Prime Down 100bp			Prime Up 100bp		
	Balance Sheet GAP*	ECR[t]	Income Statement GAP	Balance Sheet GAP*	ECR[t]	Income Statement GAP
Rate-Sensitive Assets	A	B	A X B	C	D	C x D
Loans						
Fixed Rate	$5,661	100%	$5,661	$5,661	100%	$5,661
Floating Rate	3,678	100%	3,678	3,678	100%	3,678
Securities						
Principal Cash Flows						
Agencies	200	71%	142	200	71%	142
Agy Callables	2,940	71%	2,087	300	60%	180
CMO Fixed	315	58%	183	41	51%	21
Fed Funds Sold	2,700	96%	2,592	2,700	96%	2,592
Floating Rate						
Total Rate-Sensitive Assets	$15,494		$14,343	$12,580		$12,274
Rate-Sensitive Liabilities						
Savings	$1,925	75%	$1,444	$1,925	5%	$96
Money Mkt Accts	11,001	60%	6,601	11,001	40%	4,400
NOW	2,196	80%	1,757	2,196	20%	439
Fed Funds Purch/Repo	0	96%	0	0	96%	0
CDs - IOOM	3,468	85%	2,948	3,468	85%	2,948
CDs < 100M	4,370	84%	3,671	4,370	84%	3,671
Total Rate-Sensitive	$22,960		$16,420	$22,960		$11,554
Rate Sensitivity Gap (Assets-	($7,466)		($2,077)	($10,380)		$719
Total Assets	$29,909		$29,909	$29,909		$29,909
GAP as a Percent of Total	-24.96%		-6.94%	-34.71%		2.40%
Change in Net Interest			($20.8)			$7.2
Change in Net Interest			0.07%			0.02%
Net Interest Margin			5.20%			5.20%
Percentage Change in Net			1.34%			0.46%

Managing the GAP and Earnings Sensitivity Risk

- Steps to reduce risk
  - Calculate periodic GAPs over short time intervals.
  - Fund repriceable assets with matching repriceable liabilities so that periodic GAPs approach zero.
  - Fund long-term assets with matching noninterest-bearing liabilities.
  - Use off-balance sheet transactions to hedge.

Adjust the Effective Rate Sensitivity of a Bank's Assets and Liabilities

Objective	Approaches
Reduce asset sensitivity	Buy longer-term securities. Lengthen the maturities of loans. Move from floating-rate loans to term loans.
Increase asset sensitivity	Buy short-term securities. Shorten loan maturities. Make more loans on a floating-rate basis.
Reduce liability sensitivity	Pay premiums to attract longer-term deposit instruments. Issue long-term subordinated debt.
Increase liability sensitivity	Pay premiums to attract short-term deposit instruments. Borrow more via non-core purchased liabilities.