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Federal Home Loan Bank of New York

◆ *Complete ALM Solutions* ◆

Watch the *Curve* Ahead

Credit Union Strategies in a Rising Rate Environment

Presented October 3, 2013

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Goals for Today - Agenda

- First, The Good News…Rates are HIGHER
- Strategy Development…The First Step
- Getting the Numbers Right: Credit Union “Business Model” & “Risk Management” Issues
- CASE STUDIES
- Strategies (miscellaneous)
- Q&A

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10 Year Treasury…What's Going On?

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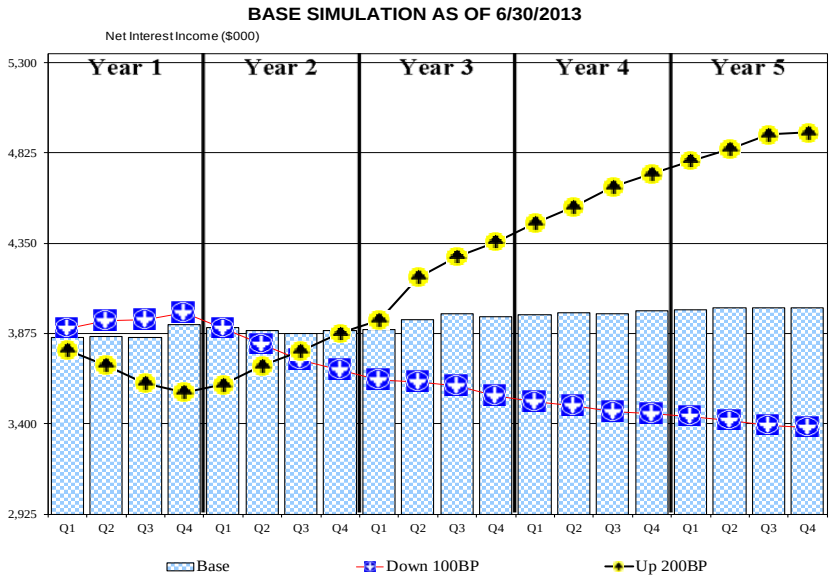
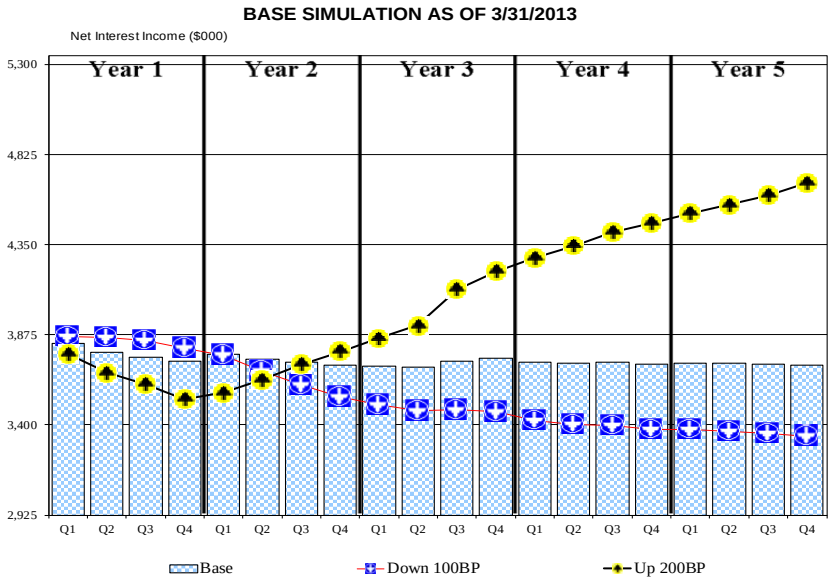
Good News: Higher Rates = HIGHER NII





NII SUMMARY

	Down 100BP	Base	Up 200BP
Year-1 NII	15,773	15,491	14,675
Year-2 NII	15,141	15,562	14,967
Year-3 NII	14,398	15,787	16,751
Year-4 NII	13,930	15,932	18,356
Year-5 NII	13,626	16,028	19,486

NII SUMMARY

	Down 100BP	Base	Up 200BP
Year-1 NII	15,374	15,109	14,599
Year-2 NII	14,606	14,963	14,715
Year-3 NII	13,932	14,899	16,105
Year-4 NII	13,600	14,909	17,507
Year-5 NII	13,434	14,887	18,366

CHANGE / DIFFERENCE IN RESULTS

	Down 100BP	Base	Up 200BP
Year-1 NII	399	382	76
Year-2 NII	535	599	252
Year-3 NII	466	888	646
Year-4 NII	330	1,023	849
Year-5 NII	192	1,141	1,120

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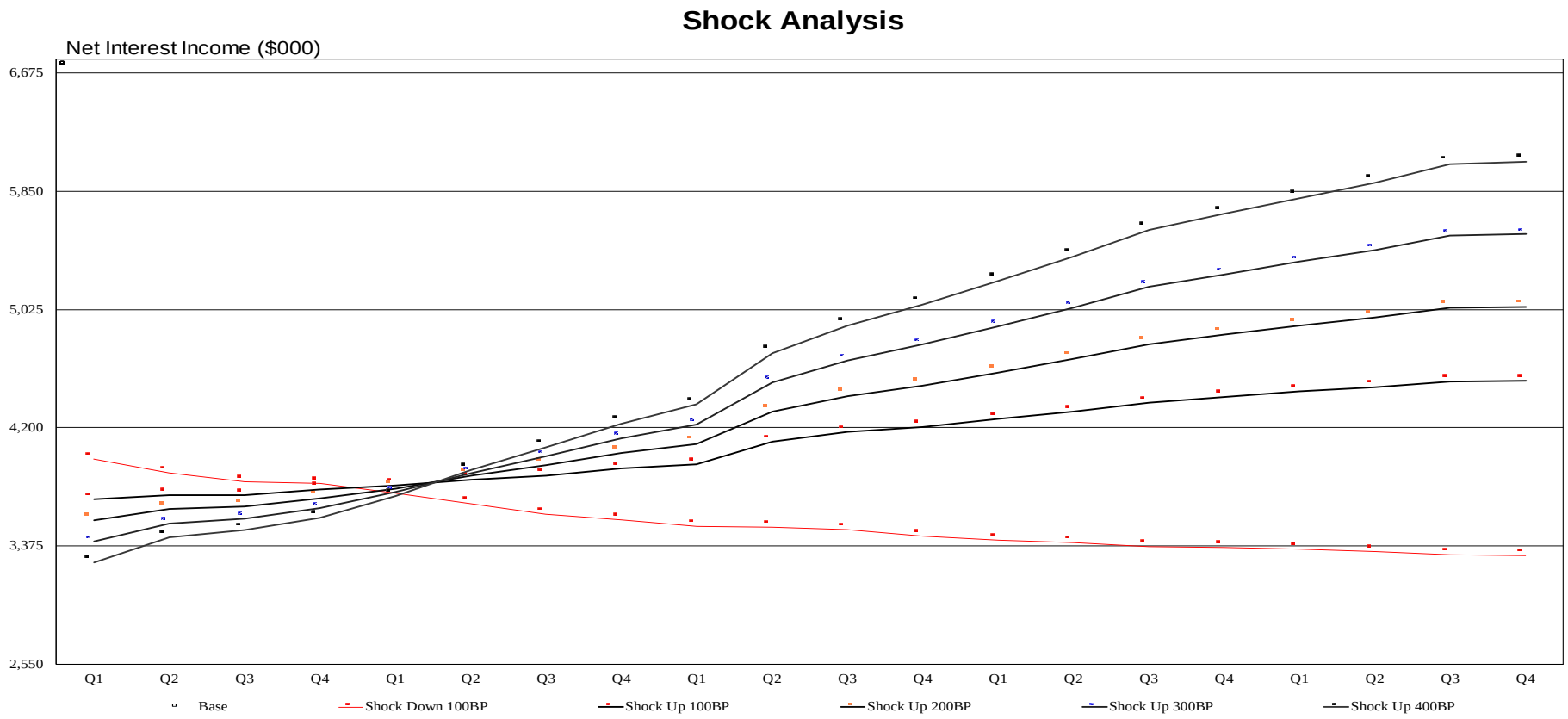
Higher Rates "Shocked" = Higher Earnings…but,



NII SUMMARY

	Shock Down 100BP	Base	Shock Up 100BP	Shock Up 200BP	Shock Up 300BP	Shock Up 400BP
Year-1 NII	15,499	15,491	14,928	14,539	14,143	13,747
Year-2 NII	14,567	15,562	15,419	15,601	15,761	15,916
Year-3 NII	13,951	15,787	16,417	17,315	18,193	19,058
Year-4 NII	13,546	15,932	17,362	18,895	20,403	21,896
Year-5 NII	13,313	16,028	17,985	19,956	21,888	23,811

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NEV Looks WORSE!…What's Going On?

RATE SHOCK SCENARIOS

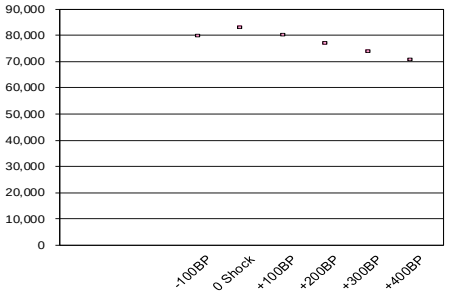
	Book Value	-100BP	0 Shock	+100BP	+200BP	+300BP	+400BP
ASSETS							
Investments	125,441	127,361	125,902	123,390	120,736	118,129	115,595
Loans	467,230	473,122	466,876	456,988	447,445	438,299	429,598
Other Assets	20,508	20,508	20,508	20,508	20,508	20,508	20,508
TOTAL ASSETS (EVA)	**613,179**	**620,991**	**613,286**	**600,886**	**588,689**	**576,936**	**565,701**
% Chg from 0 Shock	*-0.02%*	*1.26%*		*-2.02%*	*-4.01%*	*-5.93%*	*-7.76%*
LIABILITIES							
Non Maturity Deposits	305,431	300,202	290,993	284,189	277,874	272,004	266,540
Time Deposits	233,974	238,657	237,026	234,159	231,358	228,621	225,945
Borrowings	0	0	0	0	0	0	0
Other Liabilities	1,619	1,619	1,619	1,619	1,619	1,619	1,619
TOTAL LIABILITIES (EVL)	**541,024**	**540,479**	**529,638**	**519,968**	**510,852**	**502,245**	**494,105**
% Chg from 0 Shock	*2.15%*	*2.05%*		*-1.83%*	*-3.55%*	*-5.17%*	*-6.71%*
NET ECONOMIC VALUE (NEV)	**72,155**	**80,512**	**83,648**	**80,918**	**77,837**	**74,691**	**71,596**
% Chg from 0 Shock		**-3.7%**		**-3.3%**	**-6.9%**	**-10.7%**	**-14.4%**
Policy Limits		*-50.0%*		*-50.0%*	*-50.0%*	*-50.0%*	
NEV Ratio (NEV/EVA)	**11.77%**	**12.97%**	**13.64%**	**13.47%**	**13.22%**	**12.95%**	**12.66%**
Policy Limits		*3.00%*		*3.00%*	*3.00%*	*3.00%*	
BP Chg from 0 Shock		**-67**		**-17**	**-42**	**-69**	**-98**

Risk Summary Grid*

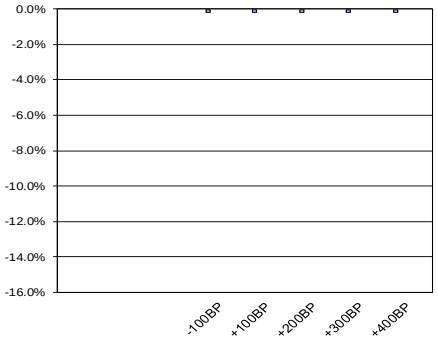
Post Shock NEV/EVA Ratio	**0 to 100bp**	**100 to 200bp**	**200 to 400bp**	**Over 400bp**
Over 10%	**MIN. RISK (1)**	Min. Risk -1	Min. Risk -1	Mod. Risk -2
6.00% to 10.00%	Min. Risk -1	Min. Risk -1	Mod. Risk -2	Sig. Risk -3
4.00% to 6.00%	Min. Risk -1	Mod. Risk -2	Sig. Risk -3	High Risk -4
Below 4.00%	Mod. Risk -2	Sig. Risk -3	High Risk -4	High Risk -4

*Included for discussion purposes only. Grid evaluates +200/-100 scenarios for risk assessment.
*Current risk assessment for Risk Summary Grid is based on -100 scenario.

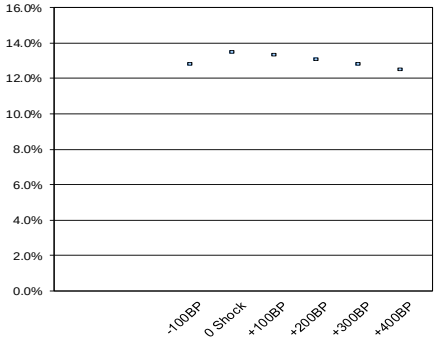
Net Economic Value($000s)



NEV ($) - Pct. Chg from 0 Shock



NEV Ratio (NEV/EVA)



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“Two” Choices: Protect Earnings or Protect Value

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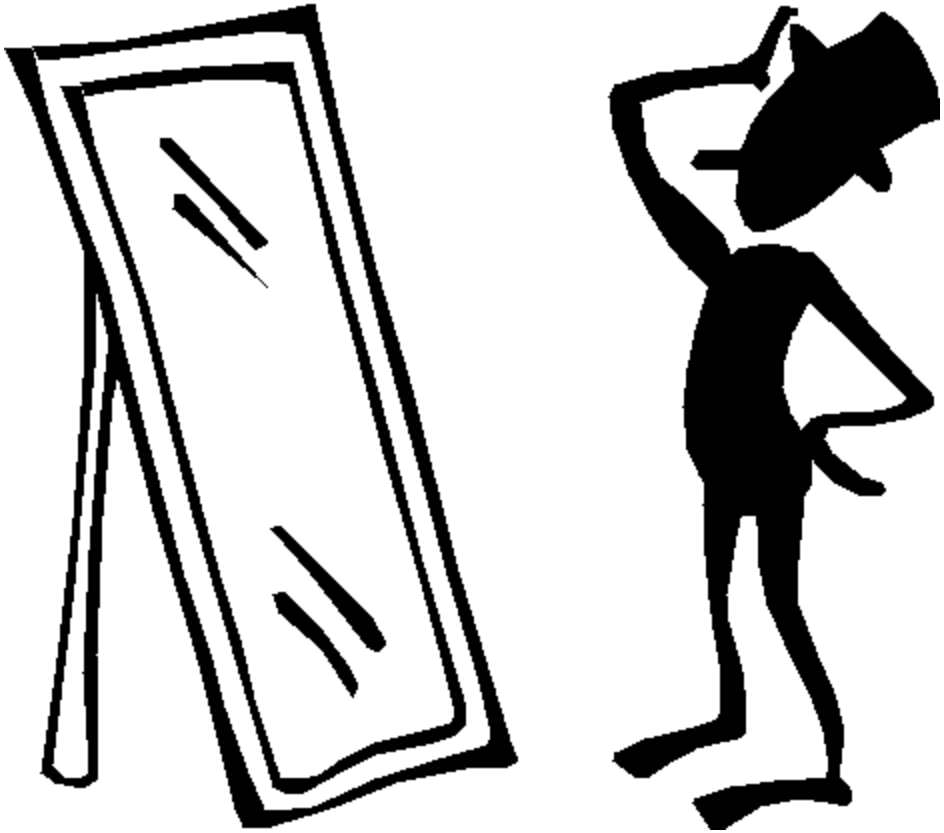
Strategy/Business Development: First Step



TAKE REALISTIC LOOK INTO THE MIRROR

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Build Models? **NO**

≠ Compliance / Regulatory Appeasement

Support Decision-Making? **YES!**

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All Models ARE ***WRONG***….By Definition!

Regardless of "the Approach" (e.g. simple vs. complex math)

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All Models ARE ***WRONG***….By Definition!

Impact of Model Assumptions…

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2 Quick Reminders About Modeling

1) **All Models Will Be "Wrong"… by Definition**
   - …. If not, it is "by accident"
   - …. particularly true when "predicting" human behavior
   - …. certainly the case with deposits

2) **He/She Who Controls the Assumptions, Controls the Results**
   - …. Tell me the results you want & I can "create it"
   - …. For IRR, deposit assumptions are key (betas, balance sensitivities/decay)

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Deposit Assumptions Can Be Most Impactful

- "Tough" to Get Assets Wrong…unless
  - "bad math"
  - model user error (mistakes)
  - …same for wholesale funding

- Deposit Assumptions = Where the ACTION is
  - Non-Maturity Deposits (NMDs)
  - CDs to a lesser extent

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NMD Growth Patterns

Non-Maturity Deposits (Financial Institutions <$10 Billion)	Compounded Annualized Growth %
12/31/2008- 12/31/2012	8.9%
12/31/2004- 12/31/2008	.8%

FACT or Fiction?

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Non-Maturity Deposits…Additional Perspective

	5 Year "Pre-Surge" CAGR 1Q04 – 1Q09	Last 5 Year CAGR 1Q08 – 1Q13
NMDs	.2%	6.5%
CDs	8.2%	- 6.4%

NOTE: < $10 Billion Assets

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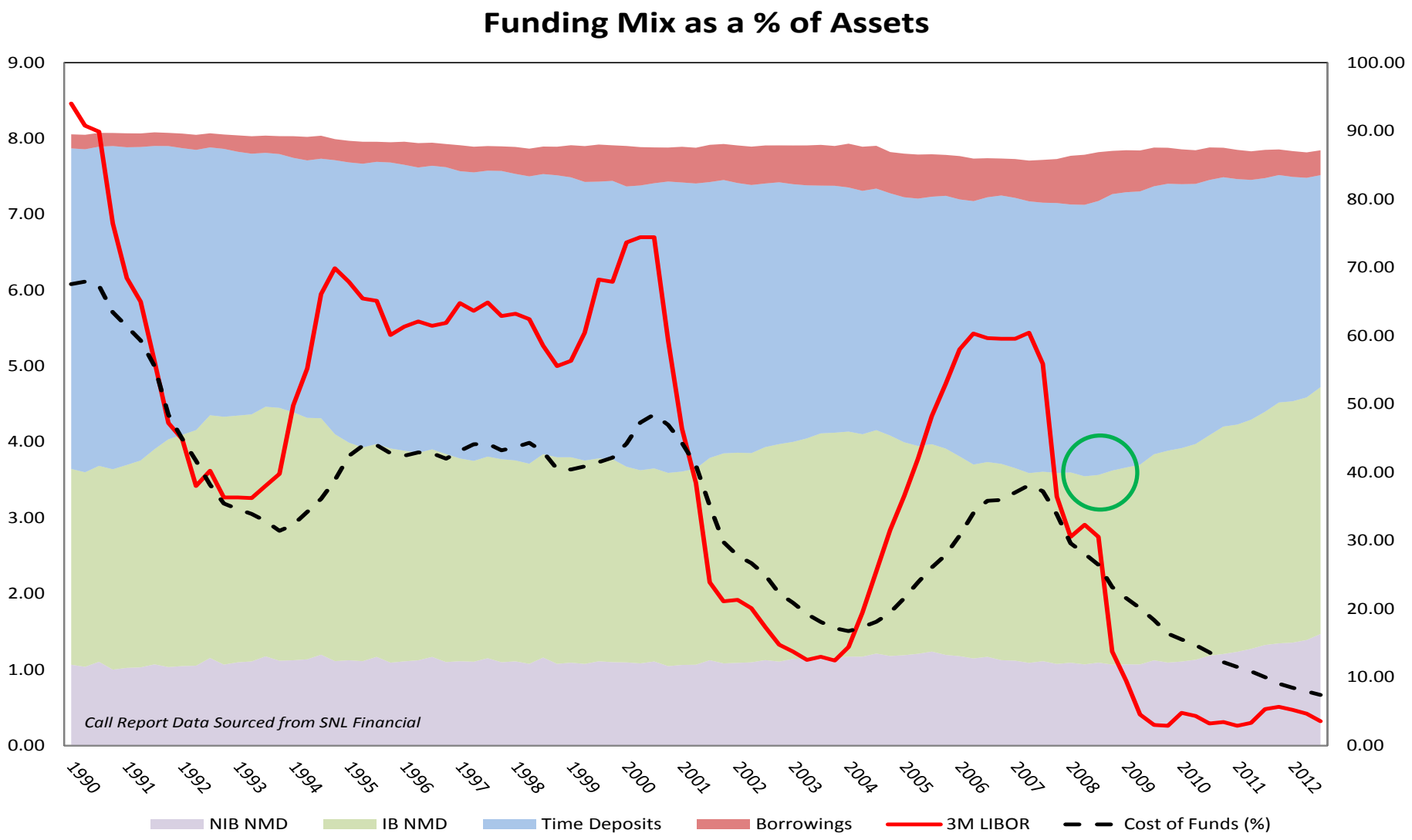
Deposit Mix … All



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Non-Maturity Deposits…Key Assumptions

- Potential for Reductions in NMD Balances (“Surge,” “Parked,” etc.)
  - Disintermediation (leave “banking” system)
  - Migrate/Shift Back to CDs
  - Public Funds
  - Interest on DDA
  - Etc.
  - Sensitized Customers (“Smarter” / More Aware / Less Loyal ?)

- Important Consideration: > “Normal” Growth Can be “CORE”
  - Local Market Bank Failures / Troubled Institutions
  - In-Market Mergers (Large and/or Out-of-Market Banks)
  - Some Simply DO BETTER JOB @ Increasing Market Share

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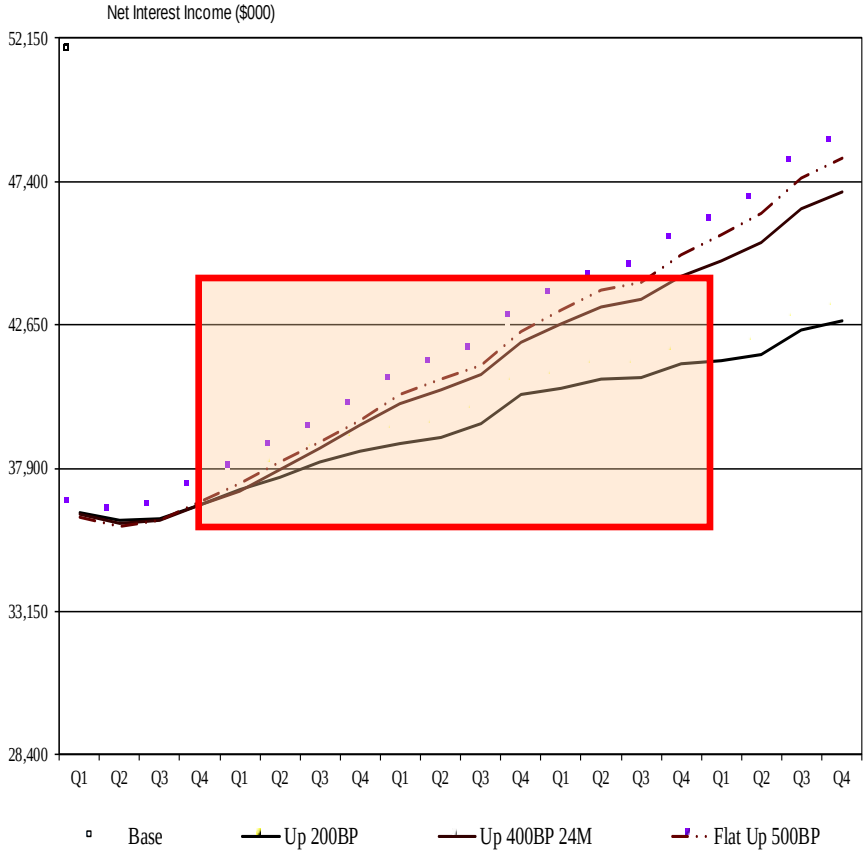
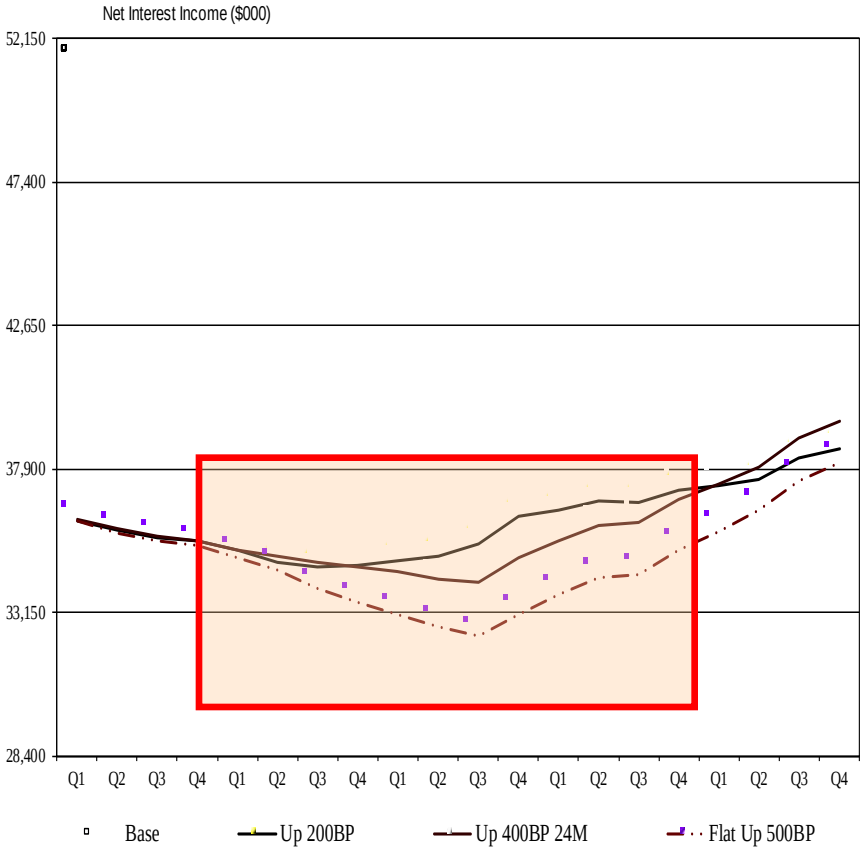
Example A: Sensitivity Analysis

Deposit Migration & Deposit Pricing Betas

Base Simulation



Combined Deposit Stress Test



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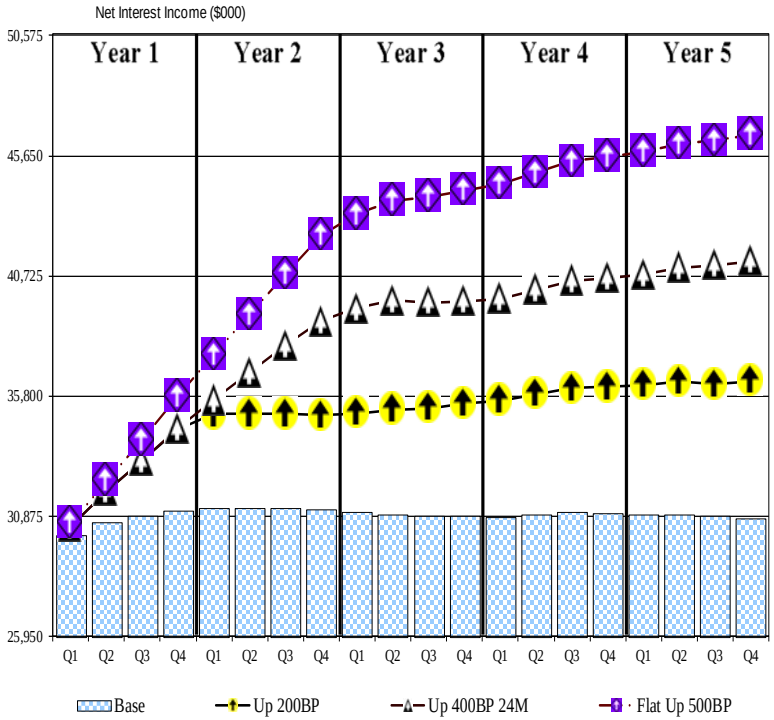
Example B: Sensitivity Analysis

Deposit Migration & Deposit Pricing Betas

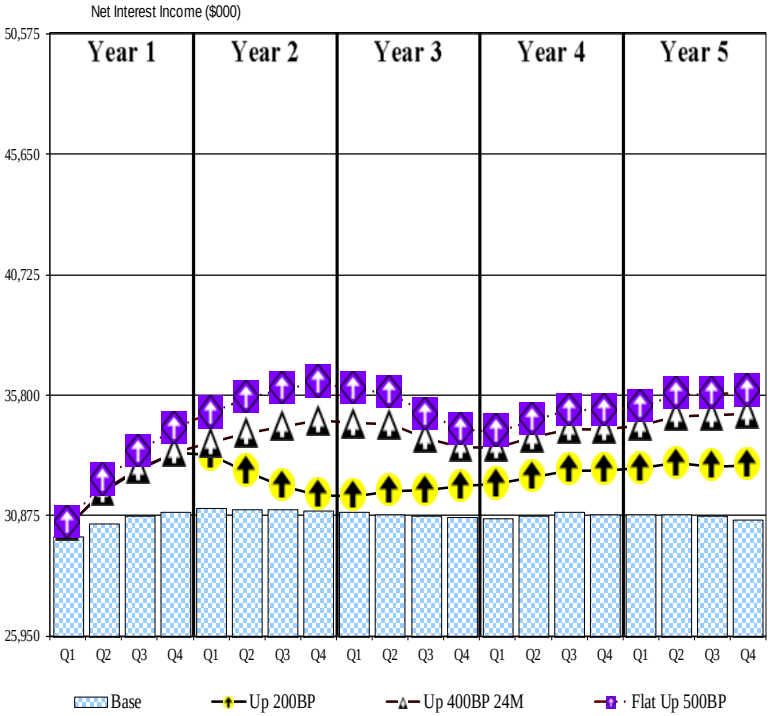
Bas



NII SUMMARY

	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	122,632	129,993	130,042	132,780
Year-2 NII	124,696	140,201	149,162	159,825
Year-3 NII	123,766	141,148	158,462	175,291
Year-4 NII	123,775	143,812	161,144	180,506
Year-5 NII	123,536	145,344	164,348	184,780

Stress Test: NMD Migration & Alt CD Pricing Combined



NII SUMMARY

	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	122,632	128,603	128,640	130,831
Year-2 NII	124,696	129,836	137,426	143,123
Year-3 NII	123,766	127,548	136,965	141,368
Year-4 NII	123,775	130,089	136,549	139,462
Year-5 NII	123,536	131,641	139,506	142,968

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Some Time Deposit Considerations

- Pricing Betas
- Potential for Early Withdrawals
  - Historically insignificant (customers inefficient managers of option value)
  - Will next rising rate cycle be different? …. Depends!
- Term Structure of Migrating NMDs

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Take a Deeper Dive Into The Deposit Base

- Where is Potential Volatility Likely to be "Hiding"?
- What is the Potential Magnitude of Deposits "At Risk"?
- What Has Been Historical Experience and How Might That Be Different in the Next Cycle?
- Develop Meaningful/Thoughtful Deposit Related Assumptions
  - Pricing Betas
  - Balance Volatility
  - Decay
  - Etc.

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Plausible Actions/Activities

- Deposit Studies (More Quantitative & Analytical)
  - Still won't provide "certainty"
  - Need "humility" with quantitative analysis
- Conduct Sensitivity Testing Of Key Deposit Assumptions (Even if Use Results of a Deposit Study)
  - Betas (especially MMDA and CDs)
  - NMD disintermediation and/or shift into CDs
- Analyze 1-Dimensional Products with LARGE Total Balances
  - High probability of "co-mingling" of VERY DIFFERENT customers

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CASE STUDY #1

Situation:

- Credit Union Criticized for Long-Term Assets/Total Assets Ratio
- “Suggested” to Use 0-2.5 Year Average Lives on NMDs
- DOR

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Key Findings – Average Lives

NMD Study Results:

			Baseline Scenario		Stress Scenario	
Account Type	*Balance*	*Rate*	*12 Mo.*	*36 Mo.*	*12 Mo.*	*36 Mo.*
DDA	165,663,919	0.00%	7.00	5.89	6.03	2.87
MMDA	275,005,406	0.14%	4.07	3.80	2.34	2.19
MMDA - Business	16,309,677	0.11%	4.07	2.74	3.21	1.32
MMDA - Premium	230,173,046	0.27%	6.81	5.81	6.19	2.70
NOW	92,405,897	0.02%	8.16	6.71	7.47	2.23
NOW - Rewards	40,712,787	0.00%	3.61	2.45	3.12	0.53
Savings	241,035,848	0.05%	5.04	3.86	4.18	1.93
Savings - IRA	40,048,990	0.25%	7.20	6.93	7.03	4.41
Total	1,101,355,569	0.12%	5.7	4.8	4.7	2.4

Model Implementation:

****** Average Life Assumptions *******							
Product	Balance	Rate	DCG 12 Mo. Average	DCG 36 Mo. Average	DCG 12 & 36 Mo. Average	Current Average	Change
DDA (Non-Int. Checking)	$ 165,663,919	0.00%	7.00	5.89	6.45	5.04	1.40
MMDA (Regular Money Market)	$ 275,005,406	0.14%	4.07	3.80	3.94	3.16	0.78
MMDA - Business	$ 16,309,677	0.11%	4.07	2.74	3.41	3.16	0.25
MMDA - Premium	$ 230,173,046	0.27%	6.81	5.81	6.31	3.16	3.15
NOW (Interest Checking)	$ 92,405,897	0.02%	8.16	6.71	7.44	4.75	2.68
NOW - Rewards (Bus. Checking)	$ 40,712,787	0.00%	3.61	2.45	3.03	5.04	(2.01)
Savings	$ 241,035,848	0.05%	5.04	3.86	4.45	3.40	1.05
Savings - IRA	$ 40,048,990	0.25%	7.20	6.93	7.07	3.40	3.66
Totals	**$ 1,101,355,570**	**0.11%**	**5.74**	**4.84**	**5.29**	**3.71**	**1.58**

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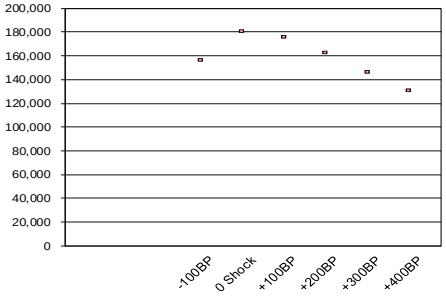
Net Economic Value (DCG Core Deposit Analysis Results)

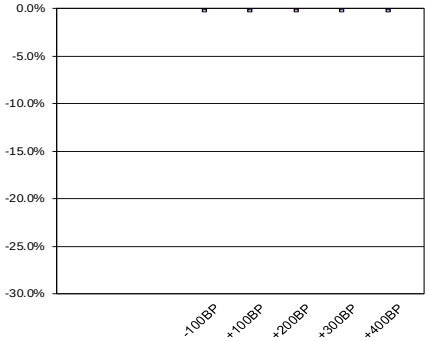
RATE SHOCK SCENARIOS

	Book Value	-100BP	0 Shock	+100BP	+200BP	+300BP	+400BP
ASSETS							
Investments	779,705	796,913	779,844	750,070	716,901	684,606	654,246
Loans	805,804	824,135	817,473	803,038	786,497	769,701	753,062
Other Assets	161,693	161,693	161,693	161,693	161,693	161,693	161,693
TOTAL ASSETS (EVA)	**1,747,202**	**1,782,741**	**1,759,009**	**1,714,801**	**1,665,091**	**1,616,000**	**1,569,000**
% Chg from 0 Shock	*-0.67%*	*1.35%*		*-2.51%*	*-5.34%*	*-8.13%*	*-10.80%*
LIABILITIES							
Non Maturity Deposits	1,189,377	1,198,480	1,152,889	1,119,790	1,089,324	1,061,298	1,035,336
Time Deposits	308,163	314,606	312,549	308,677	304,907	301,235	297,657
Borrowings	75,000	84,982	84,272	81,786	79,881	78,471	77,061
Other Liabilities	26,799	26,799	26,799	26,799	26,799	26,799	26,799
TOTAL LIABILITIES (EVL)	**1,599,339**	**1,624,867**	**1,576,509**	**1,537,053**	**1,500,911**	**1,467,802**	**1,436,853**
% Chg from 0 Shock	*1.45%*	*3.07%*		*-2.50%*	*-4.80%*	*-6.90%*	*-8.86%*
NET ECONOMIC VALUE (NEV)	**147,863**	**157,874**	**182,500**	**177,748**	**164,179**	**148,198**	**132,147**
% Chg from 0 Shock		**-13.5%**		**-2.6%**	**-10.0%**	**-18.8%**	**-27.6%** *-40.0%*
NEV Ratio (NEV/EVA)	**8.46%**	**8.86%**	**10.38%**	**10.37%**	**9.86%**	**9.17%**	**8.42%** *4.50%*
BP Chg from 0 Shock		**-152**		**-1**	**-52**	**-120**	**-195**

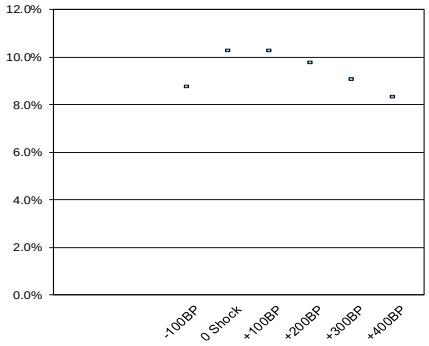
Net Economic Value($000s)



NEV ($) - Pct. Chg from 0 Shock



NEV Ratio (NEV/EVA)



Risk Summary Grid*

Post Shock NEV/EVA Ratio	0 to 100bp	100 to 200bp	200 to 400bp	Over 400bp
Over 10%	Min. Risk -1	Min. Risk -1	Min. Risk -1	Mod. Risk -2
6.00% to 10.00%	Min. Risk -1	**MIN. RISK (1)**	Mod. Risk -2	Sig. Risk -3
4.00% to 6.00%	Min. Risk -1	Mod. Risk -2	Sig. Risk -3	High Risk -4
Below 4.00%	Mod. Risk -2	Sig. Risk -3	High Risk -4	High Risk -4

*Included for discussion purposes only. Grid evaluates +200/-100 scenarios for risk assessment.
*Current risk assessment for Risk Summary Grid is based on -100 scenario.

Average lives are based on Core Deposit Study performed by DCG.

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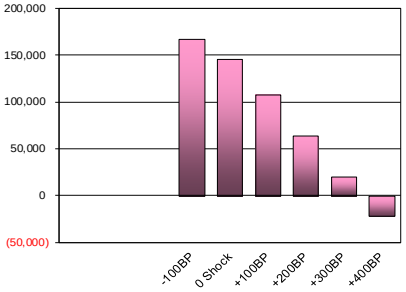
Net Economic Value (Par NMDs)

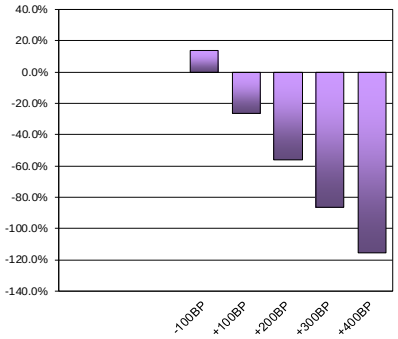
RATE SHOCK SCENARIOS

	Book Value	-100BP	0 Shock	+100BP	+200BP	+300BP	+400BP
ASSETS							
Investments	779,705	796,913	779,844	750,070	716,901	684,606	654,246
Loans	805,804	824,135	817,473	803,038	786,497	769,701	753,062
Other Assets	161,693	161,693	161,693	161,693	161,693	161,693	161,693
TOTAL ASSETS (EVA)	**1,747,202**	**1,782,741**	**1,759,009**	**1,714,801**	**1,665,091**	**1,616,000**	**1,569,000**
% Chg from 0 Shock	*-0.67%*	*1.35%*		*-2.51%*	*-5.34%*	*-8.13%*	*-10.80%*
LIABILITIES							
Non Maturity Deposits	1,189,377	1,189,377	1,189,377	1,189,377	1,189,377	1,189,377	1,189,377
Time Deposits	308,163	314,606	312,549	308,677	304,907	301,235	297,657
Borrowings	75,000	84,982	84,272	81,786	79,881	78,471	77,061
Other Liabilities	26,799	26,799	26,799	26,799	26,799	26,799	26,799
TOTAL LIABILITIES (EVL)	**1,599,339**	**1,615,764**	**1,612,997**	**1,606,639**	**1,600,964**	**1,595,882**	**1,590,894**
% Chg from 0 Shock	*-0.85%*	*0.17%*		*-0.39%*	*-0.75%*	*-1.06%*	*-1.37%*
NET ECONOMIC VALUE (NEV)	**147,863**	**166,977**	**146,013**	**108,161**	**64,127**	**20,118**	**(21,894)**
% Chg from 0 Shock		**14.4%**		**-25.9%**	**-56.1%**	**-86.2%**	**-115.0%**
NEV Ratio (NEV/EVA)	**8.46%**	**9.37%**	**8.30%**	**6.31%**	**3.85%**	**1.24%**	**-1.40%**
BP Chg from 0 Shock		**107**		**-199**	**-445**	**-706**	**-970**

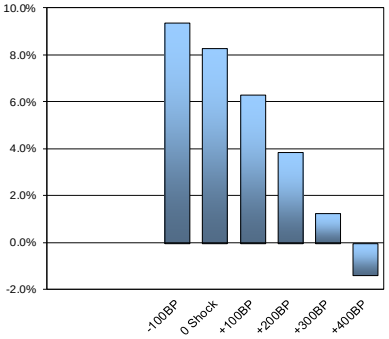
Net Economic Value($000s)



NEV ($) - Pct. Chg from 0 Shock



NEV Ratio (NEV/EVA)



Risk Summary Grid*

Post Shock NEV/EVA Ratio	0 to 100bp	100 to 200bp	200 to 400bp	Over 400bp
Over 10%	Min. Risk -1	Min. Risk -1	Min. Risk -1	Mod. Risk -2
6.00% to 10.00%	Min. Risk -1	Min. Risk -1	Mod. Risk -2	Sig. Risk -3
4.00% to 6.00%	Min. Risk -1	Mod. Risk -2	Sig. Risk -3	High Risk -4
Below 4.00%	Mod. Risk -2	Sig. Risk -3	High Risk -4	**HIGH RISK (4)**

*Included for discussion purposes only. Grid evaluates +200/-100 scenarios for risk assessment.
*Current risk assessment for Risk Summary Grid is based on +200 scenario.

This NEV assumes that NMDs are priced at par in all rate shocks.

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CASE STUDY #2

SITUATION:

- Credit Union Criticized for Long-Term Assets/Total Assets Ratio
- 2.0 Year Average Lives on NMDs Used
- NEV Policies Insufficient
- DOR in Place

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Core Deposit Study Results 7.8 Years…

			Baseline Scenario		Stress Scenario	
Account Type	*Balance*	*Rate*	*12 Mo.*	*36 Mo.*	*12 Mo.*	*36 Mo.*
IMMA	343,878,054	0.45%	8.67	8.62	8.44	8.22
Share Drafts	237,272,049	0.11%	6.07	6.59	5.26	5.26
Share Drafts - Business	23,968,819	0.20%	6.12	5.80	5.85	3.89
Shares	581,851,207	0.30%	7.96	7.88	7.79	7.05
Shares - Business	13,383,652	0.30%	6.20	6.21	5.40	4.93
Shares - IRA	23,638,320	0.30%	7.85	8.01	7.62	7.62
Total	1,223,992,102	0.30%	7.7	7.8	7.4	7.0

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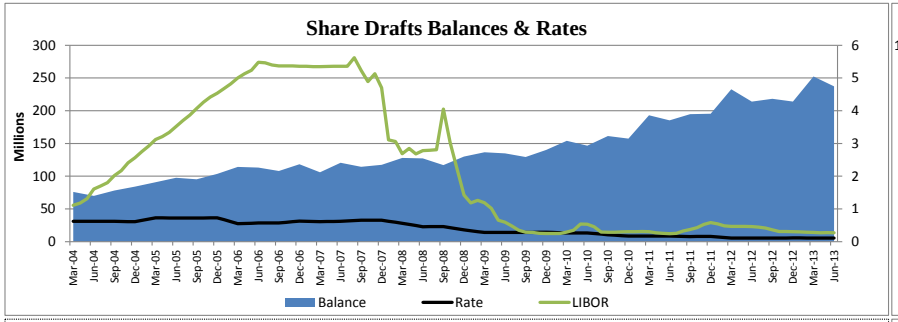
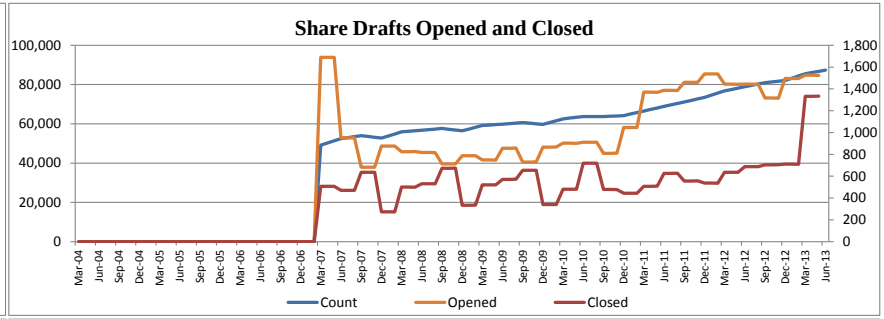
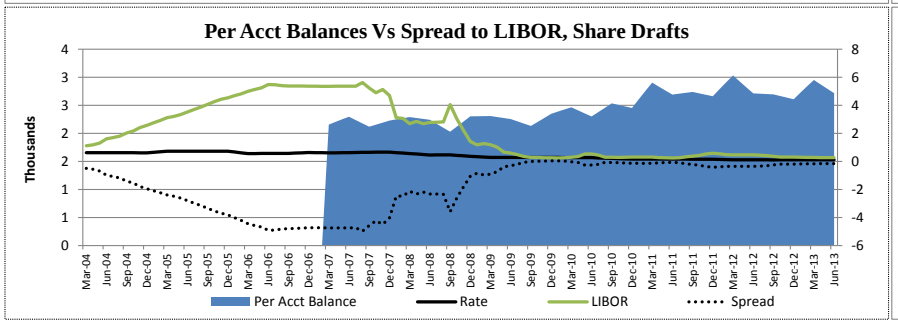
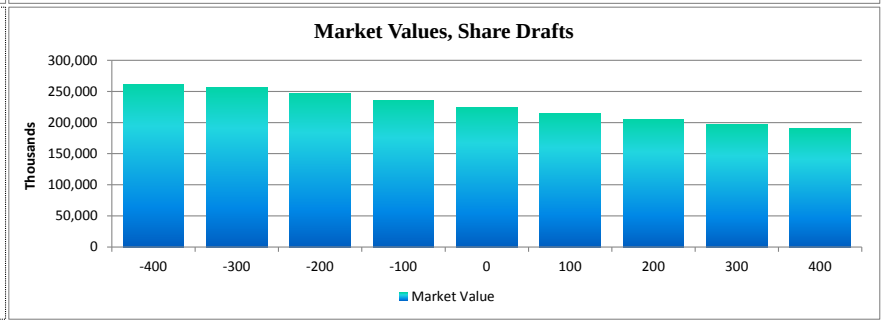
Share Drafts









Beta Estimates					
Rising					
Full Rising Cycle 437bp Increase from March 2004 - June 2006					
Beta	R-Sq	Beta Sign	R-Sq Rank	Func Res	Reason
-4%	52%	-1	Low	No	Negative Beta
Falling					
Full Falling Cycle 537bp Decrease from August 2007 - December 2009					
Beta	R-Sq	Beta Sign	R-Sq Rank	Func Res	Reason
8%	89%	1	High	Yes	High R-Squared

Account Information			
Type	*Balance*	*Rate*	*Func. Cost*
Share Drafts	237,272,049	0.11%	1.80%

Decay Estimates			
Baseline		*Stress*	
12Mo	12.3%	12Mo	14.3%
36Mo	10.6%	36Mo	14.3%

Baseline 12 Mo. Scenario Valuation			
Scenario	*Value*	*Premium*	*Prem%*
-400	260,925,301	-23,653,251	-10.0%
-300	256,685,732	-19,413,682	-8.2%
-200	247,110,774	-9,838,724	-4.1%
-100	236,173,333	1,098,716	0.5%
0	224,726,882	12,545,167	5.3%
100	214,854,826	22,417,223	9.4%
200	205,796,749	31,475,300	13.3%
300	197,471,778	39,800,271	16.8%
400	189,807,860	47,464,189	20.0%

Volatility				
	Non-Core %	*Core %*	*Non-Core $*	*Core $*
Baseline 12 Mo.	3.9%	96.1%	9,245,735	228,026,315
Baseline 36 Mo.	4.5%	95.5%	10,599,707	226,672,342
Stress 12 Mo.	8.1%	91.9%	19,131,886	218,140,163
Stress 36 Mo.	8.1%	91.9%	19,203,765	218,068,284

Average Lives			
Baseline		*Stress*	
12Mo	6.1	12Mo	5.3
36Mo	6.6	36Mo	5.3

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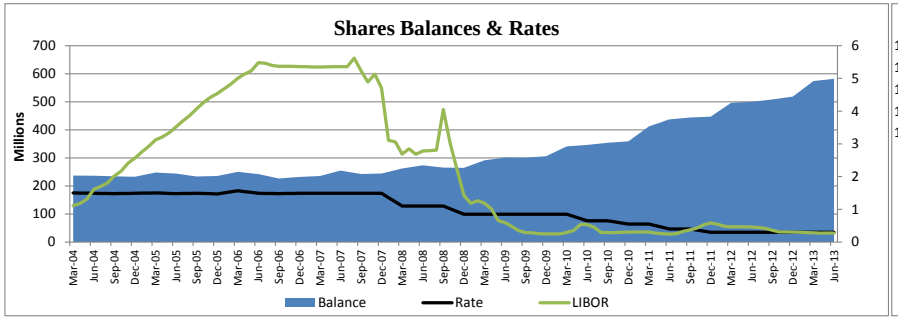
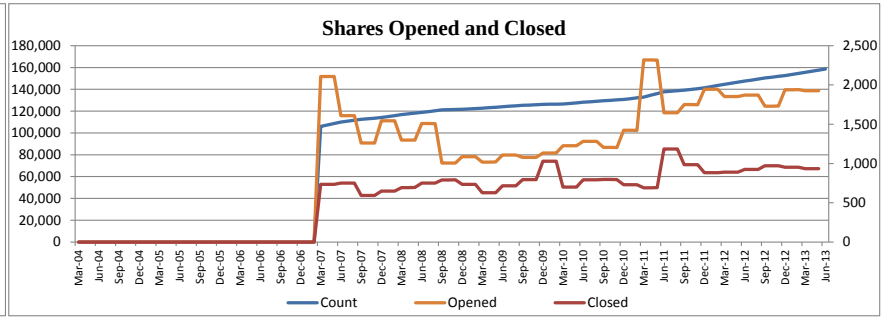
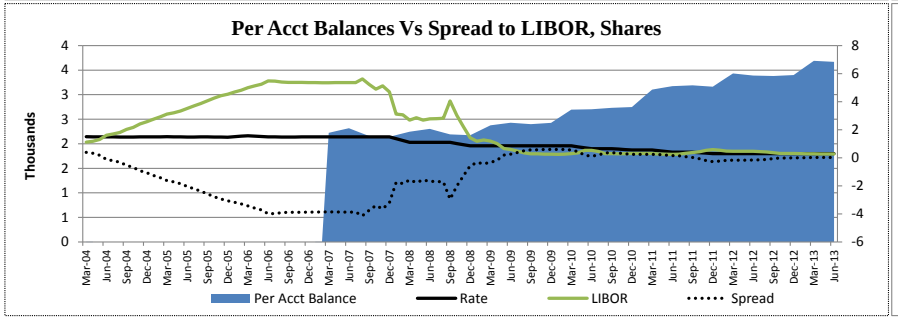
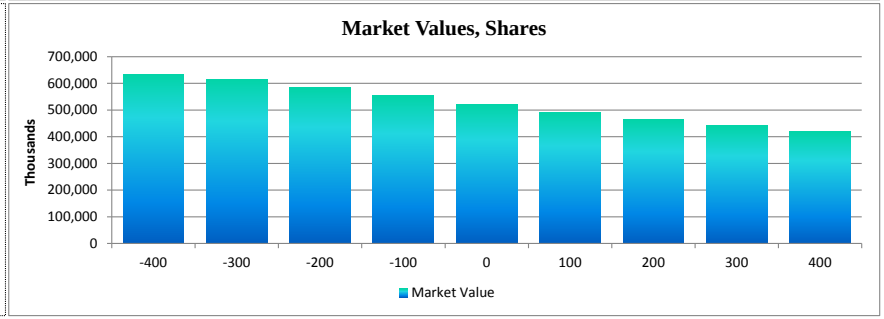
Shares









Beta Estimates					
Rising					
Full Rising Cycle 437bp Increase from March 2004 - June 2006					
Beta	R-Sq	Beta Sign	R-Sq Rank	Func Res	Reason
1%	16%	1	Low	No	Low R-Squared
Falling					
Full Falling Cycle 537bp Decrease from August 2007 - December 2009					
Beta	R-Sq	Beta Sign	R-Sq Rank	Func Res	Reason
13%	89%	1	High	Yes	High R-Squared

Account Information			
Type	*Balance*	*Rate*	*Func. Cost*
Shares	581,851,207	0.30%	1.39%

Decay Estimates			
Baseline		*Stress*	
12Mo	7.4%	12Mo	7.6%
36Mo	7.5%	36Mo	9.3%

Baseline 12 Mo. Scenario Valuation			
Scenario	*Value*	*Premium*	*Prem%*
-400	633,946,951	-52,095,744	-9.0%
-300	616,026,979	-34,175,772	-5.9%
-200	585,489,758	-3,638,551	-0.6%
-100	553,343,972	28,507,235	4.9%
0	521,748,683	60,102,524	10.3%
100	492,169,743	89,681,464	15.4%
200	465,383,658	116,467,549	20.0%
300	441,090,748	140,760,459	24.2%
400	419,025,586	162,825,621	28.0%

Volatility				
	Non-Core %	*Core %*	*Non-Core $*	*Core $*
Baseline 12 Mo.	2.6%	97.4%	14,942,180	566,909,027
Baseline 36 Mo.	2.9%	97.1%	16,665,002	565,186,205
Stress 12 Mo.	3.9%	96.1%	22,521,838	559,329,369
Stress 36 Mo.	4.3%	95.7%	25,103,720	556,747,487

Average Lives			
Baseline		*Stress*	
12Mo	8.0	12Mo	7.8
36Mo	7.9	36Mo	7.1

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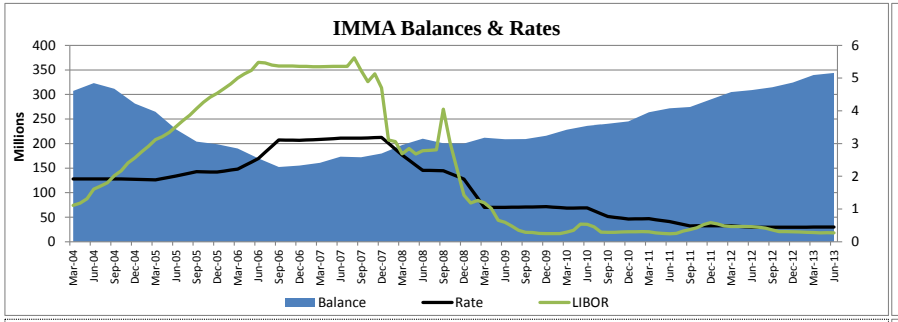
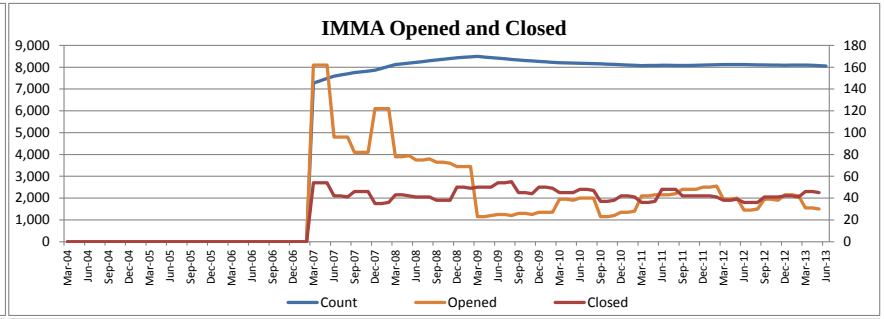
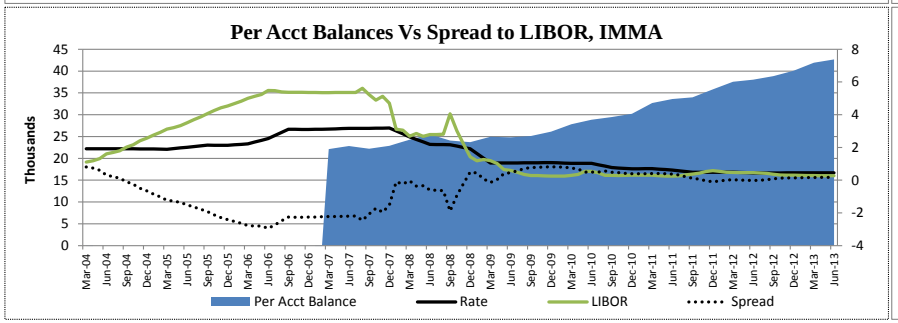
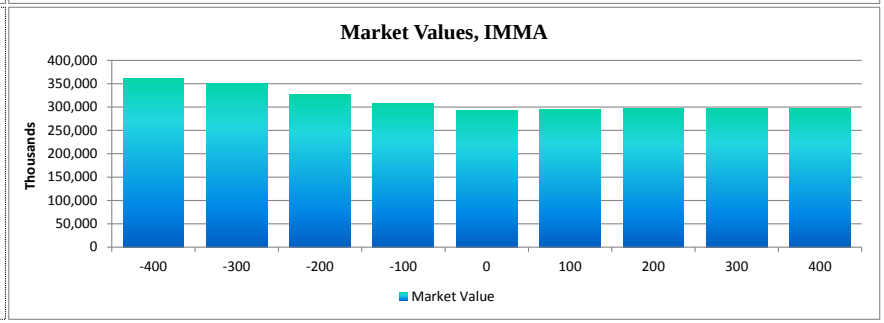
Money Market Accounts

IMMA









Beta Estimates					
Rising					
Full Rising Cycle 437bp Increase from March 2004 - June 2006					
Beta	R-Sq	Beta Sign	R-Sq Rank	Func Res	Reason
35%	91%	1	High	Yes	High R-Squared
Falling					
Full Falling Cycle 537bp Decrease from August 2007 - December 2009					
Beta	R-Sq	Beta Sign	R-Sq Rank	Func Res	Reason
44%	92%	1	High	Yes	High R-Squared

Account Information			
Type	*Balance*	*Rate*	*Func. Cost*
IMMA	343,878,054	0.45%	0.86%

Decay Estimates			
Baseline		*Stress*	
12Mo	6.1%	12Mo	6.5%
36Mo	6.1%	36Mo	6.9%

Baseline 12 Mo. Scenario Valuation			
Scenario	*Value*	*Premium*	*Prem%*
-400	361,800,590	-17,922,536	-5.2%
-300	349,613,416	-5,735,362	-1.7%
-200	326,837,031	17,041,023	5.0%
-100	307,973,417	35,904,637	10.4%
0	293,663,319	50,214,735	14.6%
100	294,927,996	48,950,058	14.2%
200	296,106,964	47,771,090	13.9%
300	297,211,623	46,666,431	13.6%
400	298,251,295	45,626,759	13.3%

Volatility				
	Non-Core %	*Core %*	*Non-Core $*	*Core $*
Baseline 12 Mo.	1.3%	98.7%	4,595,936	339,282,117
Baseline 36 Mo.	1.7%	98.3%	5,696,899	338,181,155
Stress 12 Mo.	1.8%	98.2%	6,137,836	337,740,218
Stress 36 Mo.	2.3%	97.7%	7,849,323	336,028,730

Average Lives			
Baseline		*Stress*	
12Mo	8.7	12Mo	8.4
36Mo	8.6	36Mo	8.2

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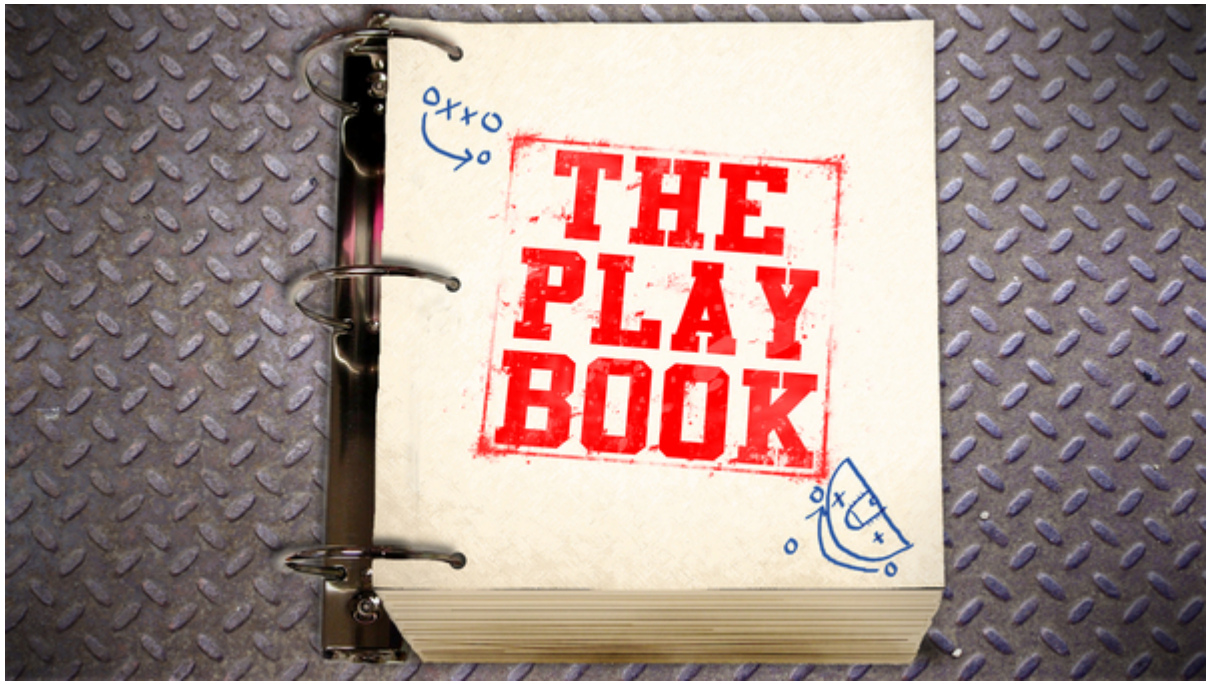
Key ALCO/ERM Issue: Rising Rate Readiness

- Integrate Assessment Into Overall Risk Management (ALCO & ERM)
  - Interest Rate Risk
  - Liquidity Risk (Operational & Contingency)
  - Profit/Capital Planning



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Deposit Assumptions Earnings at Risk vs. NEV

- Don't Forget…..THEY ARE DIFFERENT!
  - …and why NEV and EAR can provide mixed messages
- NEV: Necessarily Requires Decay & Terminal Life Assumptions
  - Value of Core Deposits "ceases" to exist
- NII Simulations: Do Not Decay NMD Balances to Zero
  - Decay typically replaced in models (maintain "average balance")
- 2 Decay Issues In Current Environment
    - "Surge" Decay (NEV & NII)
    - "Core" Decay (NEV)

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Primary Focus = Income (NII Simulation)

Secondary Focus = Value (NEV)

WHY?

- A CU's Income Primarily Result of its Intermediation Function Not Changes in Value (this is the heart of the issue!!!)

MOST CREDIT UNIONS OVERSTATE EXPOSURE TO RISING RATES BASED ON NEV!!!

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You MUST be Able to Articulate and Defend the Basis Upon Which You Decide to Measure and Manage Interest Rate Risk:

- *Ongoing Reporting Earnings (EAR)*
- *Net Economic/Market Value (NEV)*

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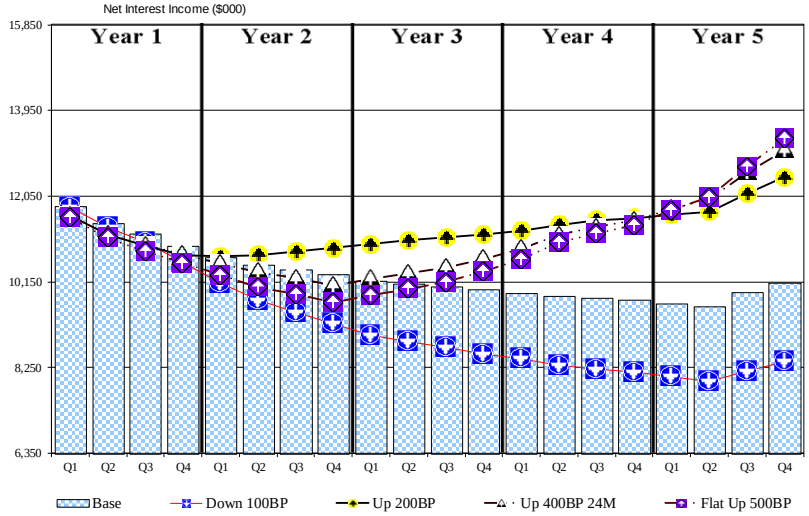
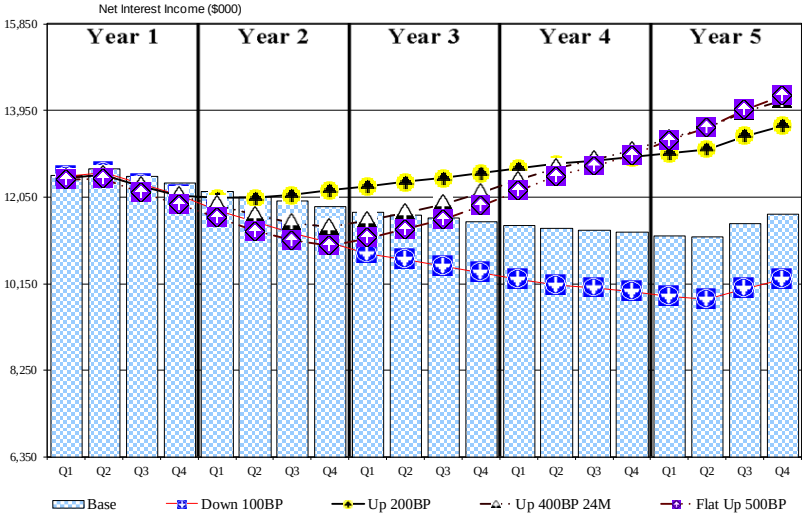
SELL Callable Bonds and HOLD Mortgages

Base Model as of 12/31/2012



Alternative Investment Strategy



NII SUMMARY

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	44,780	45,394	44,529	44,564	44,096
Year-2 NII	38,573	41,921	43,199	41,239	39,907
Year-3 NII	35,059	40,284	44,409	41,703	40,382
Year-4 NII	33,112	39,250	45,798	44,964	44,329
Year-5 NII	32,525	39,308	47,949	49,423	49,812

NII SUMMARY

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	49,529	50,116	49,381	49,416	48,948
Year-2 NII	45,593	48,108	48,371	46,416	45,024
Year-3 NII	42,390	46,534	49,723	47,302	45,923
Year-4 NII	40,396	45,474	51,245	51,067	50,396
Year-5 NII	39,949	45,580	53,143	55,018	55,139

CHANGE / DIFFERENCE IN RESULTS

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	4,750	4,722	4,852	4,852	4,852
Year-2 NII	7,020	6,186	5,171	5,178	5,117
Year-3 NII	7,331	6,250	5,313	5,599	5,541
Year-4 NII	7,285	6,224	5,447	6,103	6,067
Year-5 NII	7,423	6,272	5,195	5,595	5,326

Sell off the entire agency portfolio ($280MM) and reinvest into the following mortgages: 25% 10 Yr at 3.00%, 25% 15 Yr at 3.25%, and 50% 30 Yr at 3.75%.

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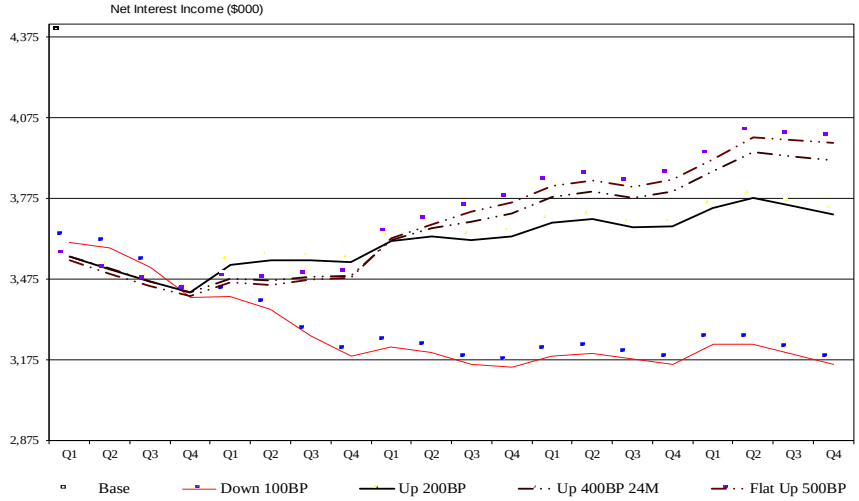
SELL Callable Bonds and BUY MBS

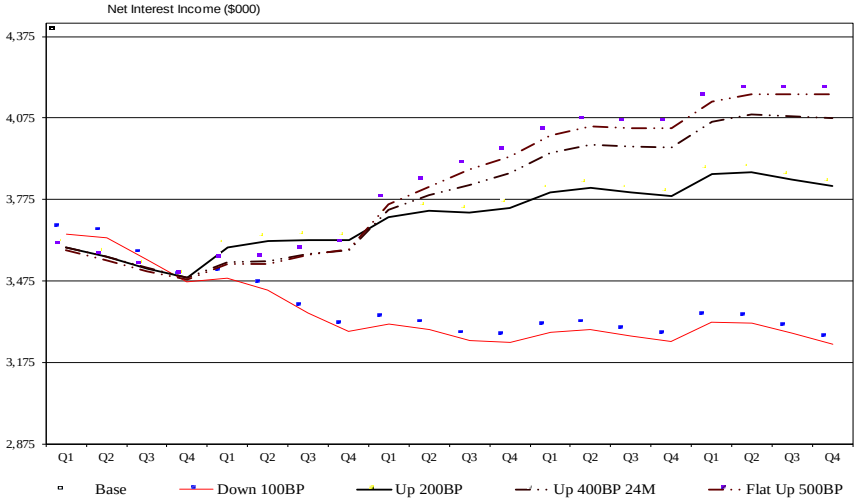
Base Model as of 2/28/2013



NII SUMMARY

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	14,132	14,107	13,964	13,967	13,903
Year-2 NII	13,226	13,641	14,158	13,920	13,869
Year-3 NII	12,732	13,470	14,507	14,695	14,791
Year-4 NII	12,724	13,590	14,722	15,160	15,327
Year-5 NII	12,818	13,742	14,977	15,674	15,898

Alternative Investment Strategy



NII SUMMARY

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	14,306	14,282	14,173	14,176	14,128
Year-2 NII	13,575	13,865	14,468	14,254	14,240
Year-3 NII	13,116	13,715	14,917	15,228	15,398
Year-4 NII	13,106	13,843	15,207	15,861	16,132
Year-5 NII	13,171	13,995	15,420	16,306	16,620

CHANGE / DIFFERENCE IN RESULTS

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	174	175	209	209	224
Year-2 NII	349	224	311	334	371
Year-3 NII	384	245	409	533	607
Year-4 NII	382	253	485	701	805
Year-5 NII	353	253	443	632	721

Sell all callable agency securities (appx. $40MM) and purchase an even mix of 15 Yr MBS at 1.75% and 20 Yr MBS at 2.00%.
No gain/loss is realized in this simulation.

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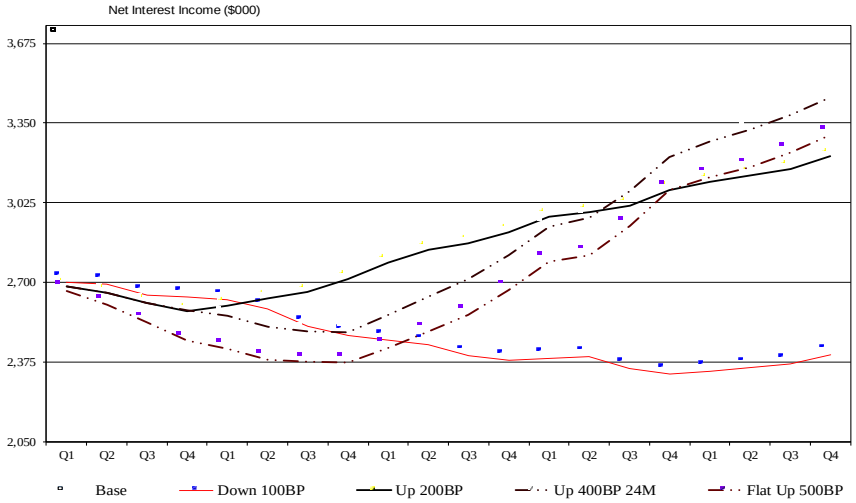
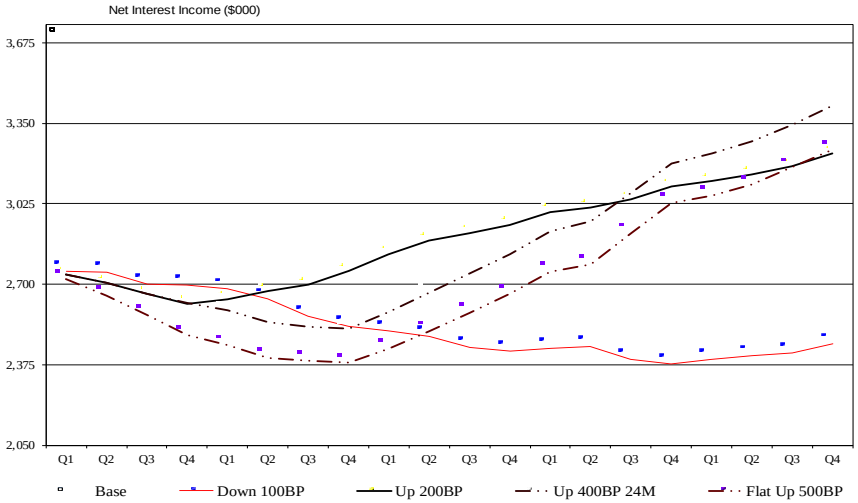
Base Model as of 6/30/2013



$15MM Investment Purchase



NII SUMMARY

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	10,685	10,670	10,546	10,550	10,280
Year-2 NII	10,224	10,529	10,619	10,085	9,567
Year-3 NII	9,699	10,454	11,383	10,735	10,173
Year-4 NII	9,465	10,464	12,045	12,178	11,603
Year-5 NII	9,466	10,622	12,628	13,439	12,831

NII SUMMARY

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	10,902	10,888	10,727	10,730	10,448
Year-2 NII	10,427	10,748	10,764	10,193	9,634
Year-3 NII	9,881	10,672	11,547	10,817	10,197
Year-4 NII	9,666	10,683	12,140	12,125	11,469
Year-5 NII	9,692	10,840	12,664	13,270	12,578

CHANGE / DIFFERENCE IN RESULTS

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	217	218	181	181	168
Year-2 NII	202	218	145	108	68
Year-3 NII	182	218	163	82	24
Year-4 NII	201	218	95	-53	-135
Year-5 NII	226	218	37	-169	-253

Purchase $5MM of 10 year MBS @ 1.81% and $10MM of 15 year MBS @ 2.53%, funded with an even mix of short-term FHLB, 3 year CDA advances, and 4 year CDA advances.

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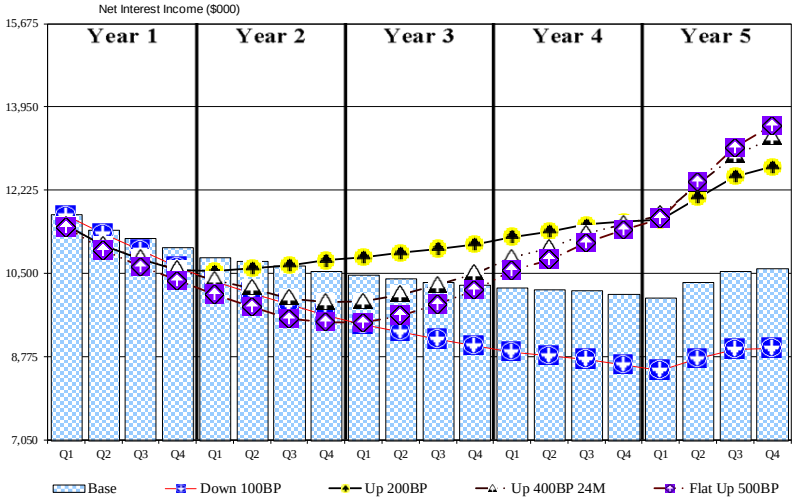
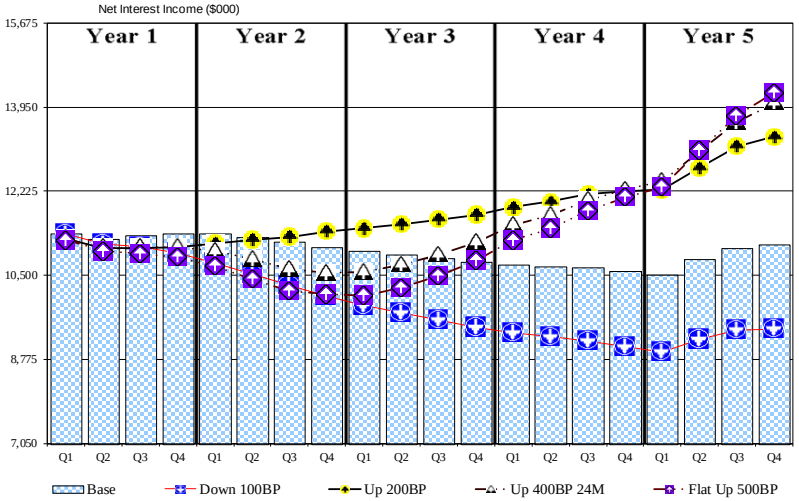
$100MM Residential Growth (March Strategy - 15 & 30 Yr)

Base Model as of 3/31/2013



$100MM Residential Growth



NII SUMMARY

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	44,635	45,379	43,952	43,979	43,445
Year-2 NII	39,921	42,770	42,616	40,451	38,922
Year-3 NII	36,878	41,449	43,897	40,743	39,135
Year-4 NII	35,006	40,588	45,721	44,709	43,888
Year-5 NII	35,124	41,446	48,906	50,315	50,719

NII SUMMARY

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	44,530	45,296	44,441	44,468	44,021
Year-2 NII	41,639	44,913	45,057	42,995	41,394
Year-3 NII	38,633	43,551	46,400	43,366	41,618
Year-4 NII	36,740	42,689	48,293	47,537	46,594
Year-5 NII	36,876	43,547	51,457	53,148	53,397

CHANGE / DIFFERENCE IN RESULTS

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	-105	-83	489	489	576
Year-2 NII	1,718	2,143	2,441	2,544	2,473
Year-3 NII	1,754	2,102	2,503	2,623	2,483
Year-4 NII	1,734	2,101	2,572	2,828	2,706
Year-5 NII	1,753	2,101	2,551	2,833	2,678

Sell $100MM in callable agencies and reinvest the proceeds into 50% 30 year mortgages at 3.90% and 50% into 15 year mortgages at 3.30% evenly over the next 12 months.
The gain/loss on the bond sales is not incorporated in this strategy.

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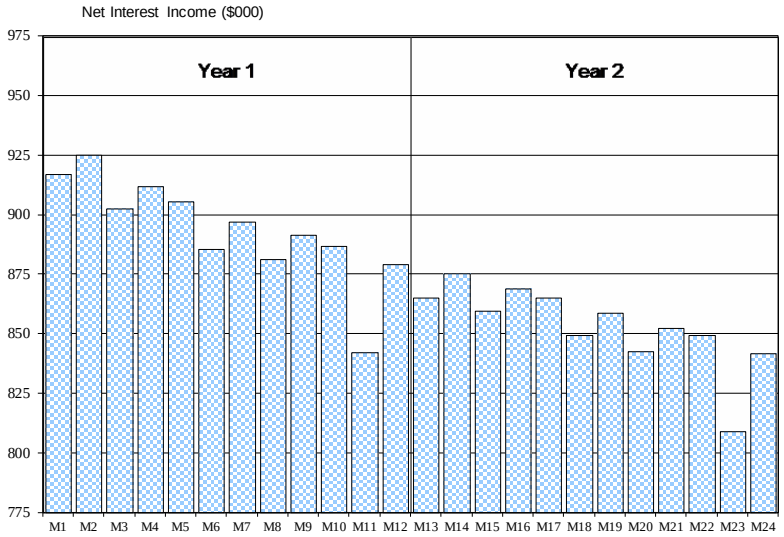
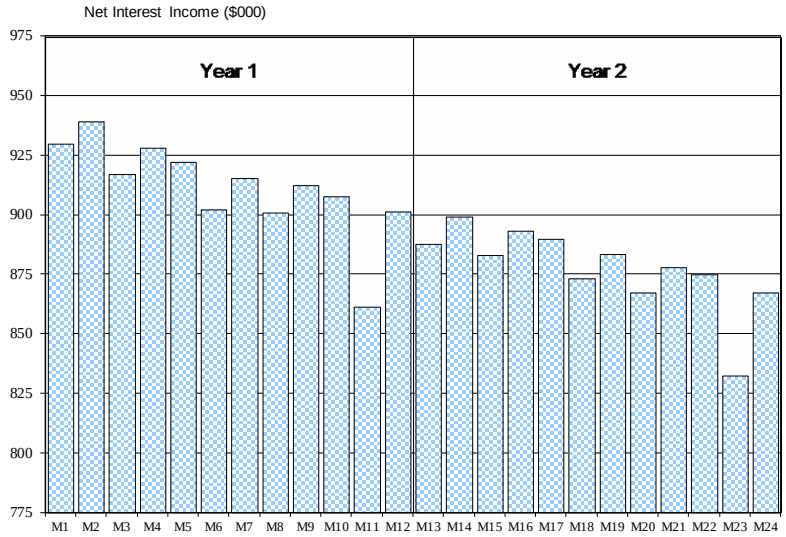
Base Model as of 3/31/2013



BASE	
Year-1 NII	10,726
Year-2 NII	10,238

Depost Rate Reduction



BASE	
Year-1 NII	10,936
Year-2 NII	10,530

CHANGE / DIFFERENCE IN RESULTS

	BASE
Year-1 NII	210
Year-2 NII	292

Lower the following deposit rates:
Share Drafts by 10 bps, Top 3 MMDAs by 15 bps, and bring all CD rates down to FHLB levels.

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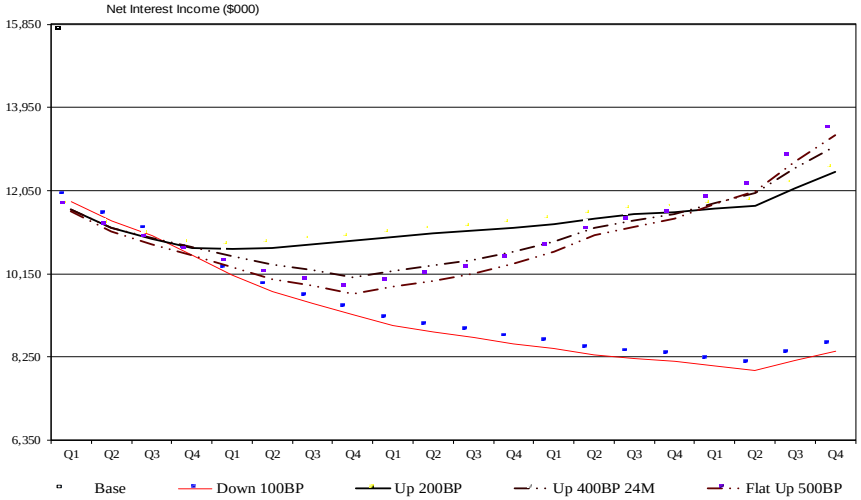
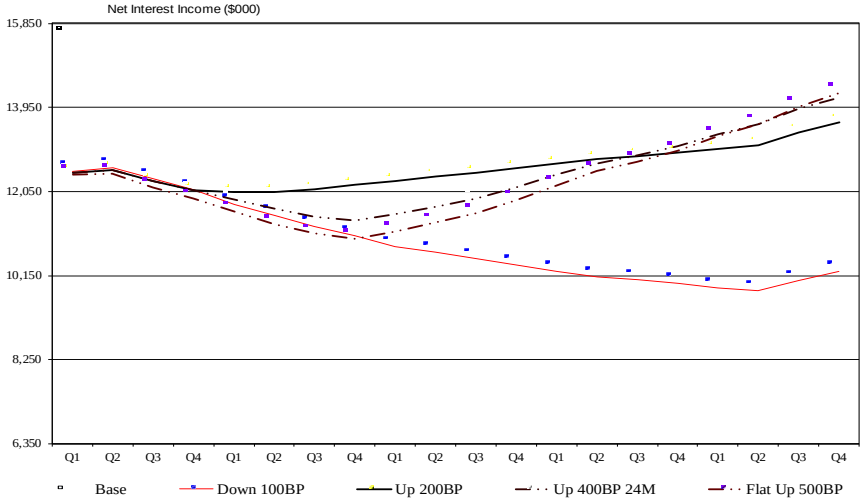
Base Model as of 12/31/2012



Alternative Investment Strategy



NII SUMMARY

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	44,780	45,394	44,529	44,564	44,096
Year-2 NII	38,573	41,921	43,199	41,239	39,907
Year-3 NII	35,059	40,284	44,409	41,703	40,382
Year-4 NII	33,112	39,250	45,798	44,964	44,329
Year-5 NII	32,525	39,308	47,949	49,423	49,812

NII SUMMARY

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	49,529	50,116	49,381	49,416	48,948
Year-2 NII	45,593	48,108	48,371	46,416	45,024
Year-3 NII	42,390	46,534	49,723	47,302	45,923
Year-4 NII	40,396	45,474	51,245	51,067	50,396
Year-5 NII	39,949	45,580	53,143	55,018	55,139

CHANGE / DIFFERENCE IN RESULTS

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	4,750	4,722	4,852	4,852	4,852
Year-2 NII	7,020	6,186	5,171	5,178	5,117
Year-3 NII	7,331	6,250	5,313	5,599	5,541
Year-4 NII	7,285	6,224	5,447	6,103	6,067
Year-5 NII	7,423	6,272	5,195	5,595	5,326

Sell off the entire agency portfolio ($280MM) and reinvest into the following mortgages: 25% 10 Yr at 3.00%, 25% 15 Yr at 3.25%, and 50% 30 Yr at 3.75%.

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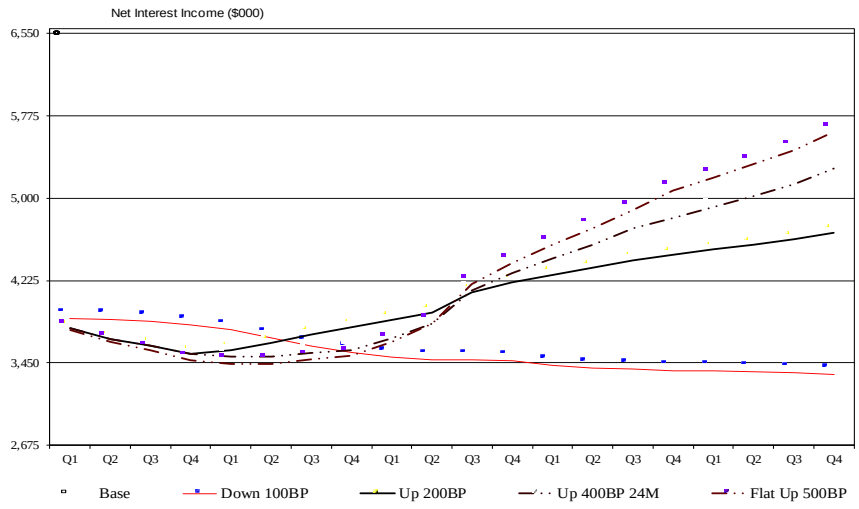
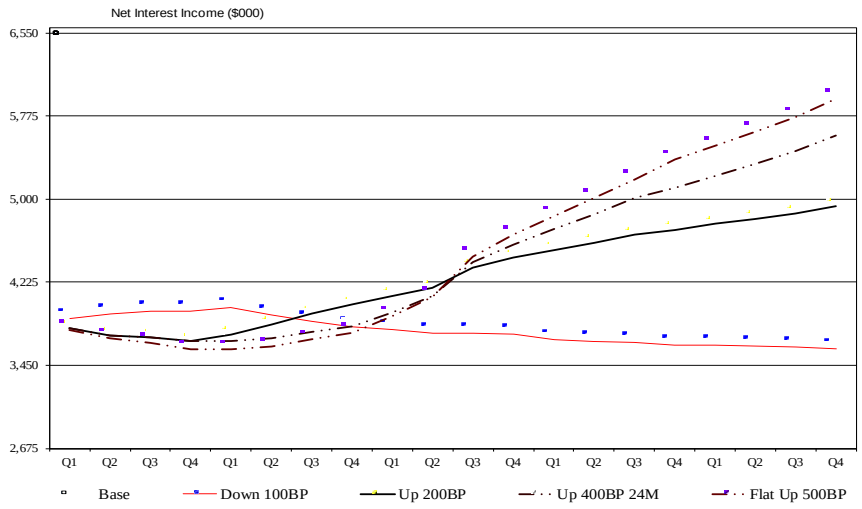
Base Model as of 3/31/2013



NII SUMMARY

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	15,374	15,110	14,600	14,600	14,451
Year-2 NII	14,607	14,963	14,714	14,139	13,880
Year-3 NII	13,932	14,899	16,105	15,928	16,045
Year-4 NII	13,600	14,909	17,508	18,522	19,244
Year-5 NII	13,434	14,887	18,366	20,345	21,592

Loan Growth



NII SUMMARY

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	15,736	15,478	14,913	14,914	14,747
Year-2 NII	15,576	15,961	15,523	14,963	14,676
Year-3 NII	15,018	16,019	17,082	17,023	17,131
Year-4 NII	14,671	16,027	18,508	19,692	20,406
Year-5 NII	14,494	16,005	19,390	21,589	22,830

CHANGE / DIFFERENCE IN RESULTS

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	361	368	314	314	296
Year-2 NII	970	998	809	825	796
Year-3 NII	1,085	1,120	977	1,096	1,087
Year-4 NII	1,071	1,118	1,000	1,170	1,163
Year-5 NII	1,060	1,118	1,024	1,244	1,238

Grow Loans by $65MM over year one (base model has loan growth of $23MM in year one, funded with bond cash flow).
Growth is funded with $50MM of bond cash flow (agencies) and $15MM of deposit inflows from new branch.

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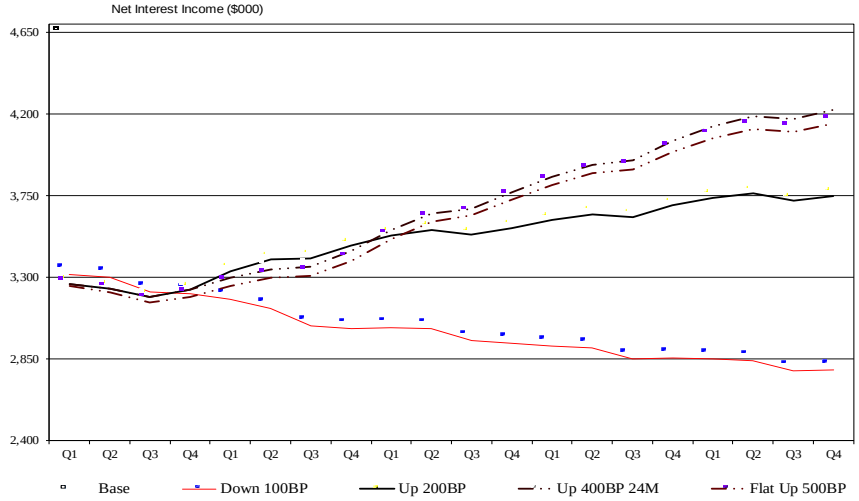
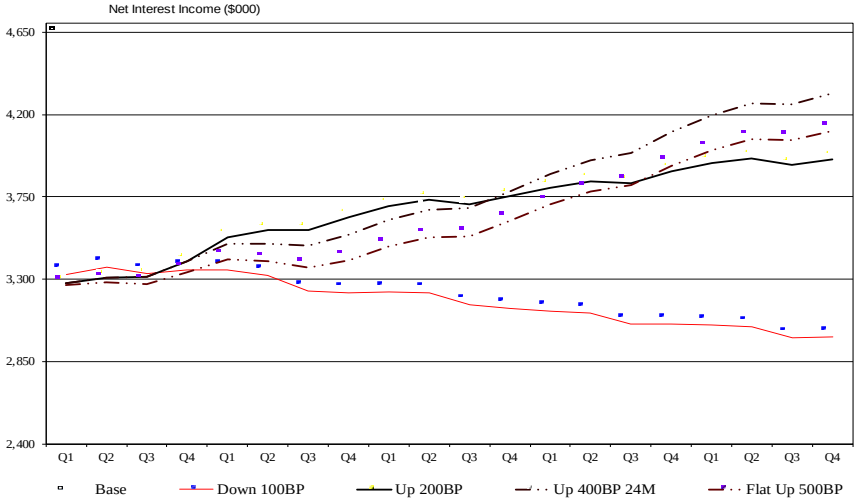
Base Model as of 6/30/2013



Alternative Investment Simulation



NII SUMMARY

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	13,049	13,050	12,923	12,924	12,825
Year-2 NII	12,364	12,941	13,614	13,445	13,251
Year-3 NII	11,931	12,884	14,202	14,657	14,494
Year-4 NII	11,545	12,772	14,599	15,778	15,577
Year-5 NII	11,264	12,704	14,977	16,727	16,433

NII SUMMARY

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	13,376	13,417	13,296	13,296	13,163
Year-2 NII	13,134	13,830	14,303	14,010	13,574
Year-3 NII	12,754	13,846	14,899	14,768	14,157
Year-4 NII	12,352	13,743	15,350	15,918	15,225
Year-5 NII	12,055	13,684	15,777	17,024	16,231

CHANGE / DIFFERENCE IN RESULTS

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	327	367	373	372	338
Year-2 NII	770	888	689	565	323
Year-3 NII	824	962	697	111	-337
Year-4 NII	806	972	752	140	-352
Year-5 NII	791	980	799	297	-201

This simulation assumes that all investment CD cash flow gets reinvested into a 50/50 split of 10 Yr MBS (2.20%) and 15 Yr MBS (2.80%).
The base model assumes that all investment CD cash flow is reinvested into 12 month CDs at 0.50%.

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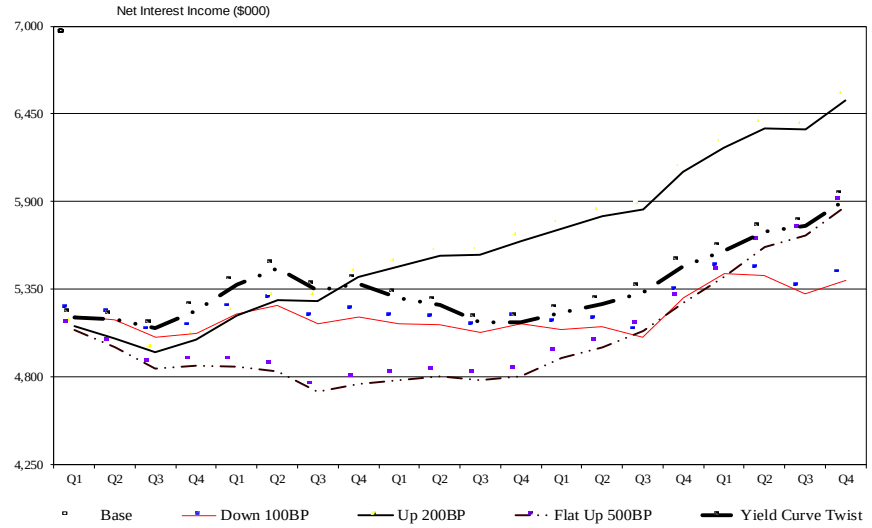
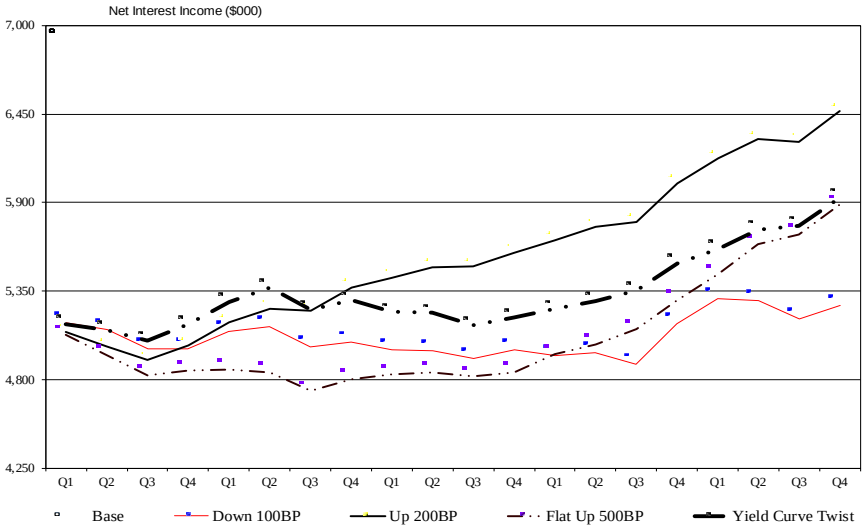
Cost/Rising Rate Benefit of "Parking" Investment Cash Flow Short (ouch!)

Base Simulation as of 7/31/2013



Alternative Investment Assumptions - Cash



NII SUMMARY

	Down 100BP	Base	Up 200BP	Flat Up 500BP	Yield Curve Twist
Year-1 NII	20,458	20,507	20,144	19,802	20,654
Year-2 NII	20,758	21,461	21,169	19,167	21,592
Year-3 NII	20,483	21,858	22,267	19,170	20,832
Year-4 NII	20,558	22,450	23,476	20,261	21,285
Year-5 NII	21,621	23,872	25,485	22,600	22,957

NII SUMMARY

	Down 100BP	Base	Up 200BP	Flat Up 500BP	Yield Curve Twist
Year-1 NII	20,248	20,309	20,029	19,712	20,441
Year-2 NII	20,267	21,066	21,001	19,246	21,183
Year-3 NII	19,880	21,311	22,024	19,342	20,757
Year-4 NII	19,964	21,902	23,216	20,383	21,405
Year-5 NII	21,035	23,324	25,211	22,678	23,032

CHANGE / DIFFERENCE IN RESULTS

	Down 100BP	Base	Up 200BP	Flat Up 500BP	Yield Curve Twist
Year-1 NII	-210	-198	-115	-90	-212
Year-2 NII	-491	-395	-168	78	-409
Year-3 NII	-603	-548	-243	172	-75
Year-4 NII	-594	-548	-260	122	120
Year-5 NII	-586	-548	-275	79	75

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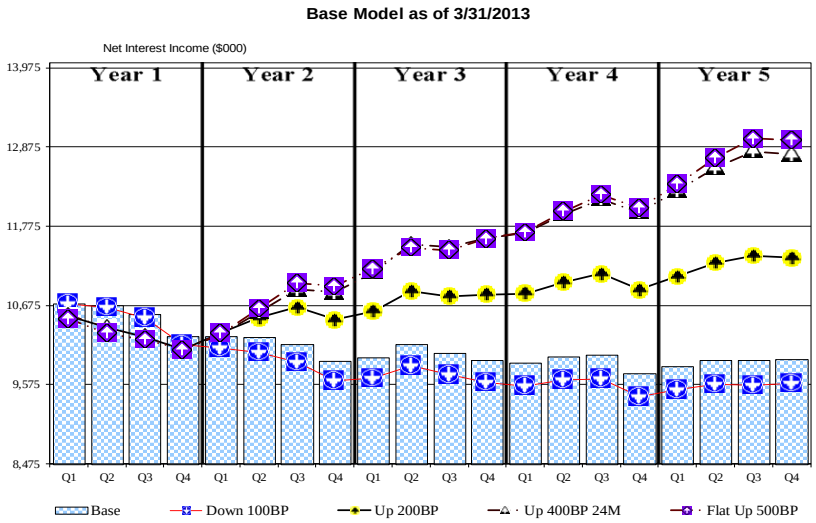
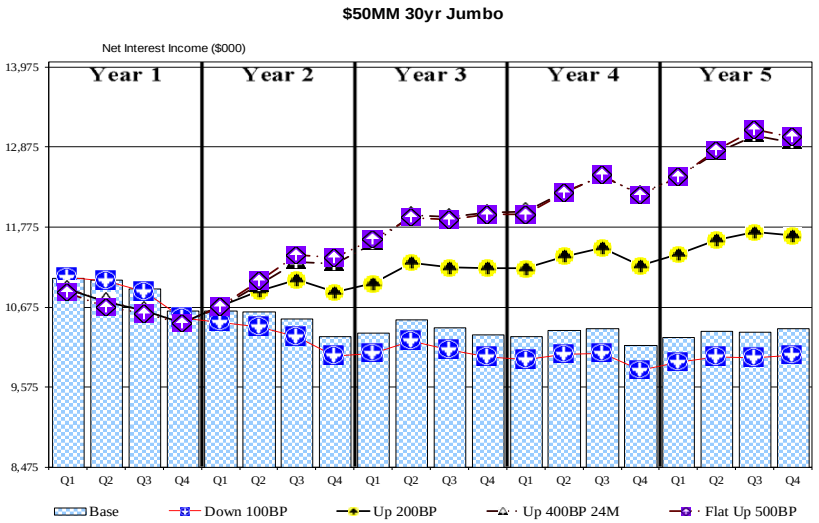
Jumbo Loans Funded By 3-5 Year FHLB Ladder





NII SUMMARY

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	41,982	42,159	41,200	41,217	41,038
Year-2 NII	39,619	40,509	41,930	42,620	42,857
Year-3 NII	38,821	39,996	43,103	45,747	45,715
Year-4 NII	38,262	39,534	43,856	47,749	47,914
Year-5 NII	38,241	39,571	45,055	50,443	51,054

NII SUMMARY

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	43,524	43,704	42,750	42,768	42,588
Year-2 NII	41,143	42,054	43,517	44,216	44,454
Year-3 NII	40,327	41,553	44,722	47,389	47,333
Year-4 NII	39,829	41,188	45,308	48,964	48,901
Year-5 NII	39,897	41,347	46,362	51,248	51,426

CHANGE / DIFFERENCE IN RESULTS

	Down 100BP	Base	Up 200BP	Up 400BP 24M	Flat Up 500BP
Year-1 NII	1,542	1,545	1,550	1,550	1,550
Year-2 NII	1,524	1,545	1,587	1,597	1,597
Year-3 NII	1,505	1,557	1,618	1,642	1,619
Year-4 NII	1,568	1,654	1,453	1,216	987
Year-5 NII	1,656	1,776	1,307	806	372

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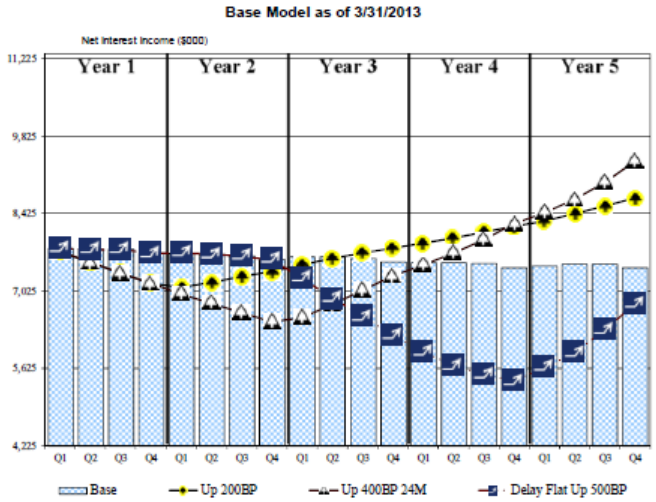
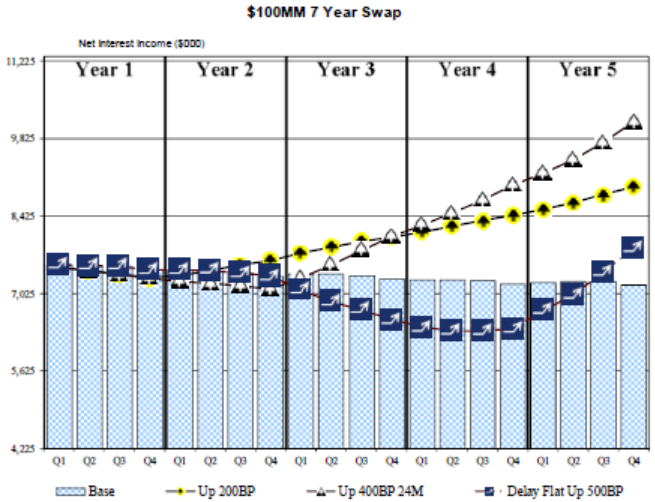
Extend Funding: Pay Fixed Swaps

Swap
As of March 31, 2013





NII SUMMARY

	Base	Up 200BP	Up 400BP 24M	Delay Flat Up 500BP
Year-1 NII	31,051	29,775	29,769	31,051
Year-2 NII	30,639	28,920	26,854	30,639
Year-3 NII	30,438	30,604	27,662	26,924
Year-4 NII	30,016	32,144	31,385	22,505
Year-5 NII	29,935	33,957	35,464	24,653

NII SUMMARY

	Base	Up 200BP	Up 400BP 24M	Delay Flat Up 500BP
Year-1 NII	30,043	29,610	29,605	30,043
Year-2 NII	29,631	29,940	28,717	29,631
Year-3 NII	29,427	31,627	30,718	27,250
Year-4 NII	29,008	33,164	34,433	25,494
Year-5 NII	28,927	34,977	38,511	28,978

CHANGE / DIFFERENCE IN RESULTS

	Base	Up 200BP	Up 400BP 24M	Delay Flat Up 500BP
Year-1 NII	-1,008	-165	-165	-1,008
Year-2 NII	-1,008	1,020	1,863	-1,008
Year-3 NII	-1,011	1,023	3,056	326
Year-4 NII	-1,008	1,020	3,048	2,989
Year-5 NII	-1,008	1,020	3,048	4,325

Execute a $100MM 7 Year Swap. Pay fixed at 1.27% and receive 3 Month LIBOR.

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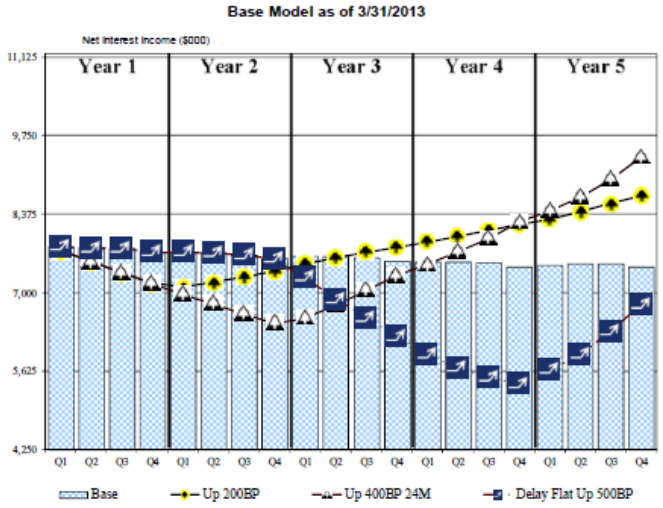
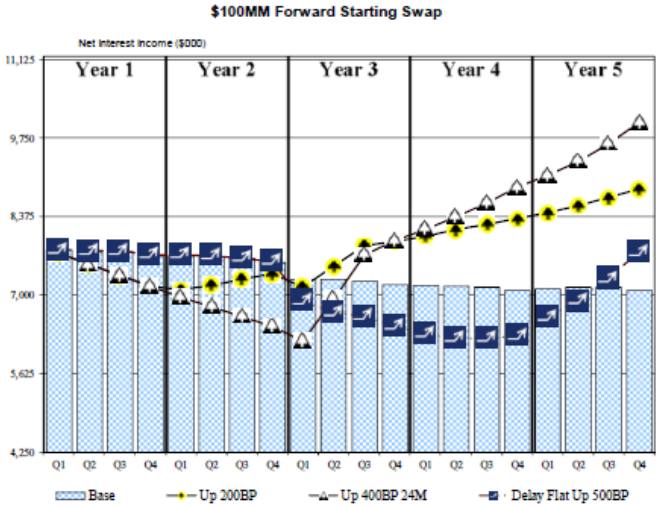
Extend Funding: Forward Starting Swaps (or Advances)

Forward Swap
As of March 31, 2013





NII SUMMARY

	Base	Up 200BP	Up 400BP 24M	Delay Flat Up 500BP
Year-1 NII	31,051	29,775	29,769	31,051
Year-2 NII	30,639	28,920	26,854	30,639
Year-3 NII	30,438	30,604	27,662	26,924
Year-4 NII	30,016	32,144	31,385	22,505
Year-5 NII	29,935	33,957	35,464	24,653

NII SUMMARY

	Base	Up 200BP	Up 400BP 24M	Delay Flat Up 500BP
Year-1 NII	31,051	29,775	29,769	31,051
Year-2 NII	30,639	28,920	26,854	30,639
Year-3 NII	29,021	30,459	28,789	26,676
Year-4 NII	28,603	32,759	34,028	25,089
Year-5 NII	28,522	34,571	38,106	28,572

CHANGE / DIFFERENCE IN RESULTS

	Base	Up 200BP	Up 400BP 24M	Delay Flat Up 500BP
Year-1 NII	0	0	0	0
Year-2 NII	0	0	0	0
Year-3 NII	-1,417	-145	1,127	-247
Year-4 NII	-1,413	614	2,642	2,584
Year-5 NII	-1,413	614	2,642	3,920

Execute a $100MM 5 Year Swap - 2 Years Forward. Pay fixed at 1.67% and receive 3 Month LIBOR.

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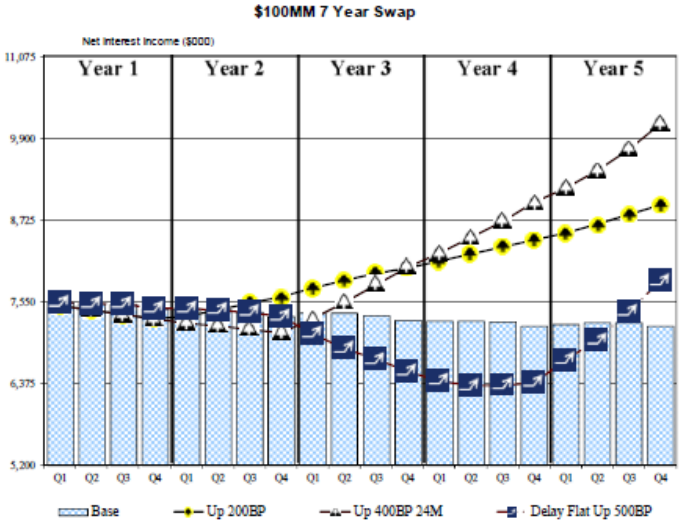
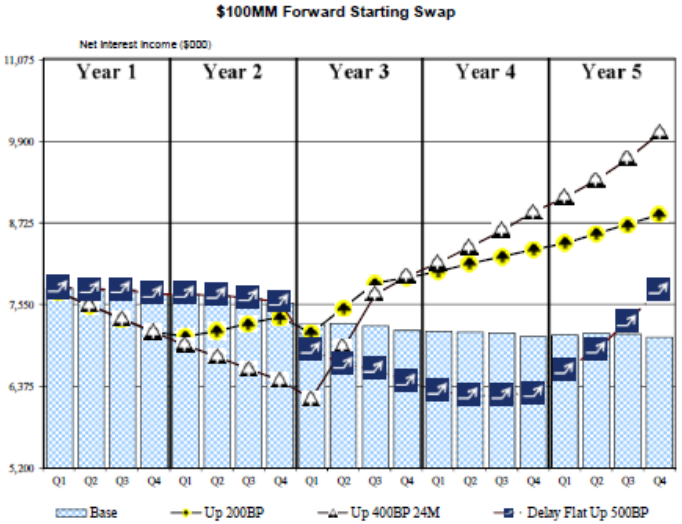
Spot vs. Forward Starting

Swap Comparison
As of March 31, 2013





NII SUMMARY

	Base	Up 200BP	Up 400BP 24M	Delay Flat Up 500BP
Year-1 NII	30,043	29,610	29,605	30,043
Year-2 NII	29,631	29,940	28,717	29,631
Year-3 NII	29,427	31,627	30,718	27,250
Year-4 NII	29,008	33,164	34,433	25,494
Year-5 NII	28,927	34,977	38,511	28,978

NII SUMMARY

	Base	Up 200BP	Up 400BP 24M	Delay Flat Up 500BP
Year-1 NII	31,051	29,775	29,769	31,051
Year-2 NII	30,639	28,920	26,854	30,639
Year-3 NII	29,021	30,459	28,789	26,676
Year-4 NII	28,603	32,759	34,028	25,089
Year-5 NII	28,522	34,571	38,106	28,572

CHANGE / DIFFERENCE IN RESULTS

	Base	Up 200BP	Up 400BP 24M	Delay Flat Up 500BP
Year-1 NII	1,008	165	165	1,008
Year-2 NII	1,008	-1,020	-1,863	1,008
Year-3 NII	-407	-1,168	-1,929	-574
Year-4 NII	-406	-406	-406	-406
Year-5 NII	-406	-406	-406	-406

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Even If A “Perfect” Model Did Exist…

What’s the REAL ISSUE?

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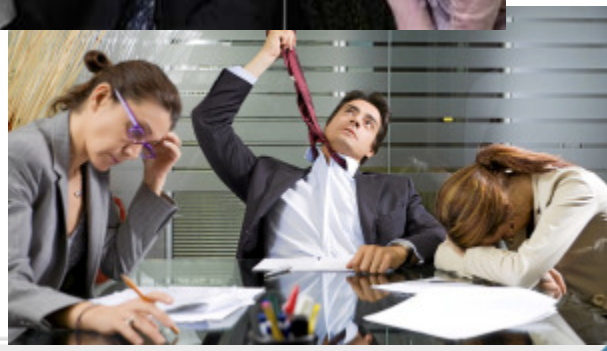
What Happens If Insert a “Perfect” Model Into an Ineffective ALCO Process?



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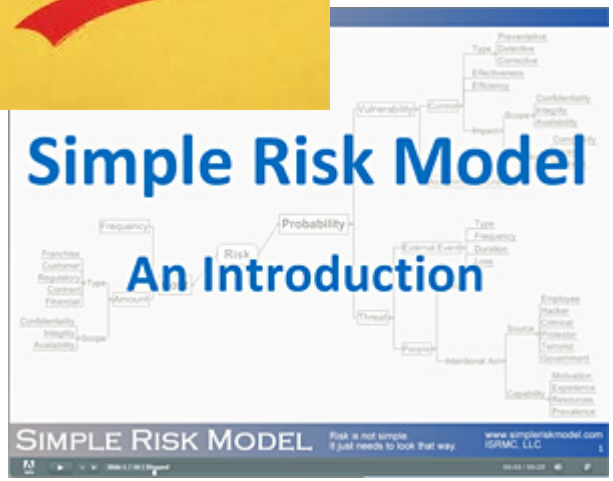
What Happens If Insert an “Average” Model Into an Effective ALCO Process?



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Questions?

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