ENGAGING
A NEW ERA

ALM Reports & Decisions

Mark DeBree, Manager

1:30 p.m. – 2:30 p.m.

Monday, October 24

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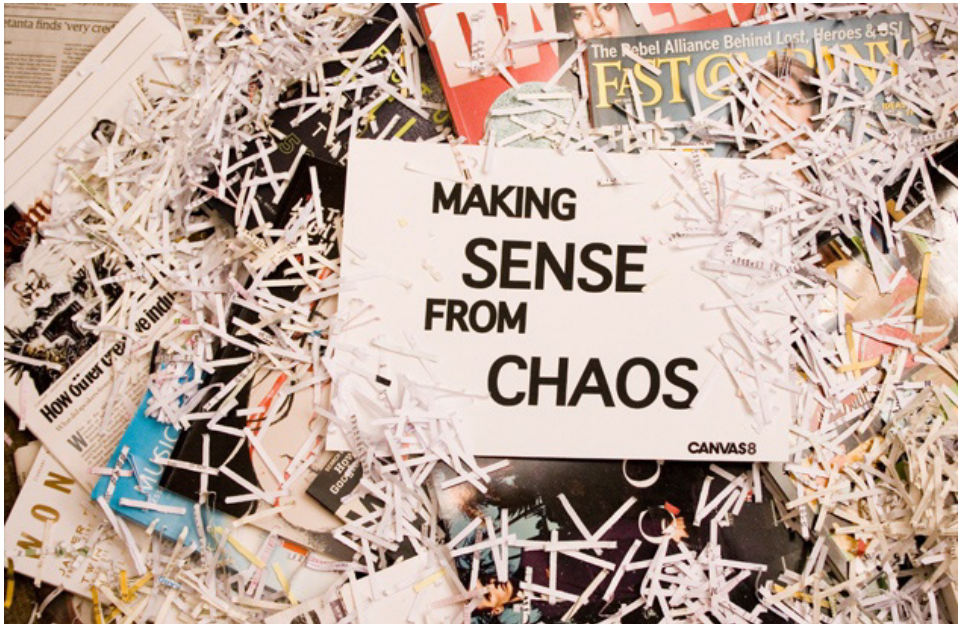
Taking ALM to the Next Level



Common theme from examinations…

"ALM is not integrated with decision making"

If properly defined, ALM is very helpful in managing balance sheet structure, but we must…

Make Sense of the Chaos

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Common Problems

Standard ALM Reports are often Unclear and Confusing

Results can be difficult to decipher

Most Commonly – The link between ALM Reports and Decision Making is not clearly defined or understood

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The ALM Process Enables Credit Unions to:

1. Identify
2. Measure
3. Monitor
4. Report
5. Control Risk

ALM REPORTS

DECISION MAKING

Controlling risk exposures implies making decisions to manage those risks!

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Steps of the ALM Decision Process

1. Understand & Interpret Risk Profile and Balance Sheet Composition

2. Develop Economic Expectations

3. Decision Making

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ALM Checkup

Before making any decision,
answer the following questions:

1. Is the data fed into the ALM model accurate?
2. Are the Assumptions used in the model realistic?
3. Is the ALM model sophisticated enough for the balance sheet complexity?

Be Cautious if any answer is “NO”

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Data Assumptions

Data Inputs
- Maturity Dates
- Interest Rates
- Reset Information

Dividend Rate Pricing

New Business Inputs
- Rates
- Volumes

Theory Assumptions

Prepayment Estimates
- Single factor vs. Multi-factor

Non-Term Shares
- Decay vs. WAL

Term Deposits
- Early Withdrawals

Using the Right ALM Model

Balance Sheet Complexity

- Real Estate Exposure
- Complex Investments

Off-Balance Sheet Items

- Mortgage Servicing
- Interest Rate Swaps & Caps

Data Inputs

- Instrument vs. Product Level

Risk Measurement Methods

- Gap, Net Economic Value (NEV), and Net Interest Income (NII) Simulation

Valuation Techniques

- Deterministic –Present Value vs.
- Stochastic – Lattice Valuation

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Be Thorough and Accurate

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UNDERSTANDING ALM RESULTS

When working through ALM reports, develop a system

You should be able to:

- Understand the risk exposure
- Isolate Key Risk Drivers
- And know why products are driving/creating risk

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Work Backwards:

1. Identify Overall Risk Exposures

2. Isolate Key Risk Drivers

   Investment types, Auto Loans, Mortgages, Deposits, etc.

3. Understand Why Accounts are Causing Risk

   Long Maturity Terms, Embedded Options, High Concentrations, etc.

Step 1: Identify Overall Risk Exposures

Net Economic Value (NEV)					
	Book	-100	Base	+100	+300
Cash	$17,059	$17,059	$17,059	$17,059	$17,059
Bullet Inv	5,199	5,380	5,283	5,171	4,961
Callable Inv	9,808	9,899	9,869	9,699	9,176
CMO/MBS Inv	27,327	27,787	27,338	26,588	24,720
Other Inv	5,118	5,118	5,118	5,118	5,118
Vehicle Loans	69,311	70,801	69,797	68,544	66,098
RE Loans	186,553	196,192	191,008	182,259	165,043
Other Loans	54,581	58,315	57,876	57,077	55,384
Other Assets	15,570	15,570	15,570	15,570	15,570
Total Assets	390,525	406,120	398,917	387,085	363,129
$ Change		7,203		-11,833	-35,789
% Change		1.81%		-2.97%	-8.97%
Shares	$215,453	$208,961	$205,186	$201,392	$195,573
CDs	102,019	104,201	103,281	102,223	100,269
Borrowings	26,459	27,938	27,132	26,353	24,945
Other Liab.	3,787	3,787	3,787	3,787	3,787
Total Liab.	347,718	344,887	339,386	333,755	324,574
$ Change		5,501		-5,631	-14,812
% Change		1.62%		-1.66%	-4.36%
Equity	**42,808**	**61,233**	**59,531**	**53,329**	**38,554**
$ Change		**1,702**		**-6,202**	**-20,977**
% Change		**2.86%**		**-10.42%**	**-35.24%**

- Moderate/High Risk for +300bps shock
- Assets decline by more than 2x Funds
  - Decline in Funds offsets only a portion of the Asset decline

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Step 2: Isolate Key Risk Drivers - Assets

Net Economic Value (NEV)								
		Dollar Change				Percent Change		
	Book	-100	Base	+100	+300	-100	Base	+100	+300
Cash	$17,059								
Bullet Inv	5,199	98		-112	-321	1.8%		-2.1%	-6.1%
Callable Inv	9,808	30		-170	-693	0.3%		-1.7%	-7.0%
CMO/MBS Inv	27,327	449		-750	-2,619	1.6%		-2.7%	-9.6%
Other Inv	5,118								
Vehicle Loans	69,311	1,004		-1,253	-3,699	1.4%		-1.8%	-5.3%
RE Loans	186,553	5,184		-8,749	-25,965	2.7%		-4.6%	-13.6%
Other Loans	54,581	439		-799	-2,492	0.8%		-1.4%	-4.3%
Other Assets	15,570								
Total Assets	390,525	7,203		-11,833	-35,789	1.8%		-3.0%	-9.0%
Shares	$215,453	3,776		-3,794	-9,612	1.8%		-1.8%	-4.7%
CDs	102,019	920		-1,058	-3,012	0.9%		-1.0%	-2.9%
Borrowings	26,459	806		-779	-2,187	3.0%		-2.9%	-8.1%
Other Liab.	3,787								
Total Liab.	347,718	5,501		-5,631	-14,812	1.6%		-1.7%	-4.4%
Equity	42,808	1,702		-6,202	-20,977	2.9%		-10.4%	-35.2%

- Notable Accounts (Dollar Change):
  - Real Estate Loans; 72.6% of assets decline
  - Vehicle Loans; 10.3%
  - CMO/MBS Inv; 7.3%
- Notable Accounts (Percent Change):
  - Real Estate Loans; 13.6% decline
  - CMO/MBS Inv; 9.6%
  - Callable Inv; 7.0%

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Step 2: Isolate Key Risk Drivers - Liabilities

Net Economic Value (NEV)									
		Dollar Change				Percent Change			
	Book	-100	Base	+100	+300	-100	Base	+100	+300
Cash	$17,059								
Bullet Inv	5,199	98		-112	-321	1.8%		-2.1%	-6.1%
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- Notable Accounts (Dollar Change):
  - Shares; 64.9% of assets decline
  - CDs; 20.3%
- Notable Accounts (Percent Change):
  - Shares; 4.7% decline
  - Borrowings; 8.1%

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Factors Driving Risk

Term to Maturity:

Longer Maturities have more price sensitivity; i.e. more risk!

- Longer time before principal is recovered

	Price Sensitivity
Term to Maturity	
Longer	**Higher**
Shorter	Lower
Coupon	
Higher	Lower
Lower	**Higher**

Coupon:

Lower Coupons have more price sensitivity than higher coupons; i.e. Risk!

- Lower Coupons earn less

	Short Maturity	Long Maturity
High Coupon	**Lowest**	2nd Highest
Low Coupon	2nd Lowest	**Highest**

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Factors Driving Risk

Embedded Options:
(Call Options & Prepayments)

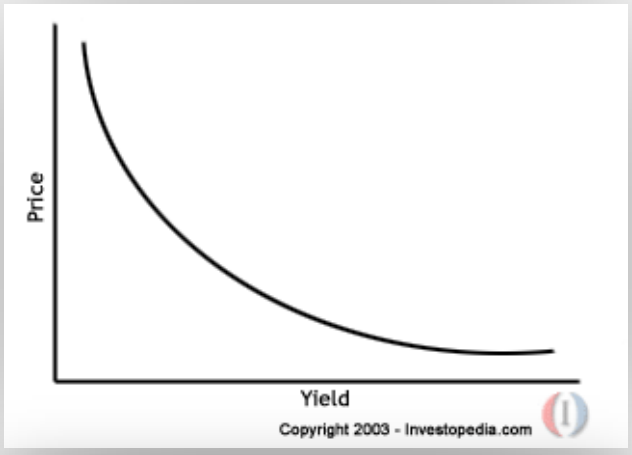
Contraction/Extension Risk

- Received cash flows differ from expected cash flows

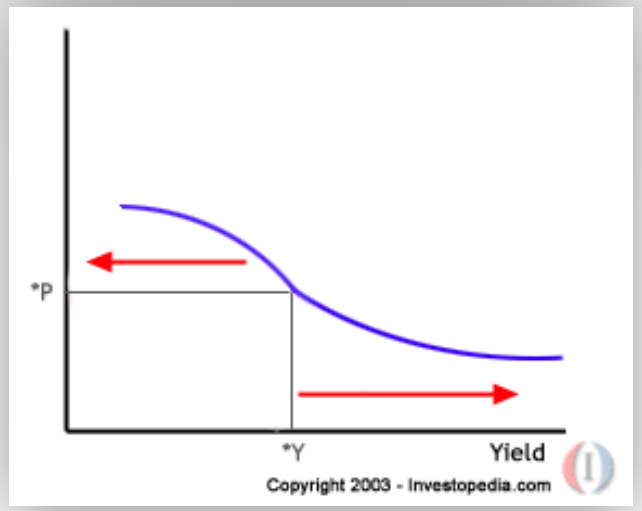
Negative Convexity

- Price increases when rates fall are less than price decline when rates rise

Price/Yield Relationship



Negative Convexity Relationship



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Factors Driving Risk – Summary

Longer maturity products

- Longer time until funds mature and are replaced at market rates
  - Causes larger decline in value when rates rise; also a greater increase if rates fall

Short maturity products

- Shorter time until funds mature and are replaced at market rates
  - Causes lower decline in value when rates rise; also a lower increase if rates fall

Amortizing products

- Pay regular principal and interest payments
- Less price volatility than bullet type products that only pay interest until maturity

Adjustable Rate products

- Typically function like short maturity products

Step 3: Understanding Why

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Step 3: Understanding Why

Driven by:

Real Estate Loans - 72.55% of Asset Volatility

Largest Balance Sheet Item & Riskiest Holdings (% decline)

- Balance Sheet holdings (47.77% of Assets or 436% of equity)
- Prepayment Option causes Extension & Contraction Risks
- Price decline: -13.6%

CMO/MBS Investments – 7.32% of Asset Volatility

2nd Riskiest Holding (% decline)

- Balance Sheet holdings (7.0% of Assets or 64% of equity)
- Prepayment Option causes Extension & Contraction Risks
- Price decline: -9.6%

Step 3: Understanding Why (continued)

Contributing Factors:

Auto Loans – 10.34% of Asset Volatility

2nd Largest Risk Contributed ($ decline)

- Balance Sheet holdings (17.75% of Assets or 162% of equity)
- Risk contribution driven by balance sheet position
- Price decline: -5.3%

Callable Investments – 1.94% of Asset Volatility

3rd Riskiest Holding (% decline)

- Balance Sheet holdings (2.51% of Assets or 23% of equity)
- Call Options cause Extension Risk
- Price decline: -7.0%

Work Backwards:

- ✓ Start at the Overall Risk Exposures
- ✓ Identify Specific Accounts Driving Risk
- ✓ Understand Why Accounts are Causing Risk

Steps of the ALM Decision Process

1. Understand & Interpret Risk Profile and Balance Sheet Composition

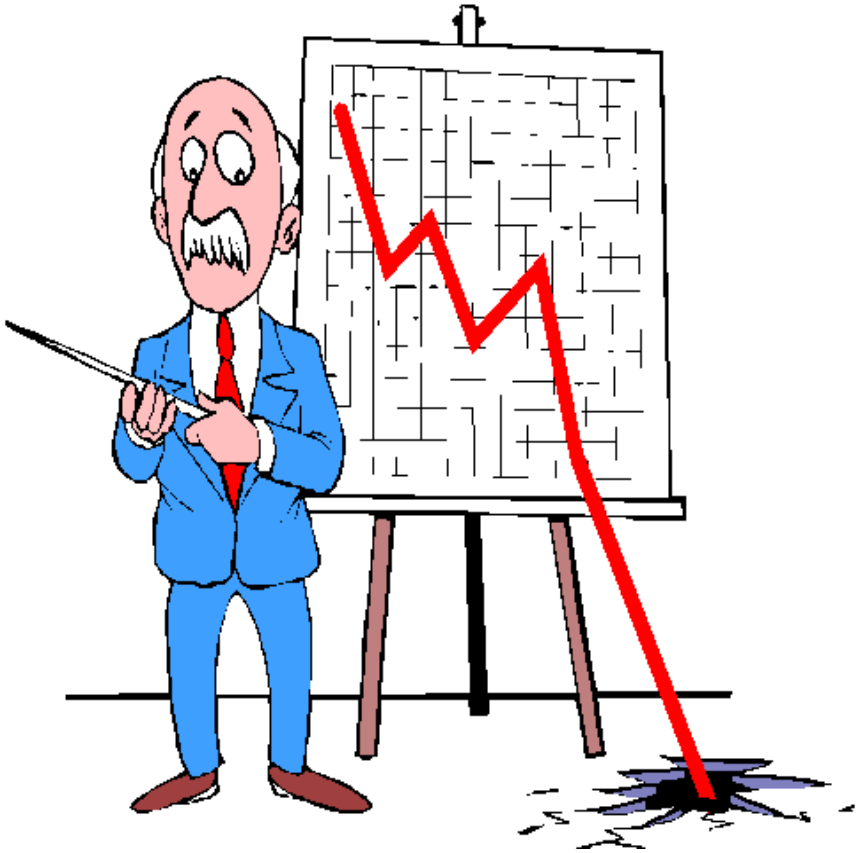
2. Develop Economic Expectations

3. Decision Making

Devloping Economic Expectations

Economic Questions:

- Where is the economy going?
- What will happen to:
  - Interest rates
  - The Consumer
    - Loan demand
    - Deposit growth



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Sources of Information:

Catalyst Strategic Solutions

- Economic Commentary
  - www.catalystcorp.org/economic.aspx
- Bi-Weekly Economic Recap (Tues.)
  - http://www.catalystcorp.org/invtrain.aspx

Your Members

Other Sources

- Bloomberg, Wall Street Journal, etc.

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Devloping Economic Expectations

Economic Growth:

Measured as the change in Gross Domestic Product on a period-over-period basis

Economic Fact

5 Year Average GDP Composition

	% of GDP
Consumer Spending	*70.75%*
Domestic Investment	11.89%
Net Imports/Exports	-3.33%
Government Spending	20.69%

Keep an eye on your Members!

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Steps of the ALM Decision Process

1. Understand & Interpret Risk Profile and Balance Sheet Composition
2. Develop Economic Expectations
3. Decision Making

Decision Making

Choosing the Right Path

Balancing ALM Theory with Reality

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ALM Theory Suggests:

Risk to Rising Rates

- Shorten Asset Durations
- Lengthen Funding Durations

Rationale:

Allows asset yields to rise faster than funding costs; improving gross spread and earnings

Risk to Falling Rates

- Extend Asset Durations
- Shorten Funding Durations

Rationale:

Enables funding costs to fall faster than asset yields; widening gross spread and improving earnings

Reality Indicates:

- Changes in interest rates seldom occur at “shocked” levels
  - ALM provides a “worst case” risk exposure
- Credit Unions are compensated for taking risks
  - Some level of risk must be taken to produce earnings
- Consider the Risk/Return tradeoff
  - Consider the “cost” of reducing risk in relation to the benefit gained

Choosing the Best Option

ALM Theory – Problem: r*ates likely to rise; Action: reduce risk to rising rates*

Actions to Take:

- Assets
  - Limit Future Long-Term Fixed Rate Mortgage Bookings
  - Tilt Investment Portfolio towards Short-Term products
  - Campaign to Increase Auto Loans
- Funds
  - Market longer term Share and IRA certificates
  - Consider Locking in Term Borrowings

Results:

- Long-term Risk Reduced
- Earnings Reduced
- Positioned for Rising Rates

Choosing the Best Option

The Current Reality

- Rates unlikely to change over the near-term
  - Rates may not rise for some time
- Need some Asset exposure for earnings
  - Need to maintain risk exposure to continue to generate earnings
- Cost of reducing risk may “hurt”
  - Earnings given up, or expenses taken on to reduce risk may be too great

The Balancing Act

Managers must choose how much risk is acceptable, when it should be taken, and when it should be avoided or adjusted

Linking ALM to Decision Making

- Balance ALM theory with the current reality
  - Consider need for risk reduction in terms of the economic environment
- There is no strategic "silver bullet" for all credit unions
  - Make the best decision based on YOUR needs with the information YOU believe to be accurate
- Consider all rate environments
  - ALM generally only evaluates rising and falling rate environments
- Examiners are simply looking for credit unions to incorporate ALM into the decision making process
  - It can be done, **DOCUMENT IT**!

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QUESTIONS

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Duration Facts – Assets

- Price Sensitivity
  - Long-Term Products > Short-Term Products
  - Fixed Rate Products > Adjustable Rate Products
- Embedded Options can change cash flow structure and duration

**Standard loan product durations, and sensitivities

Products	Maturity Term	Duration	Sensitivity
Auto Loans	5Yr	2.0	Low
Credit Card Fxd	5Yr	3.0	Low/Moderate
Home Equity Loans	10Yr	4.0	Moderate
15yr 1st Mtg	15Yr	6.0	High
30yr 1st Mtg	30Yr	10.0	High

**These are approximations for newly issued instruments

Duration Facts – Liabilities

- Price Sensitivity (same as Assets)

**Standard funding product durations, and sensitivities

Products	Maturity Term	Duration	Sensitivity
Non-Term Shares*	3.5Yr	1.70	Low/Moderate
1 Yr CD	1Yr	0.99	Low
2Yr CD	2Yr	1.98	Moderate
3Yr CD	3Yr	2.95	Moderate
5Yr CD	5Yr	4.87	High
*** Assumes 50% Rate Sensitivities**			

**These are approximations for newly issued instruments

Note: Term Borrowing durations will be close to term certificates

KEY RISK MEASUREMENT TERMS

Weighted Avg Life (WAL):

- Number of years until 50% of initial investment is received (includes interest payments)
- Higher WAL *often* leads to higher price sensitivity

Instrument Types	WAL
Zero Coupon Bond	Maturity
Bullet Product	Slightly < Maturity
Adj Rate Product	Close to Bullet
Amortizing Product	Generally < 50% of Original Term
Adj Rate Amort Product	Close to Amortizing Product

Duration:

- Indication of price sensitivity to changes in interest rates.
- Higher duration equates to higher price sensitivity

Instrument Types	Duration
Zero Coupon Bond	Maturity
Bullet Product	Slightly < Maturity
Adj Rate Product	Close to Reset Term*
Amortizing Product	Generally < 50% of Original Term
Adj Rate Amort Product	Close to Reset Term*
**Assumes products are not at their Caps/Floors*	

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Notable Equations

Net Present Value

$$NPV = \sum_{t=1} \frac{CF_t}{(1+i)^t}$$

NPV = Net Present Value
CF_t = Cash Flow to be Received
i = Market Interest Rate
t = Time

Weighted Avg Life

$$WAL = \sum_{i=1} \frac{p+i}{P} t_i$$

$p+i$ = Principal & Interest Payments
P = Total Principal
t_i = Time in Years from next Coupon i

Modified Duration

$$ModD = \frac{\partial \ln(P)}{\partial_i}$$

$\partial \ln(P)$ = Natural Log of Price Change
∂_i = Change in interest rates

Effective Duration

$$EffD = \frac{P_{-\Delta i} + P_{+\Delta i}}{2P * \Delta_i}$$

$P_{-\Delta i}$ = Price when interest rates decline
$P_{+\Delta i}$ = Price when interest rates rise
P = Current Price
Δ_i = Change in interest rates

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GO RANGERS!