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**Asset/Liability Management I
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Class Overview

Asset/Liability Management

- Defining Asset/Liability Management
- Role of Community Bank
 - Overview of asset-side of balance sheet
 - Overview of liability-side of balance sheet
- Defining interest rate risk
- Effects of interest rate risk

Asset/Liability Management

Process of managing assets, liabilities, and derivatives to obtain a risk/return trade-off that is optimal for your institution.

Goals of the ALM Process

- Earnings growth and stability
- Equity growth and stability
- Risk management
 - Interest rate risk
 - Credit risk
 - Liquidity risk
 - Leverage
- No surprises in performance

Competing Goals

- ALCO goals can conflict with each other
 - Desire higher earnings
 - Need to control risk
 - Trade-off between risk and return
- ALCO decisions involve balancing competing objectives
- Continuous process of *optimization*

Risk/Return Optimization

- Goal of ALM is not to eliminate risk
- Return requires risk
- Goal is to manage risk – make sure return is acceptable for level and type of risk being taken
- Risk management is about optimizing current profitability while still being prepared for what might happen in the future

Risk/Return Optimization

- Banks primarily put interest rate risk and credit risk on balance sheet
- Important to vary the type of risks being taken across the balance sheet – and to adjust as balance sheet composition changes
- Identifying balance sheet risks is best starting point for assessing risk management
- Effective IRR risk management is built around understanding risks present on the balance sheet and being comfortable with the bank's position should the market environment change

Constraints on ALM Process

- Economic, financial market conditions
- Local market conditions
- Institution's characteristics
- Regulatory environment

ALM Decisions

- Balance sheet optimization
 - Composition of assets
 - Composition of liabilities
 - Intensity of capital utilization
 - Capital allocation to asset classes
- Pricing strategies
- Risk management strategies
- Should be taken in context of overall balance sheet

Effective Risk Management Process

- Must be able to evaluate risk-return trade-offs on a regular basis
- Must adjust asset, liability balances, pricing, and hedging for appropriate trade-off
- Must be an on-going process with board and senior management

The Role of Community Banks

The general equation:

$$\text{Assets} = \text{Liabilities} + \text{Capital}$$

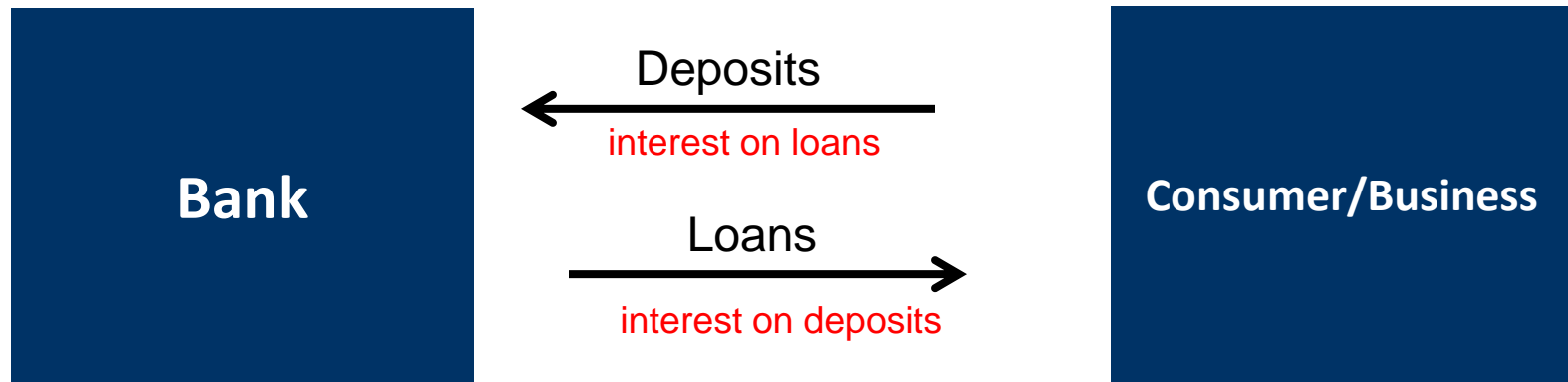
translates into the following subsections for community banks:

$$\text{loans} + \text{investments} + \text{all other assets} = \text{consumer and business deposits} + \text{other funding sources} + \text{all other liabilities} + \text{capital}$$

Banks all share the expanded definition, but with different weights among sectors and subject to varying levels of complexity within those sectors.

The Role of Community Banks

Banks facilitate the transmission of monetary policy to the financial markets, borrowers and depositors, and the economy.

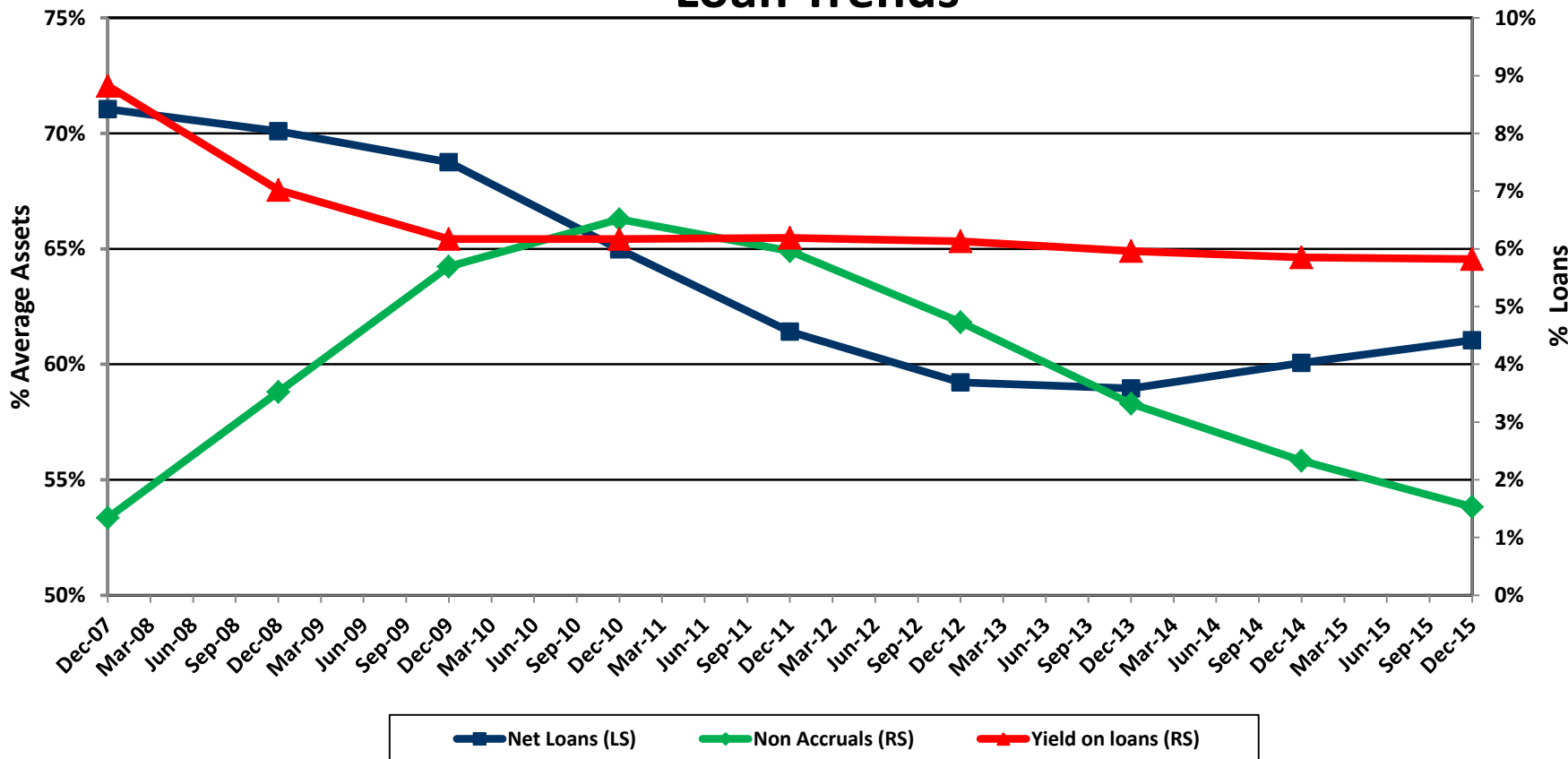


Banks take-in and safeguard deposits and either lend or invest proceeds to earn a **spread** over the cost of those deposits.

Bank Asset Management

Assets	Book Value		
	Current Book Value	Wt.Avg. Rate	Percent of Total
U.S. Treasuries	0	0.000	0.00%
U.S. Agencies	49,213,656	1.249	13.61%
Mortgage-Backed Securities	64,184,874	1.942	17.76%
CMO's	0	0.000	0.00%
Municipal Securities	24,040,691	3.498	6.65%
Corporate Securities	0	0.000	0.00%
Other Securities	2,805,700	0.052	0.78%
Total Securities	140,244,921	1.928	38.80%
Fed Funds Sold	0	0.000	0.00%
Interest Bearing Deposits	10,467,543	0.218	2.90%
Other Investments	0	0.000	0.00%
Total Other Investments	10,467,543	0.218	2.90%
Total Investments	150,712,464	1.809	41.69%
Commercial Loans	96,043,360	3.907	26.57%
Real Estate Loans	95,551,632	3.652	26.43%
Installment Loans	422,079	5.439	0.12%
Other Loans	2,956,518	1.352	0.82%
Total Loans	194,973,589	3.747	53.94%
Total Earning Assets	345,686,053	2.902	95.63%

Loan Trends



Source: FDIC

Loans are the largest segment of bank balance sheets and typically comprise the highest yields of all earning assets. As such, consider the systemic impact from the above trends.

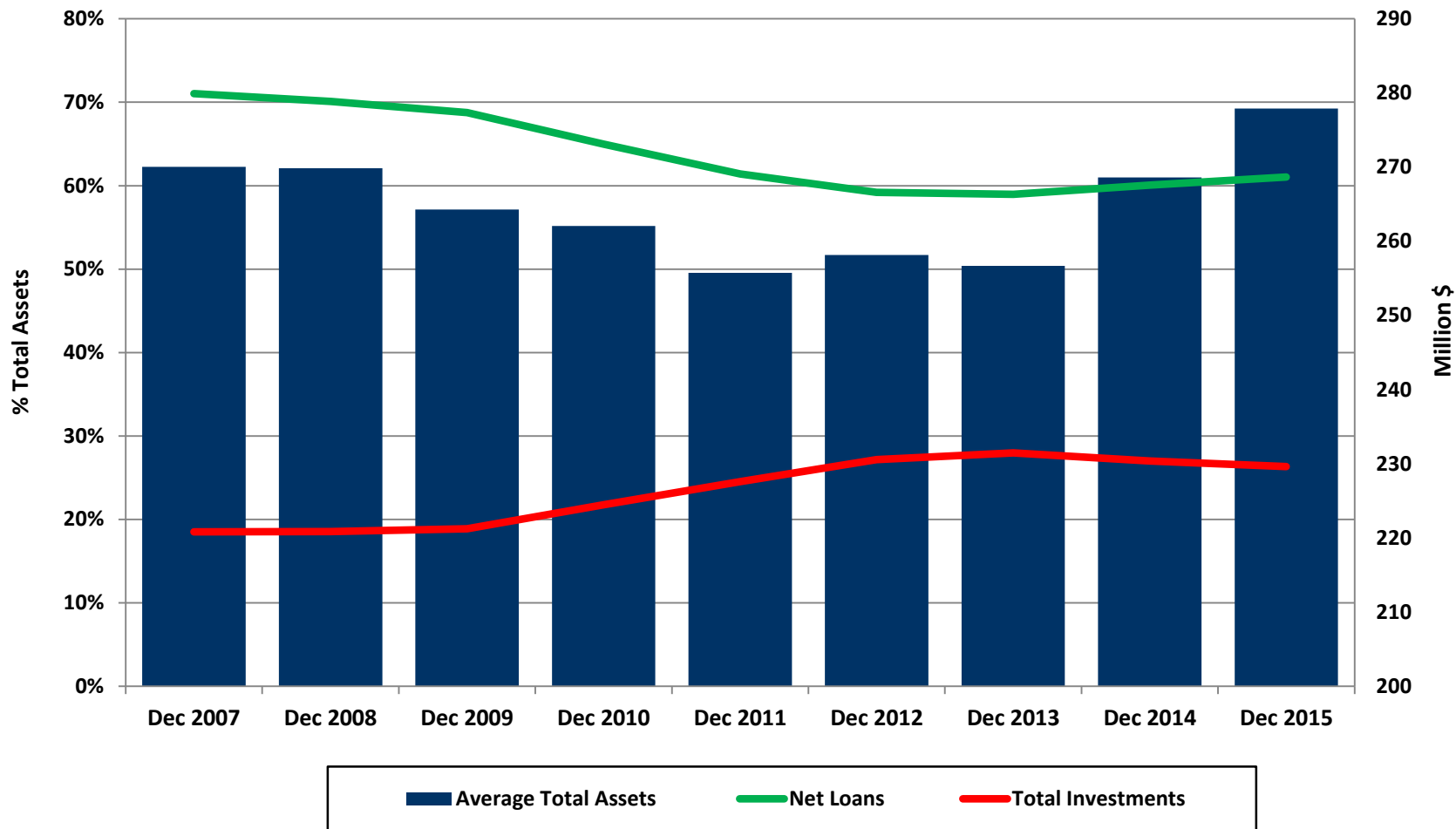
Investment Securities

Investment securities play a critical role in the management of:

- Interest rate risk
- Liquidity risk
- Credit risk
- Earnings growth and stability
- Regulatory capital maintenance (risk-based capital ratios)

**Bond portfolio acts as the primary balancing tool for all of the above areas

Investment Securities



Other (Non-Security) Investments

Assets	Current Book Value	Wt.Avg. Rate	Percent of Total
U.S. Treasuries	0	0.000	0.00%
U.S. Agencies	4,095,248	2.661	3.91%
Mortgage-Backed Securities	27,207,588	2.343	25.98%
CMO's	6,969,294	2.582	6.66%
Municipal Securities	7,289,949	3.470	6.96%
Corporate Securities	2,857,942	1.789	2.73%
Other Securities	4,028,912	3.077	3.85%
Total Securities	52,448,933	2.583	50.09%
Fed Funds Sold	0	0.000	0.00%
Interest Bearing Deposits	22,309,723	0.254	21.30%
Other Investments	3,497	0.250	0.00%
Total Other Investments	22,313,220	0.254	21.31%
Total Investments	74,762,153	1.888	71.39%
Commercial Loans	12,928,476	5.392	12.35%
Real Estate Loans	14,638,639	5.153	13.98%
Installment Loans	296,561	6.424	0.28%
Other Loans	830,119	4.577	0.79%
Total Loans	28,693,795	5.257	27.40%
Total Earning Assets	103,455,948	2.822	98.80%

Non-security investments typically identify the degree of short-term liquidity, risk aversion, and earnings drag management is willing to incur. Banks may have small securities portfolios but large non-security investment holdings.

Non-Maturity Deposits

- Non-maturity deposits (NMDs) are deposits without a contractual maturity date – the deposit “matures” at the discretion of the depositor
 - NMDs can be either interest bearing or non-interest bearing
 - Non-interest bearing NMDs consist of consumer and business demand deposits (DDA)
 - Interest bearing NMDs are broadly classified as Savings, Negotiable Order of Withdrawal (NOW), and Money Market Accounts (MMDA)
 - **The depository holds the option to set the rates on interest bearing NMDs**

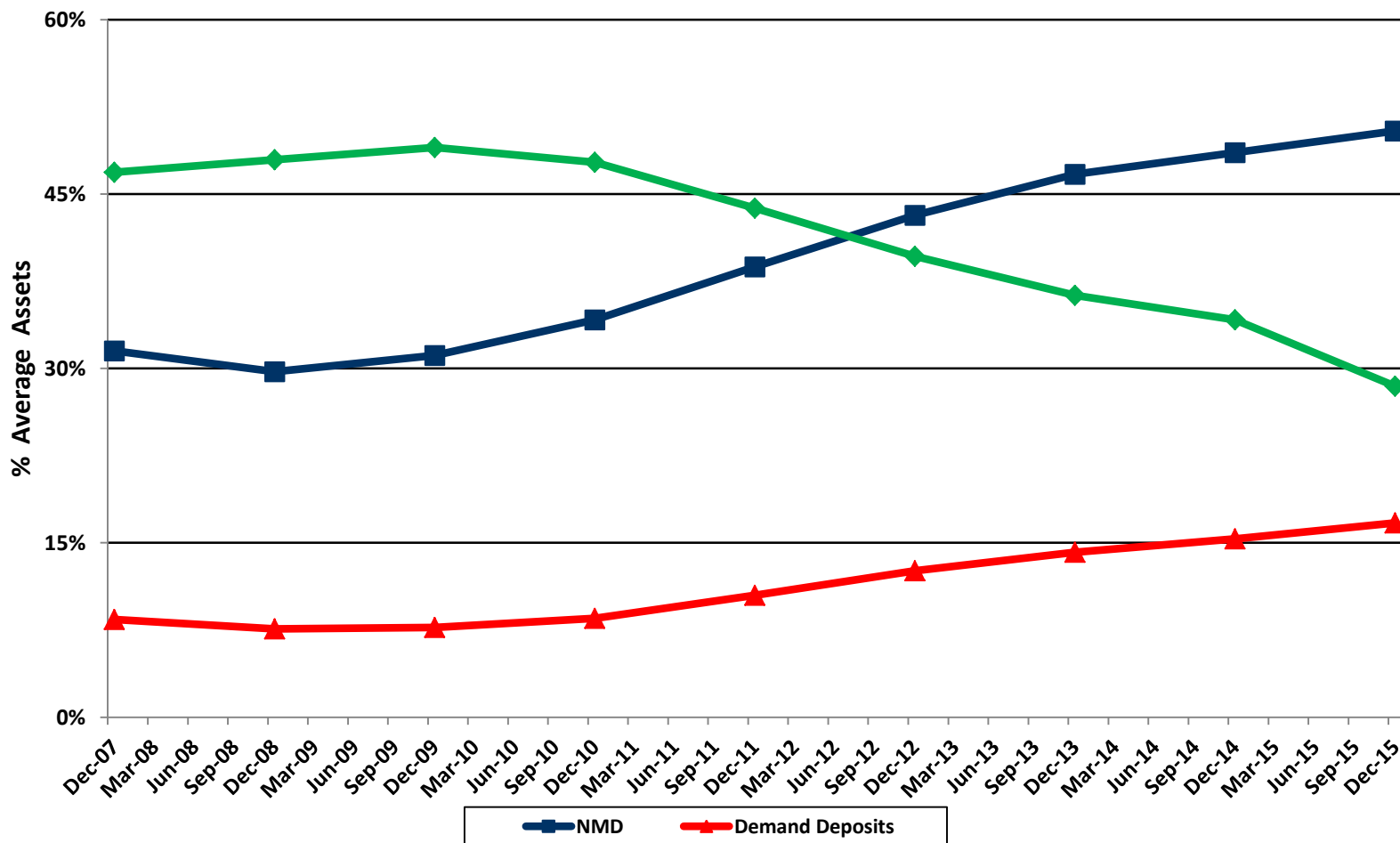
Non-Maturity Deposits

- **DDA accounts** do not pay an explicit interest rate and usually are the lowest cost and most stable form of deposit funding on a depository balance sheet
 - **Consumer DDA** – Lower balances with longer lives and low account balance volatility
 - **Business DDA** – Higher balances with shorter average lives and greater account balance volatility
- **NOW accounts** are interest bearing checking accounts that typically carry a low interest rate with minimal volatility
- **Savings accounts** pay a higher rate than NOW accounts, but are more stable due to limits on the number of withdrawals that can be made
- **MMDA** are the highest cost NMD and usually have the greatest volatility
- Typically interest bearing NMDs will have a tiered pricing structure with higher rates on larger balances
- Most are covered by FDIC insurance, but the account balance and type of the product determines coverage

Time Deposits

- Time Deposits are deposits with a set term and typically carry a fixed interest rate – also known as Certificates of Deposit (CDs)
 - Time Deposits are offered with a variety of maturity terms with most depositories offering terms ranging from 3 months to 5 years
 - Time Deposits fall into two broad categories – retail and jumbo. Jumbo time deposits are those with a balance greater than 250K. Jumbo time deposits typically carry a higher interest rate than a similar term retail deposit.

GA Bank Funding Trends



Source: FDIC

Wholesale Funds

- Wholesale funds comprise sources that do not come from the banks typical branch and customer networks, these funds often require collateral
 - **Fed Funds Purchased** – Overnight funds borrowed through correspondent banking arrangements
 - **Brokered CDs** – CDs placed through CD brokers that typically carry higher rates and balances
 - **Repurchase Agreements** – Collateralized borrowings with a set maturity and typically contain an option
 - **FHLB Advances** - Collateralized borrowings from the FHLB. Come in a variety of terms and structures to meet depository funding needs.
 - **Public Funds** – Funds from municipalities and other public entities. Public funds are typically very rate sensitive and thus volatile.

Regulatory Capital

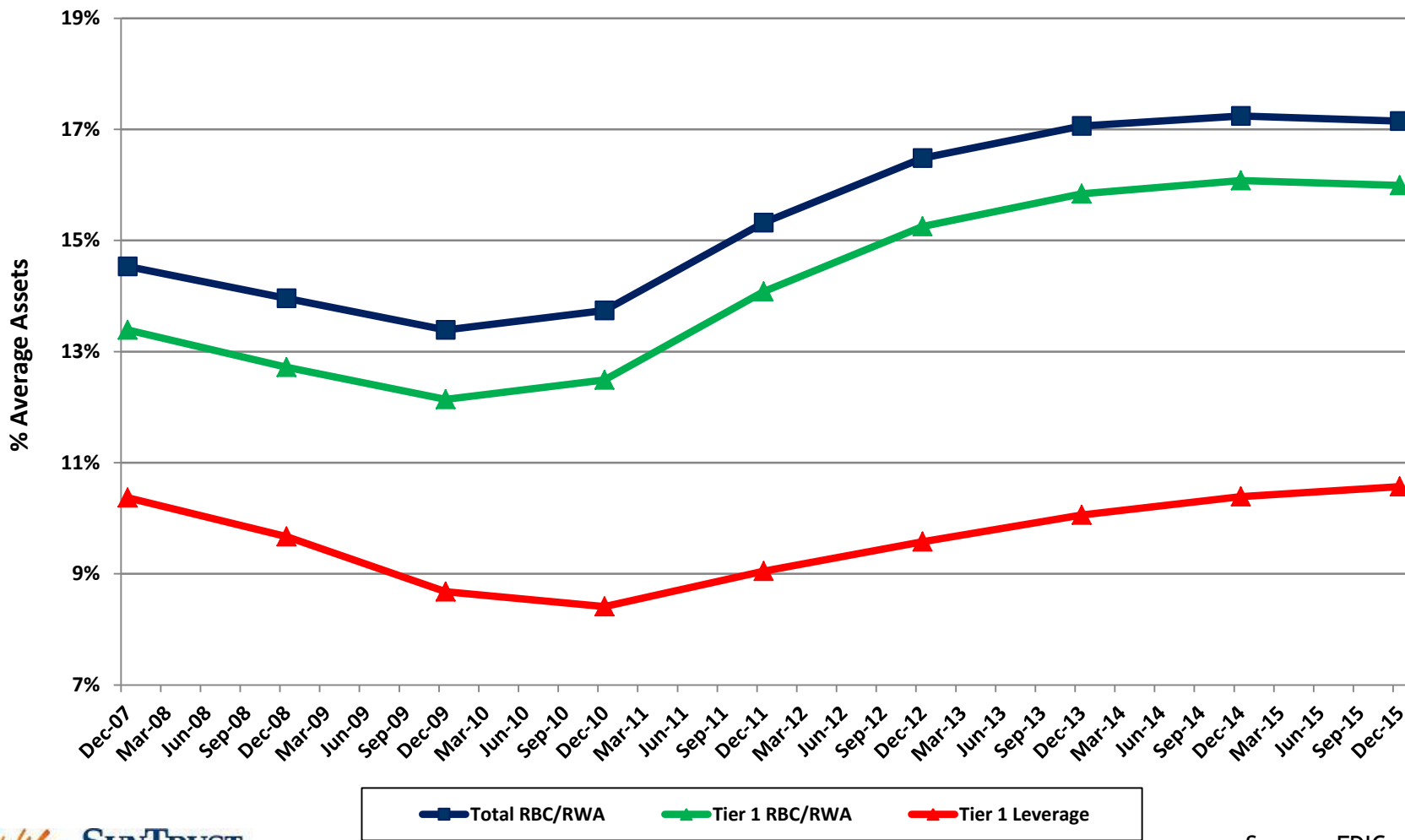
- Regulatory Capital is based on book equity with some additions and deductions based on balance sheet holdings. **Regulatory capital is viewed as the cushion against potential losses.**
- Regulatory capital is currently measured using three key capital ratios:
 - Tier One Leverage Capital – Tier One Capital/Average Assets. This is the primary regulatory capital ratio and measures the amount of **core** capital to total assets.
 - Tier One Risk Based – Tier One Capital/Total Risk Weighted Assets. This ratio applies credit risk weightings to account for the different risk levels inherent in different asset classes.
 - Total Risk Based – Total Capital/Total Risk Weighted Assets. This ratio measures risk weighted assets against total capital.
 - CET1 Risk Based – Common Stock + Surplus + Retained Earnings/Total Risk Weighted Assets

Regulatory Capital

- Each of the regulatory capital ratios has limits in place to define well capitalized and adequately capitalized, but in the current environment expectations are to have capital beyond well-capitalized thresholds. The below table represents new threshold ratios that will take place as of January 1st, 2015, from the final rule in implementing Basel III capital requirements.

PCA Capital Category	Threshold Ratios			
	Total Risk-Based Capital	Tier 1 Risk-Based Capital	CET 1 Risk-Based Capital	Tier 1 Leverage Ratio
Well Capitalized	10%	8%	6.5%	5%
Adequately Capitalized	8%	6%	4.5%	4%
Undercapitalized	<8%	<6%	<4.5%	<4%
Significantly Undercapitalized	<6%	<4%	<3%	<3%
Critically Undercapitalized	Tangible Equity/Total Assets <=2%			

GA Bank Capital Ratios



Liquidity Implications

- In the wake of the financial crisis, liquidity measurement and management has received greater regulatory scrutiny
- Each depository's funding structure will have implications on its liquidity needs
- Funding is categorized as core and non-core
 - Core – NMDs and retail time deposits
 - Non-core – Jumbo time deposits and wholesale funding
- Utilization of wholesale funding is detrimental to liquidity ratios and absorbs available asset side liquidity sources in a funding crisis
- Core deposit funding improves liquidity position and offers greater managerial flexibility in balance sheet management

Interest Rate Risk

What it is:

Risk that a financial instrument's value will change due to a change in interest rates

Our primary concern:

On balance sheet level, these changes in value could negatively impact earnings and/or capital

Interest Rate Risk

Primary Types:

- Repricing risk
- Options risk
- Basis risk
- Yield curve risk

Repricing Risk

What it is:

Risk that an asset or liability cash flow will be reinvested at or repriced to a less favorable rate

Our primary concern:

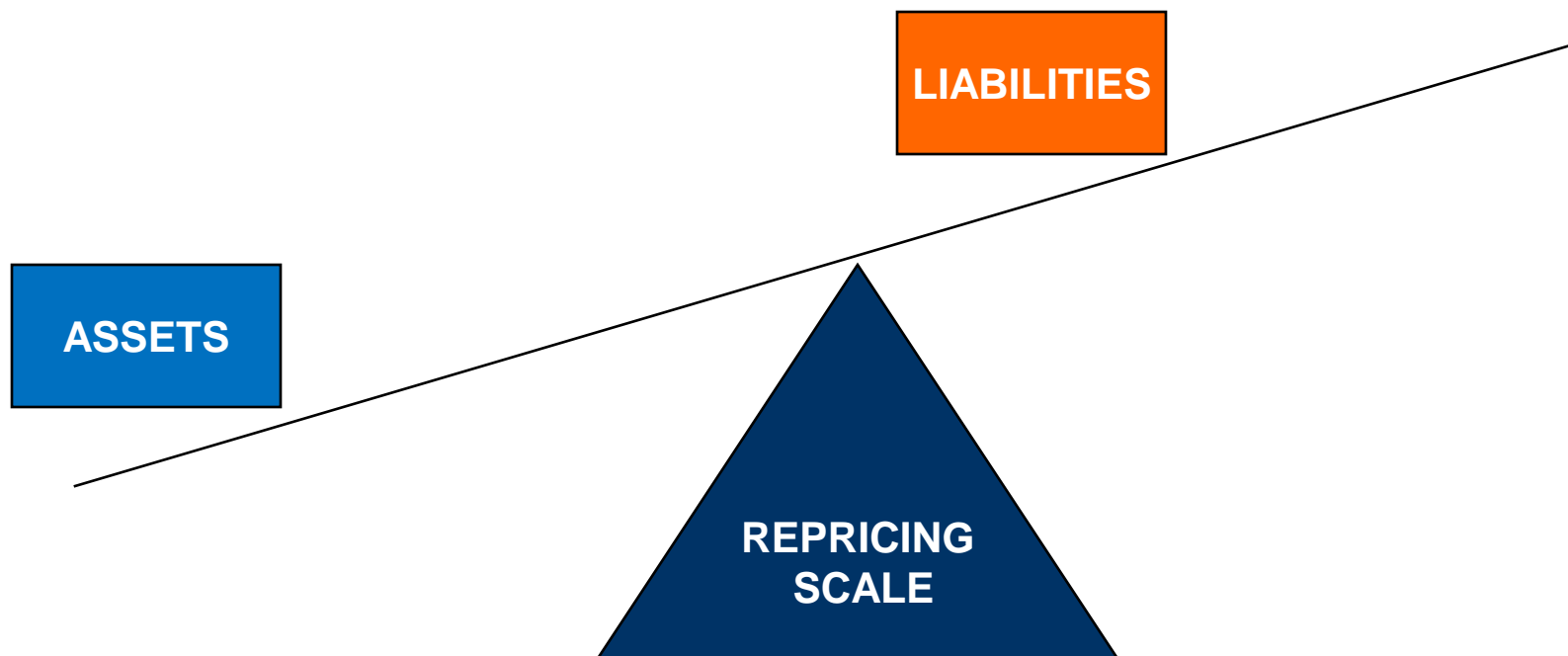
The risk that timing differences in the maturity and repricing characteristics of assets and liabilities will adversely impact earnings or capital

Repricing Risk: Earnings Perspective

- Source: assets, liabilities have different maturities or repricing dates
- Rising rates reduce income for institutions with longer maturity assets
 - Replace short liabilities with higher cost liabilities.
- Falling rates reduce income for institutions with longer liabilities
 - Reinvest in lower earning assets while still paying current (high) rates on liabilities.

Repricing Risk: Example

Basic Bank



Repricing Risk: EVE Perspective

- Longer maturity assets, liabilities have larger value change when rates change.
- Rising rates reduce economic value of institutions with longer maturity assets.
 - Value of assets falls more than value of liabilities
- Falling rates reduce economic value of institutions with longer maturity liabilities.
 - Value of liabilities rises more than value of assets

Repricing Risk: Example

- An institution funds 2-year, 4% bullet maturity loan with 3-month CD at 2%
- Institution allocates 8% equity to transaction
- If institution continues to roll the CD, it earns 2% for 2 years if rates do not change
- If rates rise 100 basis points, institution earns only 1% after first 3 months

Loan Example: Original Interest Rates

	<u>Loan Cash Flows</u>		<u>CD Cash Flows</u>		Difference in PVs
	Cash flow	Present Value	Cash Flow	Present Value	
Q1	10.00	9.90	4.60	4.58	5.32
Q2	10.00	9.80	4.60	4.55	5.25
Q3	10.00	9.71	4.60	4.53	5.17
Q4	10.00	9.61	4.60	4.51	5.10
Q1	10.00	9.51	4.60	4.49	5.03
Q2	10.00	9.42	4.60	4.46	4.96
Q3	10.00	9.33	4.60	4.44	4.89
Q4	1,010.00	932.72	924.60	888.43	44.28
Sum		1,000.00		920.00	80.00

Loan Example: Rates Rise 100bp

	<u>Loan Cash Flows</u>		<u>CD Cash Flows</u>		<u>Difference in PVs</u>
	Cash flow	Present Value	Cash Flow	Present Value	
Q1	10.00	9.90	4.60	4.58	5.32
Q2	10.00	9.75	6.90	6.80	2.96
Q3	10.00	9.63	6.90	6.75	2.89
Q4	10.00	9.52	6.90	6.70	2.82
Q1	10.00	9.40	6.90	6.65	2.75
Q2	10.00	9.28	6.90	6.60	2.68
Q3	10.00	9.17	6.90	6.55	2.62
Q4	1,010.00	914.45	926.90	873.12	41.34
Sum		981.10		917.73	63.38

Embedded Option Risk

What it is:

An **embedded option** is a set of characteristics built into a financial instrument that generates uncertainty in the timing or amount of cash flows received

Examples:

- Loan prepayments
- Callable securities
- Prepayments on mortgage-backed securities
- Callable FHLB advances
- Deposit withdrawals

Embedded Option Risk

Our primary concern:

- Cash flows are returned sooner than expected and reinvested at less favorable rates
- Cash flows are extended out longer than expected and lose value

Embedded Option Risk

- For the bank, embedded options can cause uncertainty in the timing and/or amount of cash flow received
- Uncertainty is what causes the challenge when managing IRR

Embedded Option Risk

- Institution is short these options – i.e. someone else has the ability to exercise the option
- Customer/Agency/FHLB will exercise the option when it is in his or her interest, usually the worst time for the institution
- Example:
 - When rates fall, a bank is holding mortgages with above market rates. Customers exercise option to prepay the mortgages; the bank loses valuable assets and is forced to replace at lower rates.

Basis Risk

What it is:

Risk that poor correlation between changes in market rates linked to assets and liabilities will adversely impact earnings and/or capital

Example:

Prime-Based loans funded by LIBOR-based floating rate advances

Basis Risk Example

Question: If the institution was funding 5yr floating rate loans tied to Prime with deposits tied to 3-month LIBOR during mid 2011, what happened to earnings performance over the next several quarters?

Basis Risk Example

Timing and Degree:

	<u>Prime</u>	<u>3M Libor</u>	<u>Difference</u>
6/2011	3.25	.25	3.00
8/2011	3.25	.29	2.96
10/2011	3.25	.41	2.84
12/2011	3.25	.56	2.69
1/2012	3.25	.57	2.68

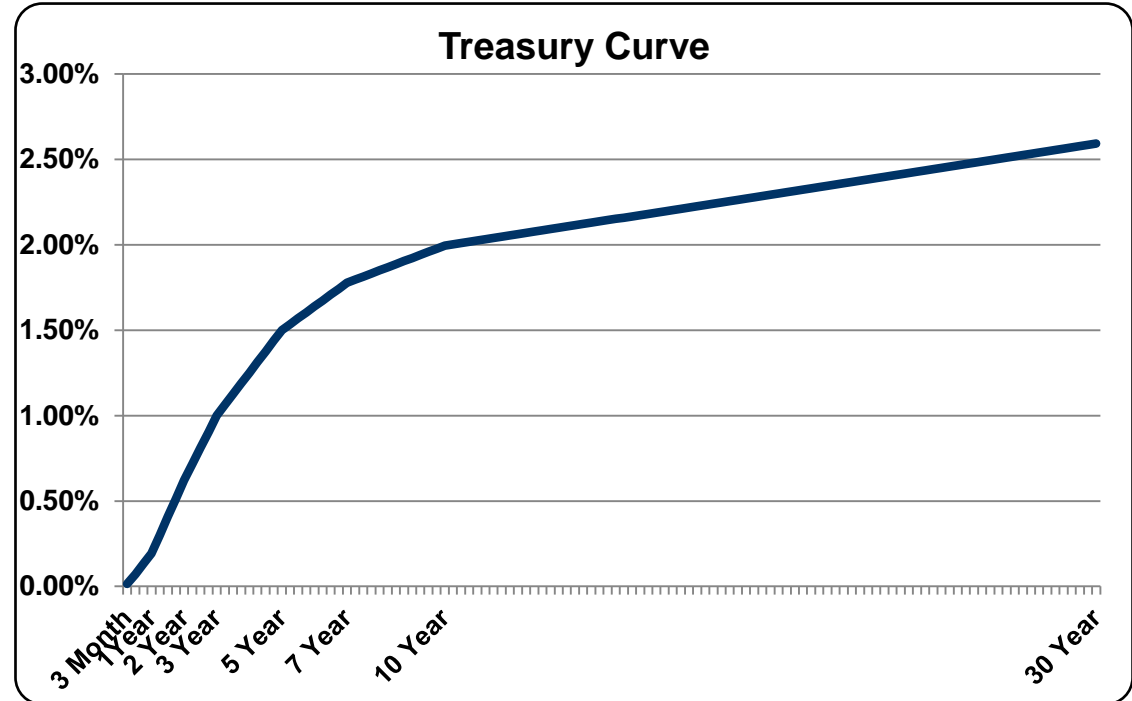
Basis Risk

- The potential level of basis risk exposure can be easily estimated by determining the volume of floating rate assets and liabilities
 - **Increased volume = increased risk potential**
- Basis risk exposure requires more complex (income simulation) modeling techniques
- Basis risk is a prominent, but frequently overlooked risk in financial institutions

Yield Curve

What is it?

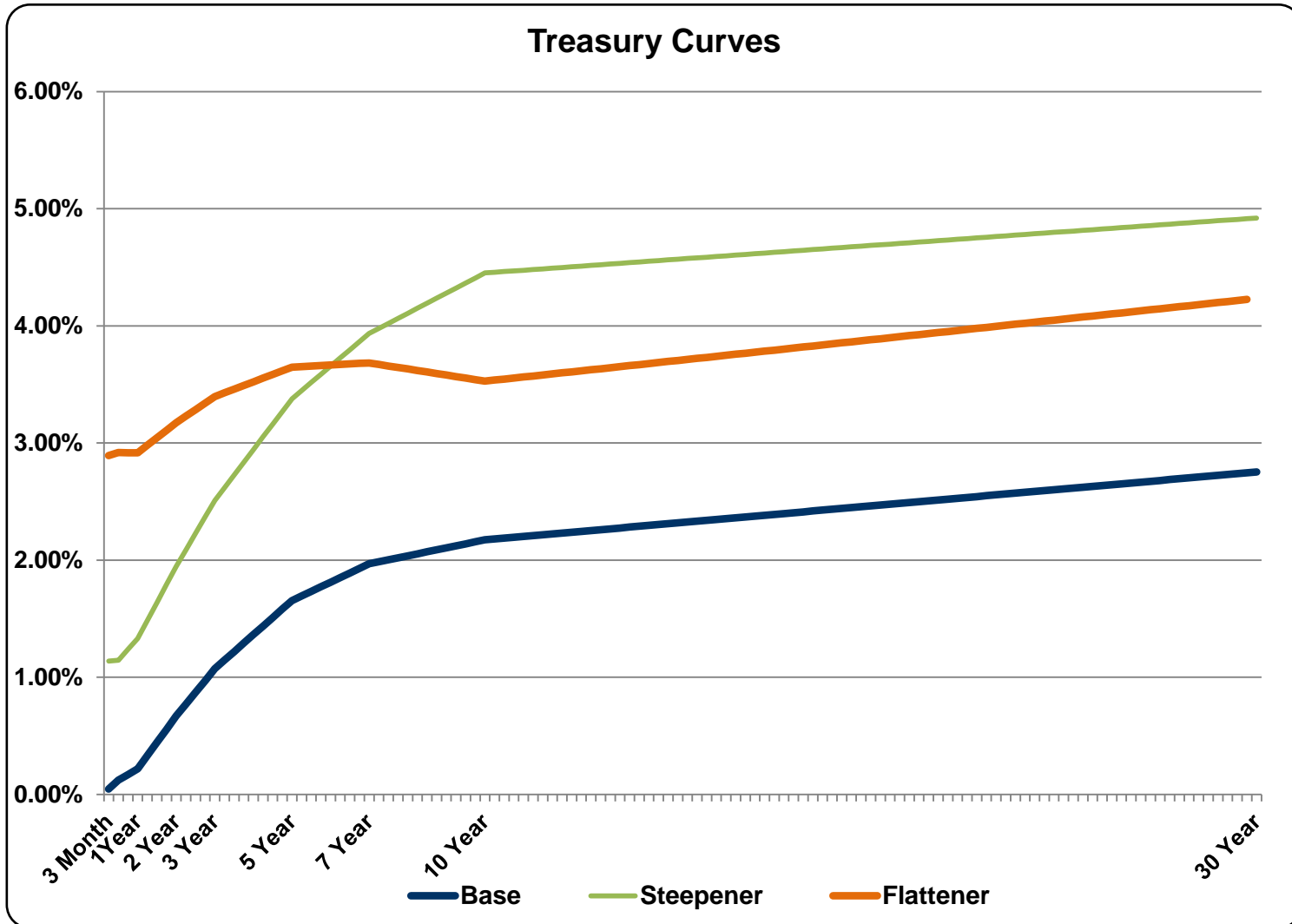
- Line that plots interest rates, for a point in time, of bonds of equal credit quality, but different maturity dates
- Shows how much incremental return the investor will receive for investing further out in time



Yield Curve Risk

What it is:

- Risk that changes in the shape of the yield curve will negatively effect earnings/capital
- Changes in the shape of the yield curve change the incremental yield difference for investing in different maturities
- Risk caused by concentrations of assets and liabilities that reprice at different points on yield curve
 - Investing in 5-10yr. Treasuries
 - Funding with 2yr. CMT-based CDs



Summary:

- Goal of Asset/Liability Management is not to eliminate risk – risk is a necessary part of return
- There are different types of interest rate risk
 - Repricing Risk
 - Embedded Option Risk
 - Basis Risk
 - Yield Curve Risk
- Effective IRR risk management is built around understanding risks present on the balance sheet and being comfortable with the bank's position should the market environment change

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Questions?

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