

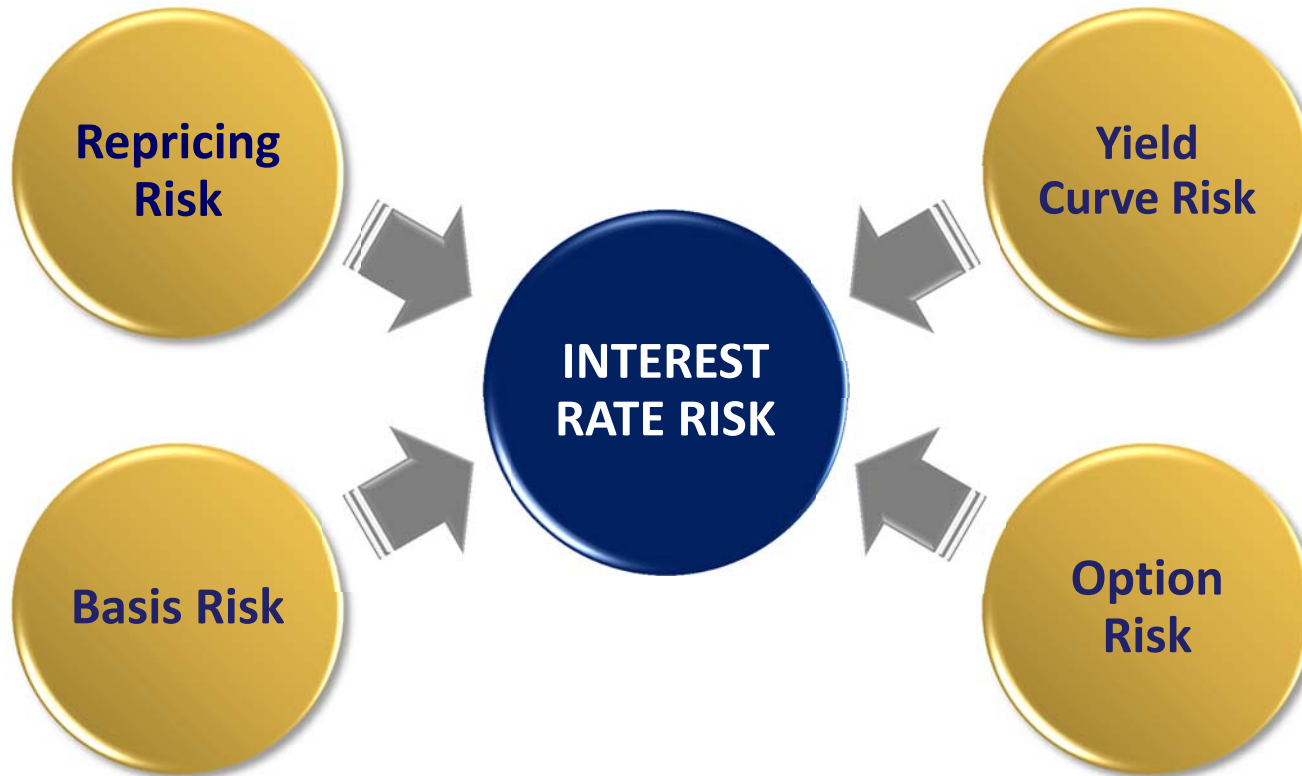


## Interest Rate Risk

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### II. Types of Interest Rate Risk

# Types of Interest Rate Risk



# Definition of Repricing Risk



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**The risk from timing differences  
between rate changes or cash flows  
from assets, liabilities, and off-balance  
sheet instruments**

# Example of Repricing Risk

Assume a 2% increase in time deposit rates in the second year

	<u>Period 1</u>	<u>Period 2</u>
15-Year Mortgage	4.00	4.00
1-Year Time Deposit	1.00	3.00
Net Interest Spread	3.00	1.00

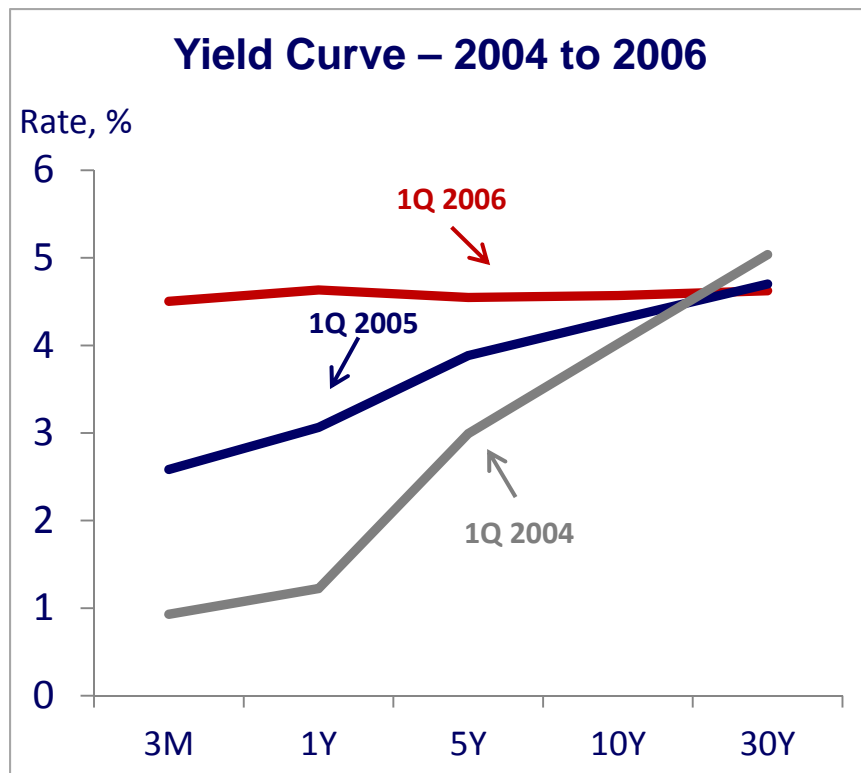
# Definition of Yield Curve Risk



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**The risk from non-parallel changes  
in the yield curve**

# Yield Curve Shifts: A Recent Example of Flattening



- **Strategy: Borrow short and lend long**
- **Risk: Yield curve flattens**
- **1Q 2004: Short-term interest rates began to rise sharply**
- **2006 or 2007: Flat or inverted yield curve**

Source: Federal Reserve Board/Haver Analytics

FEDERAL DEPOSIT INSURANCE CORPORATION

# Example of Yield Curve Risk

**Flattening Yield Curve:** short-term rates rise faster than long-term rates and reduce net interest income



# Definition of Option Risk



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**the risk that cash flows change due  
to embedded options  
(e.g., prepayment / extension, call  
options, deposit runoff)**



# Option Risk

## Assets

- Residential mortgages
- Mortgage-backed securities
- Callable bonds

## Liabilities

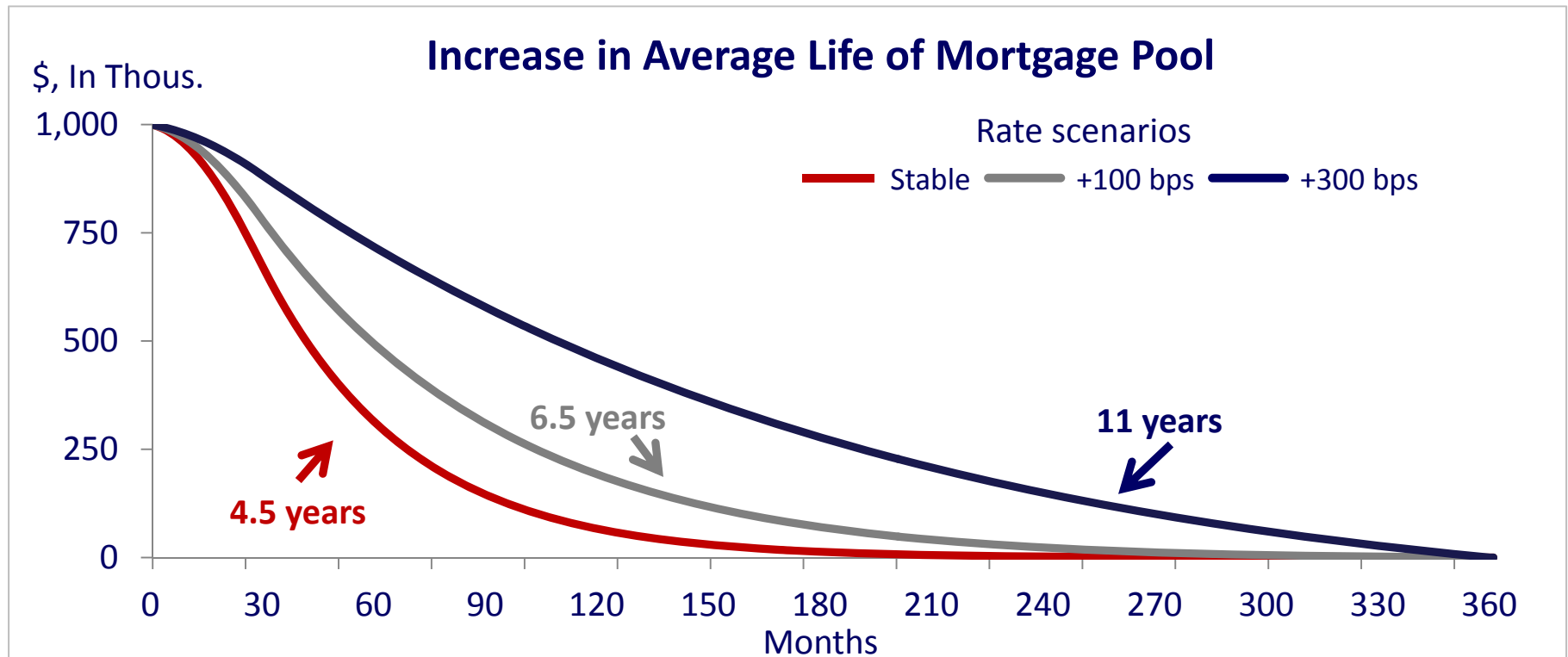
- Non-maturity deposits
- Time deposit redemptions
- Certain FHLB borrowings

# Example of Option Risk

**Assume a 2% Decrease in Mortgage Interest Rates.  
Customer refinances in Period 2.**

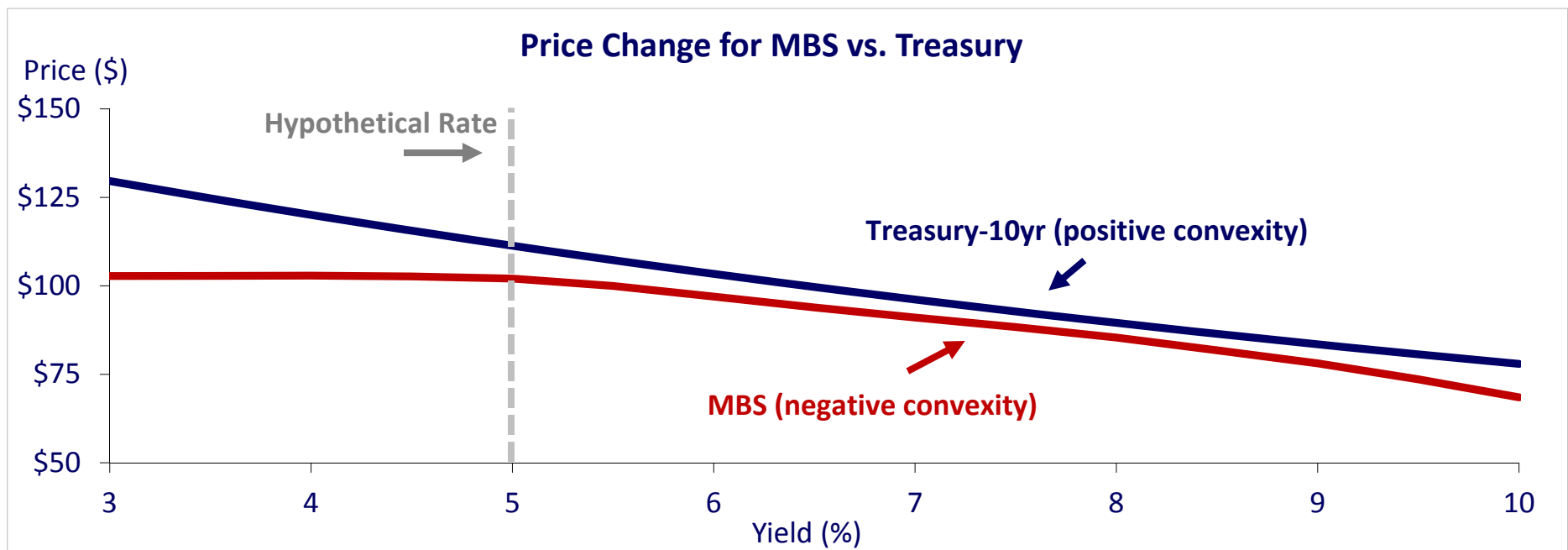
	<u>Period 1</u>	<u>Period 2</u>
15-Year Mortgage	7.00	5.00
3-Year Time Deposit	4.00	4.00
Net Interest Spread	3.00	1.00

# Example of Option Risk



# Mortgage Backed Securities are More Price Sensitive as Rates Rise

**Negative Convexity: As interest rates rise, MBS portfolios stand to lose more value than non-callable bonds**



# Definition of Basis Risk



**Basis Risk**

**= The risk that different indices with the same repricing frequency do not move in unison**

# Example of Basis Risk

**Short-term rates increase unevenly: 3-month Treasury increases 1% and LIBOR increases 2%**

	<u>Period 1</u>	<u>Period 2</u>
3-Month Treasury-based Loan	3.25	4.25
3-Month LIBOR-based Borrowing	1.00	3.00
Net Interest Spread	2.25	1.25

# Summary

- **Interest Rate Risk has several components including:**
  - Repricing Risk
  - Yield Curve Risk
  - Option Risk
    - Prepayment / Extension Risk
  - Basis Risk
  
- **How financial institutions identify, measure, monitor, and control these risks is critical to an effective IRR Management program**