



What's New in Derivatives

Presentation to Treasury Institute

February 12, 2007

Key Themes and Opportunities

◆ **Market Summary**

- Low long term rates
- Flat yield curve
- Low risk premiums



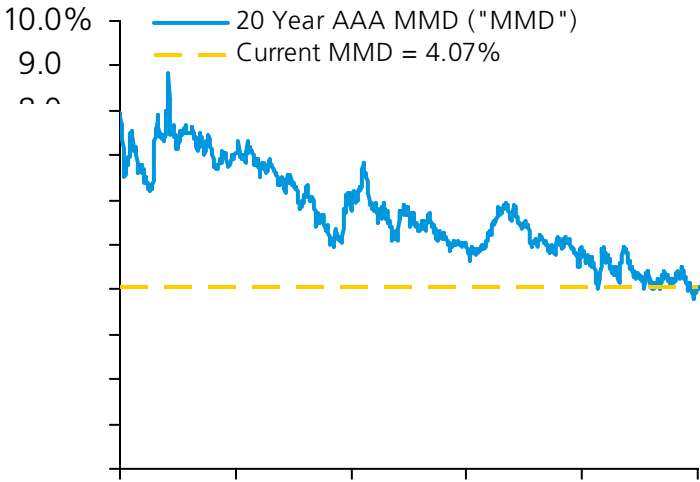
- Increase/overweight fixed rate exposure
- Capture current rate environment for future financings
- Modify, transfer and/or reduce risks



- Forward hedging of future financings
- Constant Maturity Swaps
- Structured Credit Products

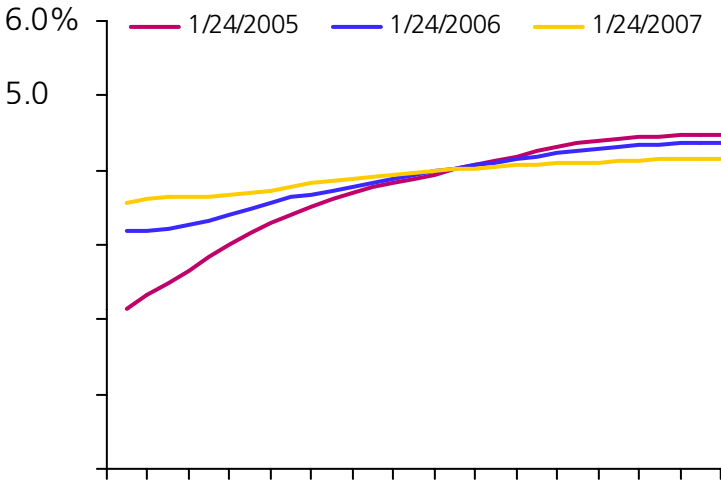
Municipal yields are at historical lows

20 Year AAA MMD



As of January 25, 2007

"AAA" MMD Comparison



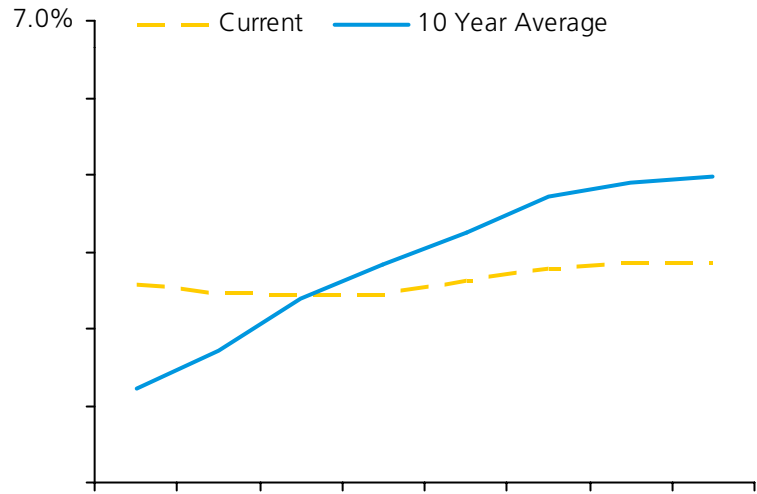
As of January 25, 2007

- ◆ 99% of the time since 1986
- ◆ Yield curve has continued to flatten as short-term rates have continued to rise

Taxable and tax-exempt yield curves are historically flat

- ◆ The FOMC tightening regime and high levels of liquidity globally have led to flat yield curves across most sectors

Historical LIBOR Yield Curve



Historical BMA Yield Curve Spread Between 2 – 30 year BMA Swaps

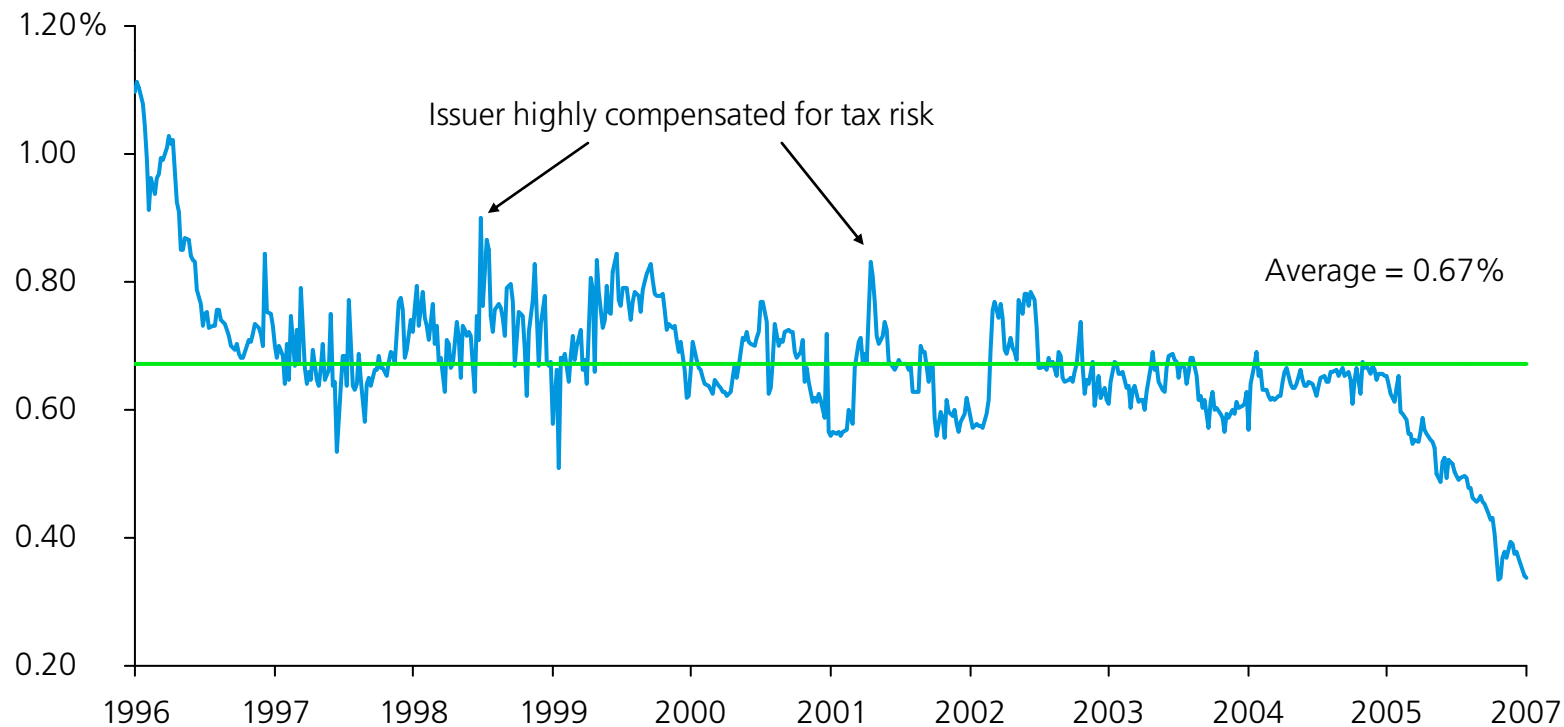


Tax-risk premiums are at historical lows

◆ Changes:

- Cash Bonds are rich
- Structured Notes using BMA/LIBOR relationship
- Perception of tax risk

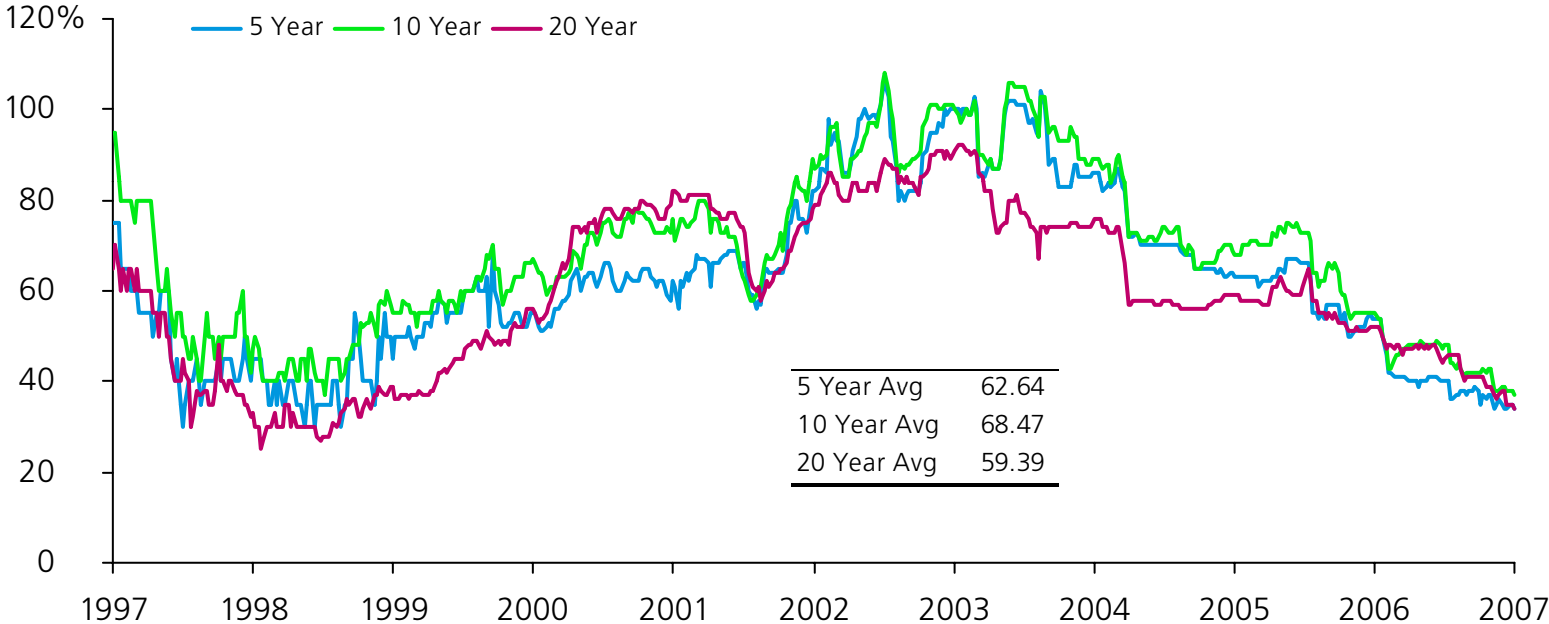
-year BMA vs. 67% LIBOR spread differential



Credit risk spreads are near historical lows

- ◆ Strong demand for municipal credit has lowered credit spreads

Credit Spreads: GO AAA to BAA



Source: MMD Interactive



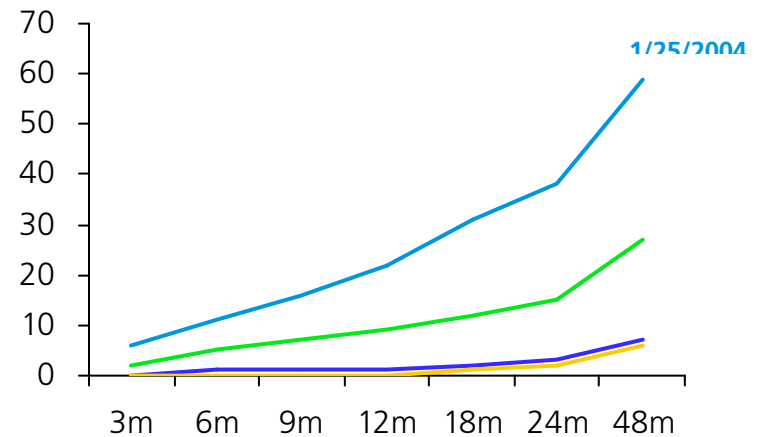
Forward Hedging

Forward hedging is inexpensive

As a result of the flat yield curve, forward premiums are currently at very low levels

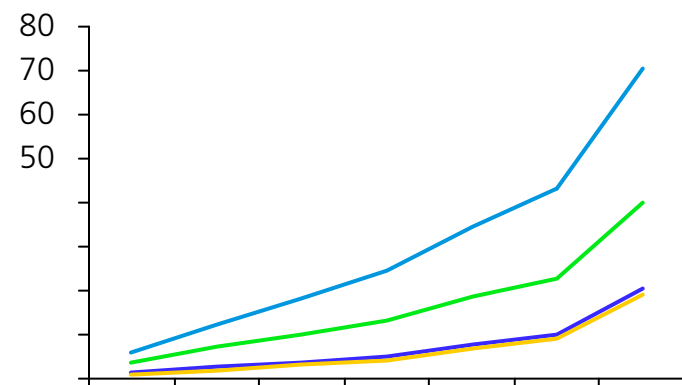
Implied 67% LIBOR Forward Premiums ⁽¹⁾

3 months	6	2	0	0
6 months	11	5	1	0
9 months	16	7	1	0
12 months	22	9	1	0
18 months	31	12	2	1
24 months	38	15	3	2
48 months	59	27	7	6



Implied BMA Forward Premiums ⁽¹⁾

	2004	2005	2006	2007
3 months	6	4	1	1
6 months	12	7	3	2
9 months	18	10	4	3
12 months	25	13	5	4
18 months	35	19	8	7
24 months	43	23	10	9
48 months	70	40	20	19



(1) As of January 25, 2007

Hedging Alternatives

A University can evaluate the risks and costs of different hedging alternatives

Hedging factors to consider	% LIBOR Swap	BMA Swap	MMD Rate Lock	Cost of Funds Rate Lock
Risk Protection	✓	✓ ✓	✓ ✓ ✓	✓ ✓ ✓ ✓
Relative Cost	\$	\$+	\$\$	\$\$
Flexibility	Good	Good	Fair	Fair

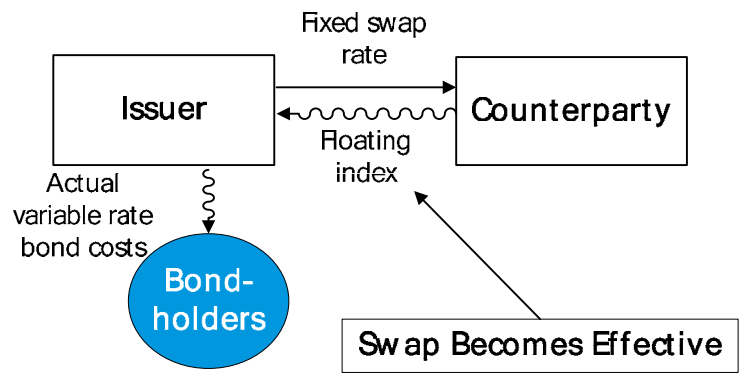
Indicative Rates ⁽¹⁾		67% LIBOR Swap	BMA Swap	MMD Rate Lock	COF Rate Lock
2 months	Forward Premium	0 bps	1 bps	13 bps	25 bps
		3.69%	4.04%	N/A	N/A

(1) Assumes 100mm, 20 yr. avg. life hedge; does not include dealer spread.

Forward-starting swaps provide greater flexibility than rate locks

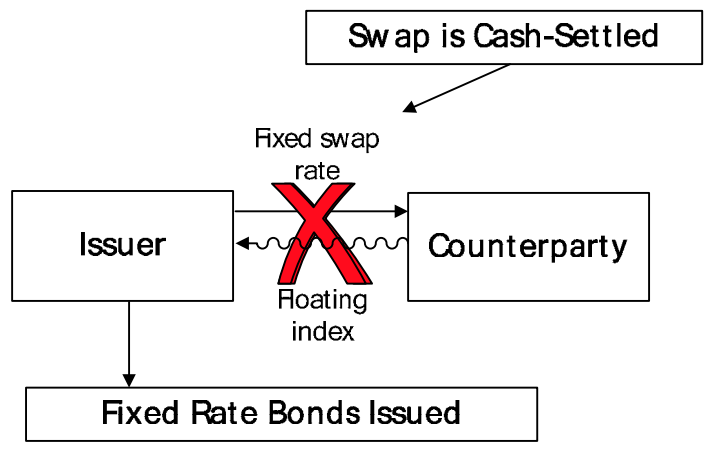
Physically-Settled Swap

- Execute swap with cashflows to begin when bonds are delivered
- Issue floating rate bonds
- Take delivery of the swap

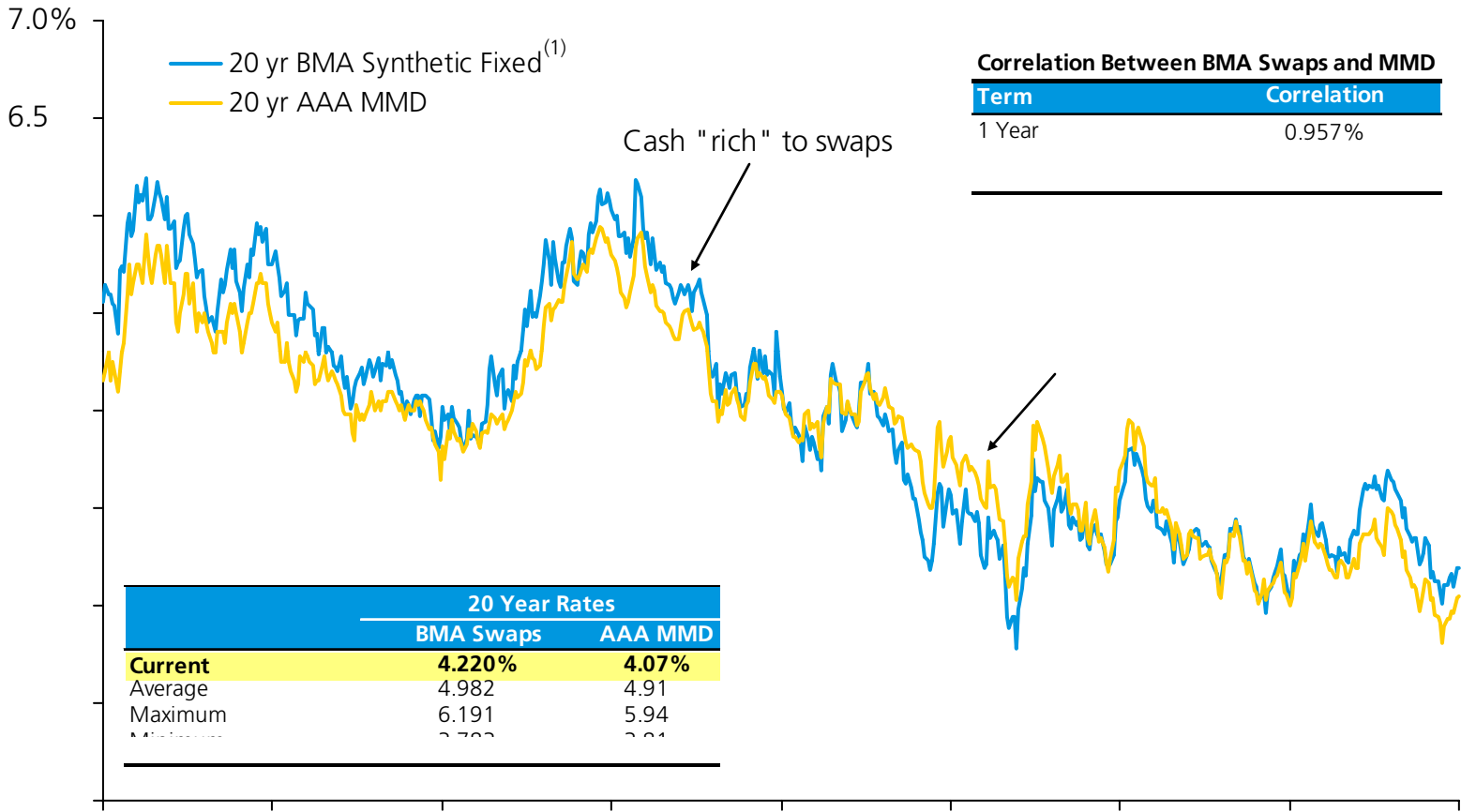


Cash-Settled Swap

- Sell fixed rate bonds
- Unwind the swap
- Issuer makes or receives a payment



The relationship between BMA swaps and the cash market changes over time



(1) Includes 25 bps support cost for underlying variable rate bonds.

MMD Rate Locks

◆ **An MMD Rate Lock protects against changes in the general level of municipal bond yields**

- ❑ Issuer makes payment on hedge
 - ❑ Issues more bonds at lower yields
- Hedged Scale
- ❑ Issuer receives payment on hedge
 - ❑ Issues fewer bonds at higher yields

The hedged scale and PV01 are set at execution of the rate lock

Termination Payment = (Hedged Scale - MMD Scale) x PV01

Term	MMD Scale	Forward Spread	Hedged MMD Scale	MMD Scale at Settlement	Difference	PV01	Termination Payment
2	2.65	0.12	2.78	4.12	0.25	1,974	65,500
Total						43,315	1,516,025

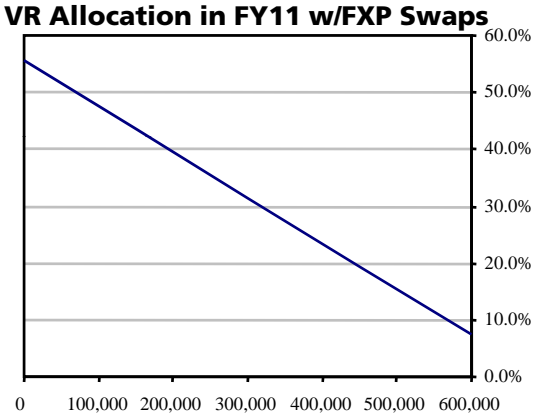
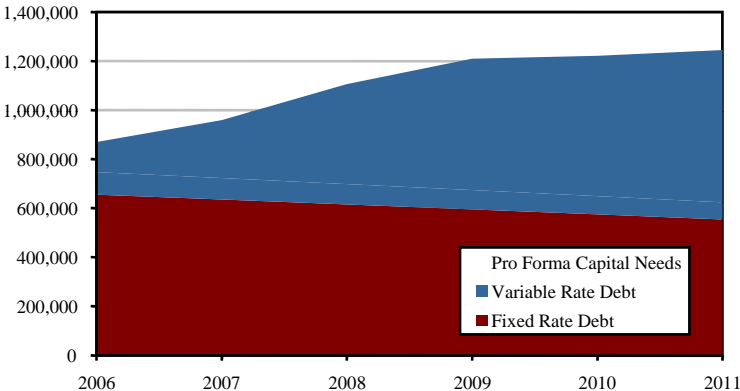
Cost of Funds Rate Locks

- ◆ Hedges against changes in an issuer's actual bond yields
- ◆ Mechanically similar to an MMD Rate Lock
 - Settlement against the actual yields on the bonds when sold
- ◆ Priced at forward MMD scale plus an additional credit premium negotiated by issuer and dealer
- ◆ Dealer underwrites bonds and takes the risk of widening credit spreads

Term	Scale Set Today			Scale at Time of Closing			Termination Payment
	Today's Bond Scale	Forward Spread	Hedged Bond Scale	Bond Scale at Closing	Difference	PVO1	
2	3.85	0.25	4.10	4.35	0.25	1,874	46,850
3	3.87	0.25	4.12	4.37	0.25	2,741	68,525
Total						43,315	1,082,875

Case Study: UNC-Chapel Hill

- ◆ **With over \$600 million in anticipated debt-funded capital needs over the next few years, UNC examined hedging tools in order to lock-in the prevailing rate environment.**



(\$ in 000s)

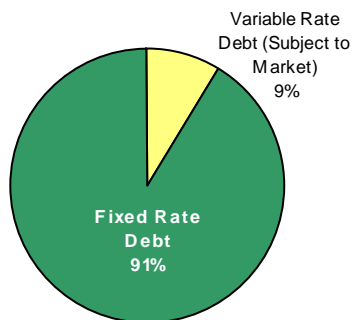
Fiscal Year	2006	2007	2008	2009	2010	2011
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FXP Notional Amount (\$000s)			
FY11 Allocation Plus FXP Swap Amount:			
150,000	300,000	450,000	600,000

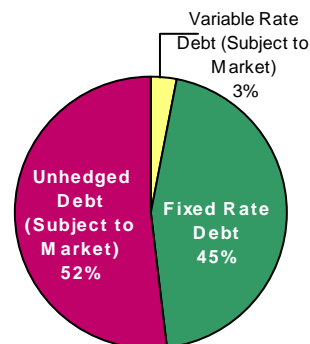
Portfolio Hedge Analysis at Current Allocation

- ◆ Given the University’s long-term debt needs through 2012, UNC-Chapel Hill’s portfolio exposure to future interest rates was approximately 50%. The University examined hedging up to \$365 million in future debt needs in the current environment.
- ◆ The target of \$365 million was computed by:
 - Taking current existing outstanding debt
 - Subtracting anticipated amortization through 2012
 - Adding expected debt issuance through 2012
 - This total debt outstanding number was multiplied by 75% to calculate the maximum total fixed debt
 - Existing fixed-rate debt outstanding in 2012 was then subtracted from this target to come up with a maximum hedging figure
- ◆ The portfolio impact of the maximum hedge level is illustrated below:

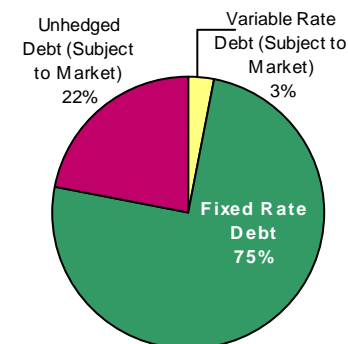
Existing Portfolio Allocation



2012 Allocation (w/o Hedging)

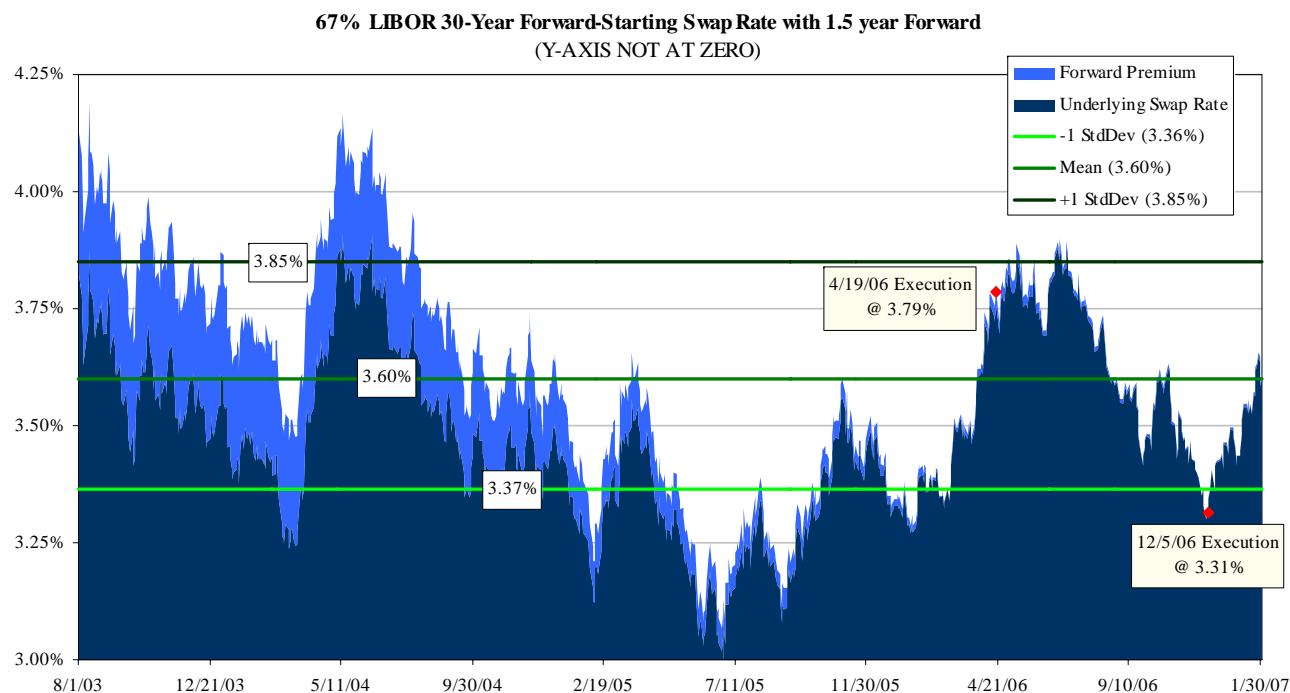


2012 Allocation (w/75% Target Hedging)



Hedge Execution

- ◆ The University elected to hedge \$250 million in two tranches. The first tranche was executed on April 19th, immediately following authorization by the Board of Governors.
- ◆ For the second tranche, we established trigger levels at a one standard deviation spread to the applicable trailing swap average. If rates stayed within this band, the swap would not be executed. If they left the band to either side, either rates were compellingly low or there was a threat of significantly higher rates.



Hedge Execution Summary

- ◆ Forward Hedging Strategy

- Use % of LIBOR forward starting swaps to hedge debt issuance
- Either unwind swaps and issue fixed rate bonds or physically settle the swap and issue synthetic fixed rate debt

	UNC-Chapel Hill Forward Starting Swaps	
	Swap 1	Swap 2
Execution Date	April 2006	December 2006
Effective Date	December 2007	December 2007
Maturity Date	December 2036	December 2036
Notional	\$150 million	\$100 million
Basis	67% of 1 Month LIBOR	67% of 1 Month LIBOR
Rate	3.785%	3.314%

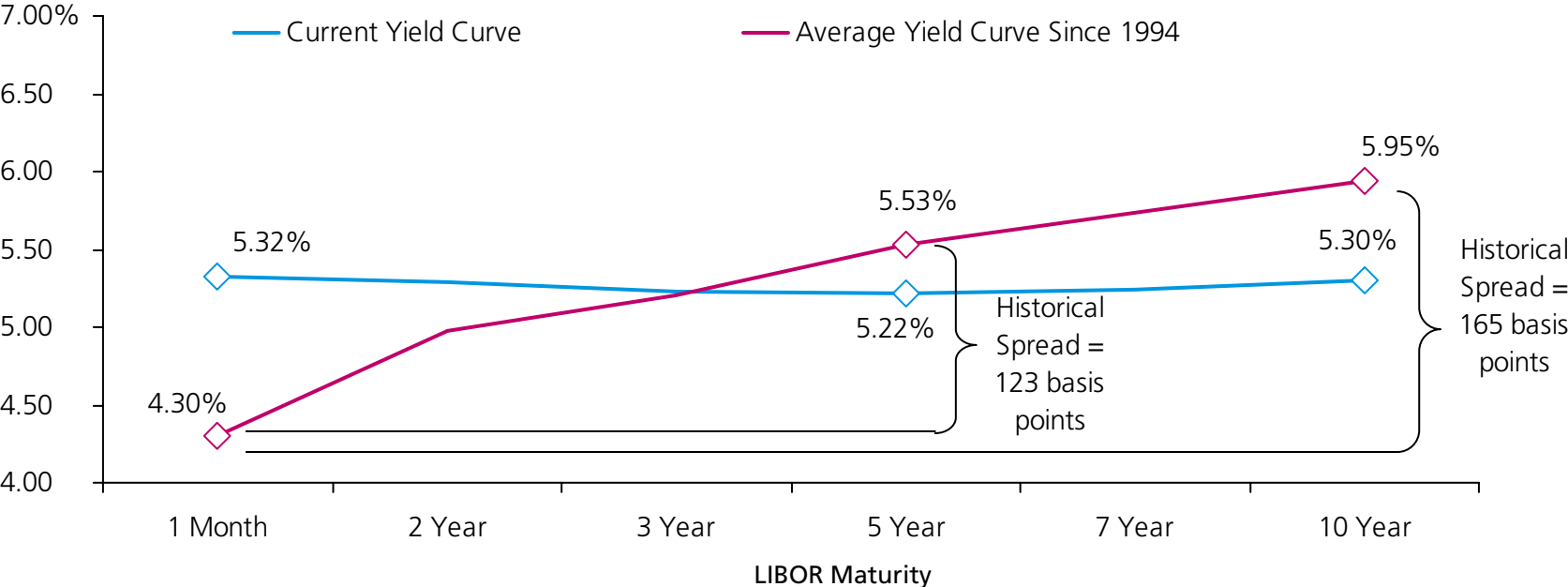


Taking Advantage of the Yield Curve

Today's Flat Yield Curve = Market Opportunity

- ◆ Constant Maturity Swaps (CMS) enable issuers to benefit from a future steepening of the yield curve in return for taking yield curve risk

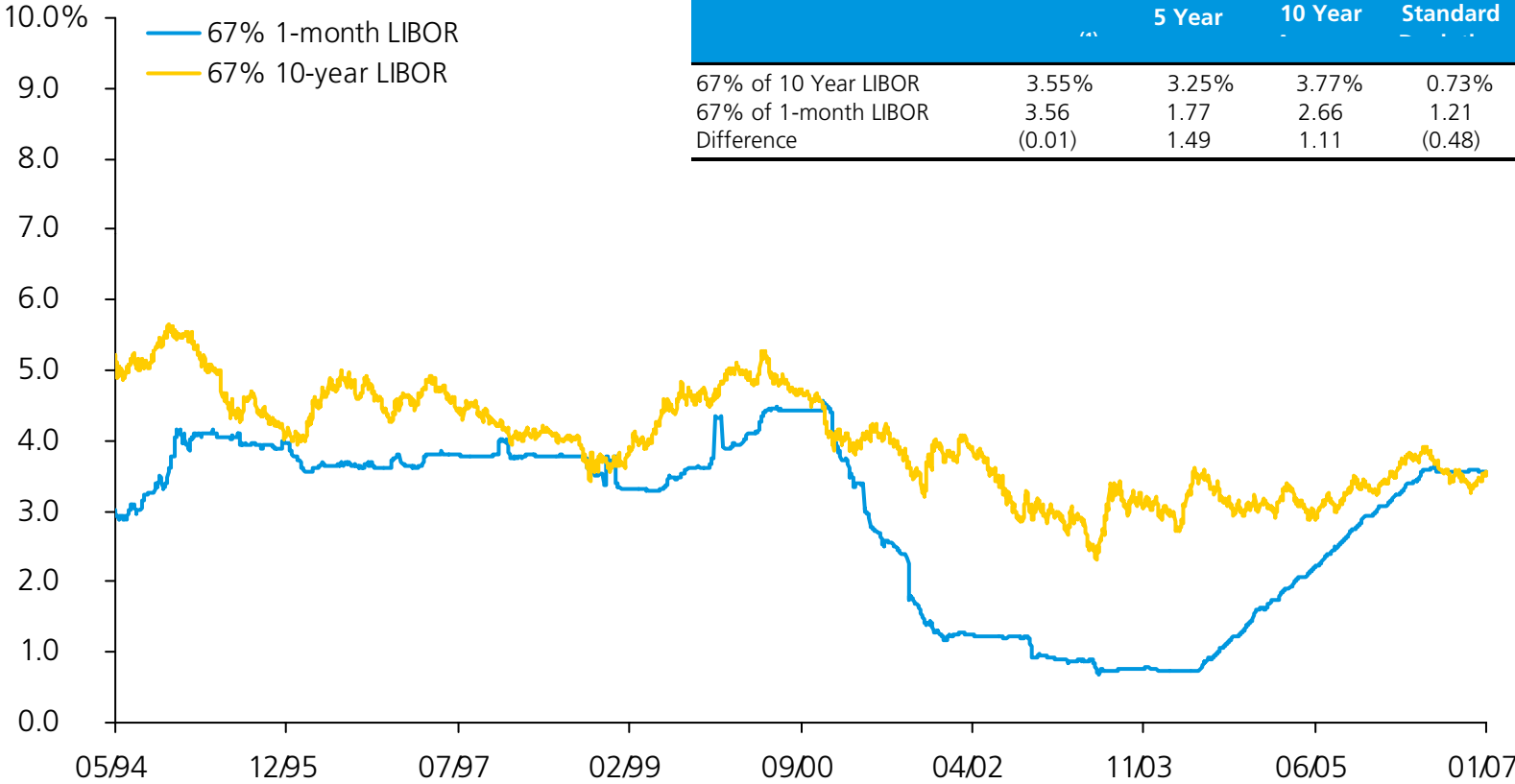
CMS Index	Spread to 1-month LIBOR		Difference
	Current ⁽¹⁾	12-year Average	
5-year LIBOR	(10)	123	133
10-year LIBOR	(1)	165	167



(1) As of January 24, 2007.

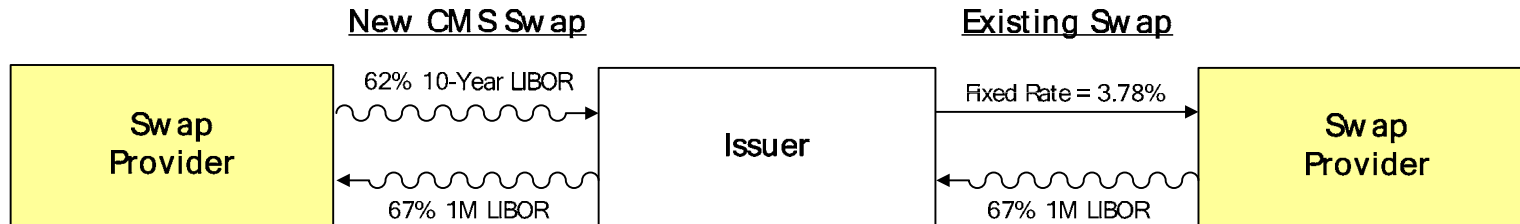
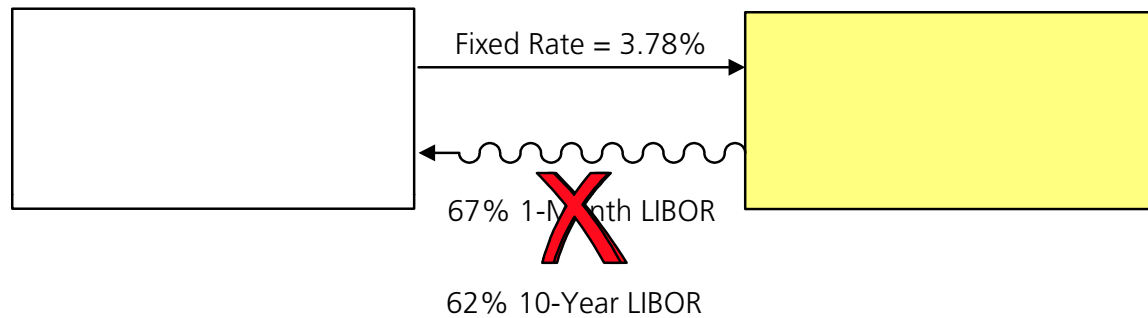
Historical 1-Month LIBOR versus 10-Year LIBOR

- ◆ Since 1994, 10-year LIBOR has been higher than 1-month LIBOR 95.7% of the time



Application: Restructure Existing Swap

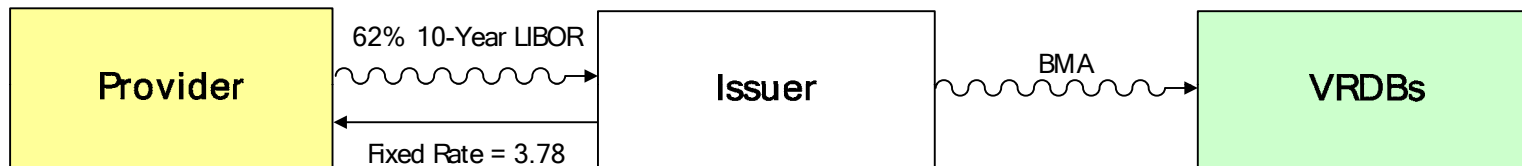
- ◆ CMS may be applied to synthetic fixed rate or basis swap transaction by amending the existing trade



Application: Use CMS in New Transaction

- ◆ CMS can also be used as part of a new transaction

Synthetic Fixed with CMS

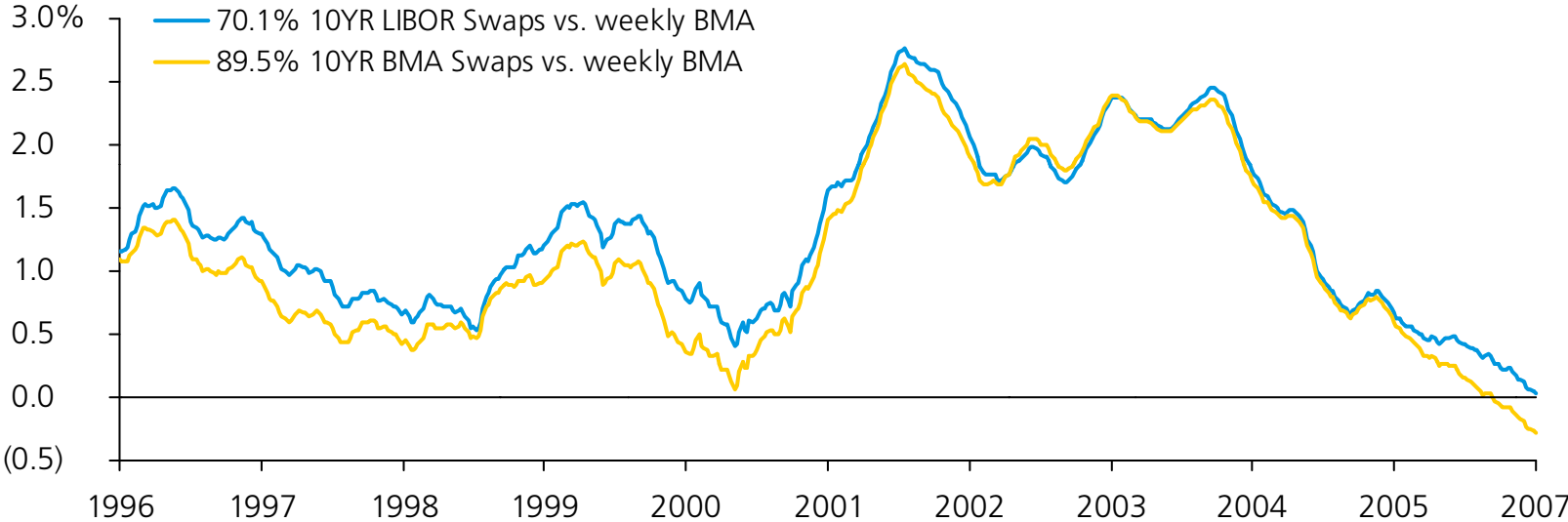


CMS Basis Swap



BMA CMS vs. LIBOR CMS

- ◆ Historically, 10-year BMA CMS has provided attractive cashflow
- ◆ Reduced tax risk

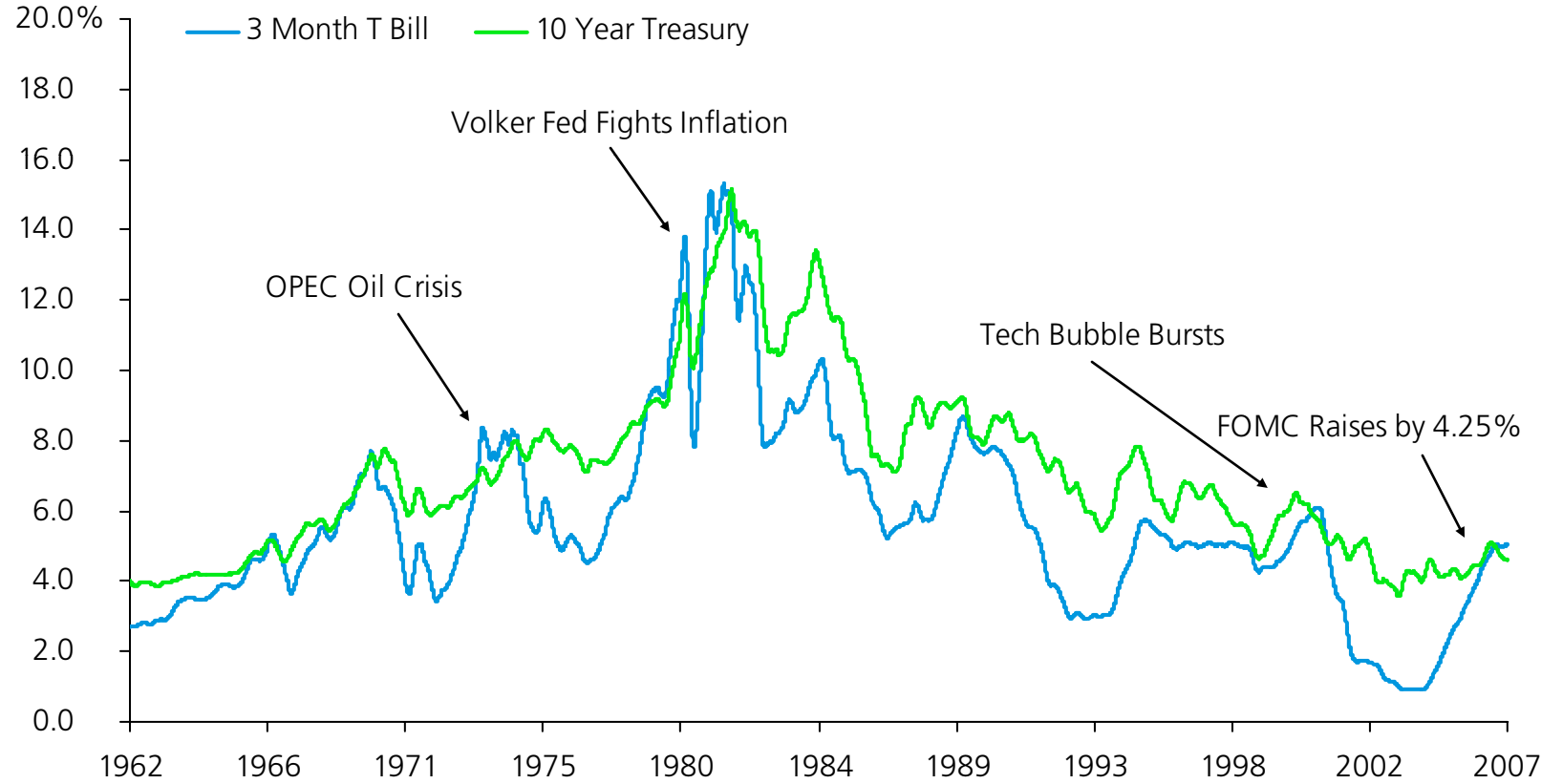


	LIBOR Spread Statistics	BMA Spread Statistics
Maximum Spread	277 bps	264 bps
Minimum Spread	3 bps	(28.6) bps
Average Spread	131 bps	113 bps
Standard Deviation of Spread	65 bps	72 bps

Historical Inversion Risk in the Treasury Market

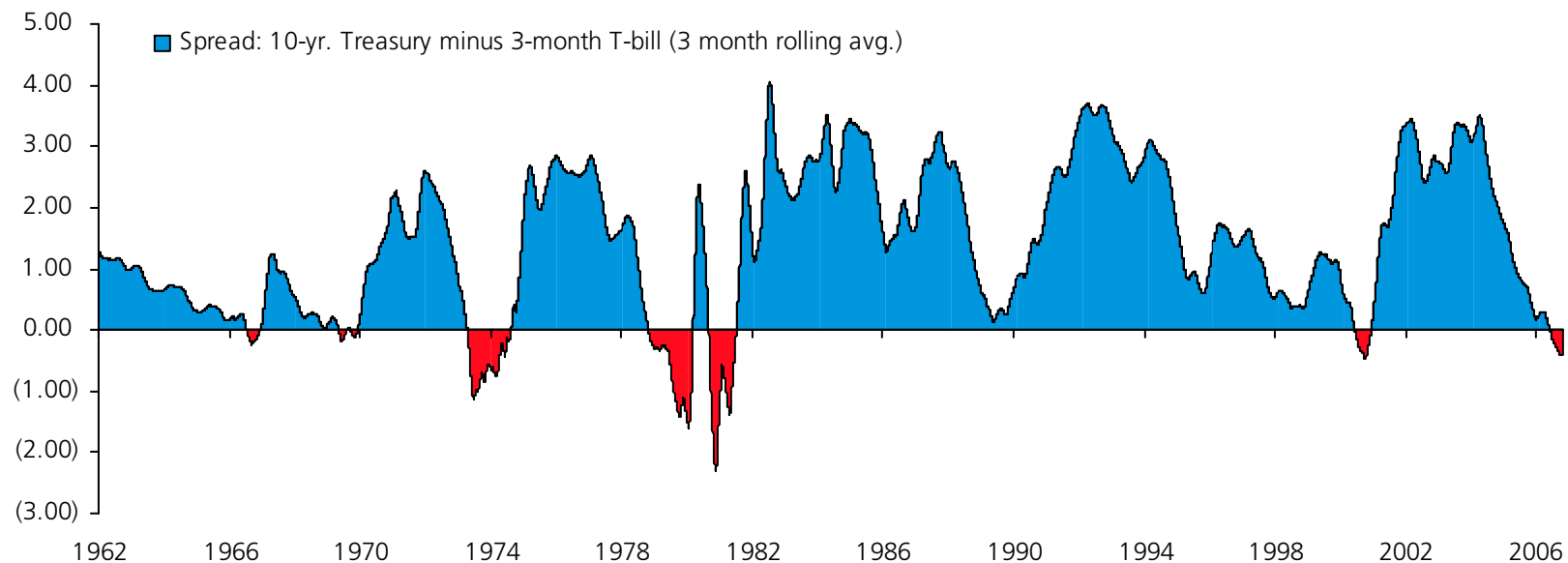


History of 3-mo T-Bill versus 10-yr Treasury Note



Historical Inversion Risk in the Treasury Market

Spread Between 3-m T-bill and 10-Yr Treasury Note



Historical Data

Statistic	Result
Average Steepness	1.22
1 Standard Deviation	1.03
Min	(3.25)
Max	5.18

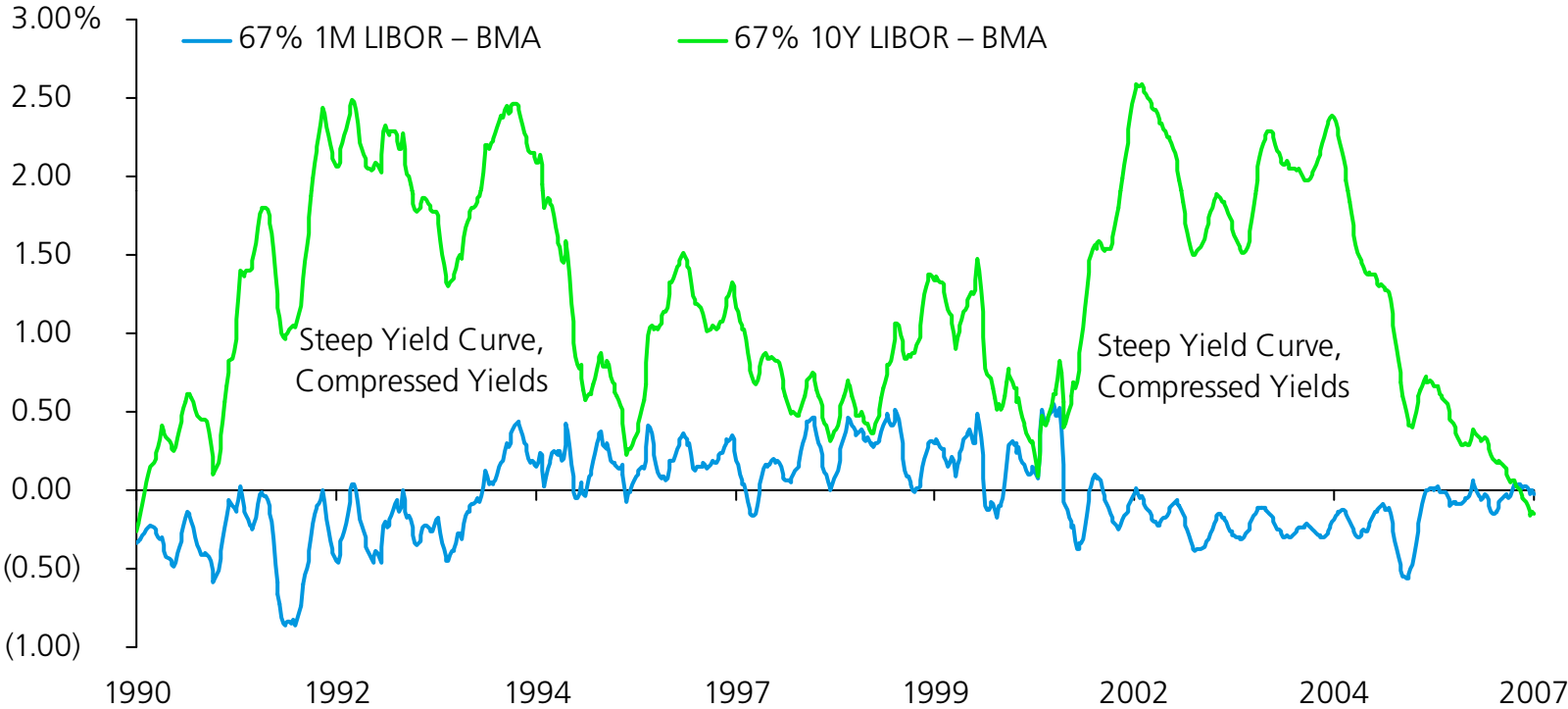
Historical Inversion Information

Start Date	End Date	Day	Days Apart *	Average Spread	Max Neg Spread	% NegObs
01/12/66	01/19/66	6		(0.03)	(0.05)	100.00%
09/08/66	02/07/67	103	232	(0.19)	(0.42)	95.15
12/17/68	02/09/70	285	679	-	(0.45)	55.79
06/01/73	11/04/74	354	1,208	(0.57)	(1.87)	85.03
11/01/78	04/29/80	368	1,458	(0.74)	(2.98)	93.75
10/27/80	09/08/81	216	181	(1.21)	(3.73)	90.74
05/31/89	07/28/89	42	2,822	0.12	(0.09)	21.43
07/27/00	01/18/01	120	4,017	(0.34)	(0.77)	96.67
07/17/06	01/25/07	139	2,006	(0.31)	(0.59)	99.28

*Days until next inversion.

CMS as offset to rate compression risk

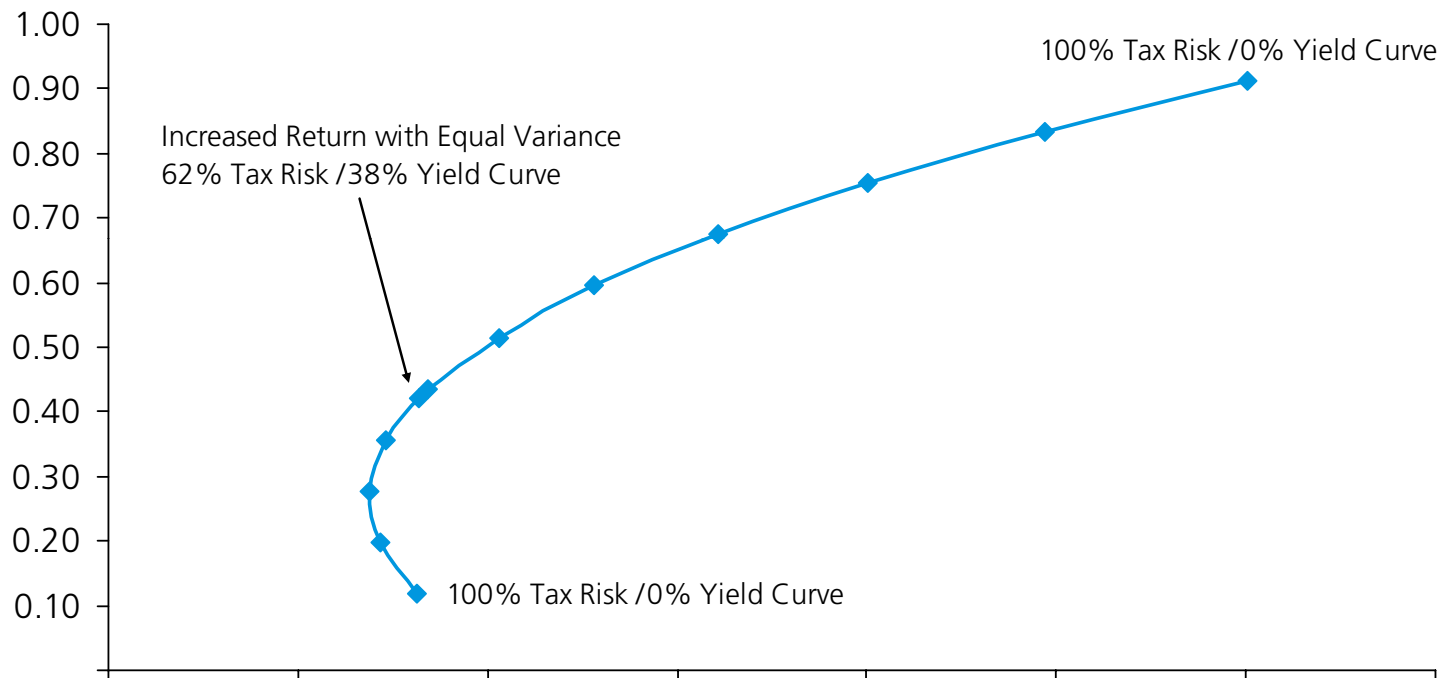
- ◆ Historically, CMS returns have offset the effects of yield compression on the BMA-LIBOR relationship



(1) Rates shown on a 3-month rolling average

Hypothetical Tax Risk/Yield Curve Risk Optimization

- ◆ Historically, introducing CMS into a portfolio of % LIBOR swaps has increased returns without raising interest cost volatility



Note: Assumes incremental increases in CMS exposure on portfolio of % LIBOR swaps using historical data.

Case Study: CMS Basis Swap

- ◆ Large public university with large portion of debt synthetically fixed
 - Debt mix 95% tax-exempt/5% taxable
 - 11 different bond series totaling over \$400 million
 - Over 80% of portfolio contained tax risk
 - 10 swaps among multiple counterparties
 - Significant base of cash and fixed income investments

- ◆ Goals: Future interest cost savings, tax and compression risk reduction
 - Considered 5- and 10-year LIBOR CMS

- ◆ Executed 2 swaps using combined notional schedule
 - Overlaid 10-year CMS basis swap on \$20 million taxable issue
 - Overlaid 67% 10-year CMS basis swap on approximately \$300 million of tax-exempt issues
 - Executed both swaps with one dealer



Floating Rate Notes

Floating Rate Notes (FRNs)

Tax-exempt Floating LIBOR Notes ("TEFLoNs")

- ◆ **Priced at constant fixed spread above 67% of LIBOR for the life of the bonds**
- ◆ **Risk profile similar to fixed rate bonds**

- ◆ **Diversifies capital structure and investor base**
- ◆ **Preserves capacity for future Auction Rate Securities, liquidity, etc.**

Benefits of the TEFLoN/Swap Structure

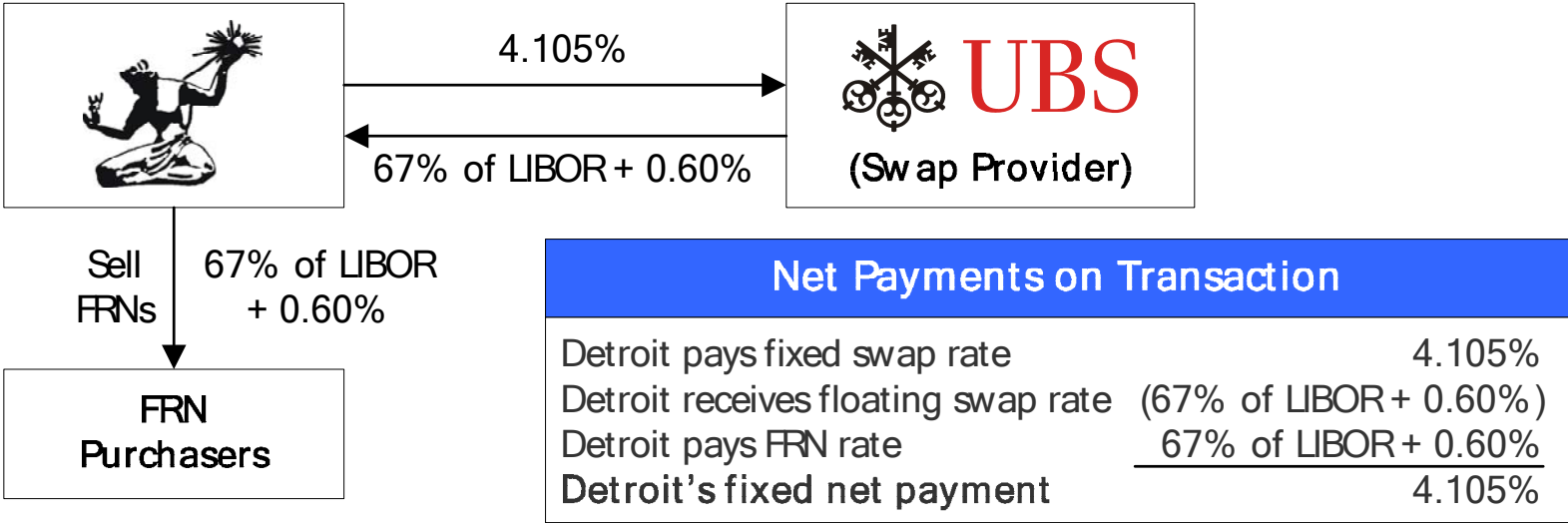
Client may enter into an cost of funds swap to lock in synthetic fixed rate debt

- ◆ **67% LIBOR plus spread creates perfect rate match to the Notes**
- ◆ **May qualify for short-cut accounting treatment**
- ◆ **May be eligible for super-integration**
- ◆ **May enhance refunding savings compared to conventional structures**

Example: City of Detroit Sewer System

◆ **FRN structured at 67% of LIBOR + 0.60%**

- \$370 million, insured w/ 21 yr average life
- Buyers included TOBs, arbitrage accounts, insurance companies, mutual funds and investment advisors



Risk Summary

- ◆ **TEFLONs have a risk profile comparable to fixed rate bonds**
- ◆ **Investor bears risks instead of issuer**

	VRDBs	ARCs	TEFLoNs	Fixed Rate Bonds
Interest rate risk	✓	✓	✓	
Tax risk	✓	✓		
Credit risk	✓	✓		
Put risk	✓			
Liquidity renewal risk	✓			
Committed funding	No	Yes	Yes	Yes

Executive Summary

- ◆ **Forward hedging products remain inexpensive and provide significant flexibility**

- ◆
 - Emphasis on isolating and valuing risks inherent in debt structures
 - Optimize value created by changing market dynamics
 - Active debt portfolio management

- ◆
 - Direct lending products
 - Alternative synthetic fixed rate products