



Risk Benchmarking Your Portfolio

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By: David Witthohn, CFA, CIPM, Director

SAFETY

Liquidity

Yield

- Preserving principal
- Providing sufficient liquidity to meet cash flow demands
- Achieving a market rate of return

Risk Return Tradeoff

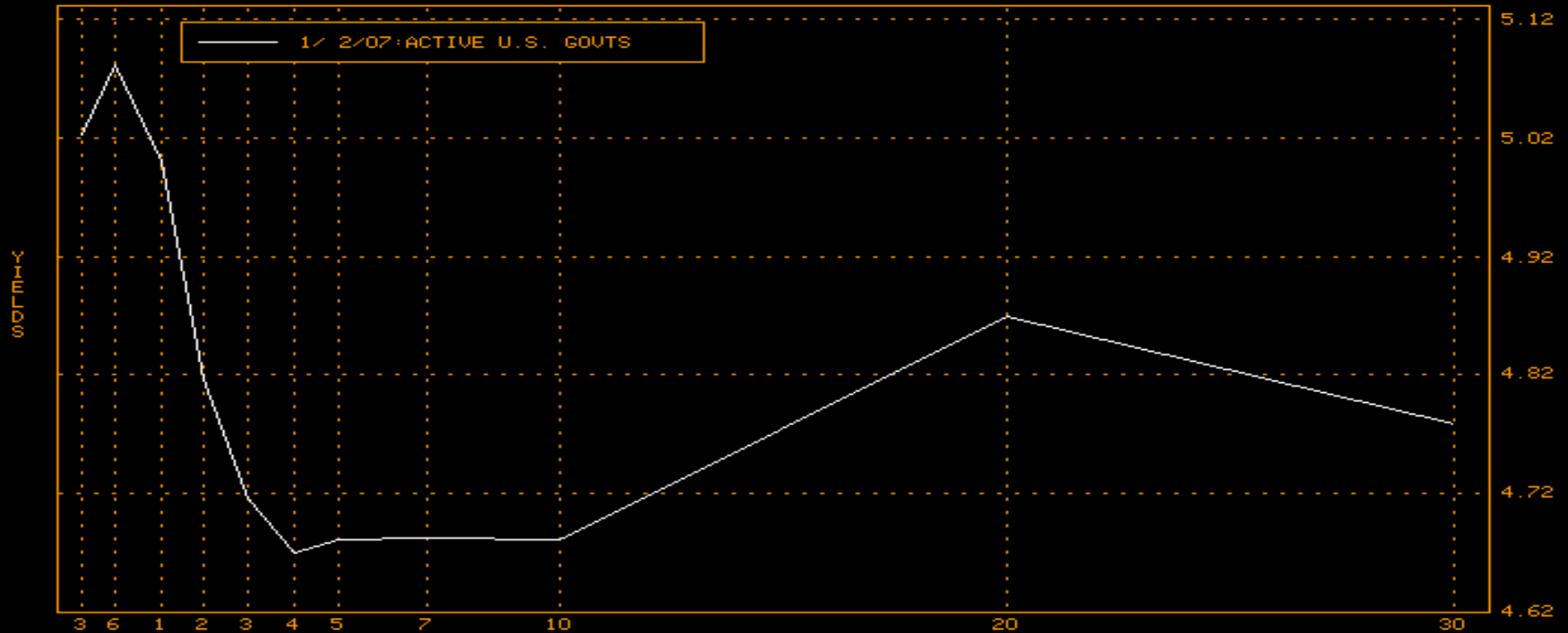
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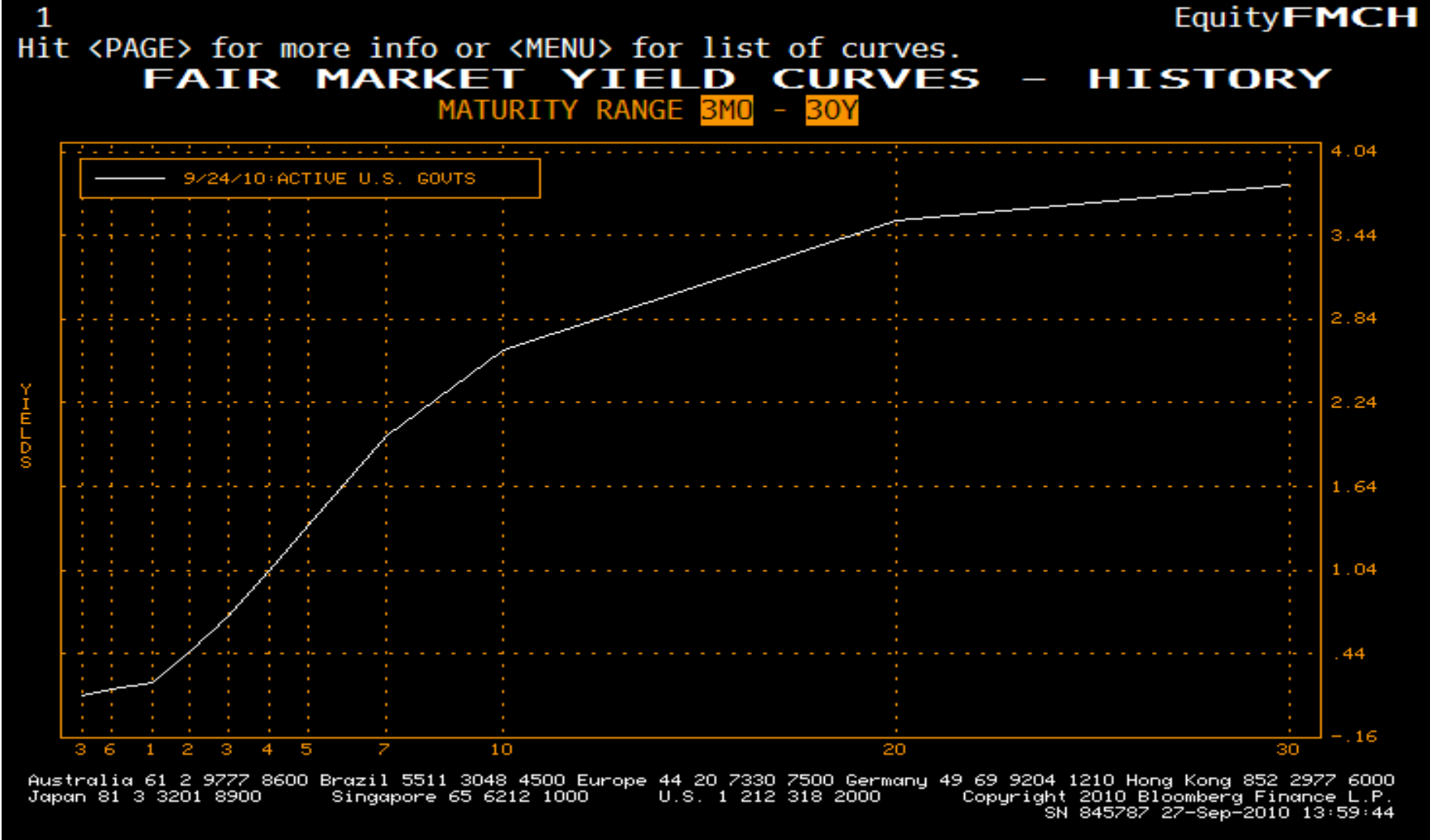
FAIR MARKET YIELD CURVES - HISTORY

MATURITY RANGE 3MO - 30Y



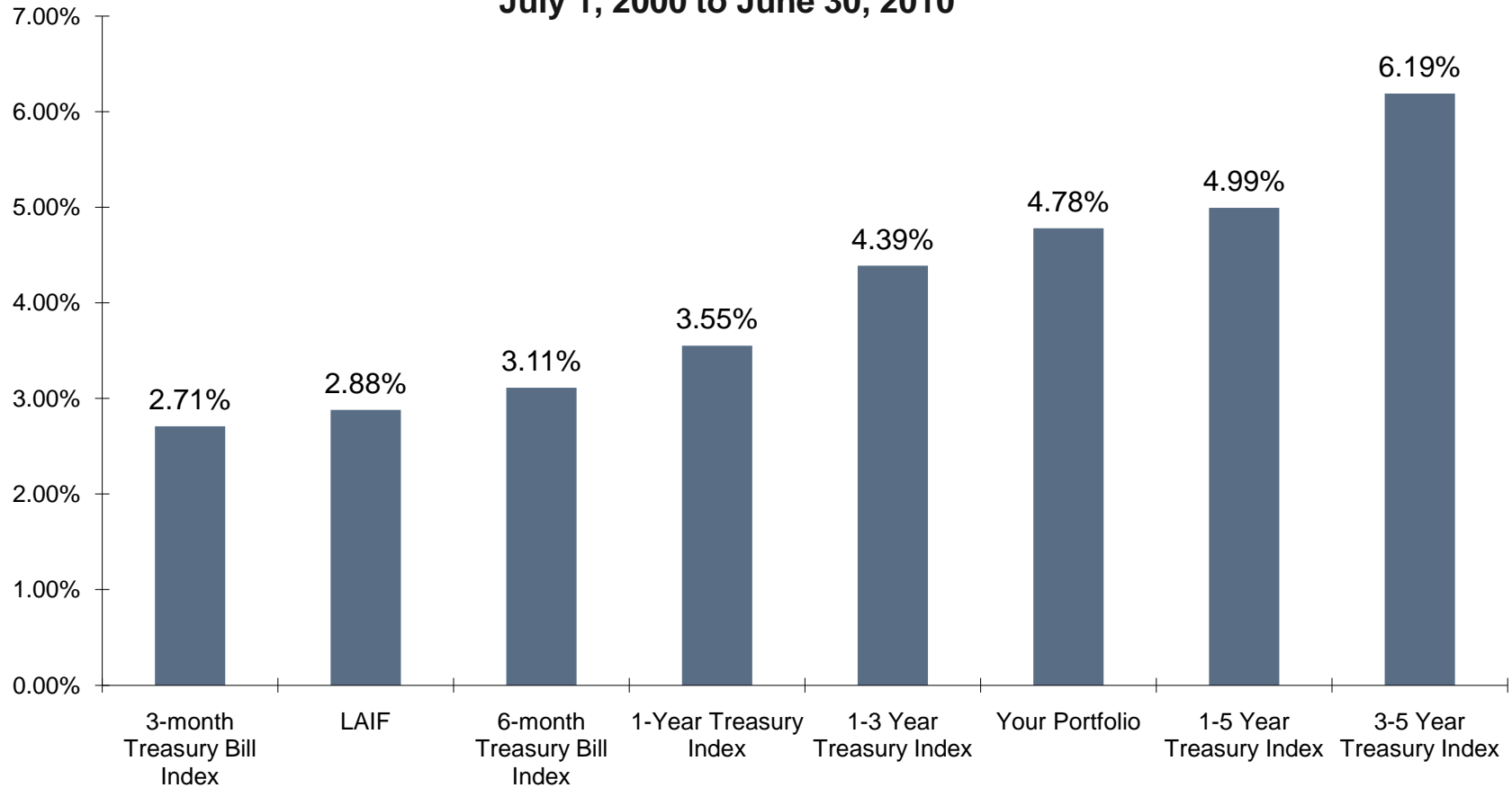
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Risk Return Tradeoff



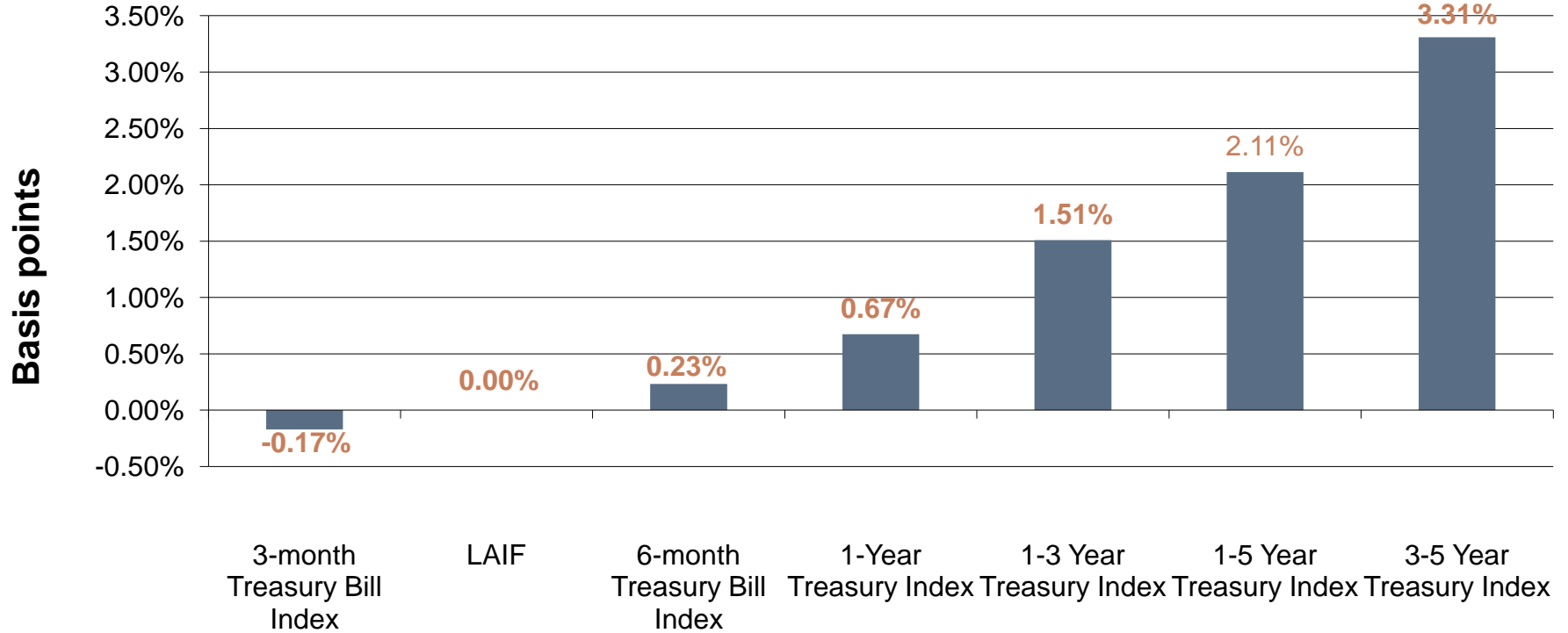
Risk/Return Tradeoff – Over Time

Treasury Returns July 1, 2000 to June 30, 2010



Additional Basis Points vs. LAIF

July 1, 2000 to June 30, 2010



Total Return – Industry Standard

Total return performance combines both Income and change in price.

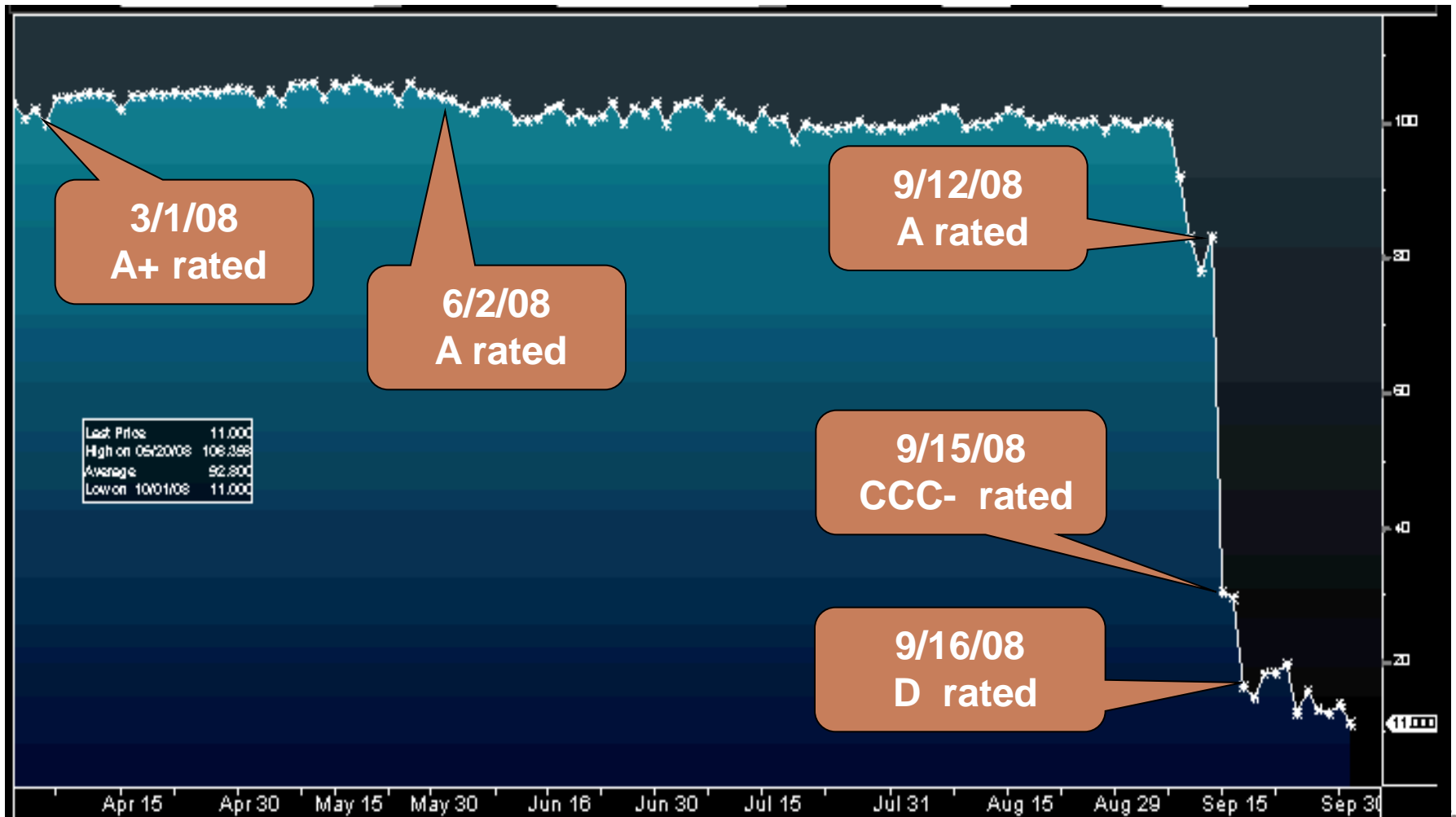
$$\text{Total Return}^* = \frac{\text{Value End} - \text{Value Start}}{\text{Value Start}}$$

*Note: Assumes no cash flows for the period - no additions or subtractions

Price of a bond captures all “known” information about the bond;
therefore, all “known” risks are accounted for in the price

Practical Example – Information effects price

Lehman Brothers MTN 7 7/8% of August 2010



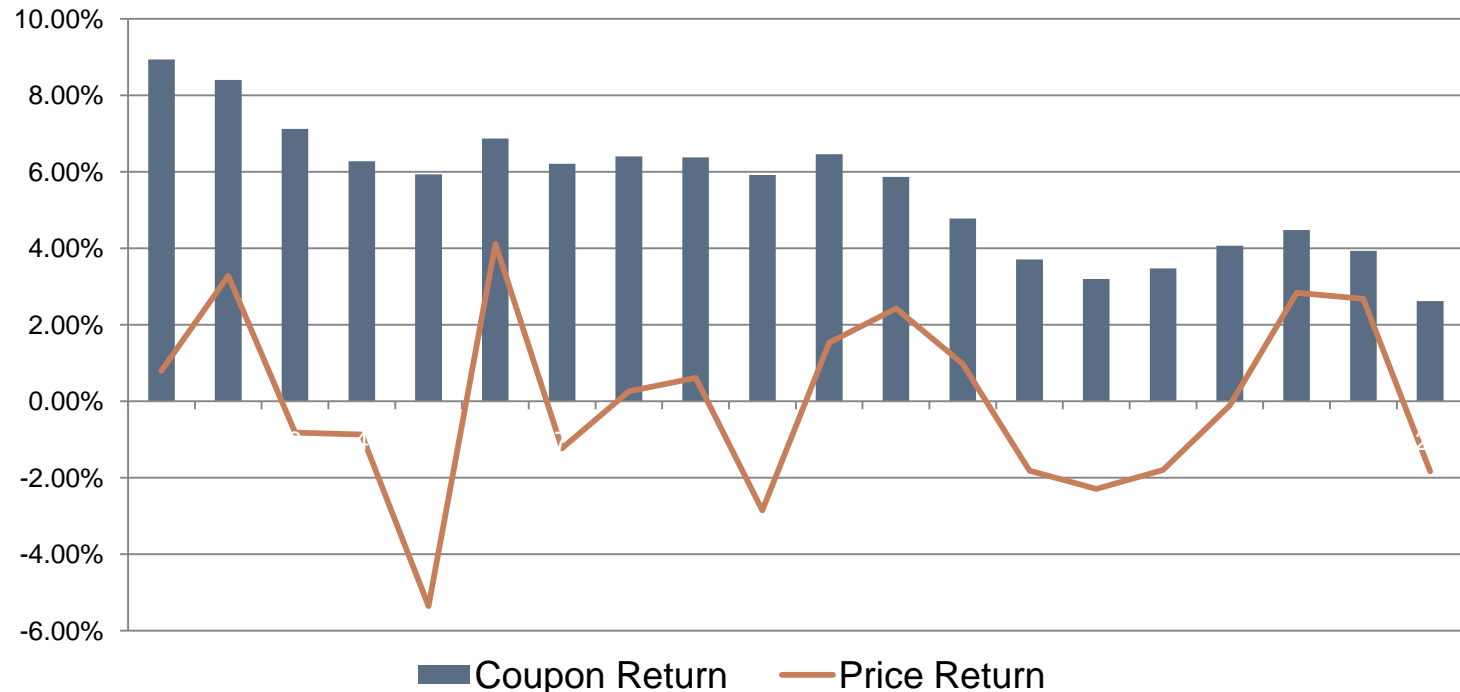
Total Return – risk is based on variability

“In considering risk we are concerned with the variability (or dispersion) of returns from an average or mean.”

Carl Bacon, *Practical Performance Measurement and Attribution*

Price vs. Coupon

BofA ML 1-3 Year Treasury Index 1990 to 2009



“Investors are risk-averse; given the same return they would prefer the portfolio with less risk or less variability....The Sharpe Ratio can be described as the return (or reward) per unit of variability (or risk)....The higher the Sharpe Ratio, the better the combined performance of risk and return”

Carl Bacon, *Practical Performance Measurement and Attribution*

Return of Portfolio – Return of Risk-free Asset

Standard Deviation of Return

= Sharpe Ratio



Sharpe Ratio – Quantifies Risk/Return Tradeoff

The Sharpe Ratio allows us to compare the return obtained per unit of risk. In this analysis, Portfolio #1 has the highest return, highest amount of risk, resulting in the lowest Sharpe Ratio.

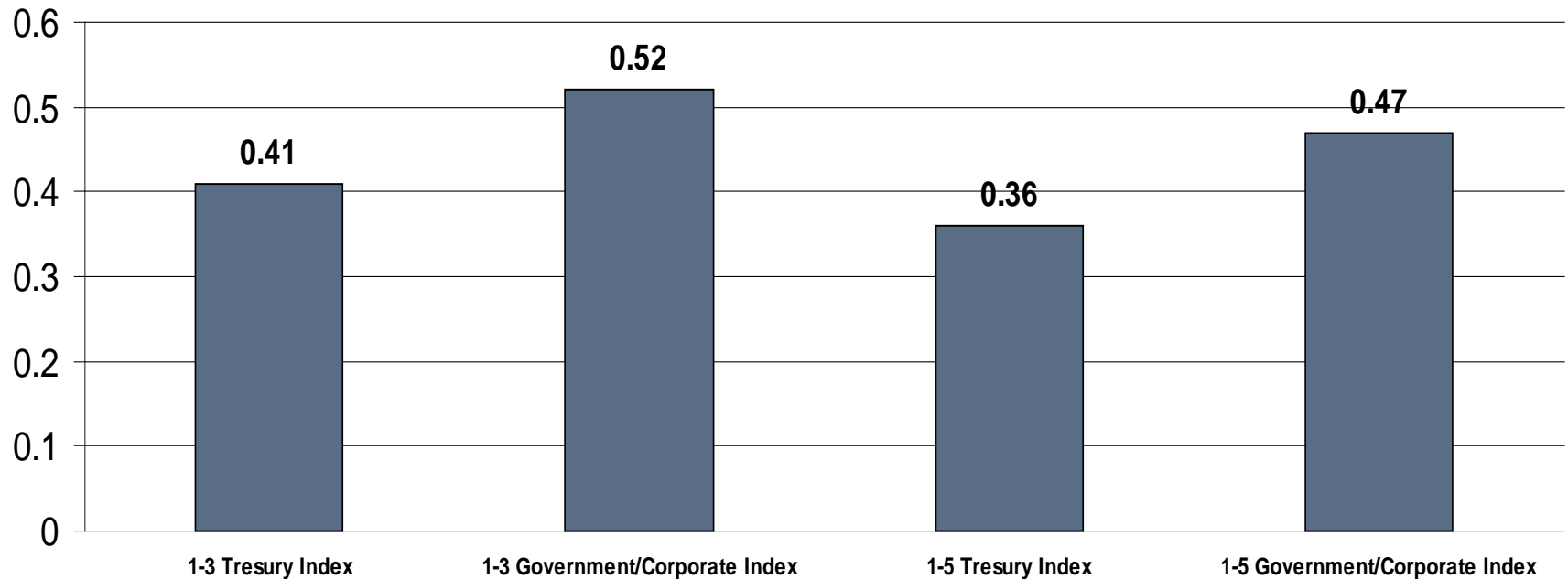
Public Entity	Returns Over 10 Years	Standard Deviation Over 10 Years	Sharpe Ratio Over 10 Years
Portfolio #1	5.47%	2.84	0.83
Portfolio #2	5.24%	2.11	1.03
Portfolio #3	4.86%	2.02	0.89

Sharpe Ratio – Links Risk and Return

The 1-3 maturity range has higher Sharpe ratios than the 1-5 year maturity range. This type of analysis needs to be done when considering total return benchmarks.

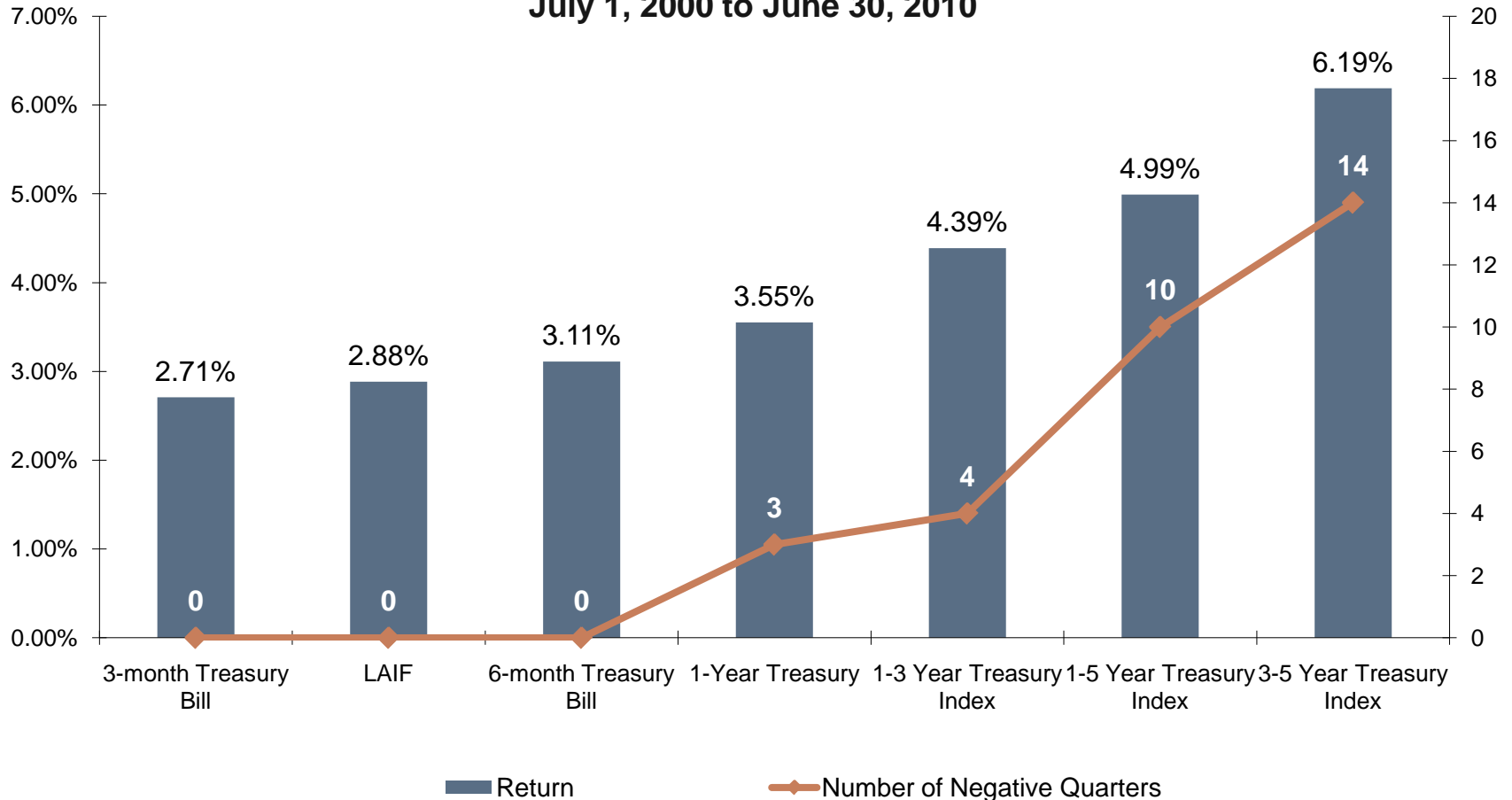
Sharpe Ratios (excess return/unit of risk)

for a 5-Year period ending December 31, 2009



Return vs. Number of Negative Quarters

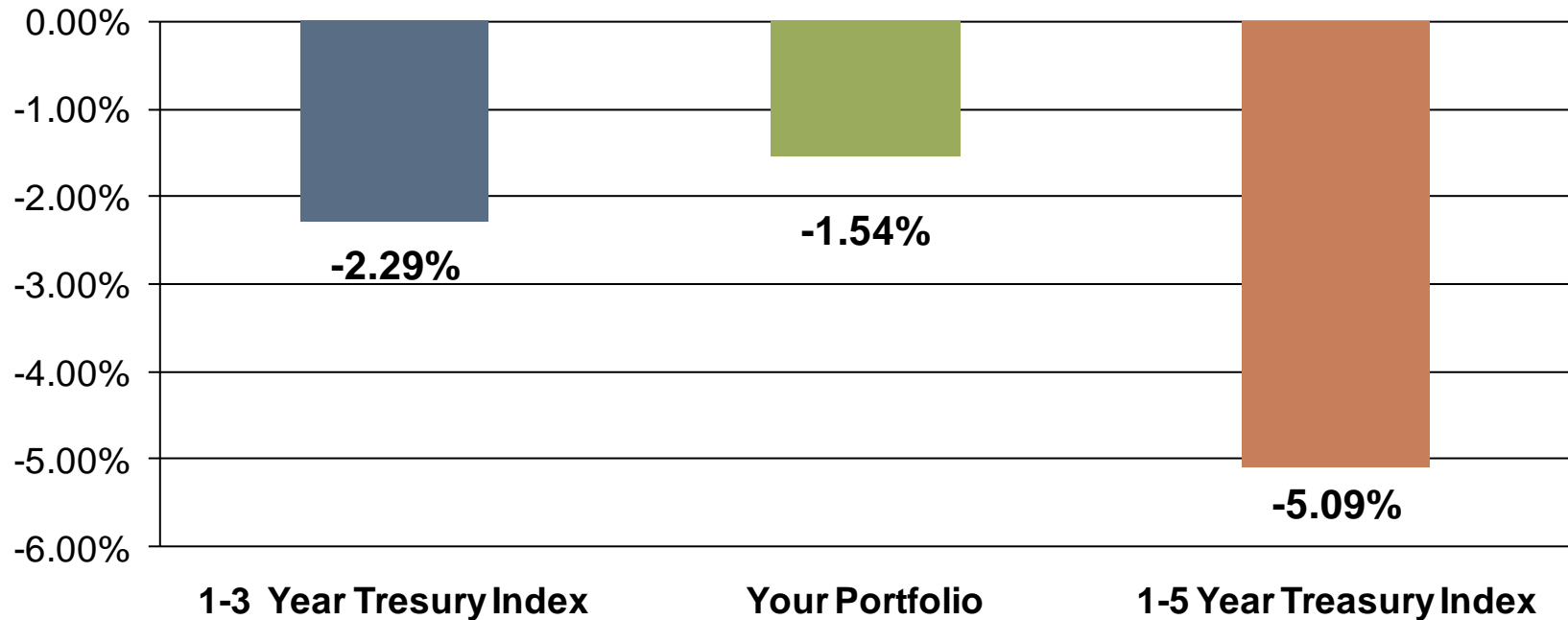
July 1, 2000 to June 30, 2010



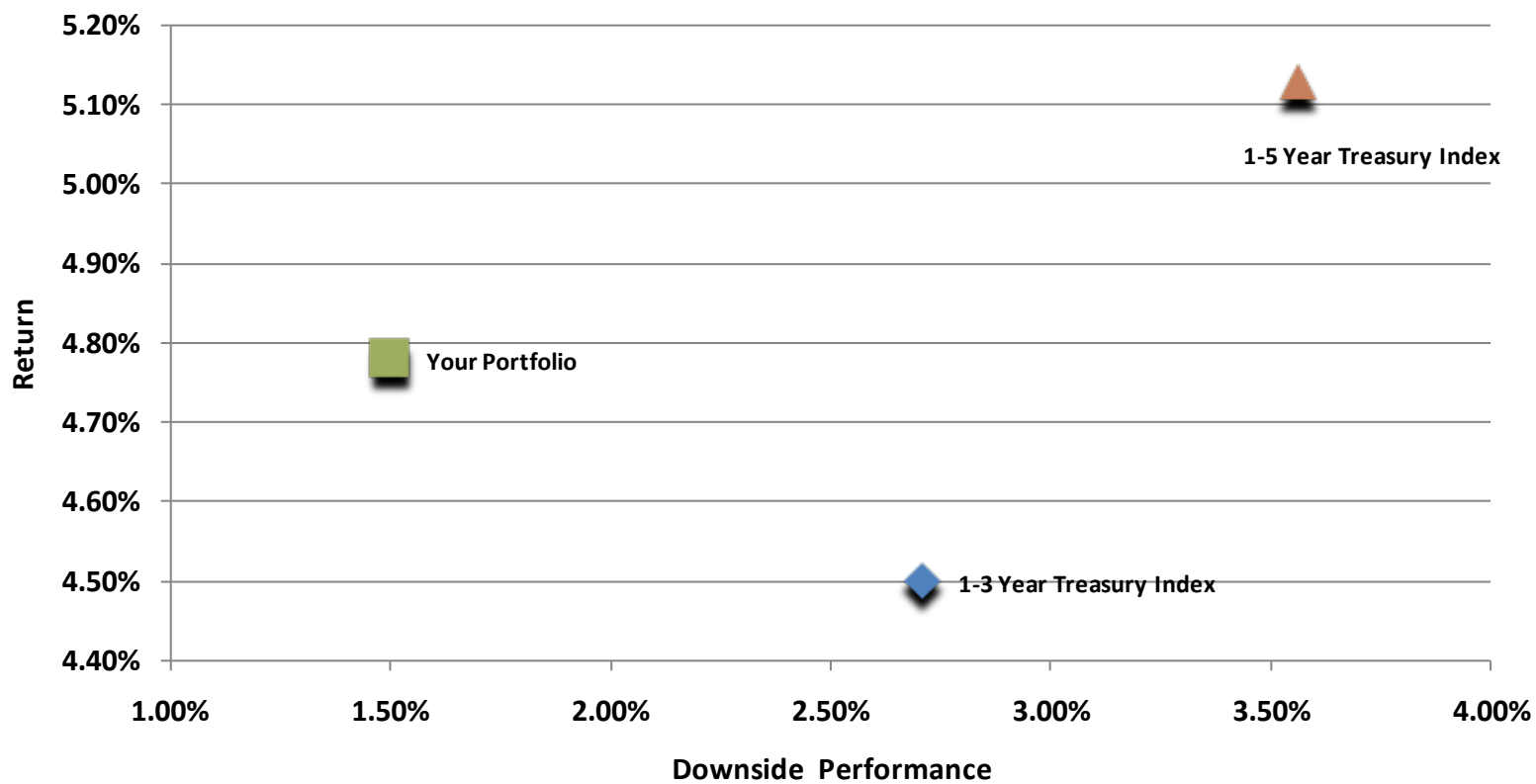
Analyzing the Risk/Return Tradeoff

Measuring downside risk is another way to view the risk/return tradeoff. Here we total the negative quarterly performance for a 10-year period to see how much risk each index is producing

Downside Risk (total negative quarterly performance)
for a 10-Year period ending June 30, 2010



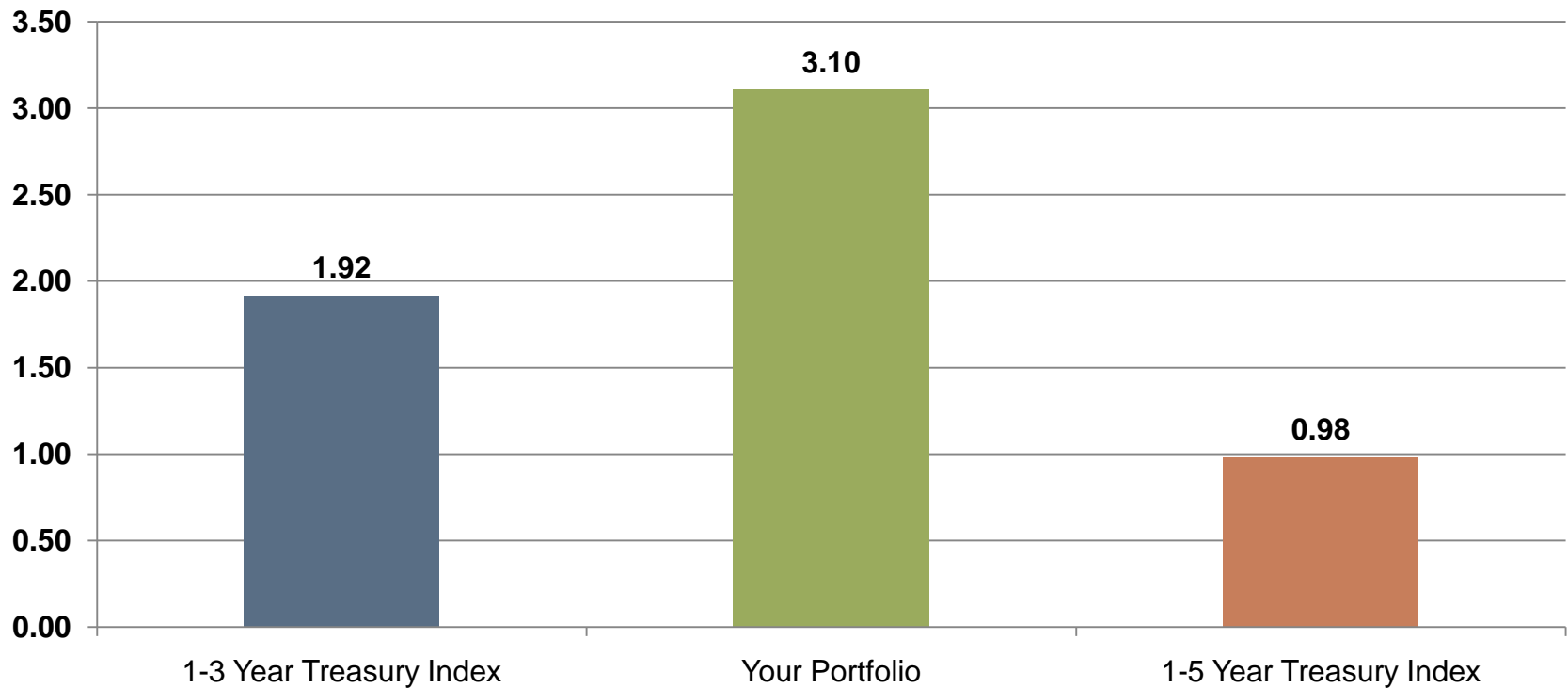
Return vs. Downside Performance



Downside Performance Ratio

This ratio compares the total return divided by the downside return. This ratio shows the amount of return obtained for a given level of downside performance.

Downside Performance Ratio



Risk Measurement For Portfolios Managed For Yield



- Evaluating market risk on a portfolio managed for yield
 - A conservative approximation method

Price Movement =

- Weighted Average Maturity of Portfolio (years) X Expected Change in Interest Rates

WAM = 573 days or 1.57 years

And

200 basis point increase in rates

-1.57 years X .0200 = -3.14%

Amortized Cost – Evaluating Market Risk



Issuer / Security	Coupon	Maturity Date	Call Date	Acquisition Cost	Days to Final	Days to Call	YTM Purchase Y	Wtd. Avg. Maturity to Final	Wtd. Avg. Maturity Call	Weighted Average Yield
FHLB	3.100%	01/08/08		1,000,000.00	8		3.100%	0.86	0.86	0.334%
FHLMC	4.890%	02/01/08		429,959.00	32		5.000%	1.48	1.48	0.232%
FHLB-Called	4.570%	04/29/08	01/29/08	359,507.00	120	29	5.000%	4.65	1.12	0.194%
FHLB	5.000%	06/27/08		125,000.00	179		5.000%	2.41	2.41	0.067%
FNMA	3.250%	08/15/08		371,528.00	228		3.000%	9.13	9.13	0.120%
FHLB-Called	4.600%	08/22/08	02/05/08	374,415.00	235		4.850%	9.49	9.49	0.196%
FHLB	4.010%	09/17/08	03/17/08	347,995.00	261		4.860%	9.79	9.79	0.182%
FHLB	4.570%	10/17/08		349,839.00	291		4.630%	10.98	10.98	0.175%
FHLB	4.100%	11/26/08	02/26/08	348,218.00	331		4.700%	12.43	12.43	0.176%
FNMA	4.550%	12/01/08	06/01/08	431,669.00	336	153	4.900%	15.64	7.12	0.228%
FHLB-Called	5.000%	01/02/09	01/02/08	430,461.00	368	2	4.880%	17.08	0.09	0.227%
FNMA-Called	4.100%	02/13/09	02/04/08	399,827.00	410	35	4.850%	17.68	1.51	0.209%
FHLB	4.000%	02/23/09	02/04/08	357,265.00	420	35	4.700%	16.18	1.35	0.181%
FHLB-Called	4.660%	04/13/09	01/16/08	369,290.00	469	16	4.810%	18.68	0.64	0.192%
FFCB-Called	4.300%	06/09/09	01/25/08	303,205.00	526	25	4.730%	17.20	0.82	0.155%
FHLB-Called	4.550%	07/14/09	01/28/08	209,365.00	561	28	4.760%	12.67	0.63	0.107%
FHLB-Called	4.520%	08/26/09	01/28/08	119,538.00	604	28	4.770%	7.79	0.36	0.061%
FHLMC-Called	4.500%	08/10/09	01/10/08	349,962.00	588	10	5.150%	22.19	0.38	0.194%
FHLMC-Called	4.500%	08/10/09	01/10/08	159,982.00	588	10	5.150%	10.14	0.17	0.089%
FHLB	4.280%	09/08/09	03/08/08	198,486.00	617	68	4.760%	13.21	1.46	0.102%
FNMA-Called	4.500%	09/30/09	01/22/08	443,103.00	639	22	4.760%	30.53	1.05	0.227%
FHLMC-Called	4.130%	10/09/09	01/30/08	291,661.00	648	30	4.800%	20.38	0.94	0.151%
FFCB-Called	4.500%	11/13/09	02/01/08	1,404,513.00	683	32	4.320%	103.44	4.85	0.654%
FFCB-Called	4.300%	11/18/09	02/01/08	98,985.00	688	32	4.880%	7.34	0.34	0.052%
Totals				\$ 9,273,773.00				391.37	79.41	4.507%

Amortized Cost – Evaluating Market Risk



06/30/10 Issuer / Security	Coupon	Maturity Date	Call Date (if any)	Acquisition Cost	% of Portfolio	Days to Final	Days to Call	YTM	Final Wtd. Avg. Maturity	Effective Wtd. Avg. Maturity	Weighted Average Yield
FNMA POOL	5.000%	11/01/10		\$ 1,438,167.80	2.68%	124		0.308%	3.33	3.33	0.008%
FNMA POOL	4.000%	12/01/10		\$ 1,326,607.49	2.48%	154		0.164%	3.81	3.81	0.004%
FNMA POOL	4.500%	01/01/11		\$ 1,630,747.40	2.30%	185		0.412%	4.25	4.25	0.009%
FNMA POOL	4.000%	06/01/11		\$ 2,077,436.49	3.88%	336		0.667%	13.02	13.02	0.026%
FNMA	2.000%	08/12/13	08/12/10	\$ 997,500.00	1.86%	1139	43	2.074%	21.20	0.80	0.039%
FHLB	1.000%	05/26/15	11/26/10	\$ 1,000,000.00	1.87%	1791	149	1.000%	33.42	2.78	0.019%
FNMA	2.000%	12/30/15	12/30/10	\$ 1,000,000.00	1.87%	2009	183	2.000%	37.48	3.41	0.037%
FNMA	4.100%	07/01/16	07/01/10	\$ 1,012,434.23	1.89%	2193	1	3.889%	41.43	0.02	0.073%
FNMA	2.530%	05/04/17	08/04/10	\$ 1,000,000.00	1.87%	2500	35	2.530%	46.65	0.65	0.047%
FHLMC	3.100%	05/19/17		\$ 1,000,000.00	1.87%	2515		3.100%	46.93	46.93	0.058%
FNMA	2.000%	11/27/17		\$ 1,000,000.00	1.87%	2707		2.000%	50.51	50.51	0.037%
FNMA	2.000%	12/18/17	09/18/10	\$ 747,000.00	1.39%	2728	80	2.000%	38.02	1.12	0.028%
FNMA	3.000%	01/29/18	07/29/10	\$ 1,000,000.00	1.87%	2770	29	3.000%	51.68	0.54	0.056%
FNMA	3.000%	02/12/18	08/12/10	\$ 1,000,000.00	1.87%	2784	43	3.000%	51.95	0.80	0.056%
FHLB	2.500%	12/23/19	09/23/10	\$ 1,000,000.00	1.87%	3463	85	2.500%	64.61	1.59	0.047%
FNMA	2.000%	02/24/20	02/24/11	\$ 1,000,000.00	1.87%	3526	239	2.000%	65.79	4.46	0.037%
FNMA	3.000%	05/19/20	11/19/10	\$ 1,000,000.00	1.87%	3611	142	3.000%	67.38	2.65	0.056%
FNMA	2.000%	06/16/20	06/16/11	\$ 1,000,000.00	1.87%	3639	351	2.000%	67.90	6.55	0.037%
FHLMC POOL	6.000%	09/01/21		\$ 1,313,080.36	2.45%	4081		4.945%	99.98	99.98	0.121%
FHLMC	4.000%	02/25/22	08/25/10	\$ 1,000,000.00	1.87%	4258	56	4.000%	79.45	1.04	0.075%
FNMA	4.000%	05/28/24	08/28/10	\$ 965,000.00	1.80%	5081	59	4.320%	91.49	1.06	0.078%
FNMA	5.125%	08/19/24		\$ 478,514.06	0.89%	5164		4.848%	46.11	46.11	0.043%
FNMA	3.000%	09/30/24	09/30/10	\$ 1,000,000.00	1.87%	5206	92	3.000%	97.14	1.72	0.056%
FHLMC	3.000%	02/02/25	08/12/10	\$ 1,000,000.00	1.87%	5331	43	3.000%	99.47	0.80	0.056%
CD		12/28/10		\$ 14,000,000.00	26.12%	181		2.650%	47.28	47.28	0.692%
Money Market		07/01/10		\$ 13,594,074.82	25.36%	1		0.210%	0.25	0.25	0.053%
Totals				\$ 53,594,961.99	100.00%				1271.94	346.90	1.850%

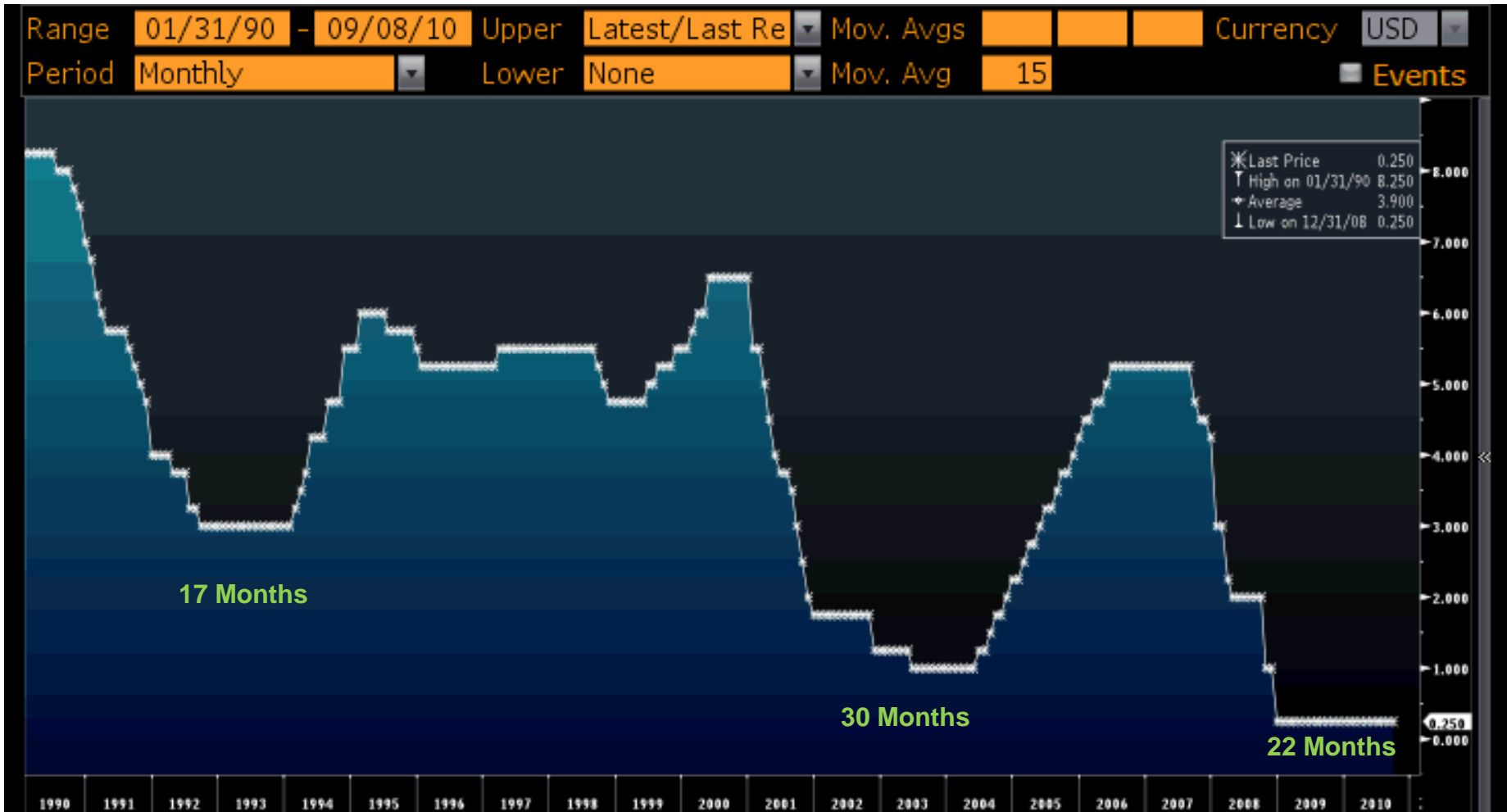
Last Recovery – 2004 to 2006



Orange County Recovery - 1994



Months Between Fed Funds Increases



Price Movement =

- Weighted Average Maturity of Portfolio (years) X Expected Change in Interest Rates

WAM = 1,278 days or 3.50 years

And

375 basis point increase in rates

Therefore,

-3.50 years X .0375 = -13.125%

- **Portfolio return is linked to portfolio safety and portfolio liquidity**
- **A bond's price captures all "known" information, including risk**
- **Sharpe Ratios measure return per unit of risk**
- **Downside risk should be a primary focus**
- **Amortized cost returns or yields make it more difficult to measure risk**
- **Optionality embedded in the portfolio needs to be taken into consideration**
- **Risk measurement is just as important as performance**