



San Francisco Treasury Symposium ***Benchmark Your Corporate Cash Portfolio*** ***September 21, 2001***

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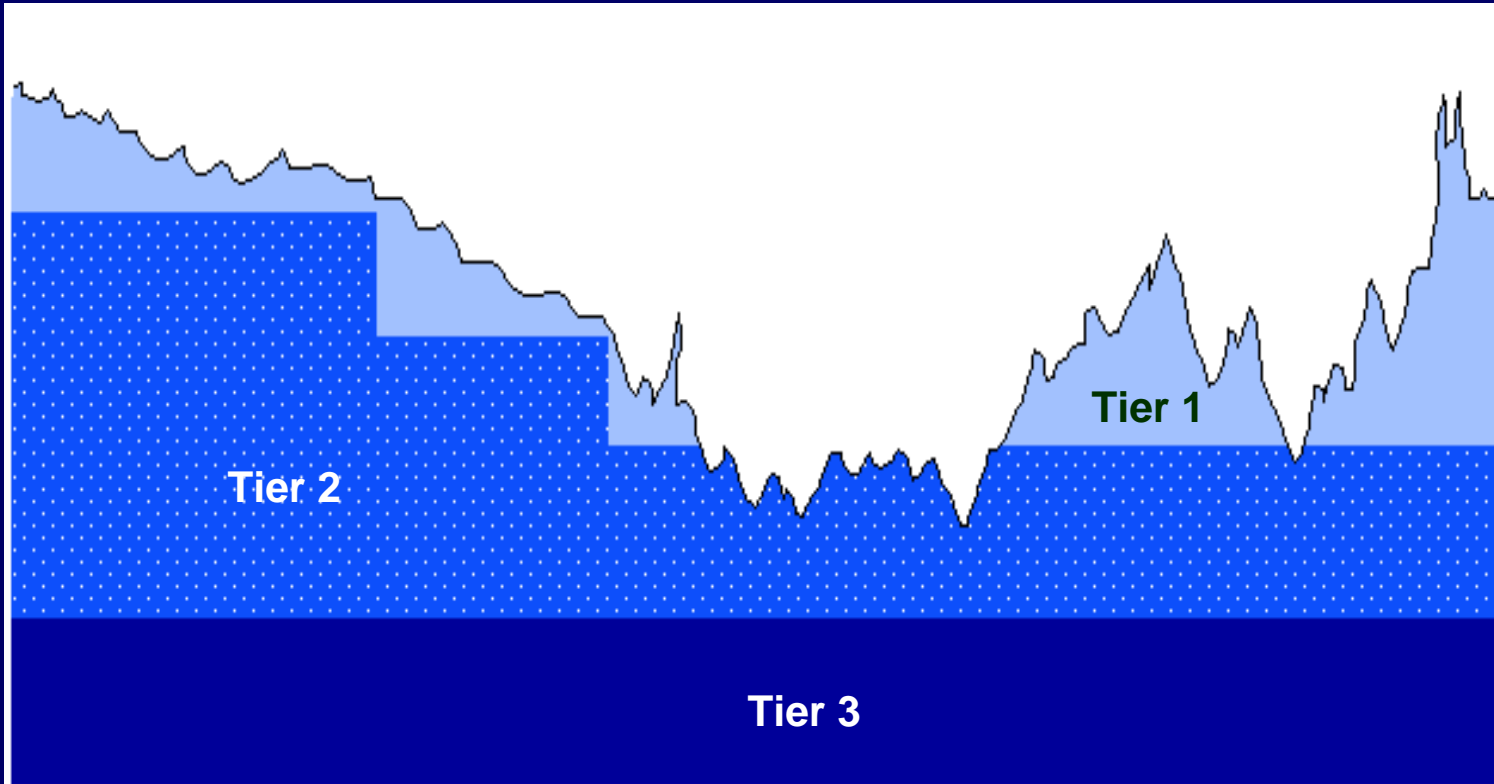
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Cash Portfolios Can be Stratified by Liquidity and Investment Horizon

Each Tier is distinct and can be benchmarked.





Why Benchmark Corporate Cash Portfolios?

- ◆ Measure portfolio performance under similar market conditions
 - ◆ Determine opportunity cost
 - ◆ Assess level of risk taken
 - ◆ Attribute the quality of performance to
 - ◆ Yield curve positioning
 - ◆ Sector selection
 - ◆ Credit decisions

- ◆ Model portfolios
 - ◆ Benchmarks can be used to create simulated portfolios
 - ◆ Evaluate risk/return of different securities
 - ◆ Credit quality
 - ◆ Duration/maturities



Short-Term Benchmarks



- ◆ Taxable Fixed Income
 - ◆ iMoney Net
 - ◆ 6 month LIBID
 - ◆ Merrill Lynch 0-1 Year Treas.
 - ◆ Merrill Lynch 1 Year LIBOR
 - ◆ Merrill Lynch 1-3 Yr. Govt/Corp.

- ◆ Tax-Advantaged Fixed Income
 - ◆ PSA Muni Index
 - ◆ Lehman Bros. 1 Year Muni Index
 - ◆ Bond Buyer AA GO
 - ◆ Merrill Lynch 0-3 Yr. Muni Index





Performance Measurement

Compare Performance TROR to Benchmark TROR

- ◆ Total rate of return
 - ◆ Time-weighted
 - ◆ Not yield but return
- ◆ After-tax
 - ◆ Use AIMR-PPS
 - ◆ Tax adjust either price return or coupon return
- ◆ Actual monthly returns
 - ◆ Geometrically link monthly returns
 - ◆ Different methods of calculation
 - ◆ Trailing 1, 3, 6, 12 months
 - ◆ Year-to-Date and Inception-to-Date

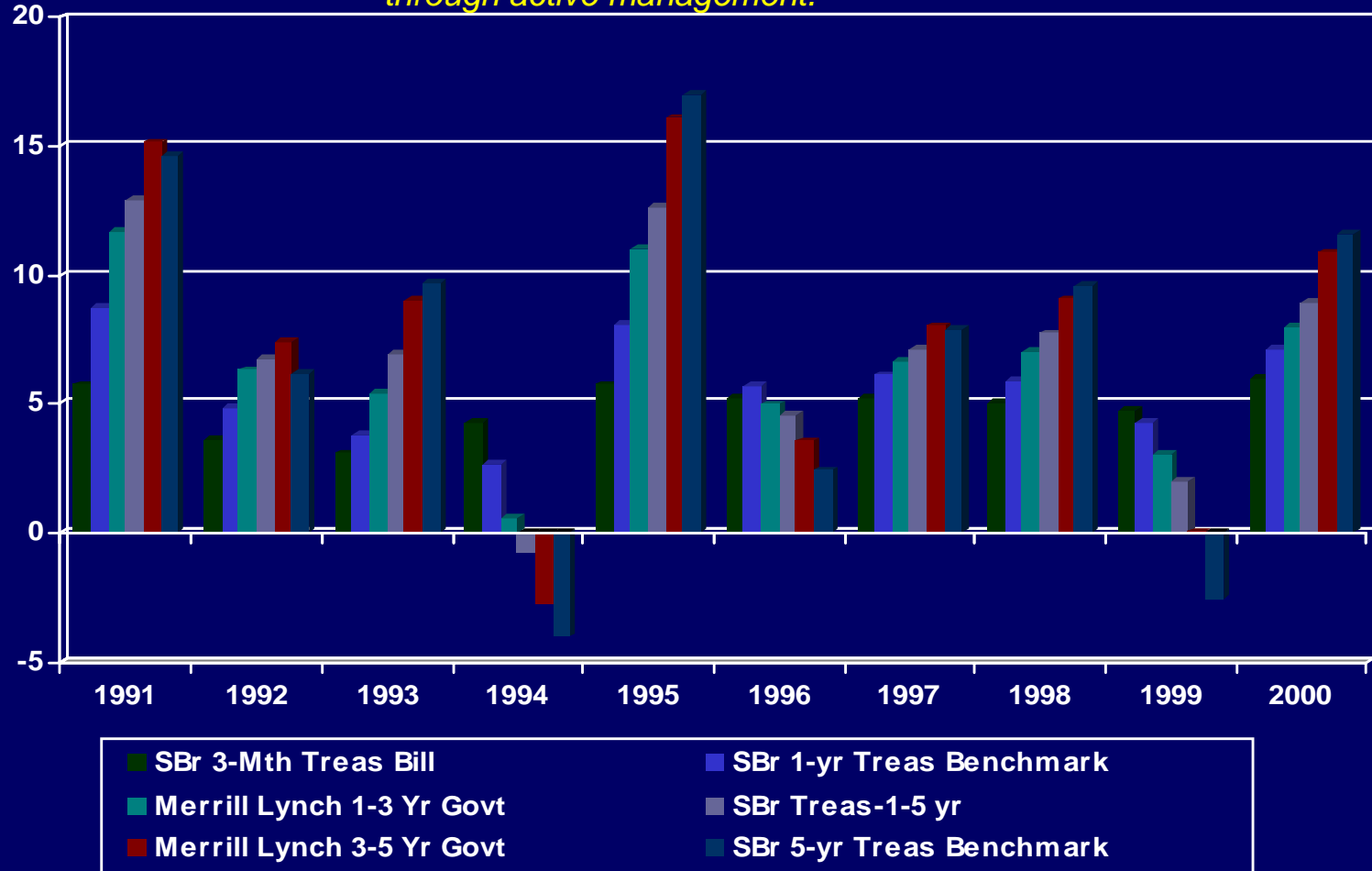




Annual Benchmark Returns

Risk/Return Trade-Off

Historically, the longer the maturity the higher the expected total rates of return. The trade-off has been higher volatility which can be mitigated through active management.



Criteria for Selecting Benchmark



- ◆ Viable alternative as a passive strategy
 - ◆ Neutral position
 - ◆ Without fees or transaction costs
- ◆ Consistently calculated and obtained from third party
- ◆ Reflect liquidity needs and risk tolerance
- ◆ Represent similar duration and market sectors as portfolio
- ◆ Should have similar credit quality
- ◆ Similar eligible instruments



Selecting a Benchmark



- ◆ Back test data over market cycle
 - ◆ Risk/Return profile
 - ◆ Measure volatility of index returns
 - ◆ Range of changes in duration
 - ◆ Number and size of negative quarters
- ◆ Customized or blended
 - ◆ Specify components and weightings



Custom-Designed Benchmarks



- ◆ Specialized way to measure investment manager
 - ◆ Use a specific list of securities
 - ◆ Combined with multiple published indices
 - ◆ Arrive at an expected rate of return
- ◆ Drawbacks
 - ◆ Complex can be costly to track and maintain
 - ◆ Benchmark composition may drift over time
 - ◆ Composition must be reviewed annually
 - ◆ Manager may mirror the index to reduce tracking error





Risk/Return Profile

As of June 30, 2001

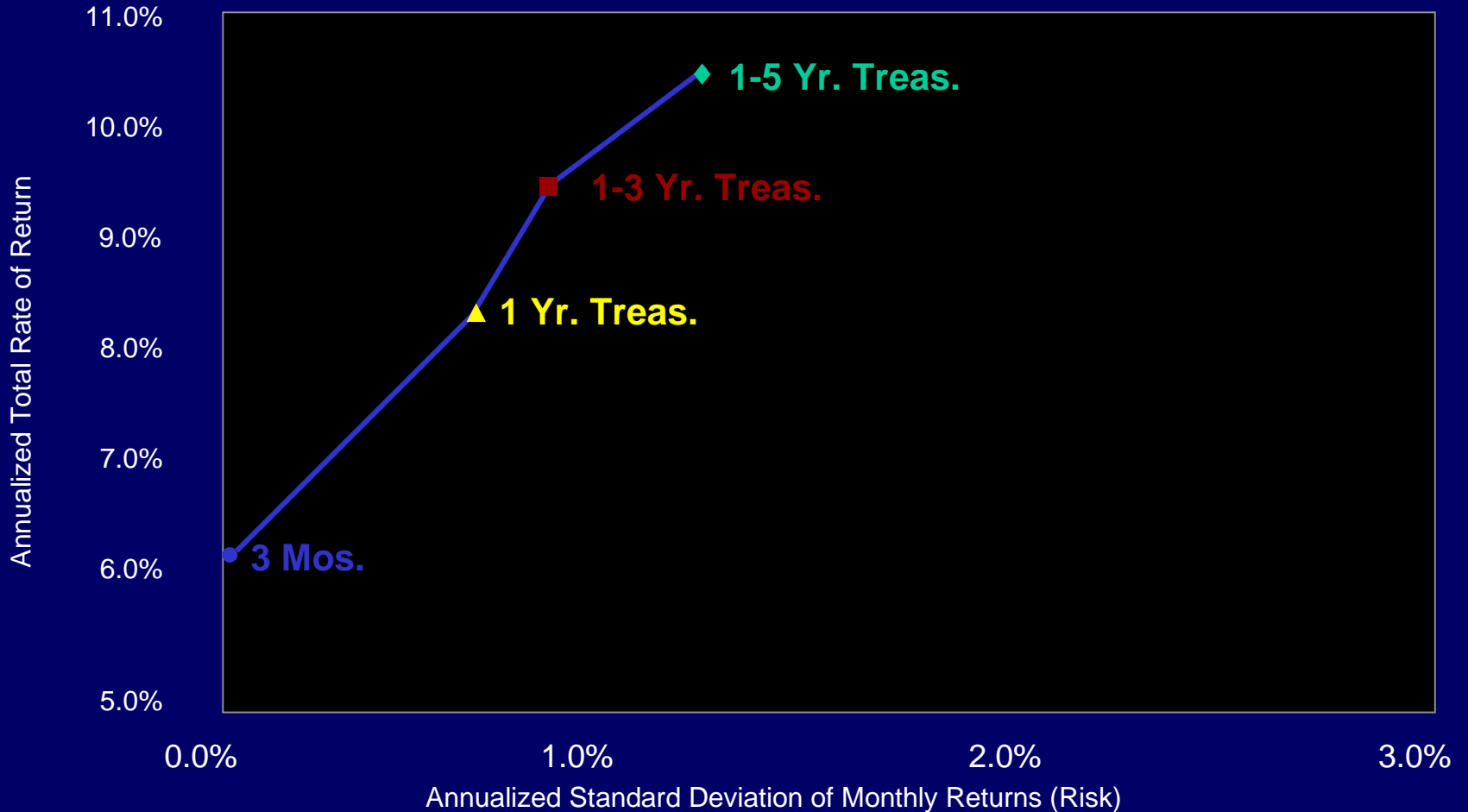
Treasury Index	Total Rate of Return				Standard Deviation of Returns				Duration Adjusted Returns			
	1 Yr.	3 Yrs.	5 Yrs.	10 Yrs.	1 Yr.	3 Yrs.	5 Yrs.	10 Yrs.	1 Yr.	3 Yrs.	5 Yrs.	10 Yrs.
1 Year Govt.	8.35	6.07	6.08	5.73	0.71	0.79	0.68	0.81	8.27	6.01	6.02	5.67
1-3 Year Govt.	9.60	6.44	6.43	6.48	0.99	1.36	1.30	1.64	6.40	4.29	4.29	4.32
1-5 Year Govt.	10.56	6.66	6.66	6.88	1.24	1.88	1.83	2.27	4.80	3.03	3.03	3.13
3-5 Year Govt.	12.52	7.09	7.11	7.61	1.85	2.98	2.94	3.44	5.01	2.84	2.84	3.04
5 Year Govt.	12.97	6.51	6.61	7.19	2.33	3.78	3.70	4.15	4.32	2.17	2.20	2.40





Historical Risk/Return

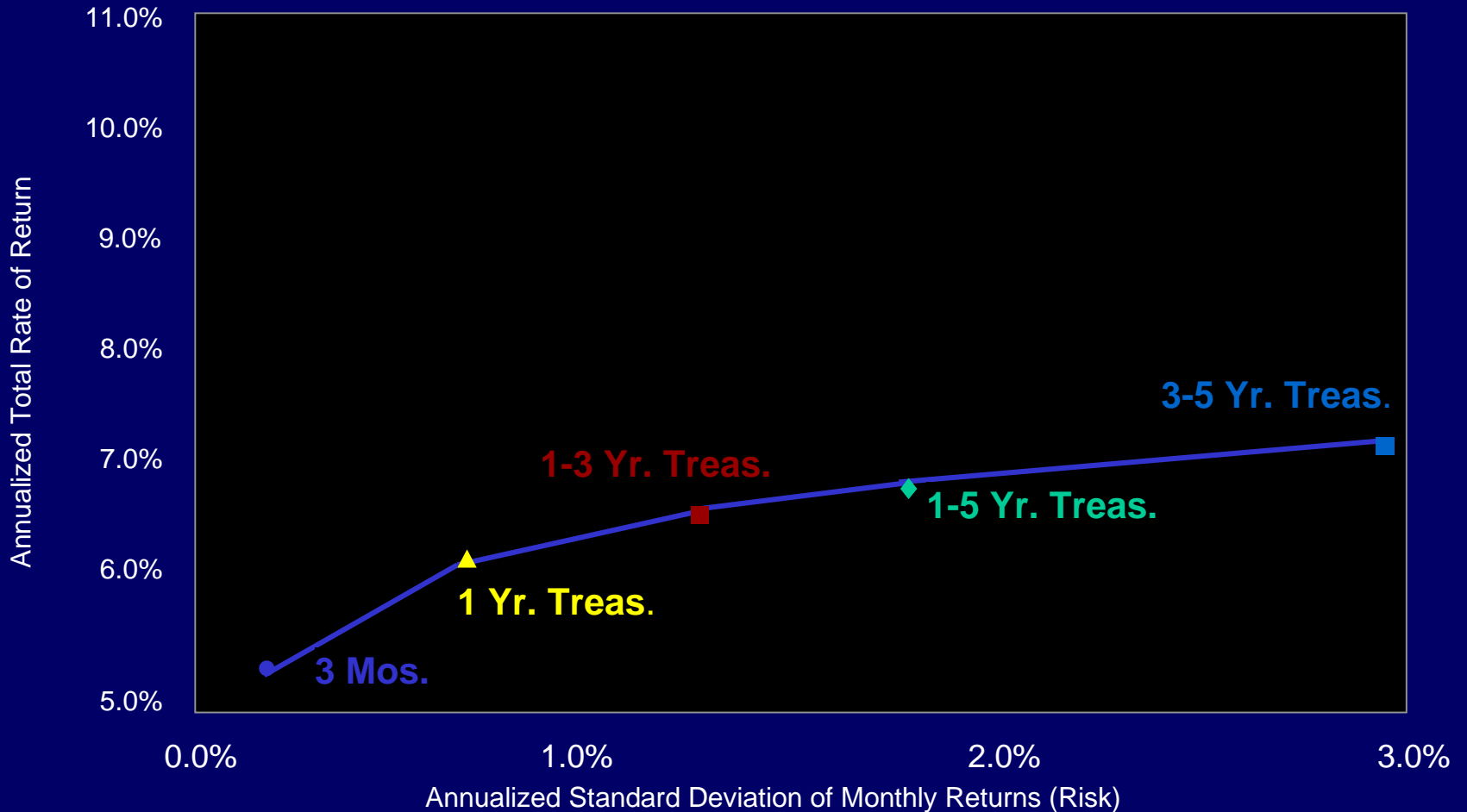
One Year ended June 30, 2001





Historical Risk/Return Efficient Frontier

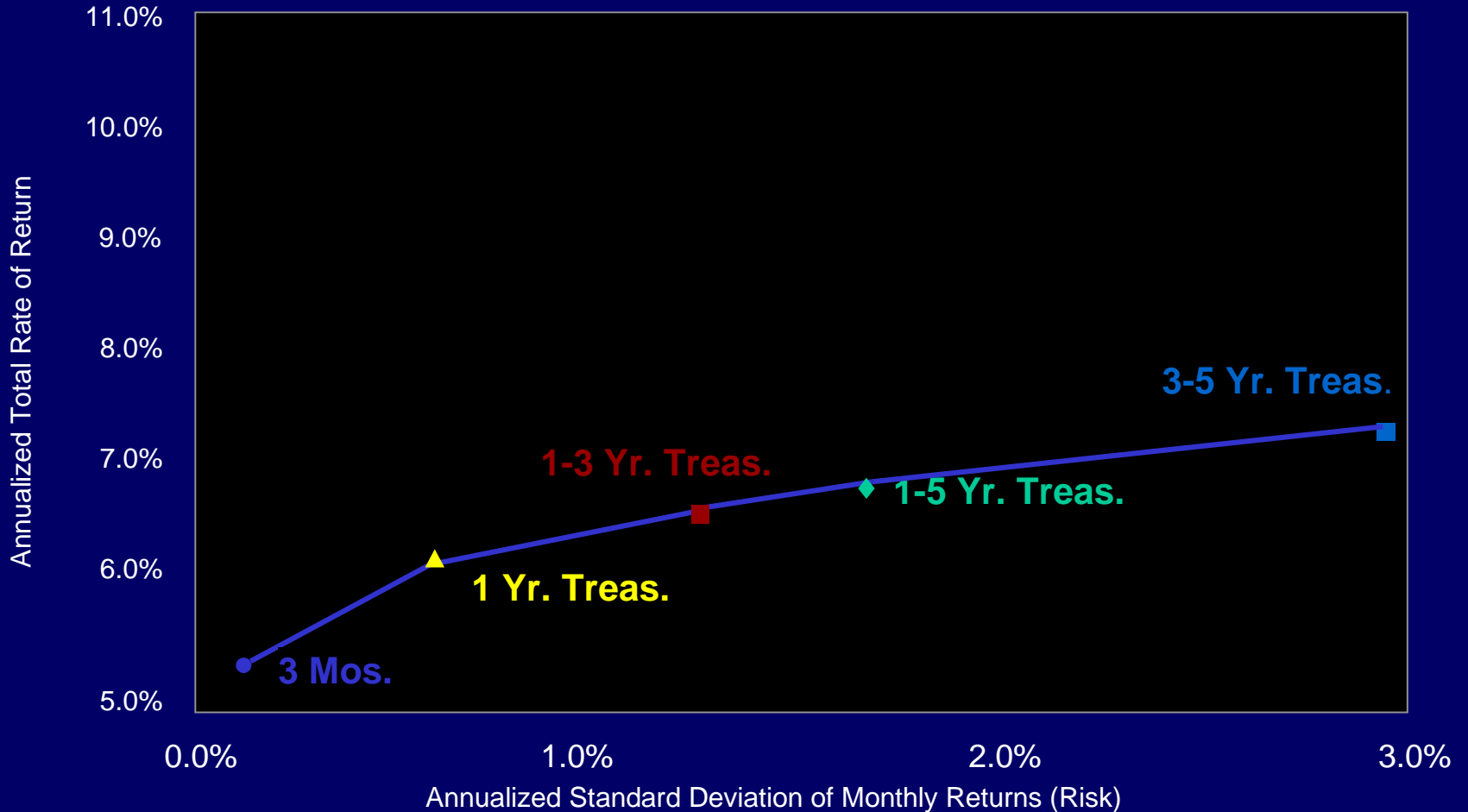
Three Years ended June 30, 2001





Historical Risk/Return Efficient Frontier

Five Years ended June 30, 2001

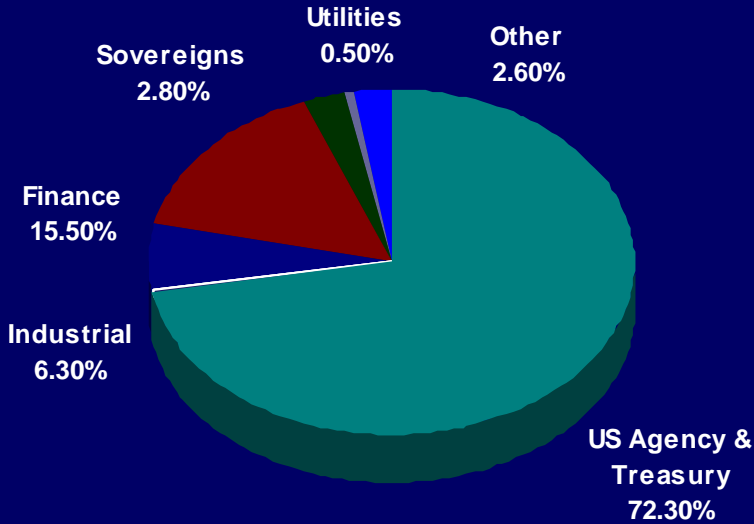




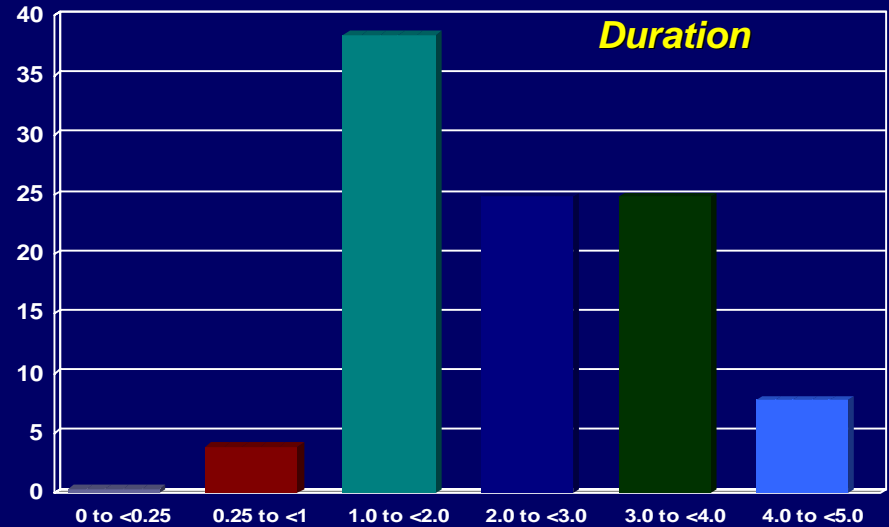
Benchmark Characteristics

Merrill Lynch 1-5 Govt/Corp Index

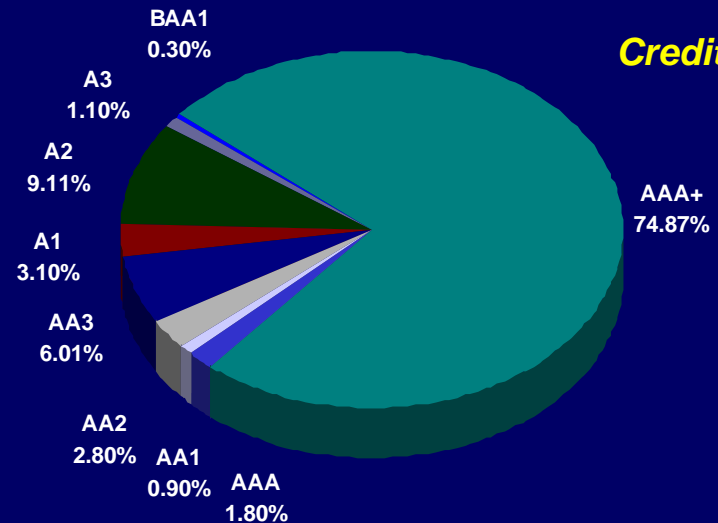
Sector



Duration



Credit Quality





Benchmark Characteristics

Merrill Lynch 1-5 Govt/Corp Index

<i>Inception Date of Index</i>	4/30/1986
<i># of Issues</i>	1,978
<i>Average Credit Quality</i>	AA1
<i>Market Weighted Coupon</i>	6.262
<i>Yield to Maturity</i>	3.906
<i>Yield to Worst</i>	3.847
<i>Modified Duration</i>	2.465
<i>Effective Convexity</i>	0.056
<i>Option Adjusted Spread</i>	49





Benchmark Return Patterns

Merrill Lynch 1-5 Govt/Corp Index

Composition of Total Return As of 8/31/2001

	Total Return	Price Return	Coupon Return
1 Month	0.726	0.229	0.497
3 Month	2.719	1.195	1.524
6 Month	4.335	1.192	3.143
1 Year	10.925	4.297	6.628





Benchmark Returns

Merrill Lynch 1-3 General Obligation (Municipal)

Components of Total Return As of 8/31/2001

	Total Return	Price Return	Coupon Return	Taxable Equivalent Return	After Tax Return
1 Month	1.159	0.71	0.449	1.40	0.91
3 Month	1.924	0.56	1.364	2.66	1.73
6 Month	3.584	0.796	2.788	5.09	3.31
1 Year	7.393	1.789	5.604	10.41	6.77



Wind River Systems, Inc.
Kurt Zumwalt
Treasurer





Sun Microsystems, Inc.
Janette San Luis



Overview Sun Microsystems, Inc.



- ◆ Total Revenue \$18.25 B as of Fiscal Year End 6/30/01
- ◆ Net Income was \$ 981 M
- ◆ Nasdaq stock ticker is SUNW
- ◆ Investment Portfolio: \$6.2 B
- ◆ Portfolio Composition:
 - ◆ Corporate Notes & Bonds \$1.7 Billion
 - ◆ Asset-backed & Mortgage-backed Securities 1.5 Billion
 - ◆ US Government/Agency Securities 1.5 Billion
 - ◆ Cash Equivalent .8 Million



Sun Microsystems Portfolio Allocation



- ◆ Sun Microsystems has 7 portfolios allocated among:
 - ◆ Money Market Funds
 - ◆ Five Investment Managers
- ◆ Investment strategies are distinct
 - ◆ Each portfolio has custom guidelines
 - ◆ Each portfolio is a sub-set of the overall policy
- ◆ Investment Managers selected for their fixed income expertise
 - ◆ Diversify by investment style and strategy
 - ◆ Sector rotation
 - ◆ Security selection
 - ◆ Quantitative systems
 - ◆ Stress test portfolios
 - ◆ Compliance checking, pre-trade and post-trade



Sun Microsystems Treasury Curve



- ◆ Portfolio Assets diversified and distributed along yield curve
- ◆ Treasury curve - segmented by pools and average duration
 - ◆ Less than 1 year
 - ◆ Average 1 year duration
 - ◆ 1.5 year duration
 - ◆ 2.2 year duration
 - ◆ 3 year duration
- ◆ Decisions based on extensive analysis



Sun Microsystems Portfolio Duration



- ◆ Considered various portfolio durations, multiple sectors
 - ◆ 0-1 year
 - ◆ 0-2 years
 - ◆ 1-3 years
 - ◆ 1-5 years
 - ◆ 3-5 years
 - ◆ 5-7 years
- ◆ Detailed evaluation determined
 - ◆ Acceptable risk/return profile over 3, 5, 10 years
 - ◆ Acceptable levels of volatility under different subperiods
 - ◆ Concentrations
- ◆ Sun selected different durations for liquidity portfolios
 - ◆ Ranging from .75 - 2.2 years



Sun Microsystems Benchmarks



- ◆ Process taken using the market benchmarks
 - ◆ Asset Allocation Study
 - ◆ Evaluate historical volatilities of returns, market price and income return
 - ◆ Returns by credit quality such as MBS 0-5 years AAA-rated
 - ◆ Duration risk
 - ◆ Sector risk/returns, scatter diagrams
 - ◆ Use benchmarks for ongoing performance tracking
 - ◆ Decompose returns for tracking
 - ◆ Performance attribution
 - ◆ Tracking error
 - ◆ Sector weights vs. benchmark



Sun Microsystems Portfolio Allocation



- ◆ Balance sheet assets allocated by
 - ◆ Domestic portfolios and offshore portfolios
 - ◆ Unique objectives and goals
 - ◆ Liquidity needs differ based on cash flows
 - ◆ Different investment horizons
 - ◆ Individualized guidelines
 - ◆ Separate portfolios with distinct, custom benchmarks



Sun Microsystems Ongoing Monitoring

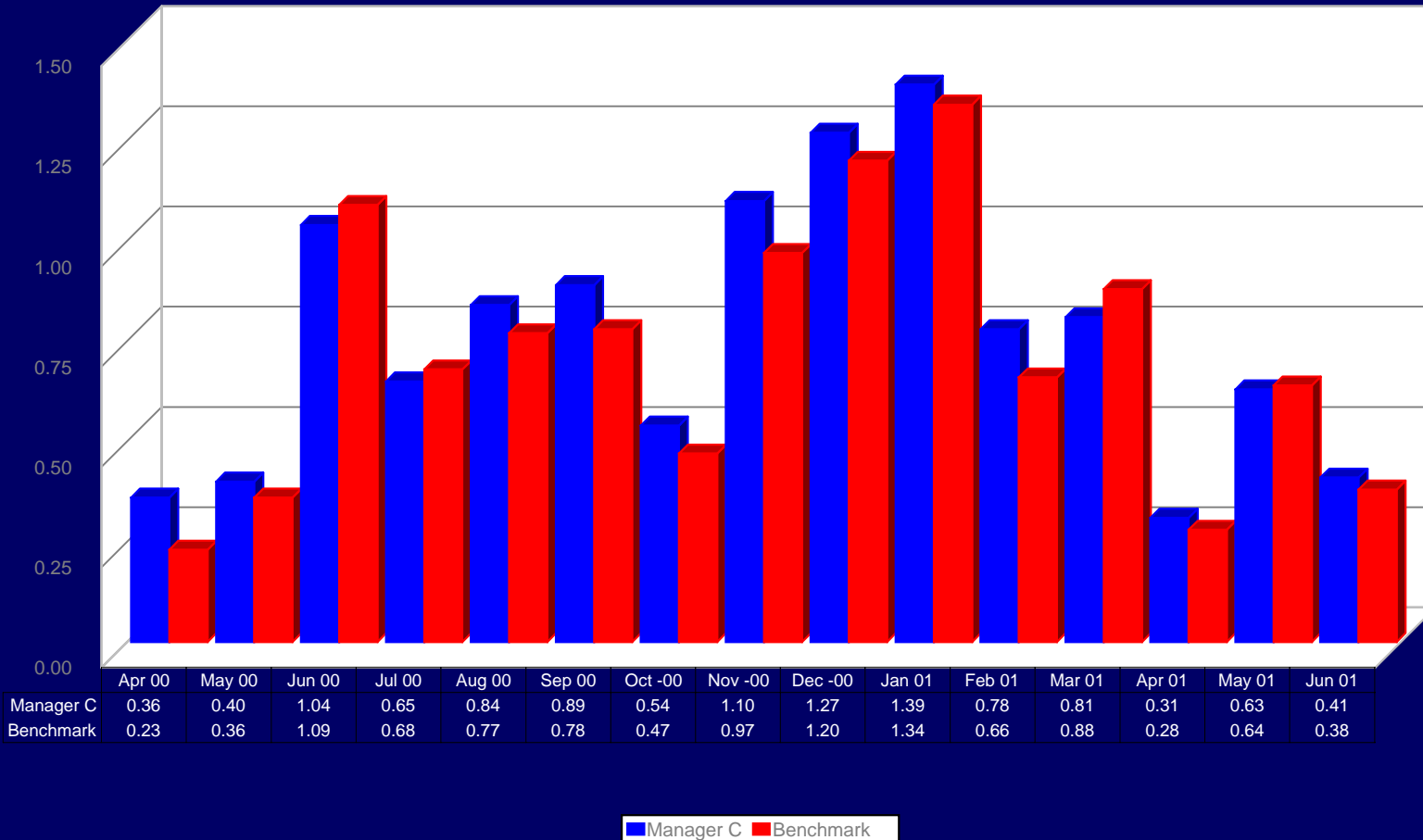


- ◆ Use benchmarks to evaluate manager performance
 - ◆ Measure monthly, quarterly, trailing 12 month, inception to date performance
 - ◆ Volatility measured by duration
 - ◆ Credit quality drift
 - ◆ Sector allocation
 - ◆ Convexity for MBS
- ◆ Review monthly and formally on quarterly basis
 - ◆ Quarterly consolidated review with third party consultant
 - ◆ Joint quarterly manager and consultant updates
- ◆ Internal review of portfolios posted on Intranet for Sun Treasury





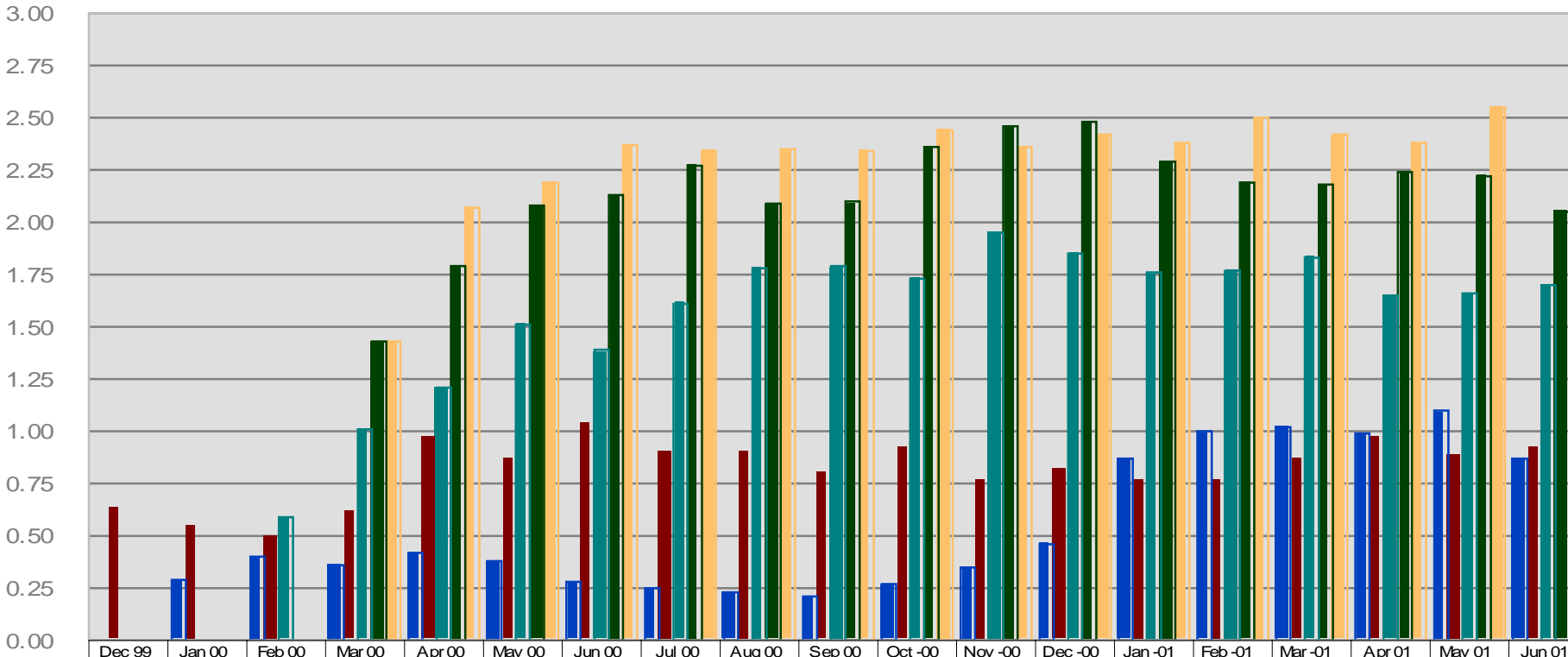
Sample Manager Performance vs. Benchmark





Sample Manager Performance Review

Average Portfolio Duration



■ Manager A
 ■ Manager B
 ■ Manager C
 ■ Manager D
 ■ Manager E

Sun Microsystems Conclusion



- ◆ Benchmarks are valuable tools
- ◆ Use benchmarks extensively
 - ◆ Simulate portfolios using historical return patterns under different market conditions
 - ◆ To construct model portfolios
 - ◆ Evaluate performance for manager selection
 - ◆ Provide ongoing monitoring of managers or portfolios
 - ◆ Identify style drift
 - ◆ Highlight potential risks in management style





Appendix



Return vs. Yield



- ◆ Yield to Maturity
 - ◆ Assumes a constant reinvestment rate (IRR)
 - ◆ Calculated by applying a discount rate to each cash flow of a bond, market value is sum of the present value of all cash flows
 - ◆ Assumes a buy and hold strategy
 - ◆ Assumes all coupons are reinvested at the same rate of interest
 - ◆ If interest rate rise during life of security, reinvestment rate rises and return is higher
 - ◆ If interest rates fall during life of security, reinvestment rate declines and return is lower



Return vs. Yield



- ◆ Yield to Call
 - ◆ Assumes a constant reinvestment rate (IRR)
 - ◆ Calculated to the call date and call price by applying a discount rate to each cash flow of a bond, market value is sum of the present value of all cash flow
 - ◆ Used to compare securities upon purchase
 - ◆ Always use Yield to Worst: lowest of YTC, YTM, YAL
 - ◆ Assumes a buy and hold strategy
 - ◆ Over life of bond it may trade on YTC or YTM depending on level of interest rates and if at premium to call price



Return vs. Yield



- ◆ Current Yield
 - ◆ Coupon interest rate divided by its market value or price
 - ◆ Ignores impact of premiums and amortization over time
 - ◆ Often used to project interest income
 - ◆ Overstates yield when market value drops (unrealized losses)
 - ◆ Understates yield when market value rises (unrealized gains)
 - ◆ Overstates high coupon, premium securities

- ◆ Book Yield
 - ◆ Yield to maturity using original purchase price
 - ◆ Often used to project interest income
 - ◆ Book yield can fluctuate sharply when securities are traded



Return vs. Yield



- ◆ Total Rate of Return
 - ◆ Dollars in and dollars out analysis
 - ◆ Captures all of the changes in the value of an investment over time
 - ◆
$$\frac{[\text{Ending Market Value}(\text{adjusted by wtd. Inflows and outflows}) - [\text{Beginning Market Value}] + [\text{Interest and dividends earned}] + [\text{Accrued interest and dividends}]}{\text{Beginning Market Value}}$$

$$\frac{(\text{Adjusted EMV-BMV}) + (I) + (AI)}{\text{BMV}}$$

- ◆ Monthly returns are linked and not annualized because it overstates capital gains/losses



Maturity or Duration Risk and Volatility Measure



7% Coupon, 5 Year Maturity @ Par



7% Coupon, Callable in 2 years @ 101. 5 Year Maturity @ Par



Zero Coupon, 5 Year Maturity @ Par, IRR 7%

