



RISK MANAGEMENT

FPPTA TRUSTEE SCHOOL

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Risk ...the degree of probability of loss

- **Event**

- **Credit / Default**
 - 2324 defaults since 1920 (7% Investment Grade)*
 - 846 defaults for past 10 years (3% Investment Grade)*

- **Market Volatility**

- **Correlation Risk**

- **Asset / Liability**

- **Costs**

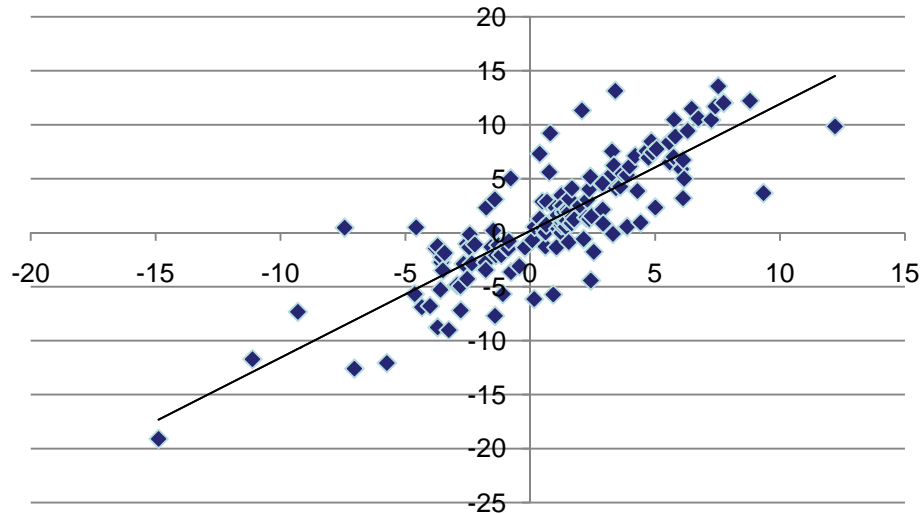
**according to Moody's*

Risk Factors...

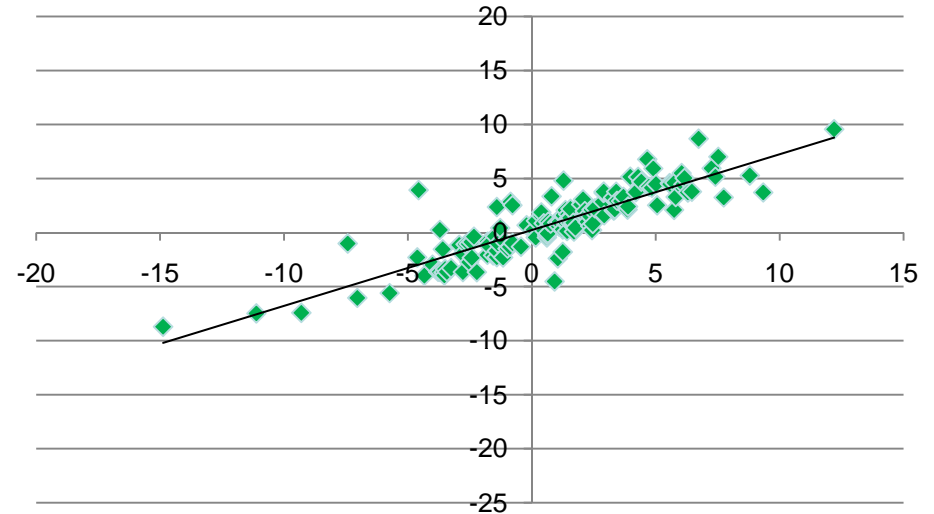
- **Fraud...restating earnings**
- **Bankruptcy...Enron**
- **Market Manipulation...short-sellers**
- **Industry Concentration... banks, but no oil**
- **Banking System... willingness to lend money**
- **Borrowers... ability to pay debts**
- **Random Events... external unknowns**
- **Federal Reserve ... short-term interest rates**
- **Currency Valuations... falling dollar**

Beta of Two Large Cap Value Managers...

High Beta Mgr. (1.18)



Low Beta Mgr. (0.70)



3 Worst Months Since 03/1996

	High Beta Mgr.	Low Beta Mgr.	Russell 1000 Value
Aug-98	(19.1)	(8.7)	(14.9)
Sep-02	(11.7)	(7.5)	(11.1)
Jul-02	(7.3)	(7.4)	(9.3)

3 Best Months Since 03/1996

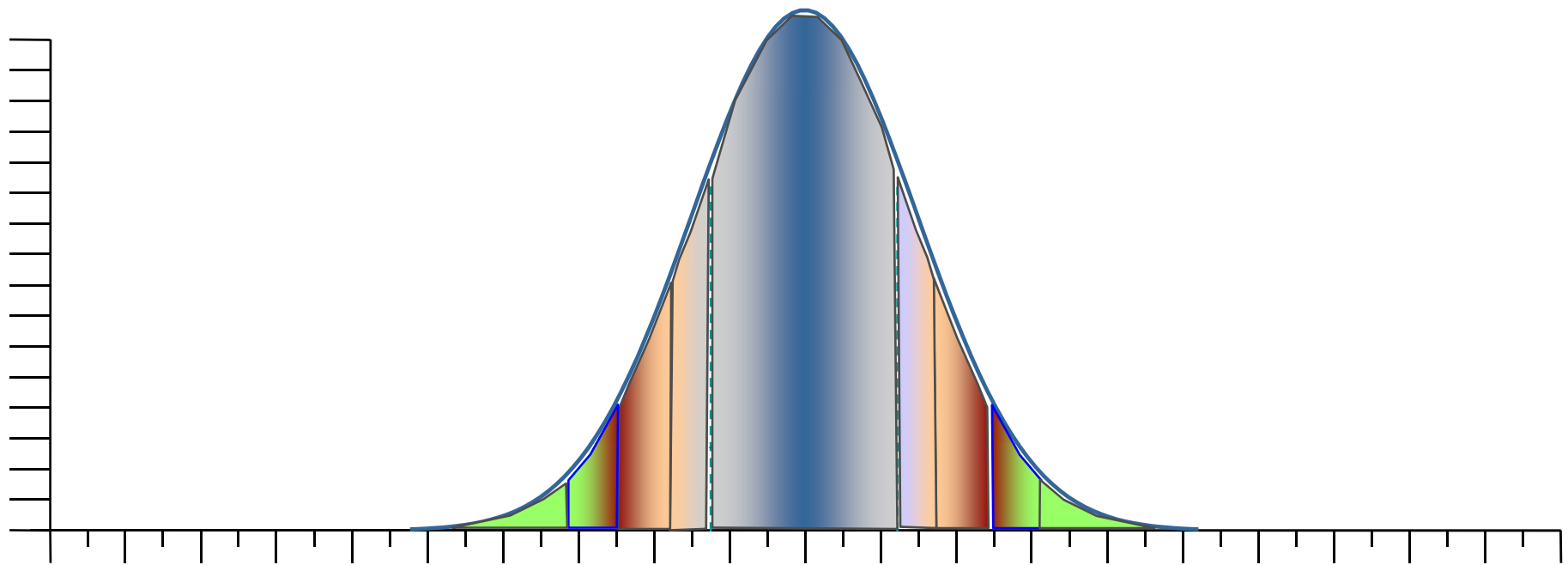
	High Beta Mgr.	Low Beta Mgr.	Russell 1000 Value
Mar-00	9.9	9.6	12.2
Apr-99	3.7	3.7	9.3
Apr-03	12.2	5.3	8.8

Standard Deviation (Volatility)...

... square root of return variance

	Calendar Year Returns			Variance		
	High Beta	Low Beta	Index	High Beta	Low Beta	Index
Stdev	23.8	15.1	15.4			
Average	16.2	11.1	12.0			
2006	7.6	14.3	22.3	(8.6)	3.2	10.3
2005	7.1	5.9	7.1	(9.1)	(5.2)	(4.9)
2004	13.8	8.2	16.5	(2.4)	(2.9)	4.5
2003	45.9	20.9	30.0	29.7	9.8	18.0
2002	(17.5)	(15.3)	(15.5)	(33.7)	(26.4)	(27.5)
2001	(7.8)	(5.0)	(5.6)	(24.0)	(16.1)	(17.6)
2000	(5.6)	3.4	7.0	(21.8)	(7.7)	(5.0)
1999	28.9	15.1	7.4	12.7	4.0	(4.6)
1998	50.2	28.8	15.6	34.0	17.7	3.6
1997	39.3	34.8	35.2	23.1	23.7	23.2

Bell Curve Distribution



Variation of Investment Return

1 Std.
Deviation
(68.3%)

2 Std.
Deviation
(95.45%)

3 Std.
Deviation
(99.73)

Tail Risk

Tail Risk = Extreme Events: Sept. 11th, Black Monday

Risk Control ...asset allocation

- **Diversification**
- **Style Drift**
- **Correlation of returns**
 - **Managers**
 - **Asset class**
- **Exposure**
 - **Individual stock or bond**
 - **Industry**
- **Quality Bond Ratings**

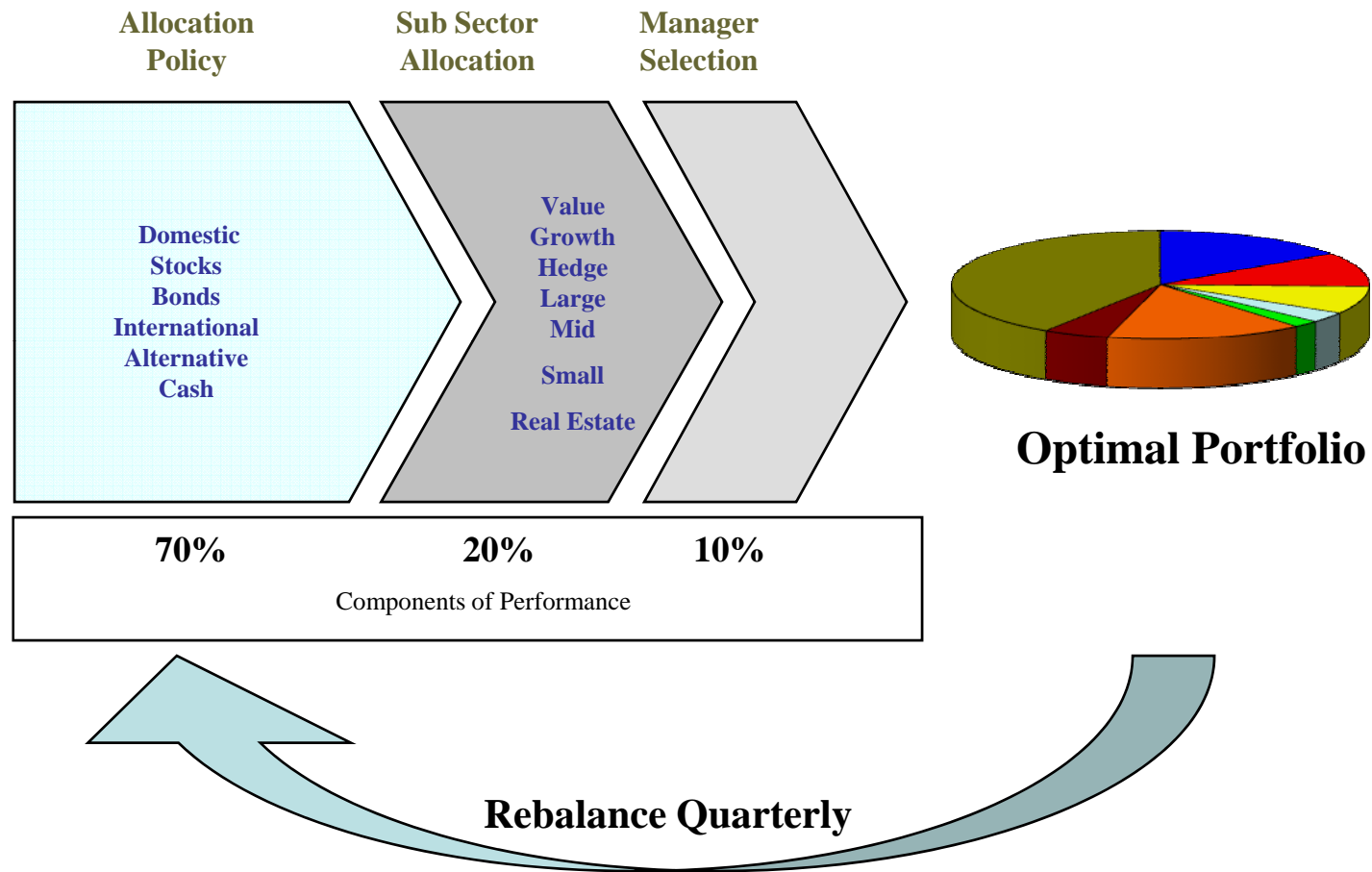
Key... “blend low correlated asset classes and managers”

Correlation...asset allocation

Ten Years Ending 9/2007
(Monthly)

Description	#	1	2	3	4	5	6	7	8	9	10	11	12
Dow Jones Wilshire Large Cap Growth	1	1.00											
Dow Jones Wilshire Large Cap Value	2	0.72	1.00										
Dow Jones Wilshire Micro Cap	3	0.69	0.48	1.00									
Dow Jones Wilshire Mid Cap	4	0.83	0.74	0.86	1.00								
Dow Jones Wilshire REIT	5	0.20	0.41	0.31	0.41	1.00							
Dow Jones Wilshire Small Cap	6	0.80	0.66	0.92	0.97	0.40	1.00						
MSCI EAFE Gross	7	0.78	0.73	0.63	0.78	0.26	0.75	1.00					
Merrill Lynch Global Government Bond Index	8	(0.26)	(0.21)	(0.23)	(0.29)	0.03	(0.27)	(0.27)	1.00				
Lehman Bros Aggregate Bond	9	(0.20)	(0.18)	(0.15)	(0.19)	0.04	(0.18)	(0.21)	0.75	1.00			
Lehman Bros US Treasury Inflation Notes	10	(0.22)	(0.14)	(0.14)	(0.17)	0.12	(0.18)	(0.17)	0.64	0.80	1.00		
CSFB Tremont Hedge Fund Index	11	0.52	0.32	0.70	0.67	0.19	0.68	0.55	(0.19)	(0.05)	(0.08)	1.00	
MSCI Emerging Markets	12	0.69	0.64	0.70	0.76	0.31	0.75	0.77	(0.26)	(0.23)	(0.11)	0.58	1.00

Asset Allocation is 90% of Performance



Asset Class Research (Why Diversify?)

