



Investment Course IV

September, 2009

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Investment Course IV

September, 2009



Topic Seven:

Identifying Superior Active
Portfolio Management

Keith Brown



Acknowledgment:



- ▶ Portions of this presentation have been published as:

The Right Answer to the Wrong Question: Identifying Superior Active Portfolio Management

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Journal of Investment Management 4, 2006, pp. 15-40

The Central Issue:



- ▶ An important line of inquiry in the area of investment management:

Do portfolio managers with consistently superior investment skills actually exist?

- ▶ This question is sometimes characterized as the “*active vs. passive investment*” debate:
 - Passive (i.e., indexed) investors inherently believe that is impossible to consistently “beat” the market over time (or find other managers who can)
 - Active management (i.e., stock selection, market timing) is based on the belief that it is possible to generate superior returns relative to established benchmarks

The Wrong Question vs. The Right Question



- ▶ When judging the quality of active portfolio managers, the important question *is not* whether:
 - The average fund manager beats the benchmark
 - The median manager in a given peer group produces a positive alpha

- ▶ Instead, investors should ask the following question:

Can you select, in advance, those managers who can offer a reasonable opportunity to add value on a risk-adjusted basis?

- Does superior investment performance persist from one period to the next and, if so, how can we identify superior managers?

Defining Superior Active Management



- ▶ Over time, the “value added” by a portfolio manager can be measured by the difference between the portfolio’s *actual return* and the return that the portfolio was *expected* to produce
- ▶ This difference is usually referred to as the portfolio’s **alpha**:

$$\text{Alpha} = (\text{Actual Return}) - (\text{Expected Return})$$

Defining Superior Active Management (cont.)



- ▶ In practice, there are *three ways* commonly used to generate the expected returns necessary to measure the value added from a portfolio investment:
 - **Benchmark Portfolio Return**
 - *Example: S&P 500, Lehman Aggregate Bond*
 - **Peer Group Comparison Return**
 - *Example: Small-cap Value funds, Large Public Pension Funds*
 - **Return-Generating Model**
 - *Example: Single Factor (CAPM), Multi-Factor (Fama-French)*

Defining Superior Active Management (cont.)

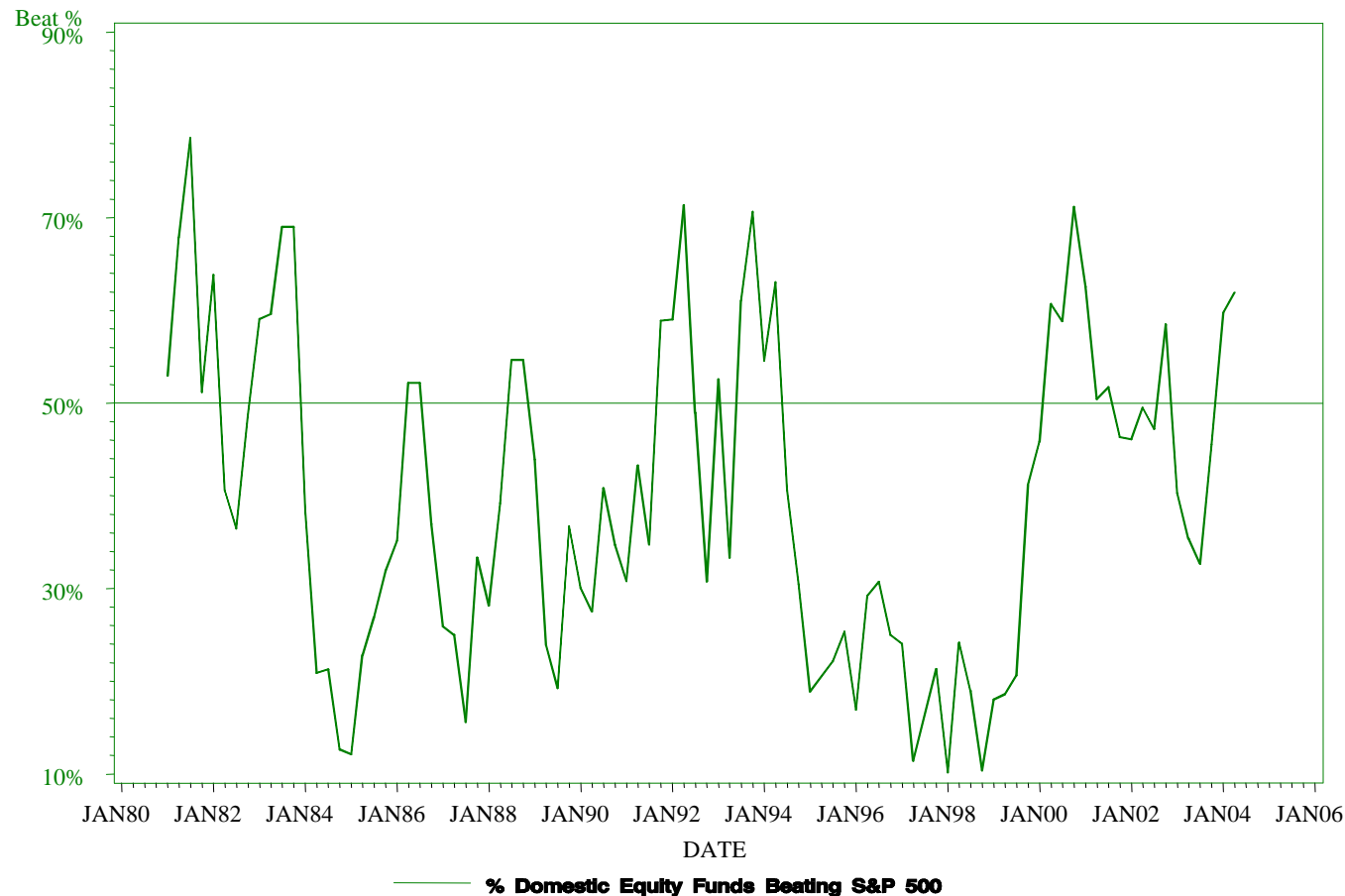


- ▶ Each of the three methods for measuring expected fund returns has *strengths* and *weaknesses* conceptually:
 - *Benchmark Portfolio Return*
 - *Pros*: Easy to identify; Easy to observe
 - *Cons*: Hypothetical return ignoring taxes, transaction costs, etc.; May not be representative of actual investment universe; No explicit risk adjustment
 - *Peer Group Comparison Return*
 - *Pros*: Measures performance relative to manager's actual competition
 - *Cons*: Difficult to identify precise peer group; "Median manager" may ignore large dispersion in peer group universe; Universe size disparities across time and fund categories; Risk exposures may vary widely within peer groups

The Problem with Benchmarks and Peers



Percent of Domestic Equity Funds Beating S&P 500 Rolling 12 Month Returns



Source: Strategic Advisers, Inc. as of 2005

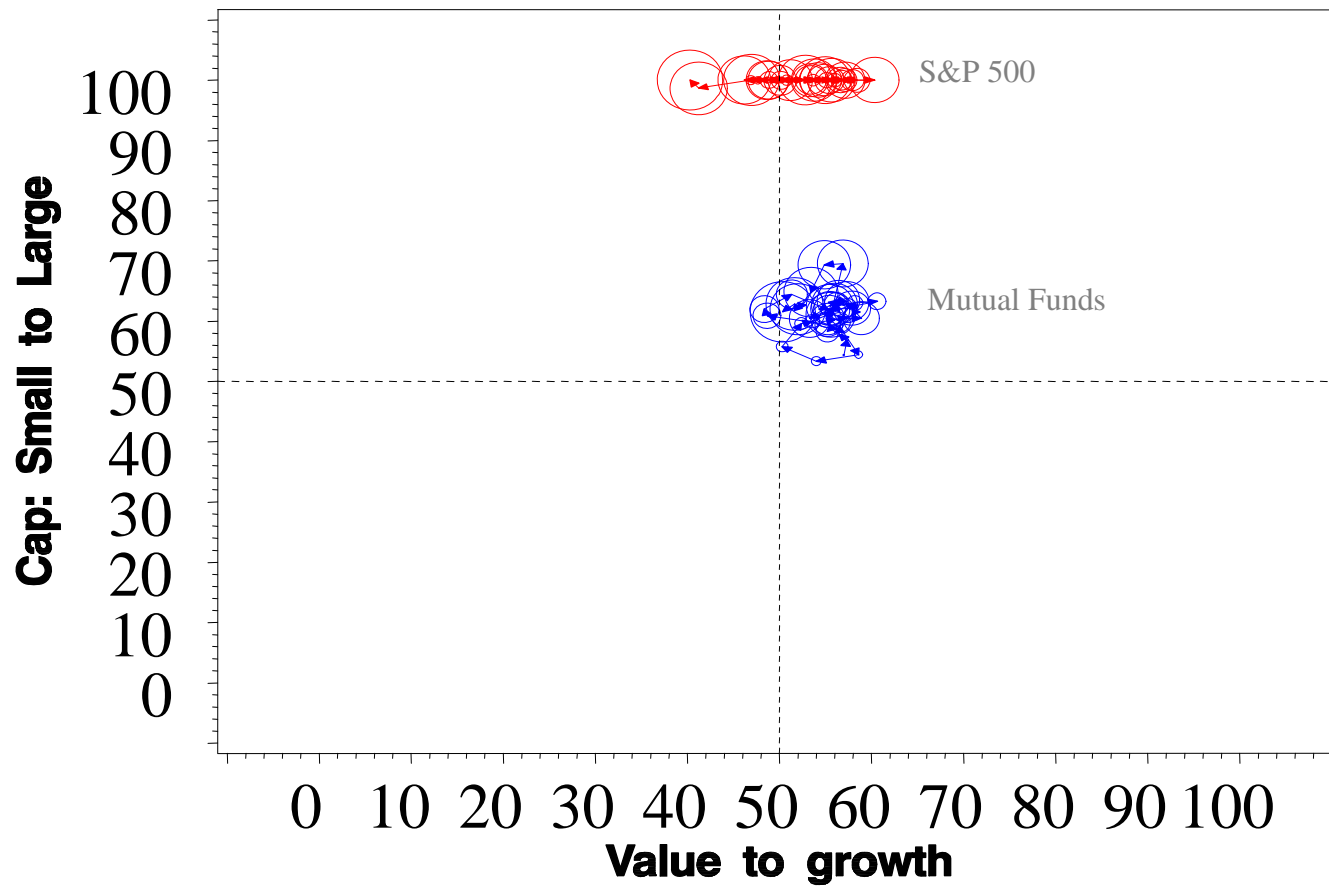
Past performance is no guarantee of future results



The Problem with Benchmarks and Peers (cont.)



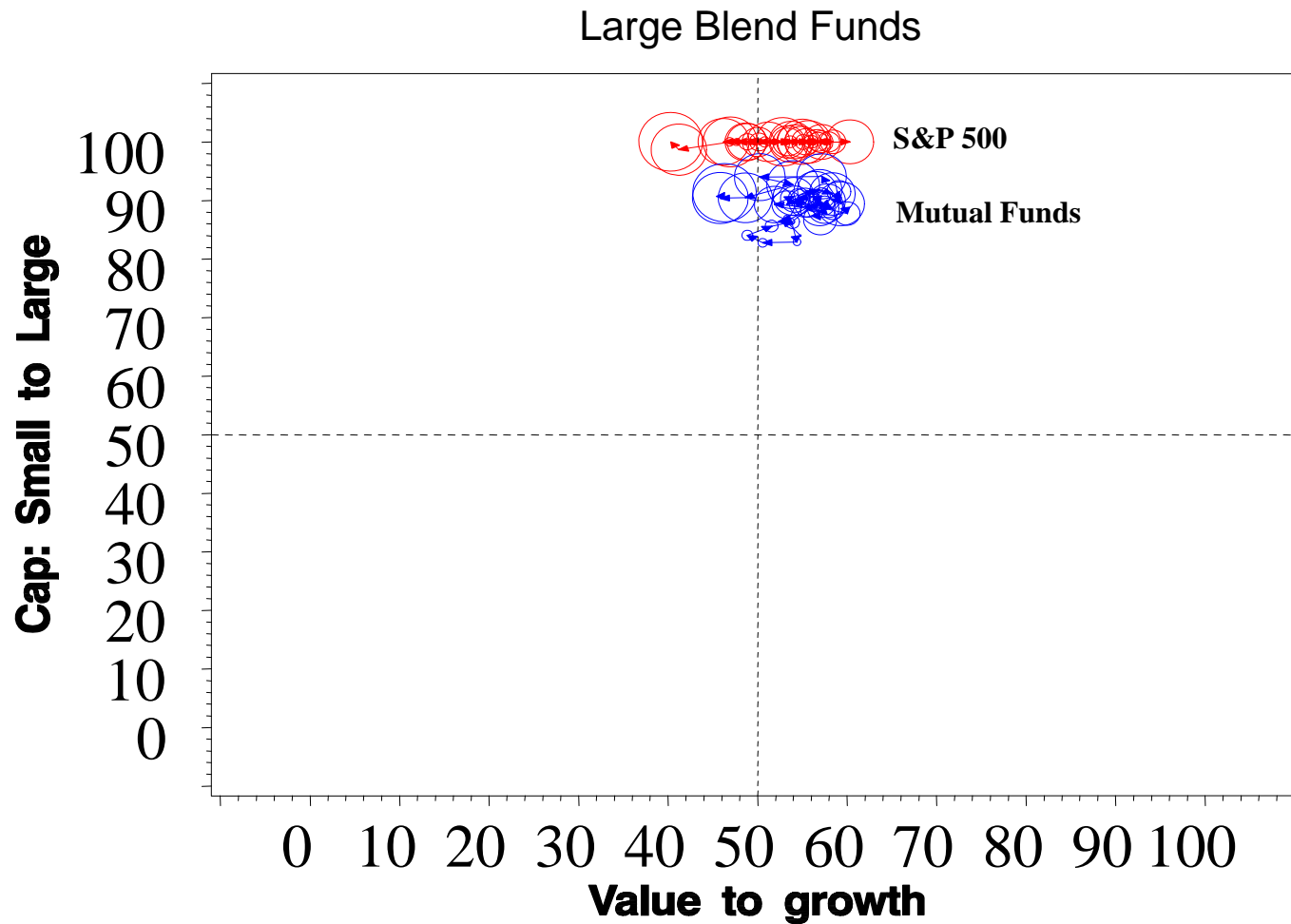
Diversified Equity Funds



Source: Strategic Advisers, Inc.



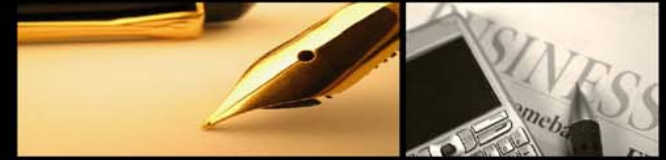
The Problem with Benchmarks and Peers (cont.)



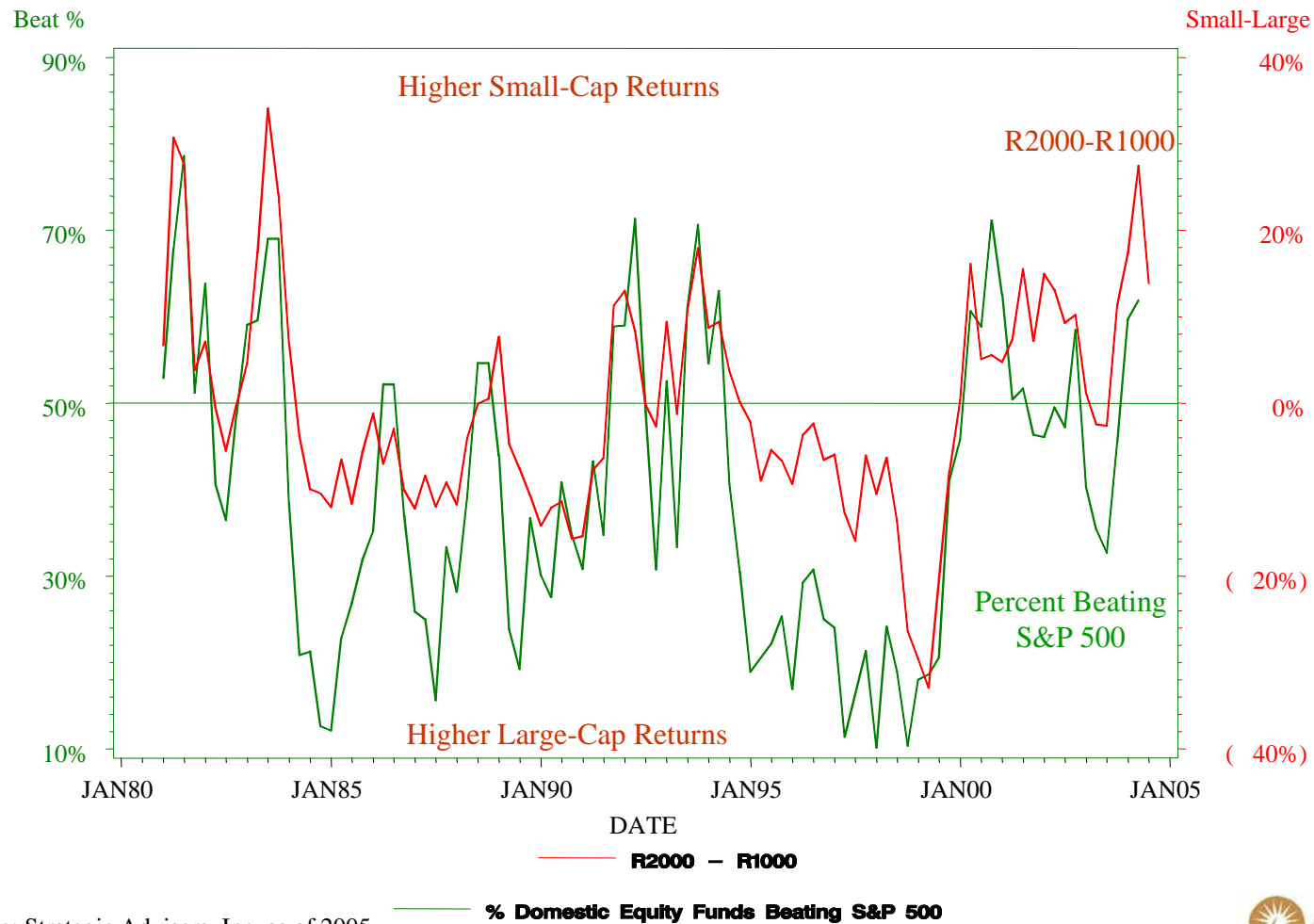
Source: Strategic Advisers, Inc.



The Problem with Benchmarks and Peers (cont.)



Fund Performance versus Style Rotation (Rolling 12 Month Returns)



Source: Strategic Advisers, Inc. as of 2005

Past performance is no guarantee of future results



Defining Superior Active Management (cont.)



► Return-Generating Model

- *Pros:* Calculates expected fund returns based on an explicit estimate of fund risk; Avoids arbitrary investment style classifications
- *Cons:* More difficult to interpret direct investment; Subject to model misspecification and factor measurement problems; Model estimation error

CAPM:

$$E(R_p) = RF + \{b_m[E(R_m) - RF]\}$$

Fama-French:

$$E(R_p) = RF + \{b_m[E(R_m) - RF] + b_{smb}[SMB] + b_{hml}[HML]\}$$

Lessons from Prior Research



- ▶ **Fund performance appears to persist over time**

- *Original View:*

- Managers with superior performance in one period are equally likely to produce superior or inferior performance in the next period

- Jensen (JF, 1968), Sharpe (JB, 1966)

- *Current View:*

- Some evidence does support the notion that investment performance persists from one period to the next

- Grinblatt and Titman (JF, 1992); Elton, Gruber, Blake (JB, 1996)

The evidence is particularly strong that it is poor performance that tends to persist (i.e., “icy” hands vs. “hot” hands)

Hendricks, Patel, Zeckhauser (JF, 1993); Brown and Goetzmann (JF, 1995)

Lessons from Prior Research (cont.)



- ▶ **Security characteristics, return momentum, and fund style appear to influence fund performance**

- *Security Characteristics:*

- After controlling for risk, portfolios containing stocks with different market capitalizations, price-earnings ratios, and price-book ratios produce different returns
Basu (JF, 1977), Banz (JFE, 1981), Fama and French (JF, 1992; JFE, 1993)

- Funds with lower portfolio turnover and expense ratios produce superior returns
Bogle (JPM, 1998)

- *Return Momentum:*

- Funds following return momentum strategies generate short-term performance persistence
Jegadeesh and Titman (JF, 1993); Grinblatt, Titman, and Wermers (AER, 1995)

- When used as a separate risk factor, return momentum “explains” fund performance persistence
Carhart (JF, 1997)

Lessons from Prior Research (cont.)



- ▶ **Security characteristics, return momentum, and fund style appear to influence fund performance (cont.)**

- *Fund Style Definitions:*

- After controlling for risk, funds with different objectives and style mandates produce different returns

- McDonald (JFQA, 1974), Malkiel (JF, 1995)

- Value funds generally outperform growth funds on a risk-adjusted basis
Capual, Rawley, and Sharpe (FAJ, 1993), Chan and Lakonishok (FAJ, 2004)

- *Style Investing:*

- Fund managers make decisions as if they participate in style-oriented return performance “tournaments”

- Brown, Harlow, and Starks (JF, 1996)

- The consistency with which a fund manager executes the portfolio’s investment style mandate affects fund performance, in both up and down markets

- Brown and Harlow (Working Paper, 2005)

Lessons from Prior Research (cont.)



▶ Active fund managers appear to possess genuine investment skills

– *Stock-Picking Skills:*

Some fund managers have security selection abilities that add value to investors, even after accounting for fund expenses

Chen, Jegadeesh, and Wermers (JFQA, 2000); Baker, Litov, Wachter, and Wurgler (Working Paper, 2004)

A sizeable minority of managers pick stocks well enough to generate superior alphas that persist over time

Koskowski, Timmerman, White, and Wermers (Working Paper, 2004)

– *Investment Discipline:*

Fund managers who control tracking error generate superior performance relative to traditional active managers and passive portfolios

Alford, Jones, and Winkelmann (JPM, 2003)

– *Manager Characteristics:*

The educational backgrounds of managers systematically influence the risk-adjusted returns of the funds they manage

Chevalier and Ellison (JF, 1999)

Data and Methodology for Performance Analysis



- ▶ **CRSP (Center for Research in Security Prices) US Mutual Fund Database**

- Survivor-Bias Free database of monthly returns for mutual funds for the period 1962-2003

- ▶ **Screens**

Diversified domestic equity funds only

Eliminate index funds

Require 30 prior months of returns to be included in the analysis on any given date

Assets greater than \$1 million

Period 1979 – 2003 in order to analyze performance versus an index fund and have sufficient number of mutual funds

- ▶ **Return-generating model used to calculate superior performance:**

Fama-French

$$E(R_p) = RF + \{b_m[E(R_m) - RF] + b_{smb}[SMB] + b_{hml}[HML]\}$$

- ▶ **Style classification**

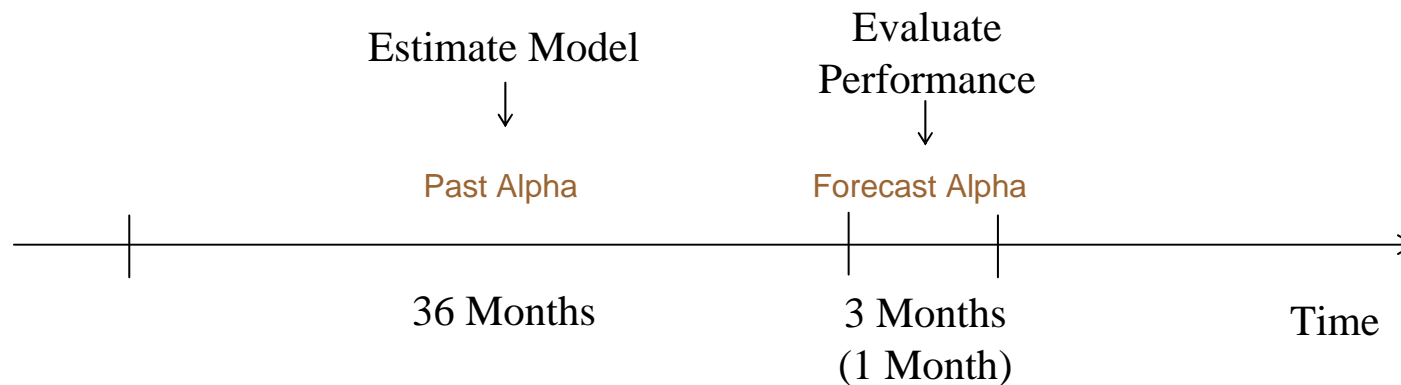
- Map funds to Morningstar-type style categories based on Fama-French SMB and HML factor exposures (LV, LB, LG, MV, MB, MG, SV, SB, SG)

Funds Mapped By Style Group



	Mutual Fund Style Category:									
Year	LV	LB	LG	MV	MB	MG	SV	SB	SG	Total
1979	9	23	70	0	3	21	0	3	27	156
1980	7	26	59	2	7	36	2	3	30	172
1981	5	20	32	1	6	39	0	3	25	131
1982	13	23	38	1	5	43	0	1	34	158
1983	14	27	60	1	7	31	0	2	42	184
1984	8	26	55	1	1	37	0	4	35	167
1985	7	23	74	3	1	37	7	1	30	183
1986	5	18	95	3	5	41	12	0	18	197
1987	6	22	80	3	2	51	14	5	16	199
1988	9	29	89	3	8	50	10	7	31	236
1989	12	30	92	2	3	54	0	11	43	247
1990	19	42	92	1	3	46	1	3	53	260
1991	25	63	97	3	3	44	0	2	48	285
1992	32	163	176	7	10	77	3	11	90	569
1993	38	202	166	8	5	92	2	19	103	635
1994	49	269	198	4	16	148	3	24	162	873
1995	57	210	224	20	67	234	24	97	264	1197
1996	86	405	421	20	45	279	47	83	262	1648
1997	160	535	478	52	111	357	83	106	324	2206
1998	355	636	601	160	130	256	133	172	356	2799
1999	469	456	827	157	107	641	261	119	412	3449
2000	771	604	992	316	82	587	215	142	459	4168
2001	812	680	1181	302	129	699	155	110	457	4525
2002	907	962	840	345	193	835	99	194	647	5022
2003	836	1250	1078	226	375	764	242	263	580	5614

Methodology (cont.)



- **Use past 36 months of data to estimate model parameters**
 - Standardized data within each peer group on a given date to allow for time-series and cross-sectional pooling [Brown, Harlow, and Starks (JF, 1996)]
- **Evaluate performance**
 - Use estimated model parameters to calculate out-of-sample (i.e., forecasted) alphas based on factor returns from the evaluation period
- **Roll the process forward one quarter (one month) and estimate all parameters again, etc.**

The Distribution of Past Alphas (PALPHA): 1979-2003



Fund Style	# of Obs.	Monthly Mean PALPHA Value at Percentile (%):					% Pos. Alphas
		5 th	25 th	Median	75 th	95 th	
Overall	19,765	-1.55	-0.55	-0.17	0.12	0.79	33.97
LV	2,405	-2.07	-0.56	-0.21	0.07	0.68	30.23
LB	3,400	-1.43	-0.54	-0.22	-0.01	0.38	24.74
LG	3,388	-1.06	-0.33	-0.06	0.17	0.81	42.65
MV	1,423	-2.55	-0.68	-0.23	0.11	0.69	32.75
MB	1,712	-1.86	-0.78	-0.32	0.08	0.65	29.21
MG	3,212	-1.47	-0.62	-0.20	0.20	1.03	35.40
SV	933	-2.02	-0.65	-0.26	0.00	0.56	25.30
SB	1,239	-1.42	-0.60	-0.20	0.11	0.76	31.80
SG	2,053	-1.36	-0.45	-0.01	0.39	1.22	48.86
S&P 500 Index Fund				0.04			

The Distribution of Forecasted Alphas (FALPHA): 1979-2003



		Quarterly FALPHA Value at Percentile (%):					
Fund Style	# of Obs.	5th	25th	Median	75th	95th	% Pos. Alphas
Overall	126,613	-8.85	-3.12	-0.49	2.06	8.55	44.50
LV	17,195	-7.53	-2.98	-0.66	1.82	6.80	42.28
LB	23,566	-7.07	-2.43	-0.48	1.28	6.10	42.37
LG	30,642	-7.95	-2.66	-0.25	1.89	7.99	46.59
MV	6,214	-10.82	-3.13	-0.09	2.93	9.41	49.10
MB	4,251	-8.21	-3.23	-0.24	2.88	9.06	47.49
MG	19,172	-9.71	-3.79	-0.56	2.67	10.32	45.34
SV	4,963	-12.37	-4.39	-1.30	1.99	10.81	38.32
SB	4,475	-9.95	-3.96	-1.12	1.89	8.47	40.20
SG	16,135	-11.07	-4.03	-0.59	3.10	10.89	45.53
S&P 500 Index Fund	295	-1.41	-0.37	0.08	0.51	1.22	54.58

Predicting Future Fund Performance



- ▶ To see if future fund performance is correlated with past fund performance (and other factors), we estimated several versions of the following functional relationship:

$$FALPHA = f(PALPHA, \text{Expense Ratio, AUM,} \\ \text{Portfolio Turnover, Diversification} \\ \text{Volatility})$$

Predicting Future Fund Performance: Results



Three-Month FALPHA as Dependent Variable (Cross-Sectional Regression):

	PALPHA	EXPR	Variable: ASSET	TURN	DIVERS	VOL	Mean Adj. R ²	# of Obs.
Model 1	0.058 (0.000)						0.036	99
Model 2		-0.021 (0.065)					0.009	99
Model 3	0.057 (0.000)	-0.011 (0.269)					0.043	99
Model 4	0.061 (0.000)	-0.019 (0.063)	0.009 (0.190)	0.022 (0.072)	-0.023 (0.333)	-0.022 (0.306)	0.130	99

Sign of Three-Month FALPHA as Dependent Variable (Logit Regression):

	Intercept	PALPHA	EXPR	Variable: ASSET	TURN	DIVERS	VOL	Chi- Square	# of Obs.
Model 1	-0.227 (0.000)	0.075 (0.000)						109.49 (0.000)	123,315
Model 2	-0.227 (0.000)		-0.026 (0.000)					19.61 (0.000)	123,315
Model 3	-0.227 (0.000)	0.072 (0.000)	-0.015 (0.010)					116.08 (0.000)	123,315
Model 4	-0.228 (0.000)	0.093 (0.000)	-0.033 (0.000)	0.023 (0.000)	0.022 (0.000)	-0.117 (0.000)	-0.022 (0.000)	426.74 (0.000)	123,315

Probability of Future Positive Quarterly Alpha:



Median Manager Controls for Turnover, Assets, Diversify, and Volatility

Std. Dev. Group	EXPR:					(High – Low)
	-2 (Low)	-1	0	+1	+2 (High)	
-2 (Low)	0.4143	0.4062	0.3982	0.3903	0.3824	(0.0319)
-1	0.4369	0.4288	0.4206	0.4125	0.4045	(0.0324)
PALPHA: 0	0.4599	0.4516	0.4434	0.4352	0.4270	(0.0329)
+1	0.4830	0.4746	0.4664	0.4581	0.4498	(0.0331)
+2 (High)	0.5061	0.4978	0.4895	0.4812	0.4729	(0.0333)
(High – Low)	0.0918	0.0916	0.0913	0.0909	0.0905	

Probability of Future Positive Quarterly Alpha:



“Best” Manager Controls for Turnover, Assets, Diversify, and Volatility

Std. Dev. Group	EXPR:					(High – Low)
	-2 (Low)	-1	0	+1	+2 (High)	
-2 (Low)	0.5051	0.4968	0.4884	0.4801	0.4718	(0.0333)
-1	0.5282	0.5199	0.5116	0.5033	0.4950	(0.0333)
PALPHA: 0	0.5512	0.5430	0.5347	0.5264	0.5181	(0.0331)
+1	0.5741	0.5659	0.5577	0.5495	0.5412	(0.0328)
+2 (High)	0.5965	0.5885	0.5804	0.5723	0.5641	(0.0324)
(High – Low)	0.0915	0.0918	0.0920	0.0922	0.0923	

Probability of Identifying a Superior Fund Manager:



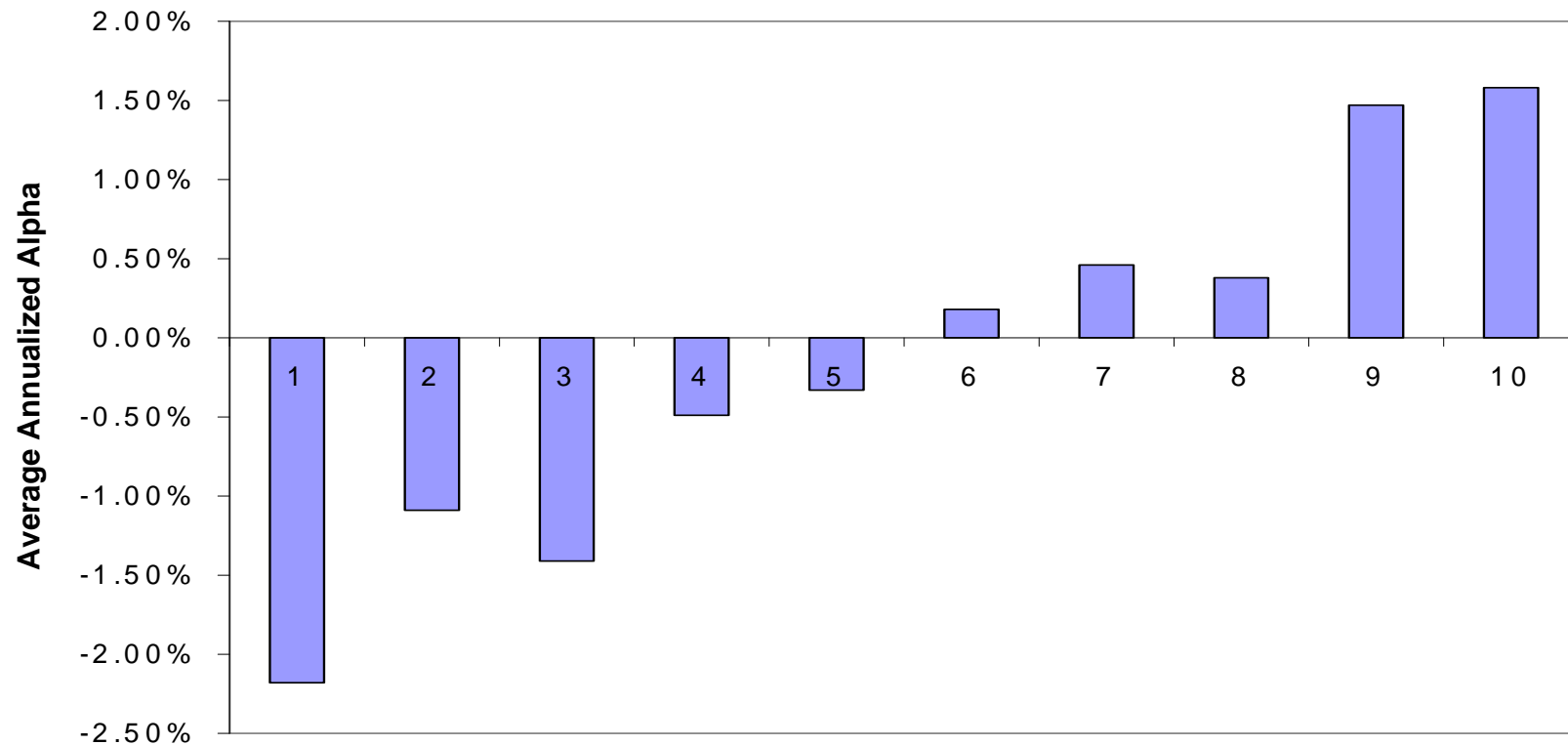
Alpha vs. Peer Ranking

	Probability			
	Positive Alpha	Above Median Peer	Bottom Peer Quartile	Top Peer Quartile
No Information	44.3%	50.0%	24.4%	24.6%
Alpha	49.0%	54.2%	27.4%	27.7%
Expense Ratio	46.0%	52.8%	27.1%	24.8%
Alpha, Expense Ratio	50.6%	58.8%	28.8%	28.3%
Alpha, Expense Ratio, Risk, Turnover, Assets	60.0%	62.9%	34.2%	48.7%
Overall Incremental Probability	15.7%	12.9%	9.8%	24.2%

Economic Consequence of Superior Manager Selection



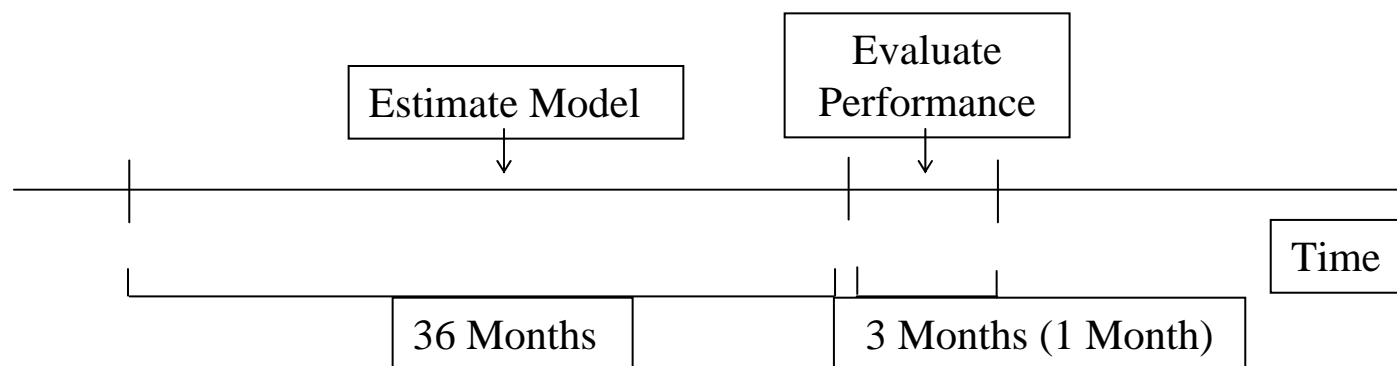
Future Alpha Performance of Portfolios Formed on the Basis of Past Alpha Performance



Economic Significance



Portfolio Methodology



- Create portfolio strategies based on the high and low quartiles using prior alpha and expense ratio as rank variables
- Evaluate the asset-weighted performance of the portfolio strategies over the next quarter
- Rebalance

Economic Significance (cont.)



Portfolio Strategies

Asset Weighted - Quarterly Rebalance

Formation Variables Separated by Upper and Lower Quartile Values

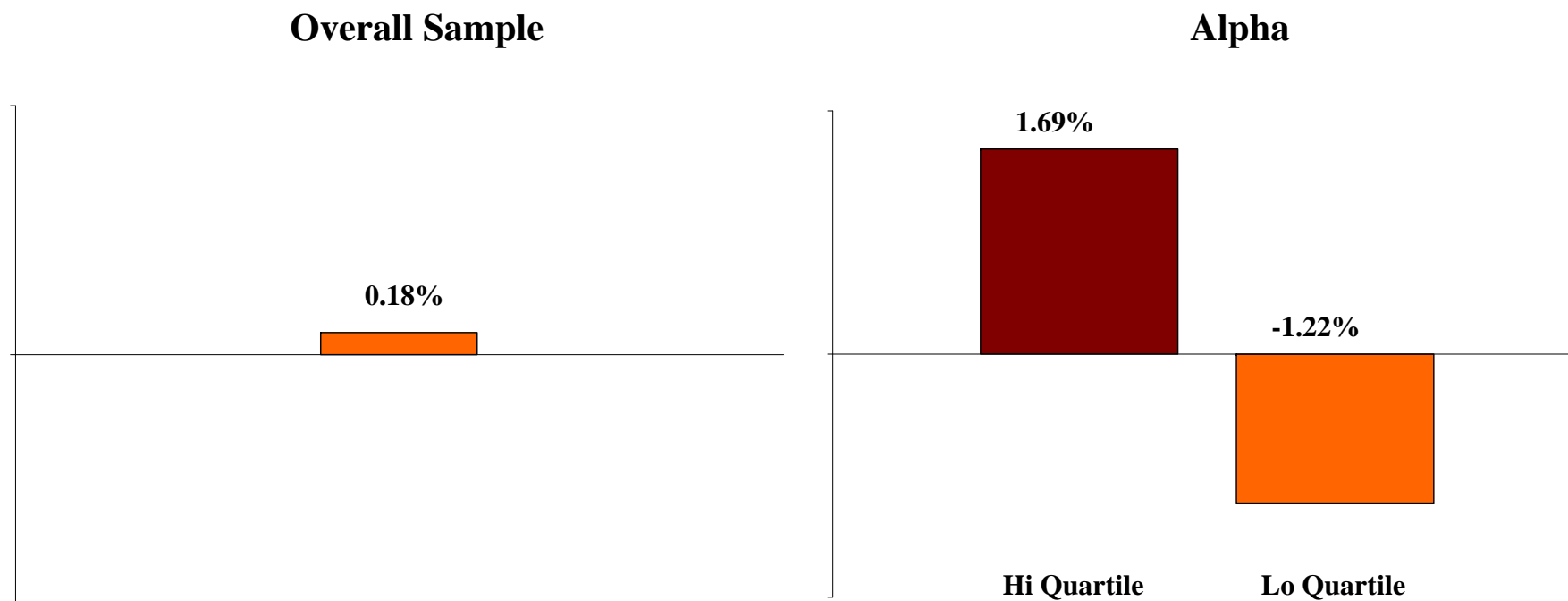
1979-2003

Portfolio Formation Variables					
Expense	Alpha	Cumulative Value of \$1 Invested	Average Alpha (%)	Alpha Volatility (%)	Return Differential (bp)
Overall Sample		1.046	0.181	2.153	
Lo		1.009	0.037	2.142	2
Hi		1.005	0.018	4.025	
	Hi	1.515	1.691	3.371	291
	Lo	0.738	(1.221)	3.469	
Lo	Hi	1.446	1.502	3.596	309
Hi	Lo	0.673	(1.585)	4.712	
S&P 500 Index Fund		1.022	0.088	1.700	

Economic Consequence of Superior Manager Selection (cont.)



Asset Weighted - Quarterly Rebalance
Formation Variables Separated by Upper and Lower Quartile Values
1979-2003



Economic Significance (cont.)



Portfolio Strategies

Asset Weighted - Quarterly Rebalance

Formation Variables Separated by Upper and Lower Quartile Values

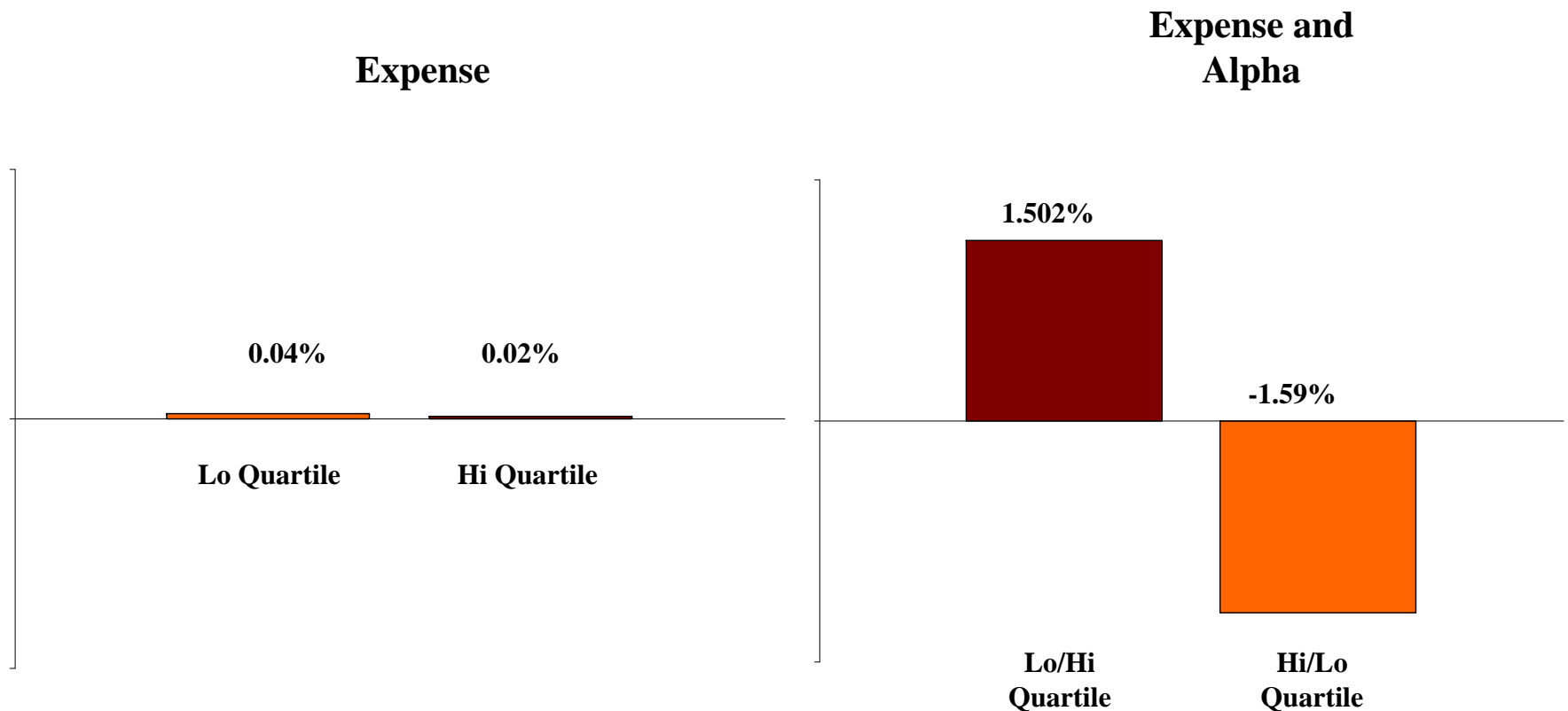
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Economic Consequence of Superior Manager Selection(cont.)



Asset Weighted - Quarterly Rebalance
Formation Variables Separated by Upper and Lower Quartile Values
1979-2003



Economic Significance



Portfolio Strategies

Asset Weighted - Quarterly Rebalance

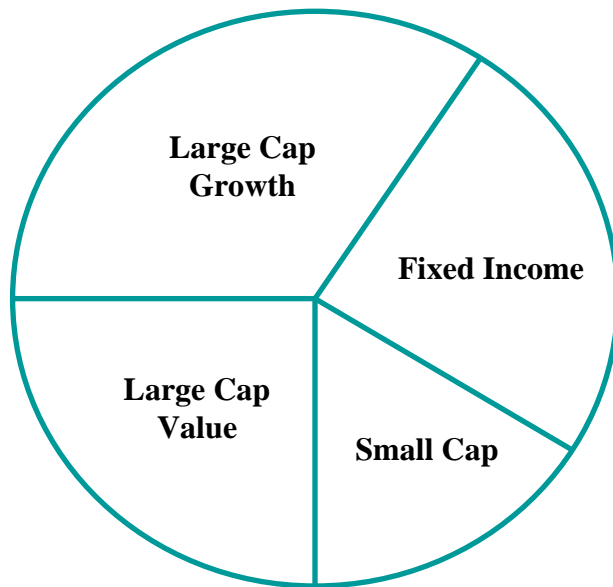
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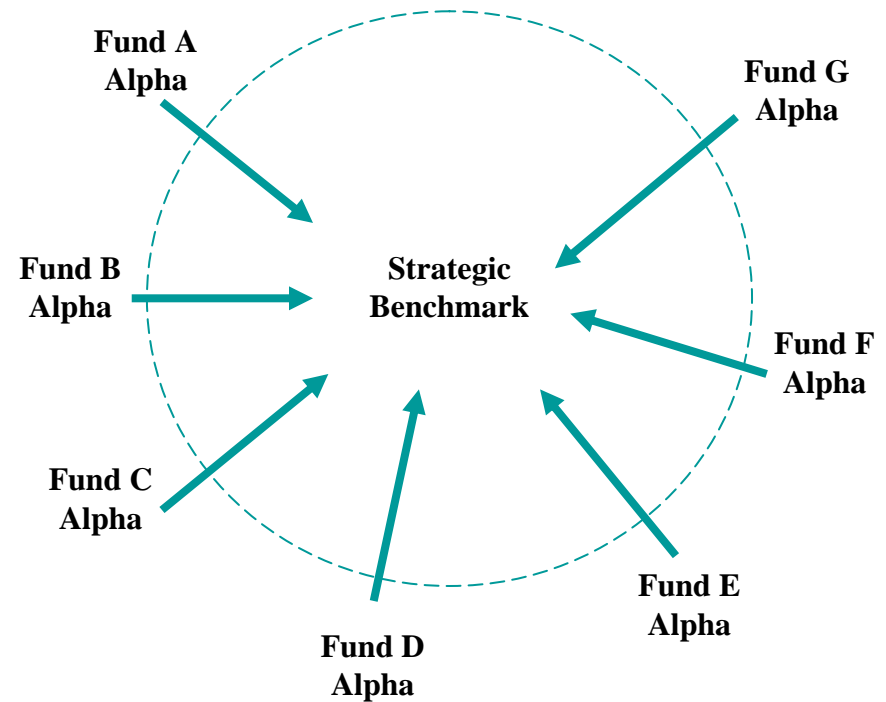
Example of Investment Performance



Past
Best-of-Breed Model



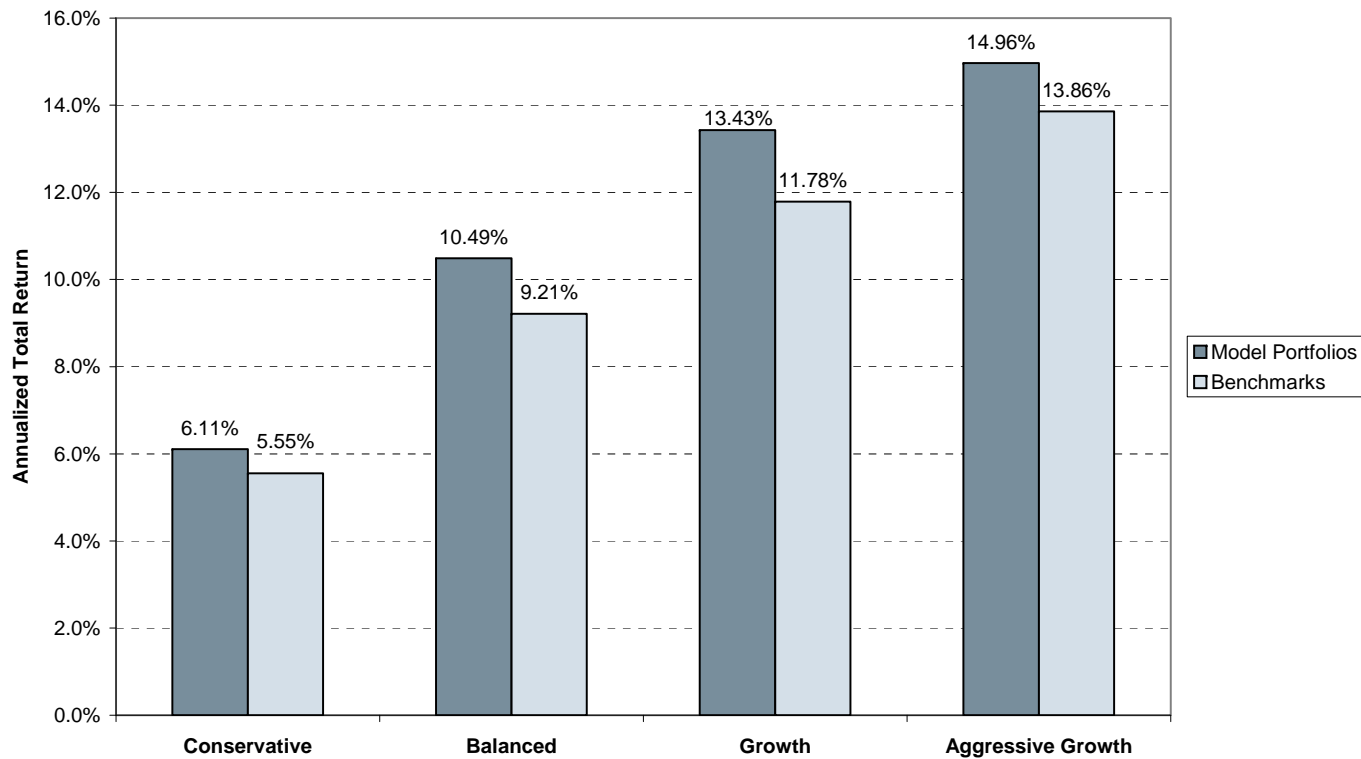
Future
Alpha/Risk Management Approach



Example of Investment Performance (cont.)



Retirement Plan Manager® FMR Corp. Profit Sharing Model Portfolio Returns vs. Benchmark *Since Inception 10-01-03 through 3-30-2007*



Returns shown are for the FMR Corp. Profit Sharing plan Retirement Plan Manager model portfolios since the plan's service inception 10-01-2003 through 3-30-2007. Returns are net of all underlying investment expenses but do not include any Retirement Plan Manager advisory fees as the FMR Corp. PS plan participants do not pay an advisory fee.



For Investment Professional Use Only



Conclusions



- ▶ **Both passive and active management can play a role in an investor's portfolio**
- ▶ **Strong evidence for both positive and negative performance persistence (i.e., alpha persistence)**
 - Prior alpha is the most significant variable for forecasting future alpha
 - Expense ratio, risk measures, turnover and assets are also useful in forecasting future alpha
- ▶ **The existence of performance persistence provides a reasonable opportunity to construct portfolios that add value on a risk-adjusted basis**
 - The investor who selects managers in a random manner will probably find indexing to be a better alternative