

**“Performance Measurement:
What Measures Up
And
What Doesn’t”**

**The NMS Fall Investment Management Forum
for Endowments & Foundations**

September 19, 2000

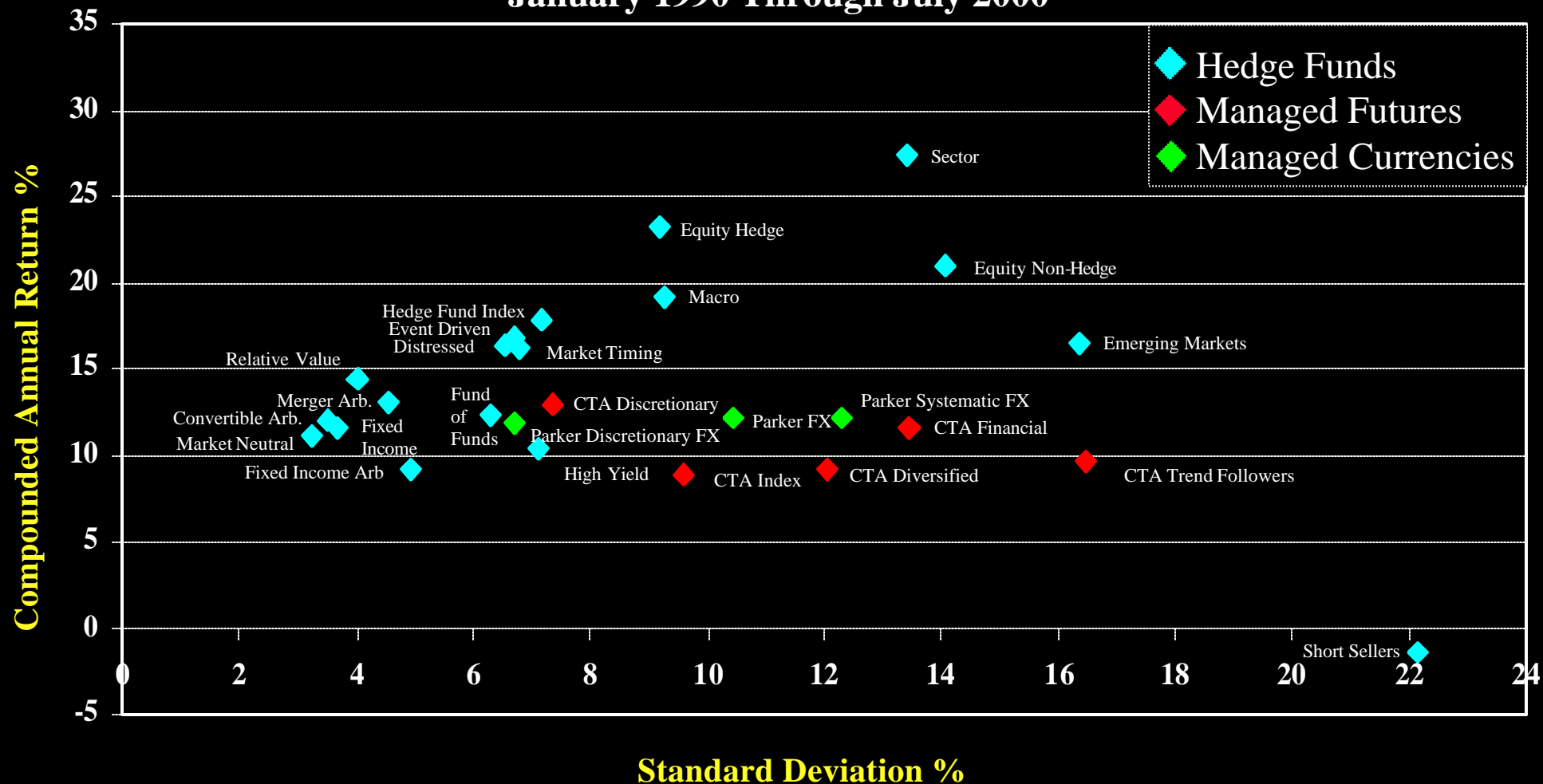
**Hotel Intercontinental
Chicago**

**Why Should We Care About
Performance Measurement?**

**Should We Be Targeting Return,
Standard Deviation, Correlation,
Sharpe Ratio or Maximum Drawdown?**

Risk Versus Return

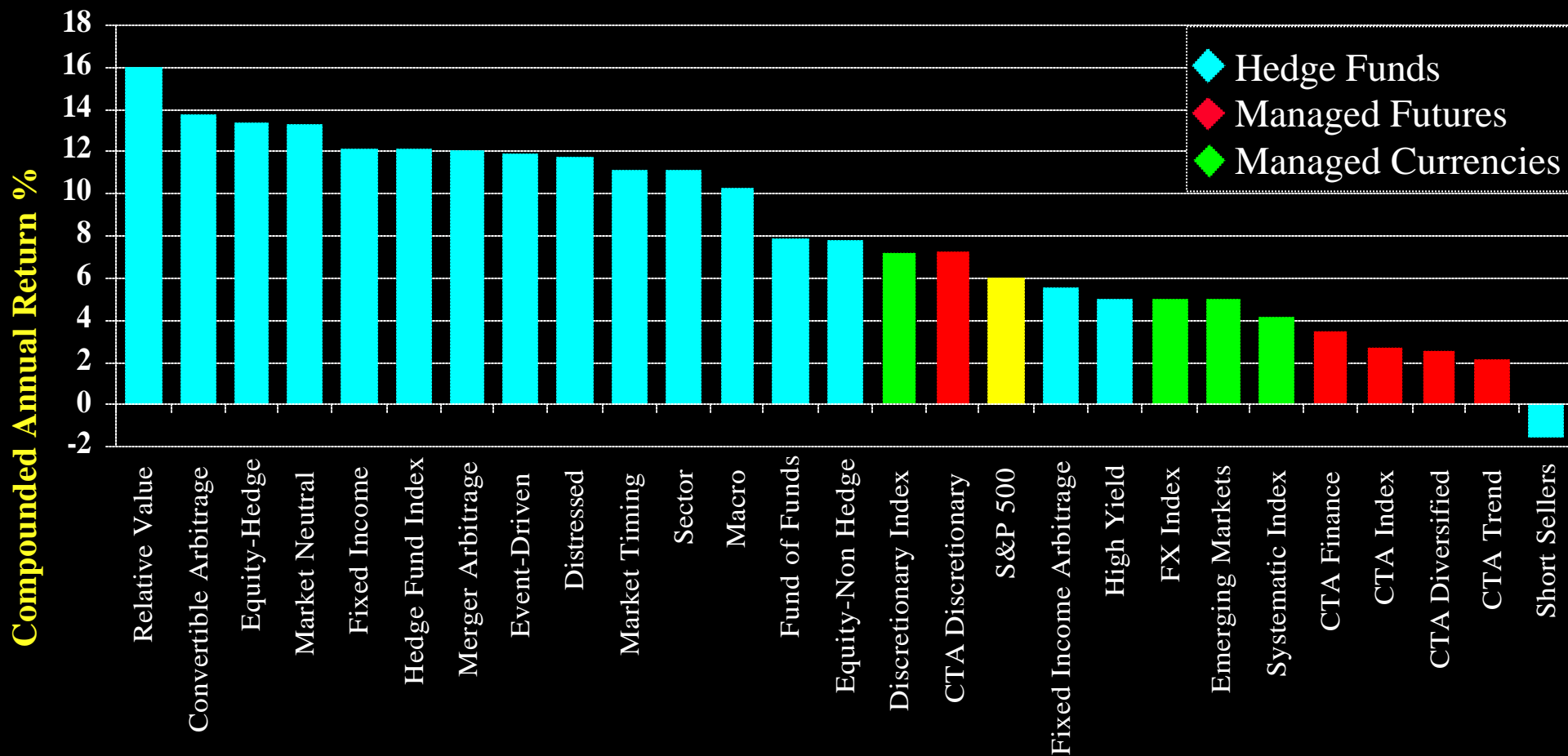
Alternative Investment Strategy Universe Reported Performance Comparison January 1990 Through July 2000



Source: Hedge Fund Research Inc., Managed Account Reports, Inc., Parker Global Strategies LLC.

Risk-Adjusted Performance Comparison*

Alternative Investment Strategy Universe
January 1990 Through July 2000

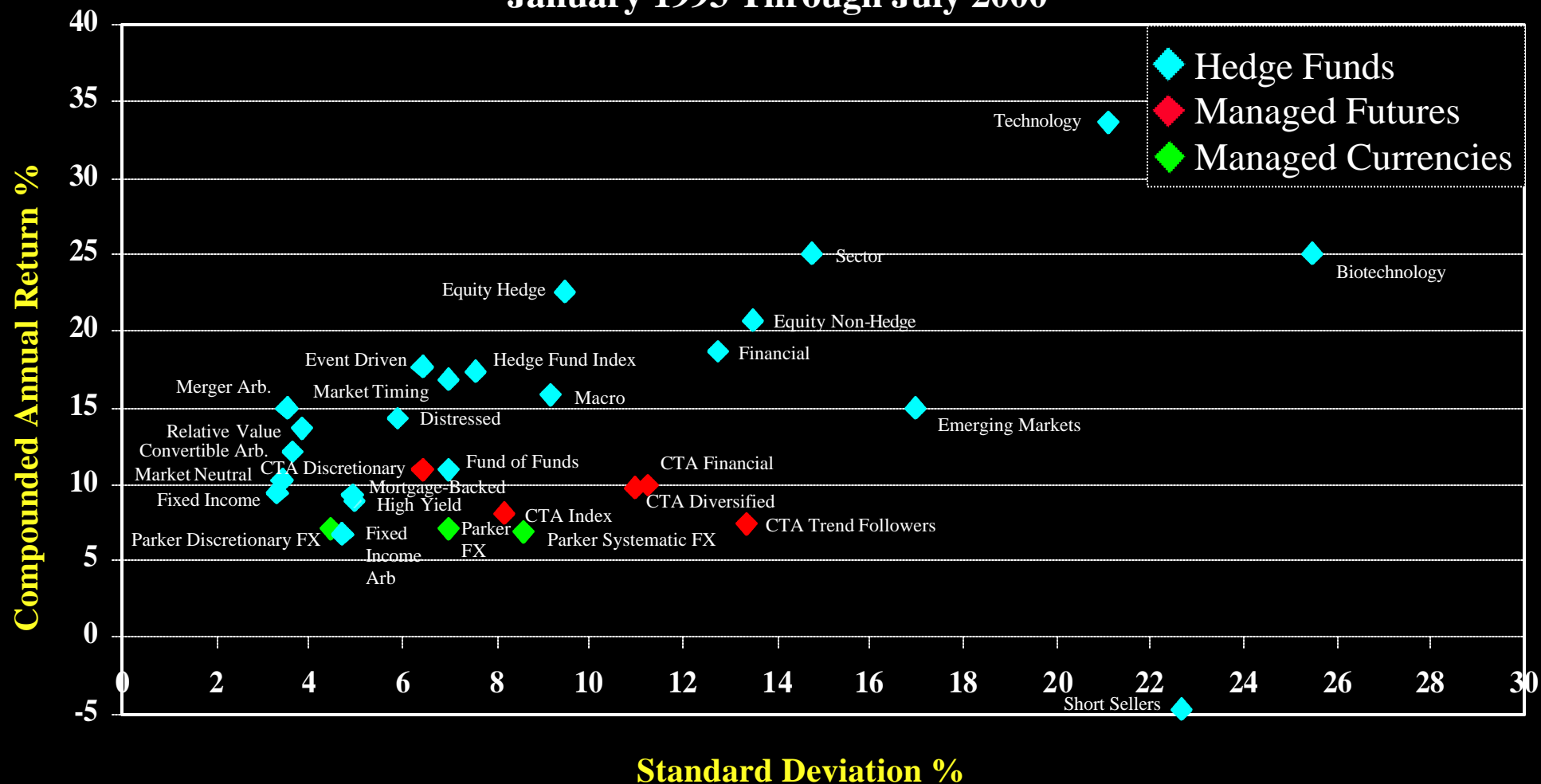


* Based on reported performance, excluding interest and scaled to a 7.15% volatility.

Source: Hedge Fund Research Inc., Managed Account Reports, Inc., Parker Global Strategies LLC.

Risk Versus Return

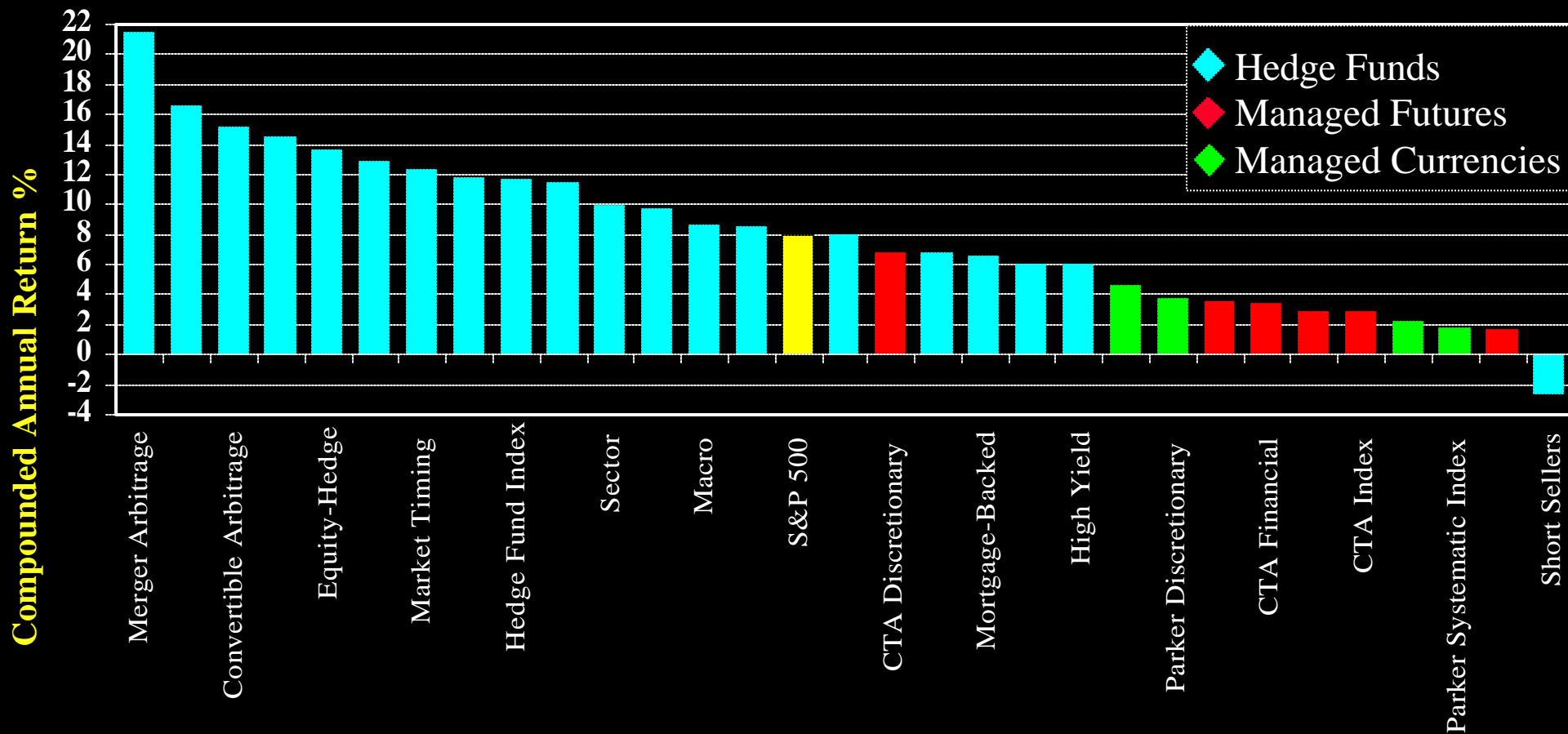
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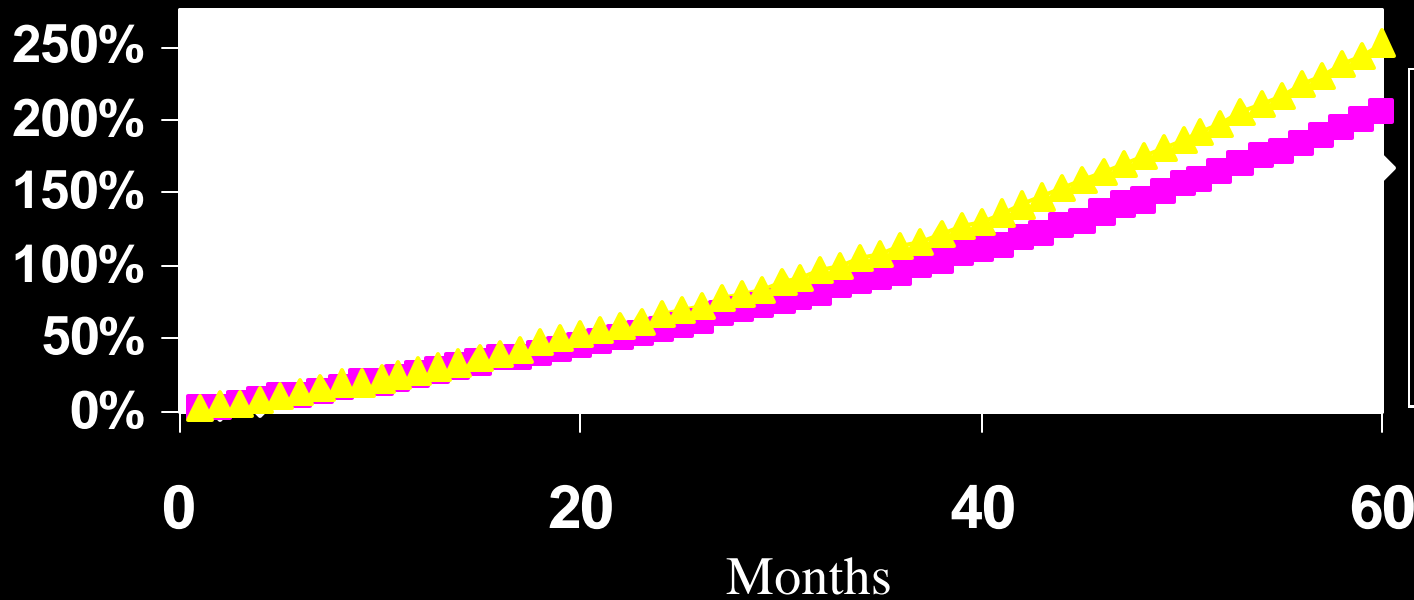
* Based on reported performance, excluding interest and scaled to a 7.55% volatility.

Source: Hedge Fund Research Inc., Managed Account Reports, Inc., Parker Global Strategies LLC.

**“Past Performance Is Not
Indicative of Future Results”**

5 Year Expected Return Range Technology

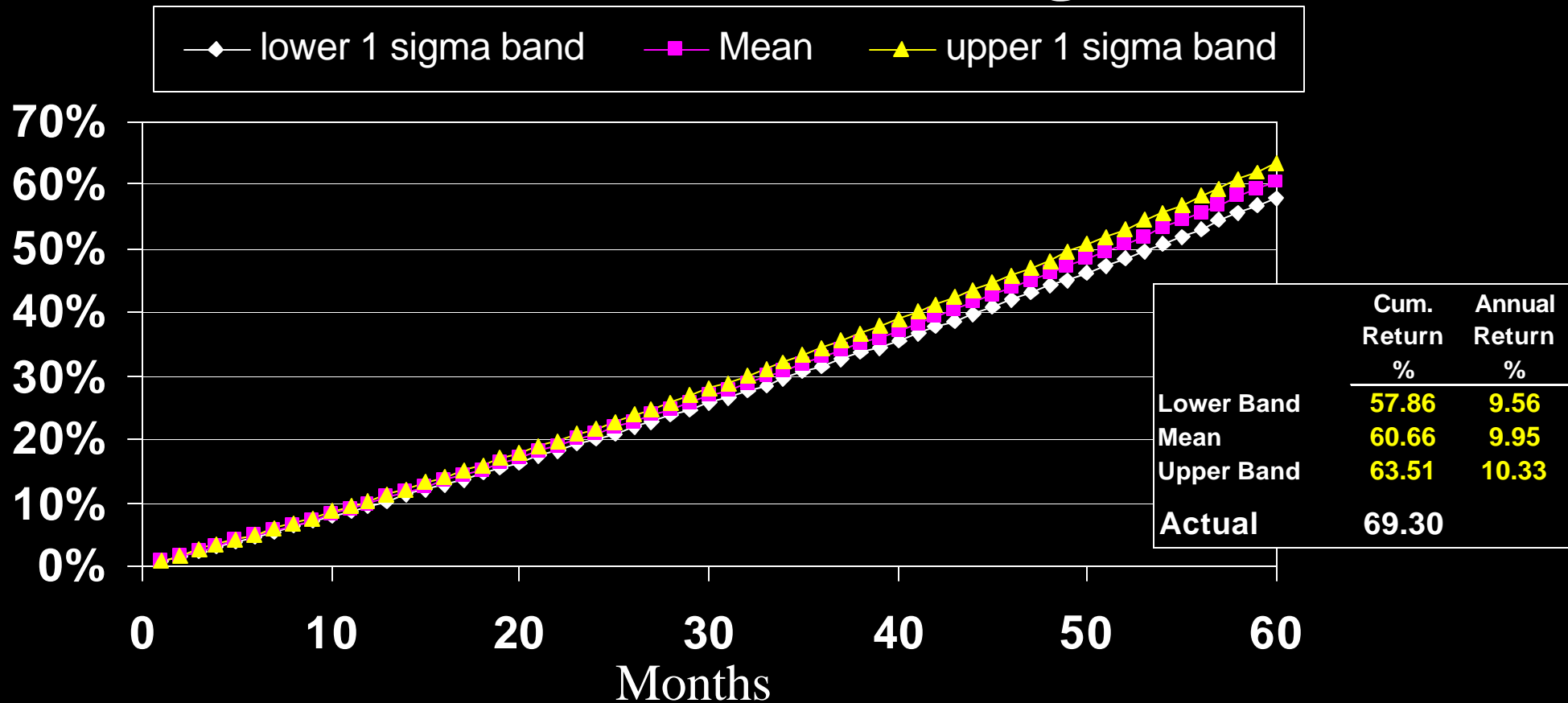
—◆— lower 1 sigma band —■— Mean —▲— upper 1 sigma band



	Cum. Return %	Annual Return %
Lower Band	165.74	21.59
Mean	206.33	25.09
Upper Band	253.00	28.69
Actual	241	

Estimate 1-91-12-95 Actual 1/96 -8/00

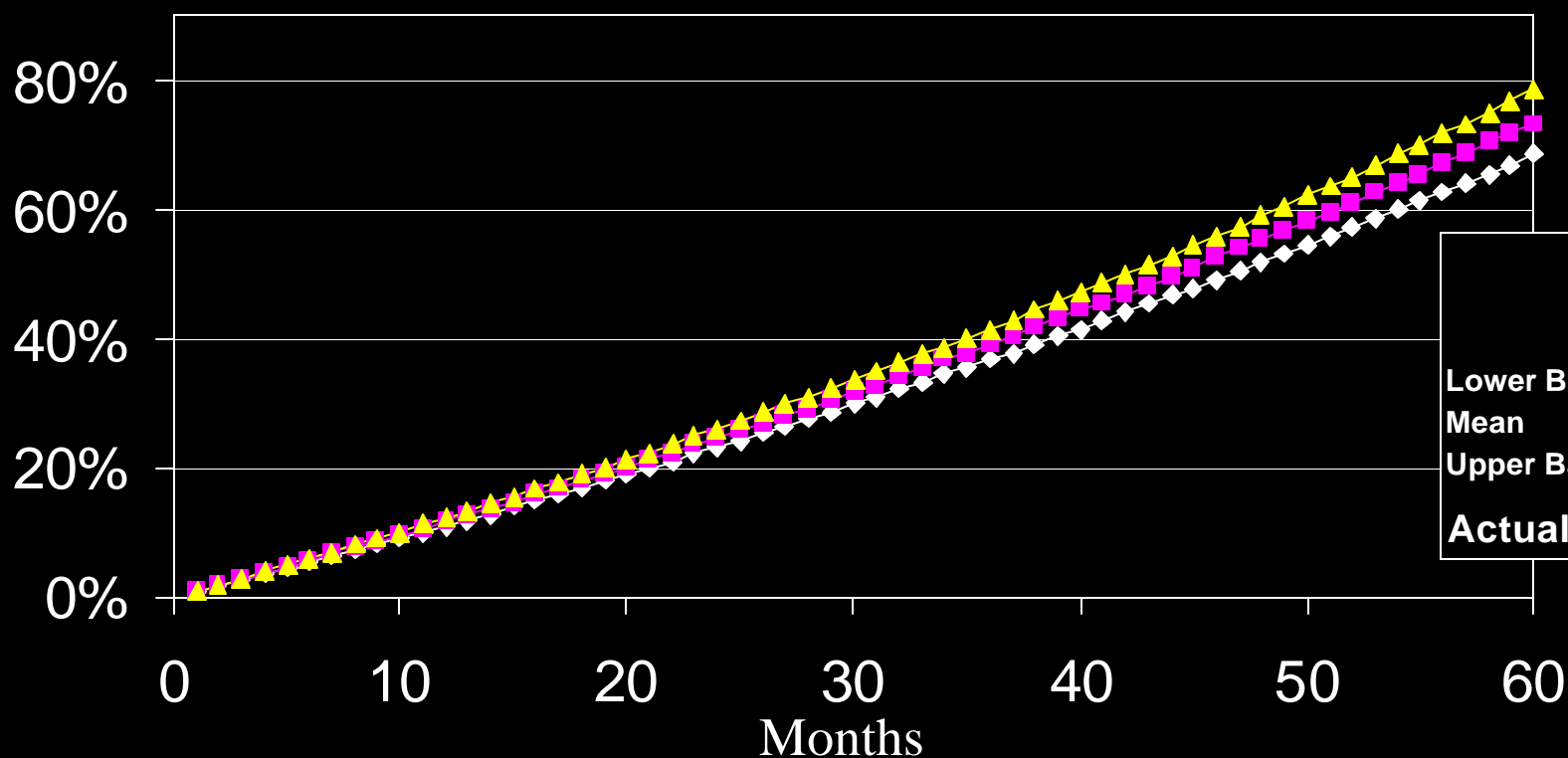
5 Year Expected Return Range Convertible Arbitrage



Estimate 1/90 -12/94 Actual 1/95-12/99

5 Year Expected Return Range Merger Arbitrage

—◆— lower 1 sigma band —■— Mean —▲— upper 1 sigma band

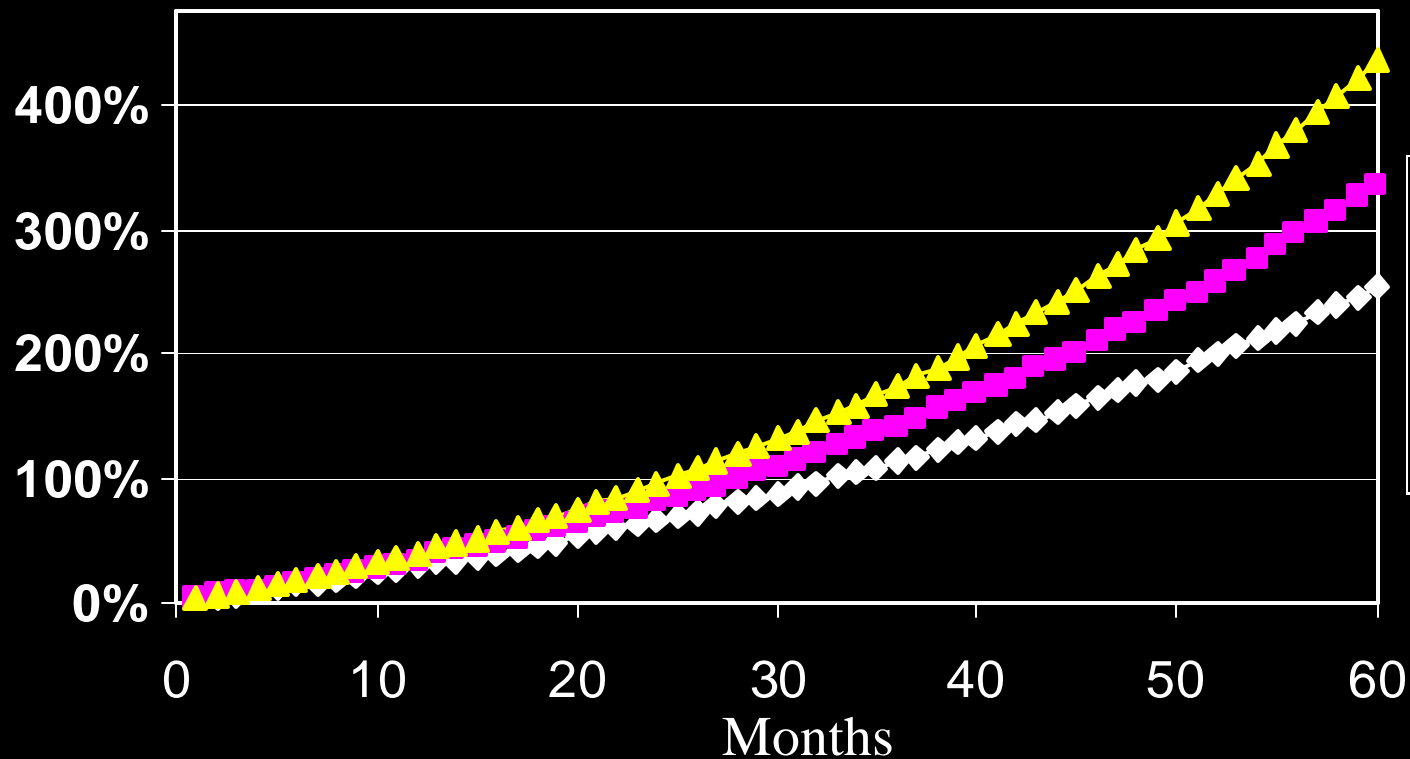


	Cum. Return %	Annual Return %
Lower Band	68.48	11.06
Mean	73.41	11.64
Upper Band	78.48	12.28
Actual	72.50	

Estimate 1/90 -12/94 Actual 1/95-12/99

5 Year Expected Return Range Emerging Markets

—◆— lower 1 sigma band —■— Mean —▲— upper 1 sigma band

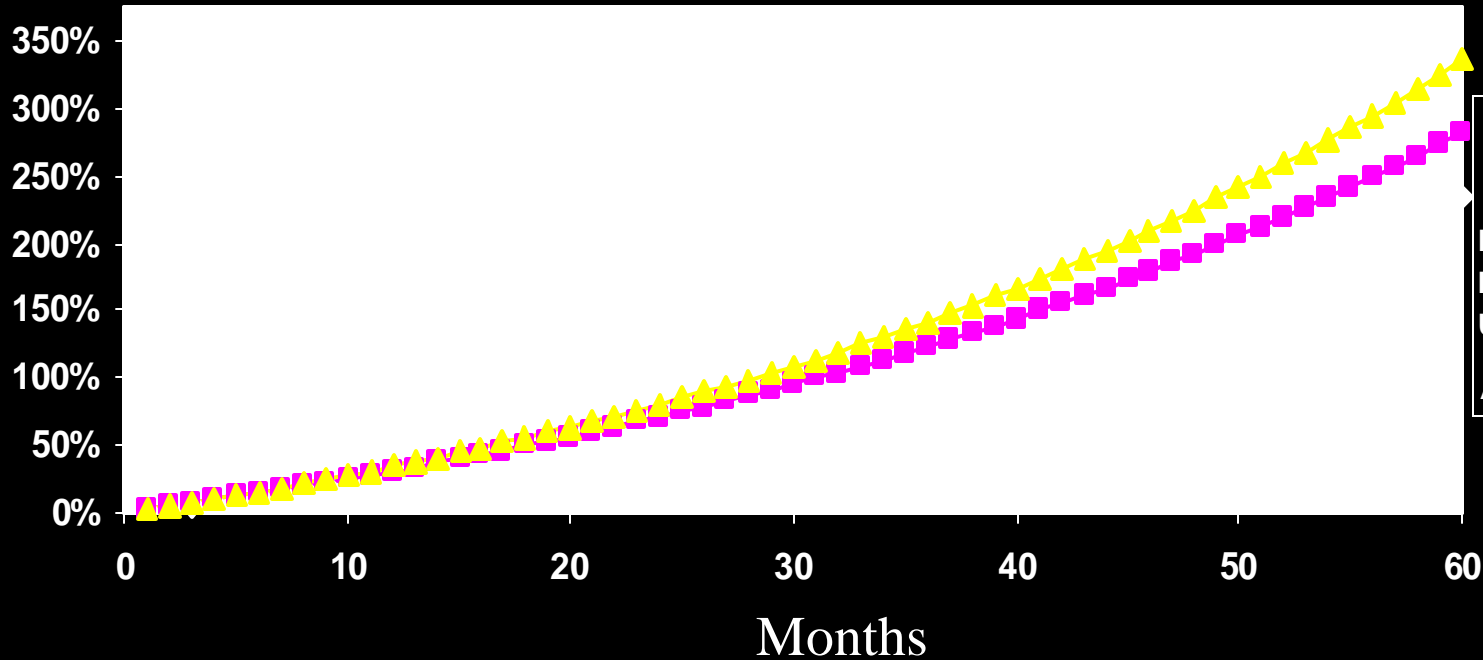


	Cum. Return %	Annual Return %
Lower Band	253.79	28.75
Mean	335.71	34.23
Upper Band	436.21	39.92
Actual	67.30	

Estimate 1/90 -12/94 Actual 1/95-12/99

5 Year Expected Return Range Macro

—◆— lower 1 sigma band —■— Mean —▲— upper 1 sigma band



	Cum. Return %	Annual Return %
Lower Band	233.99	27.28
Mean	281.88	30.73
Upper Band	336.50	34.28
Actual	81.3	

Estimate 1/90 -12/94 Actual 1/95-12/99

Percent Return Difference Between Actual Versus Estimated Lower Band Cumulative 5 Year Return

	%	
Technology	75.38*	<i>12% < upper band</i>
Convertible Arbitrage	11.41	<i>5.8% > upper band</i>
Merger Arbitrage	4.08	<i>1% < mean</i>

Market Timing	(5.19)	Relative Value	(52.50)
Market Neutral	(8.06)	Fixed Income	(60.25)
Statistical Arbitrage	(9.39)	Fixed Income Arbitrage	(80.22)
Event Driven	(14.02)	Short Selling	(80.42)
Equity Non-Hedge	(17.30)	Distressed	(91.29)
Equity Hedge	(28.70)	Macro	(152.73)
High Yield	(49.57)	Emerging Markets	(186.50)

*Estimate based on 1991-1994 mean return and STD.

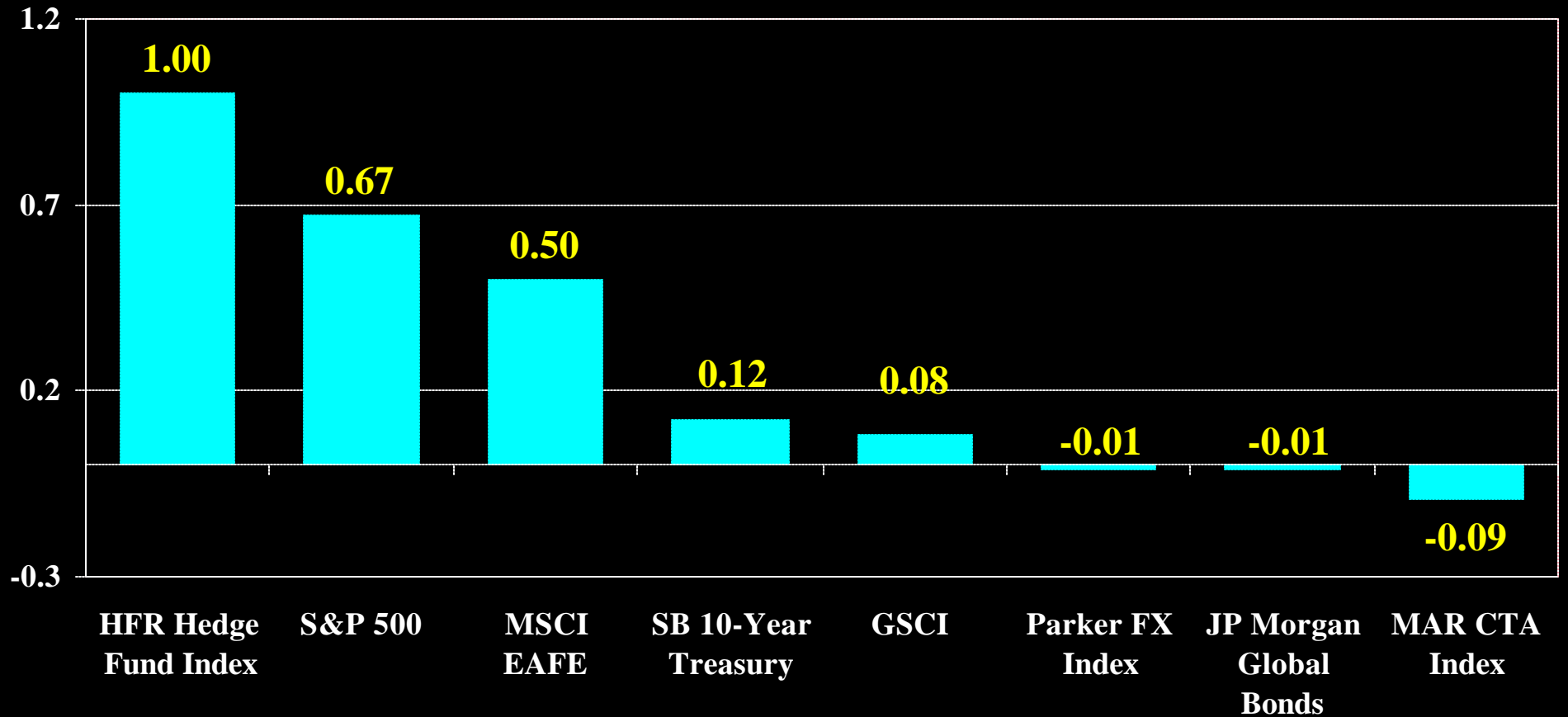
Others based on 1990 -1994 mean return and STD.

Actual cumulative returns from 1995-1999.

A Look At Some Correlations

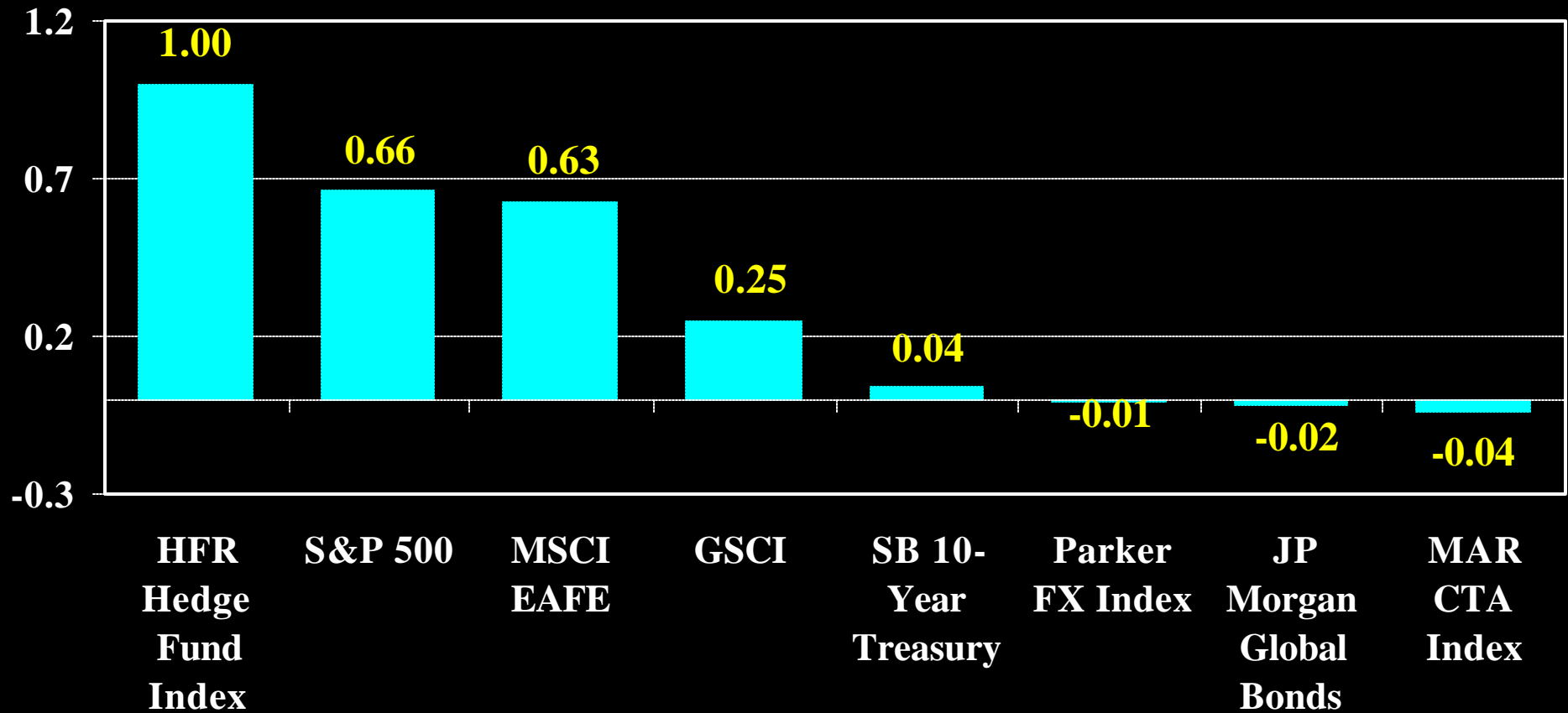
Correlation Matrix

January 1990 Through July 2000



Correlation Matrix

January 1993 Through July 2000



Correlation Statistics

January 1990 Through July 2000

? 3 out of 19 Hedge Fund styles have negative correlation to S&P 500

Short Selling (0.60)

CTAs (0.11)

Fixed Income Arbitrage (0.09)

Mortgage Arbitrage (0.02)

? 9 out of 19 Hedge Fund strategies have negative correlation to short selling

? 13 out of 19 Hedge Fund strategies are negatively correlated with CTAs

Correlation Statistics

January 1990 through July 2000

? Highest positive correlations to S&P 500:

Equity Non-Hedge	.74
Hedge Fund Index	.67
Equity Hedge	.61
Event Driven	.61

? Highest Average Correlation to all styles:

Fund of Fund Index	.39
Hedge Fund Index	.39

? Highest correlation:

Hedge Fund to Equity Non-hedge	.93
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Investment Strategy Universe

Performance in the Tough Years

	<u>1990</u>	<u>1994</u>	<u>1998</u>
<i>Asset Classes</i>			
S&P 500	(3.1)	1.3	28.6
MSCI EAFE	(24.7)	6.2	18.2
JPM Global Gov't Bonds	11.8	1.3	15.3
Lehman Gov't Bonds	9.7	(3.3)	8.7
GS Commodity Index	29.1	5.4	(34.0)
<i>Equity</i>			
Equity Hedge	14.4	2.6	16.0
Equity Non-Hedge	(7.2)	5.1	9.8
Short	36.2	18.5	(0.5)
Technology	n/a	10.1	28.4
<i>Arbitrage</i>			
Market-Neutral	15.4	2.6	8.3
Convertible	2.2	(3.7)	7.7
Merger	0.44	8.9	7.2
Relative Value	13.3	4.0	2.8
Distressed	6.4	3.8	(4.2)
Fixed Income	10.8	11.9	(10.3)

Investment Strategy Universe

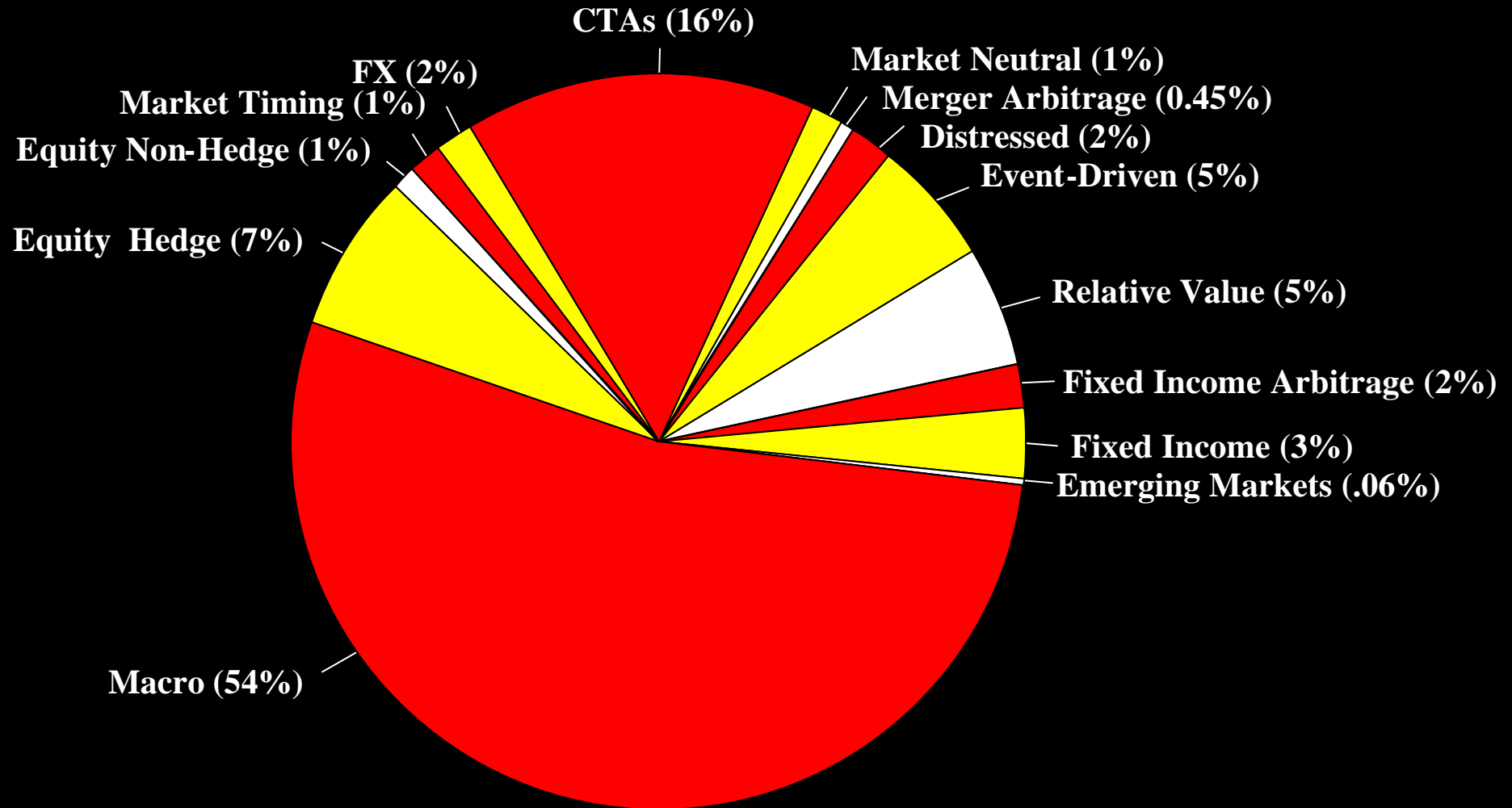
Performance in the Tough Years

	<u>1990</u>	<u>1994</u>	<u>1998</u>
<u><i>Diversified Strategies</i></u>			
Hedge Fund Index	5.8	4.1	2.6
Fund of Funds	17.5	(3.5)	(5.1)
CTA Index	25.9	2.7	11.7
<u><i>Market Strategies</i></u>			
Fixed Income	6.5	7.6	(2.0)
Foreign Exchange	37.6	(1.8)	5.2
Market Timing	13.5	3.5	24.8
High Yield	(12.1)	1.5	(5.3)
<u><i>Global Strategies</i></u>			
Macro	12.6	(4.3)	6.1
CTAs (Discretionary)	21.4	(1.0)	7.4
CTAs (Trend-following)	29.0	(5.7)	8.9
CTAs (Diversified)	19.8	5.3	11.6
Emerging Markets	(3.4)	3.8	(33.0)

**Are The Allocation Trends
Telling Us Something?**

Composition of Alternative Investment Universe

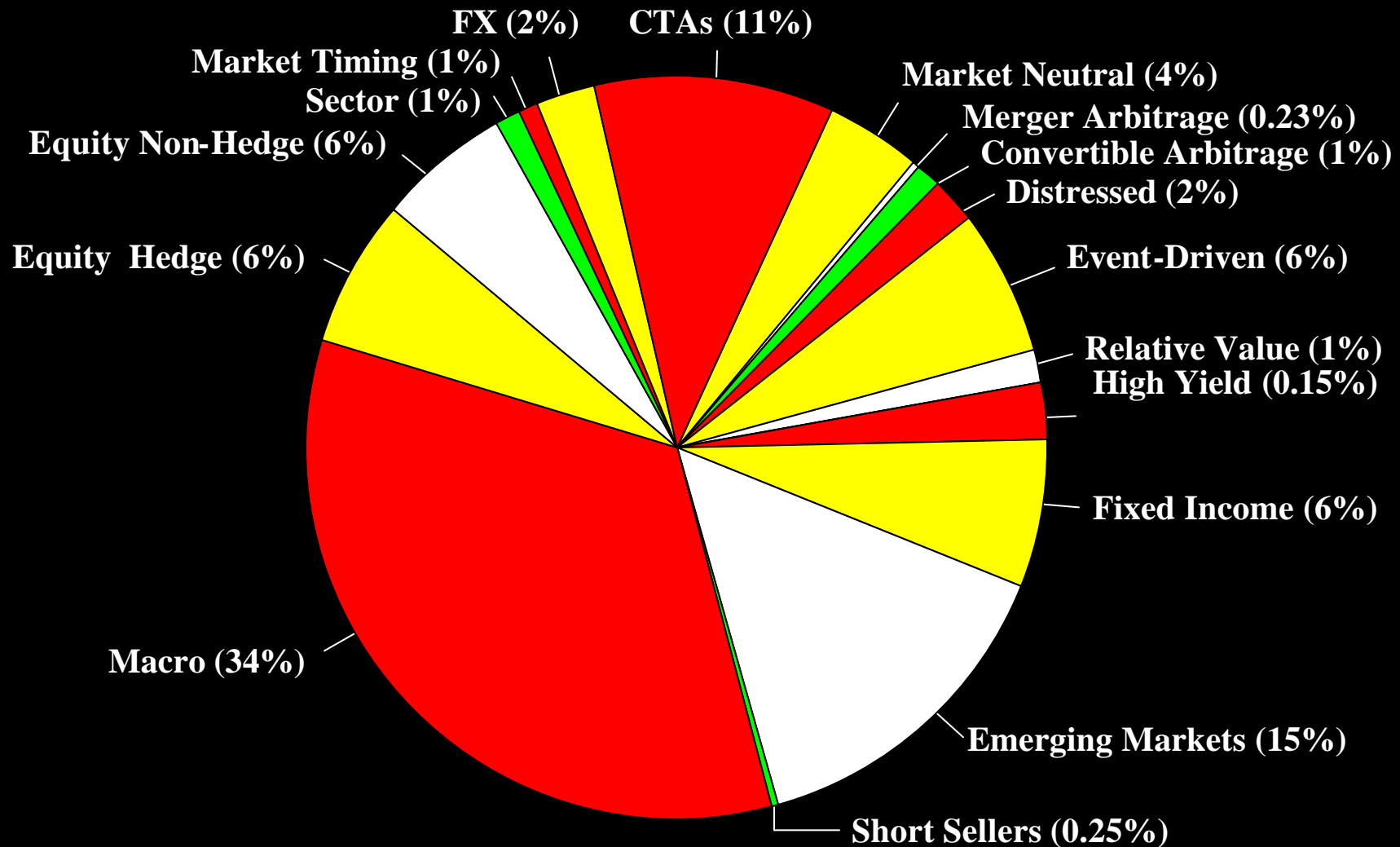
1990



Source: Managed Account Reports, Hedge Fund Research, PGS.

Composition of Alternative Investment Universe

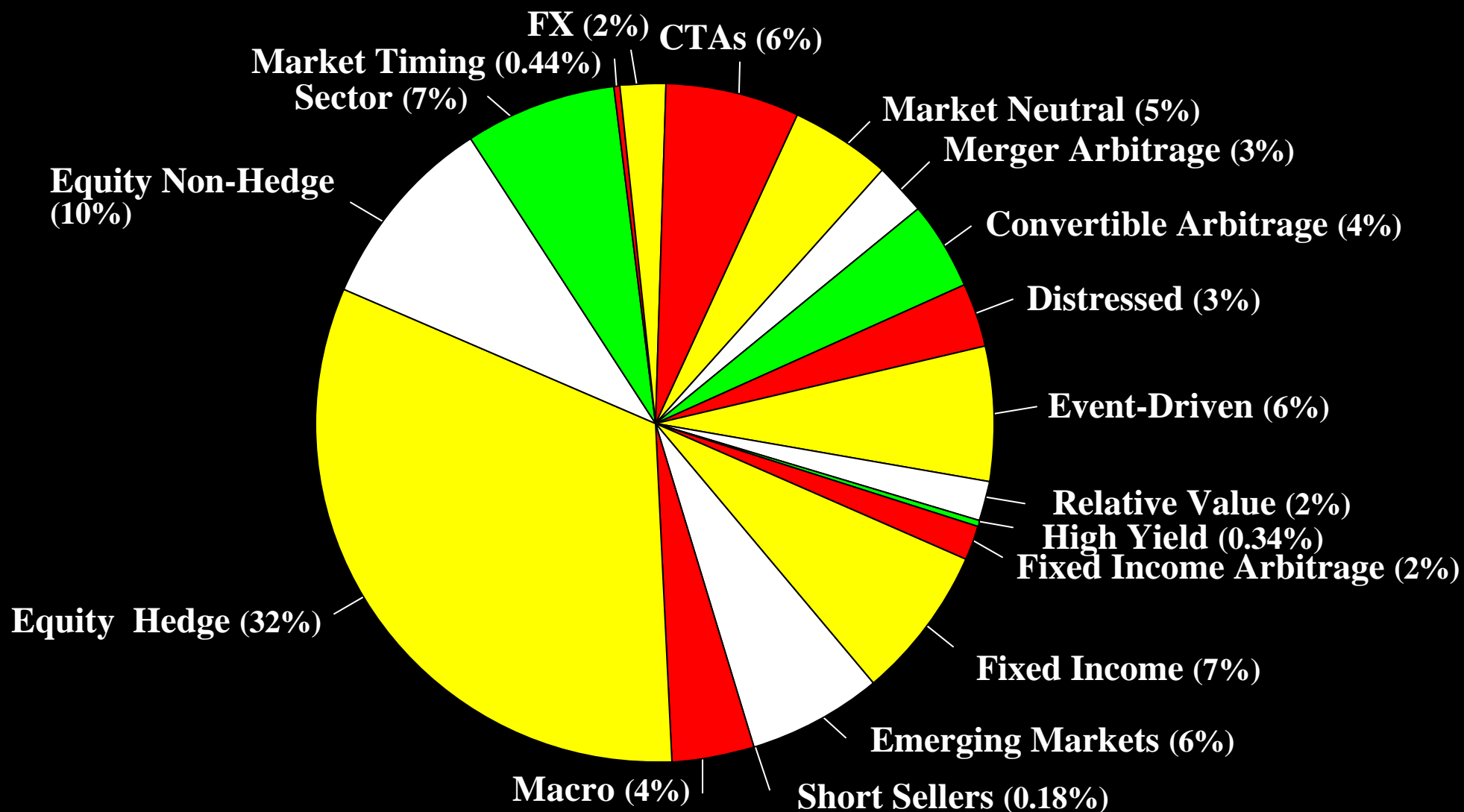
1994



Source: Managed Account Reports, Hedge Fund Research, PGS.

Composition of Alternative Investment Universe

2000



Source: Managed Account Reports, Hedge Fund Research, PGS.

Major Trends In Composition of Alternative Investment Universe

From 1990 to March 2000

	1990 %	1994 %	March 2000 %	Correlation to S&P 500
Macro	54	34	4	0.43
Equity Hedge	7	6	32	0.61
Merger Arbitrage	0.5	0.2	3	0.46
Sector	n/a	1	7	0.50
Emerging Markets	0.06	15	6	0.53
CTAs	16	11	6	-0.04

**A Look Some Performance
Measurement Statistics.**

Hedge Fund Universe

Measures of Risk/Return: January 1993 through July 2000

Strategy	Compounded Return %	Standard Deviation %	Maximum Drawdown %	Max DD/ STD Dev.	Sharpe Ratio
Technology	33.6	21.3	24.3	1.1	1.3
Sector	25.0	14.9	19.6	1.3	1.3
Healthcare/Biotech	24.3	25.5	27.3	1.1	0.8
Equity-Hedge	22.6	9.5	9.0	0.9	1.9
Equity-Non Hedge	20.7	13.5	17.3	1.3	1.2
S&P 500	19.4	13.2	15.4	1.2	1.1
Financial	19.1	12.7	26.3	2.1	1.1
Event-Driven	17.6	6.4	10.8	1.7	2.0
Hedge Fund Index	17.2	7.6	11.4	1.5	1.6
Market Timing	16.6	7.0	4.0	0.6	1.7
Macro	15.8	9.2	10.7	1.2	1.2
Merger Arbitrage	14.9	3.5	6.3	1.8	2.8

Source: Hedge Fund Research Inc., Managed Account Reports, Inc., and Parker Global Strategies, LLC.

Hedge Fund Universe

Measures of Risk/Return: January 1993 through July 2000

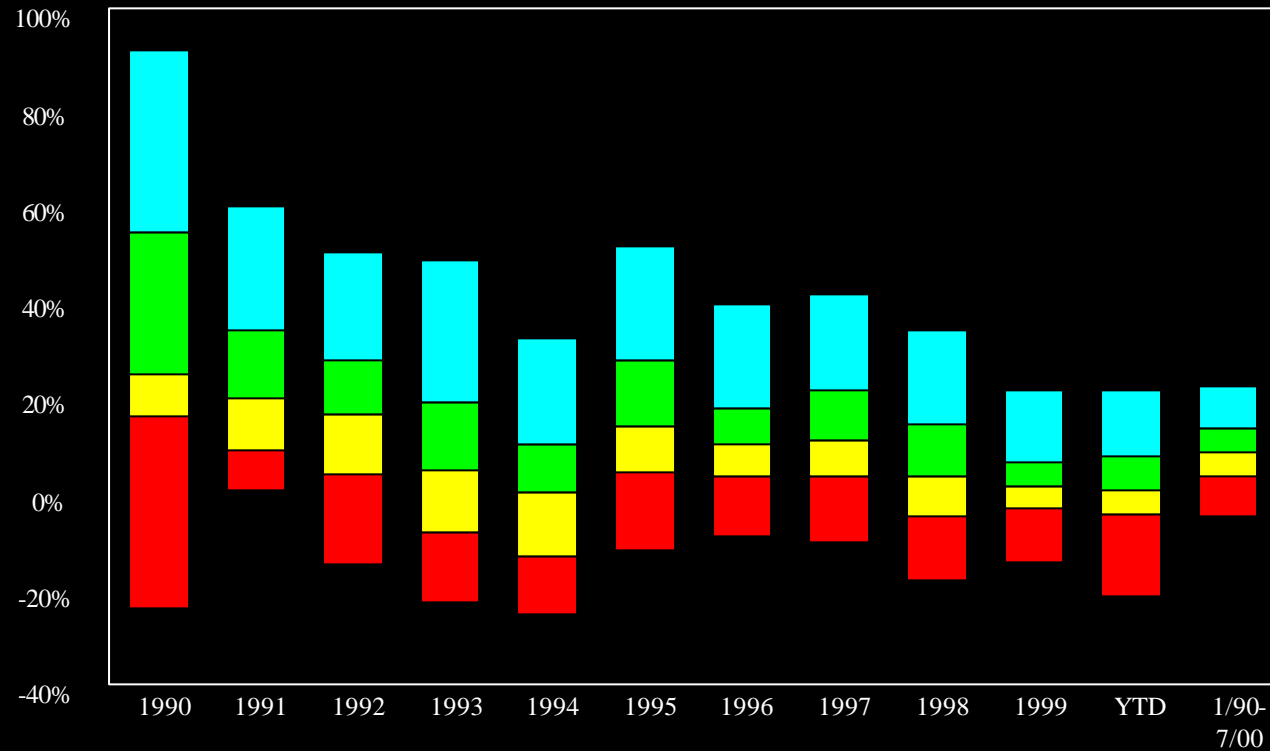
Strategy	Compounded Return %	Standard Deviation %	Maximum Drawdown %	Max DD/ STD Dev.	Sharpe Ratio
Emerging Markets	14.9	17.0	43.4	2.6	0.58
Distressed	14.1	5.9	12.8	2.2	1.54
Relative Value	13.7	3.9	6.6	1.7	2.24
Convertible Arbitrage	12.0	3.6	4.8	1.3	1.96
Fund of Funds	11.3	7.0	13.1	1.9	0.9
Market Neutral	10.3	3.4	2.7	0.8	1.55
Fixed Income	9.4	3.3	8.3	2.5	1.35
Mortgage-Backed	9.3	4.9	13.5	2.8	0.88
High Yield	9.0	5.0	12.4	2.5	0.81
CTA Index	8.1	8.2	6.0	0.7	0.38
Parker FX Index	7.0	7.0	8.9	1.3	0.29
Fixed Income Arbitrage	6.6	4.8	14.4	3.0	0.33
Short Sellers	-4.2	22.8	52.0	2.3	-0.4

Source: Hedge Fund Research Inc., Managed Account Reports, Inc., and Parker Global Strategies, LLC.

**There Can Be A Lot of Information Buried
Beneath The Numbers.**

Parker FX Index*

January 1990 Through July 2000

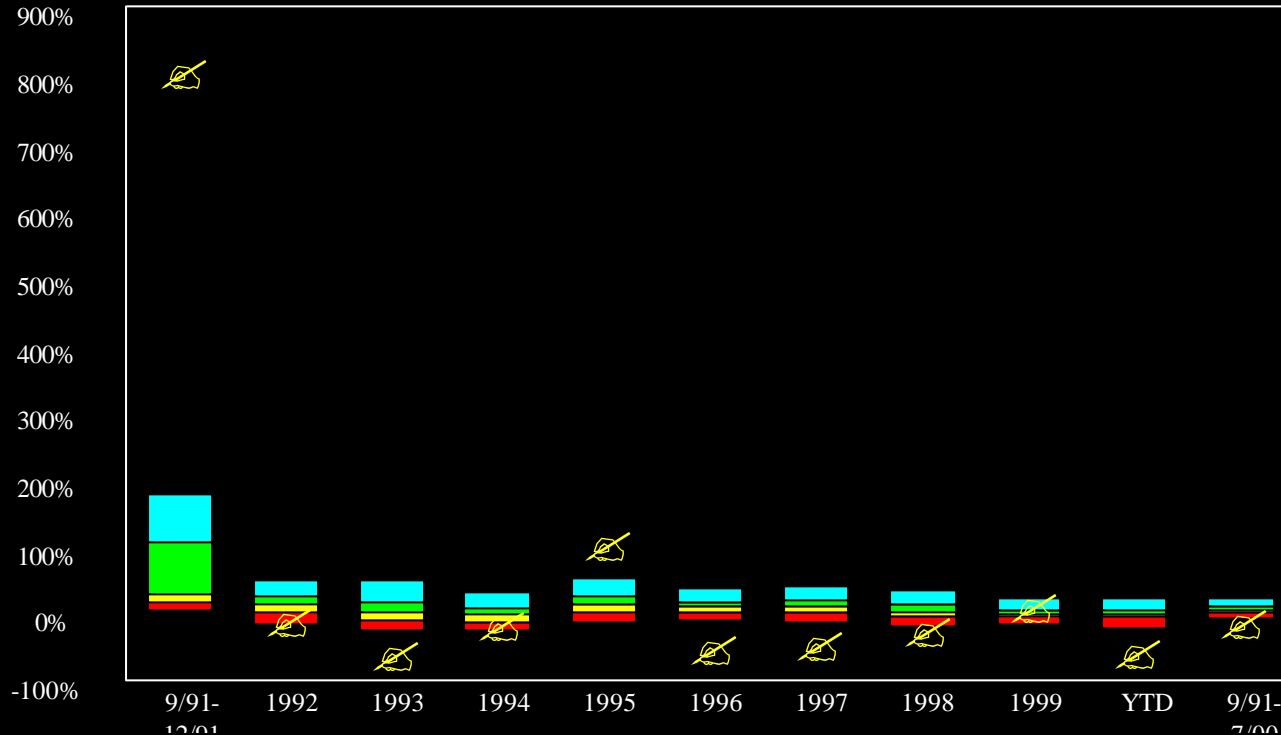


	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	YTD	1/90 - 7/00
5th Percentile	91.35	59.05	49.68	47.65	31.92	50.63	38.72	40.81	33.21	20.92	20.88	21.81
25th Percentile	54.04	33.71	27.64	18.61	9.96	27.46	17.52	21.17	14.47	6.36	7.58	13.12
50th Percentile	24.46	19.52	16.00	4.75	(0.12)	13.61	10.05	10.78	3.23	1.28	0.66	8.35
75th Percentile	15.72	8.89	3.98	(8.49)	(13.36)	4.32	3.15	3.18	(4.83)	(3.15)	(4.63)	3.38
95th Percentile	(23.69)	0.29	(14.72)	(22.80)	(25.06)	(11.98)	(8.81)	(10.35)	(18.39)	(14.55)	(21.47)	(4.82)

Source: Parker Global Strategies LLC.

Parker FX Index with Outlier*

January 1990 Through July 2000



	9/91 - 12/01	1992	1993	1994	1995	1996	1997	1998	1999	YTD	9/91 - 7/00
Outlier	849.78	38.68	(12.85)	30.76	150.75	(4.49)	2.64	23.63	60.67	(10.33)	35.82
5th Percentile	176.48	49.68	47.65	31.92	50.63	38.72	40.81	33.21	20.92	20.88	20.25
25th Percentile	107.36	27.64	18.61	9.96	27.46	17.52	21.17	14.47	6.36	7.58	10.73
50th Percentile	31.70	16.00	4.75	(0.12)	13.61	10.05	10.78	3.23	1.28	0.66	7.43
75th Percentile	18.46	3.98	(8.49)	(13.36)	4.32	3.15	3.18	(4.83)	(3.15)	(4.63)	2.05
95th Percentile	7.48	(14.72)	(22.80)	(25.06)	(11.98)	(8.81)	(10.35)	(18.39)	(14.55)	(21.47)	(6.04)

Source: Parker Global Strategies LLC.

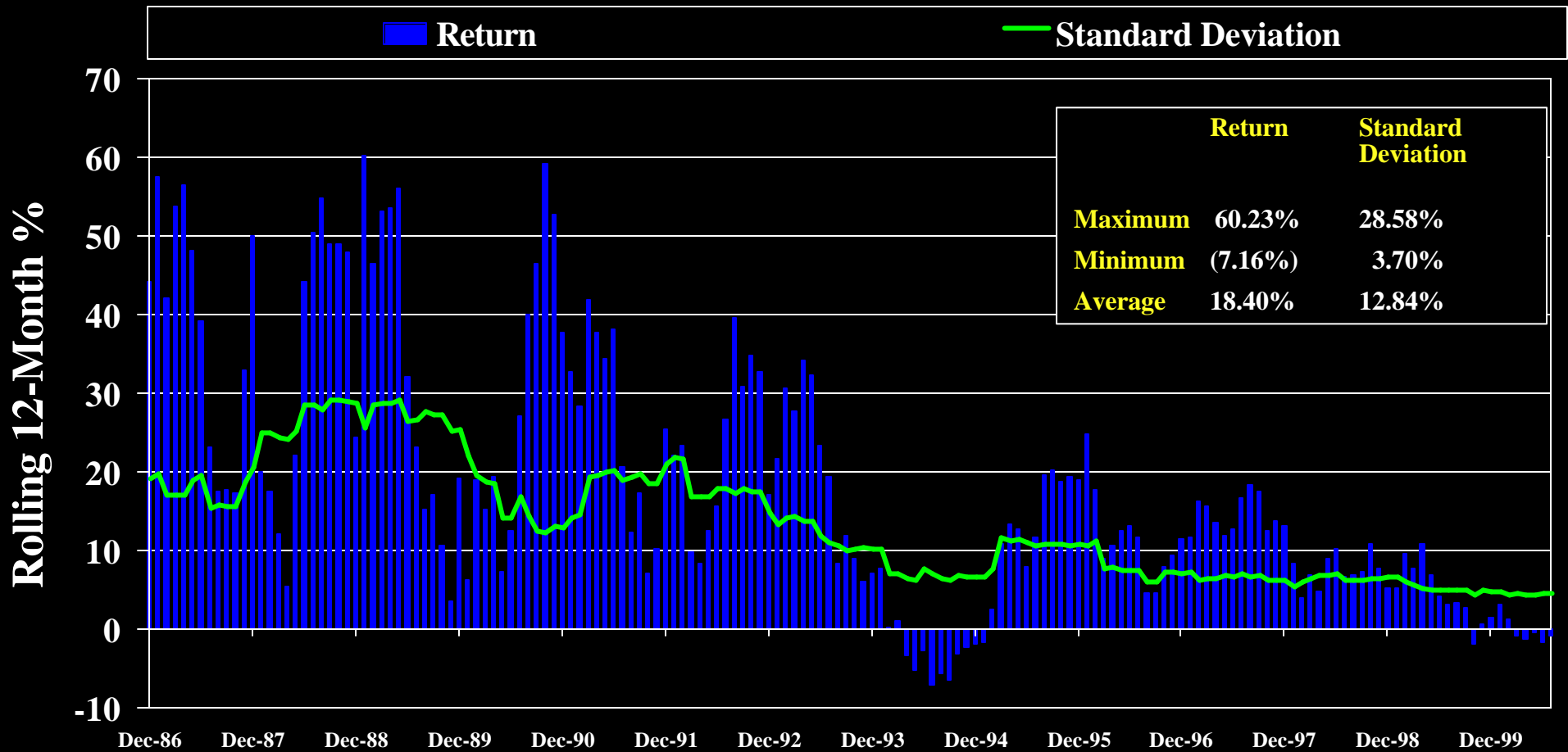
Summary

**Returns and Standard Deviations
are a Moving Target.**

The Parker FX Index

Rolling 12-Month Reported Performance

January 1986 Through July 2000



**Targeting Low or Negative Correlations
in a Portfolio can be an
Expensive Opportunity Cost.**

A Look at Correlations

January 1990 Through July 2000

- **Not many pairs of subindexes have negative correlations.**
- **5 of 350 are > -50**
- **All are short sellers against equity-oriented styles**

A Look at Correlations in 1994

- **27 indexes**
- **350 pairs of correlations**
 - 34 pairs have correlations $> -.50$
 - 46 pairs have positive correlations $> .68$

**Sharpe Ratios Can Turn Around
And Bite.**

Passive Versus Hedge Fund Indices

Performance Analysis: January 1993 through July 2000

	Passive Index			Correlation	Hedge Fund Index		
	Annual Return	Max Drawdown	Standard Deviation		Annual Return	Max Drawdown	Standard Deviation
Convertible Bonds ¹	12.1%	13.0%	14.3%	0.87	18.4%	15.7%	13.8%
Distressed Securities	8.5%	6.8%	4.7%	0.65	14.3%	12.8%	5.9%
Emerging Markets Equity	4.7%	58.5%	23.3%	0.88	15.0%	43.4%	17.0%
Equity Unhedged	19.4%	15.4%	13.2%	0.71	20.7%	17.3%	13.5%
Global Bonds	6.0%	7.6%	5.4%	-0.18	9.5%	8.3%	3.3%
U.S. Bonds	6.6%	5.4%	3.9%	0.11	9.5%	8.3%	3.3%
High Yield Bonds	8.5%	8.0%	5.2%	0.84	9.0%	12.4%	5.0%
Energy ²	8.3%	55.8%	33.4%	0.25	31.0%	37.1%	24.0%
Financial	22.6%	23.1%	21.1%	0.69	18.7%	26.3%	12.7%
Healthcare Index	25.8%	29.1%	23.2%	0.81	25.1%	24.7%	25.4%

8 Have higher returns
8 Have lower ?

¹Performance starts on 1/98 for the Goldman Sachs Convertible Bond Index.

²Performance starts on 1/95 for the HFR – Energy Index.

Source: Hedge Fund Research Inc., Bloomberg.

Passive Versus Hedge Fund Indices

Sharpe Ratio Analysis: January 1993 through July 2000

	Passive Index	Hedge Fund Index	Max D/D Hedge Fund/ Passive
Convertible Bonds ¹	0.50	0.93	1.2
Distressed Securities	0.74	1.57	1.9
Emerging Markets Equity	-0.01	0.59	0.7
Equity Unhedged	1.09	1.17	1.1
Global Bonds	0.18	1.37	1.1
U.S. Bonds	0.40	1.37	1.5
High Yield Bonds	0.67	0.81	1.6
Energy ²	0.10	1.08	0.7
Financial	0.84	1.07	1.1
Healthcare Index	0.90	0.79	0.8

All have higher sharpe
7 have higher drawdowns

*Risk Free Rate = 5.00%

¹Performance starts on 1/98 for the Goldman Sachs Convertible Bond Index.

²Performance starts on 1/95 for the HFR – Energy Index.

Source: Hedge Fund Research Inc., Bloomberg.

**Perhaps The Performance Measure We
Should Use For Judging The Quality Of
Return Is Maximum Drawdown.**

