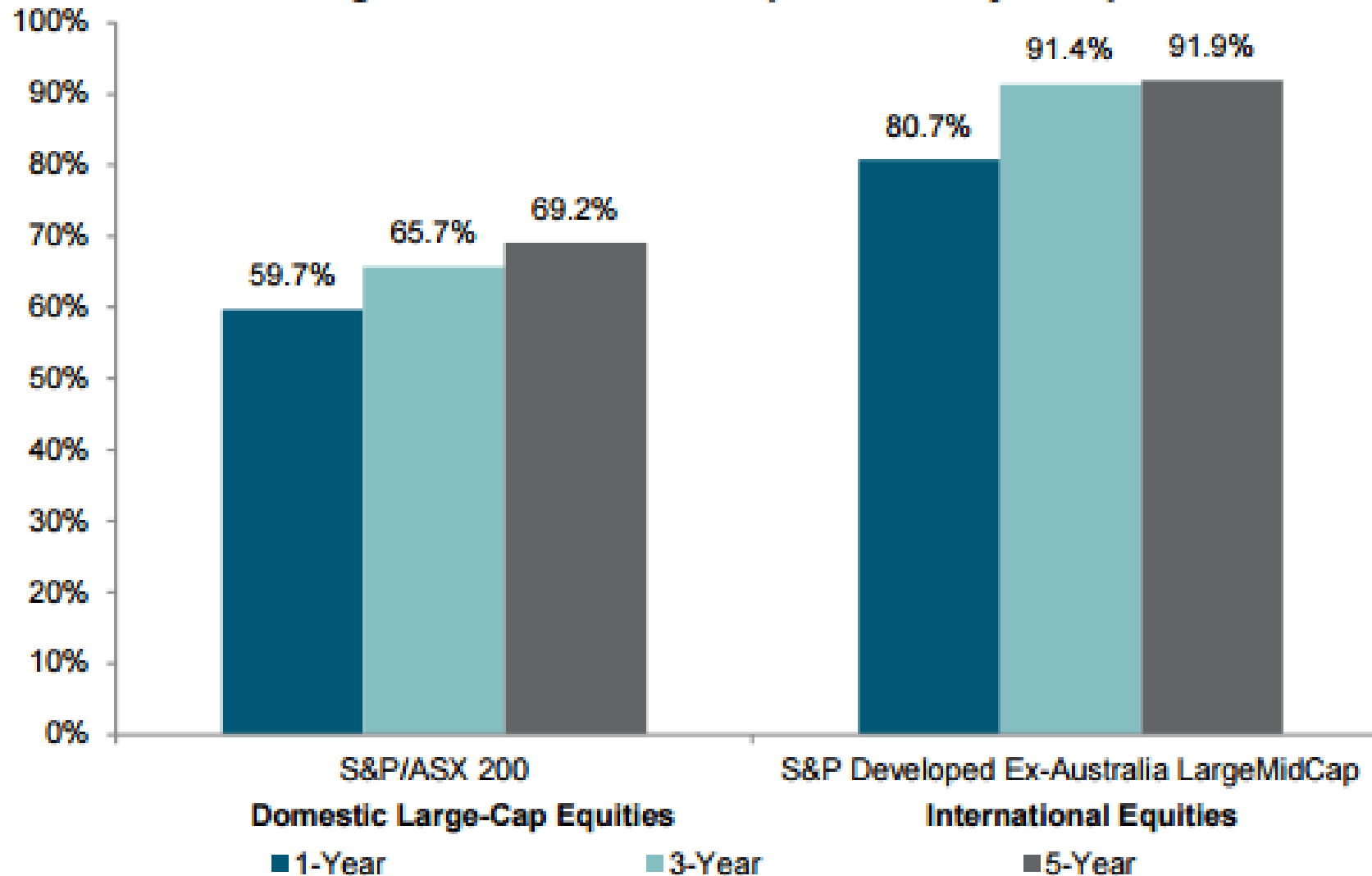


# Active vs. Passive Equity Investments

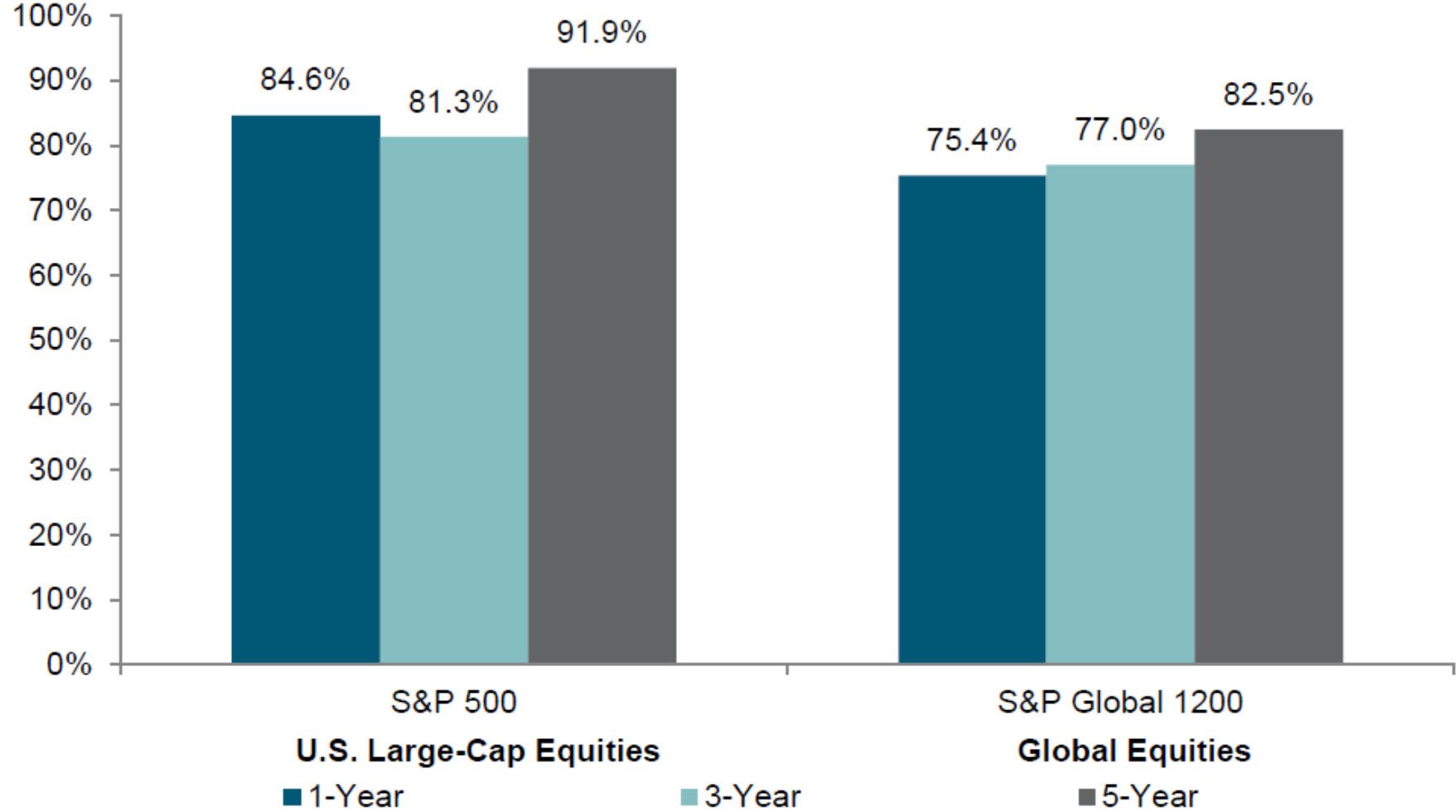
Index Funds, Mutual Funds, ETFs, Hedge Funds

### Exhibit 1: Percentage of Active Funds Outperformed by Comparable Index



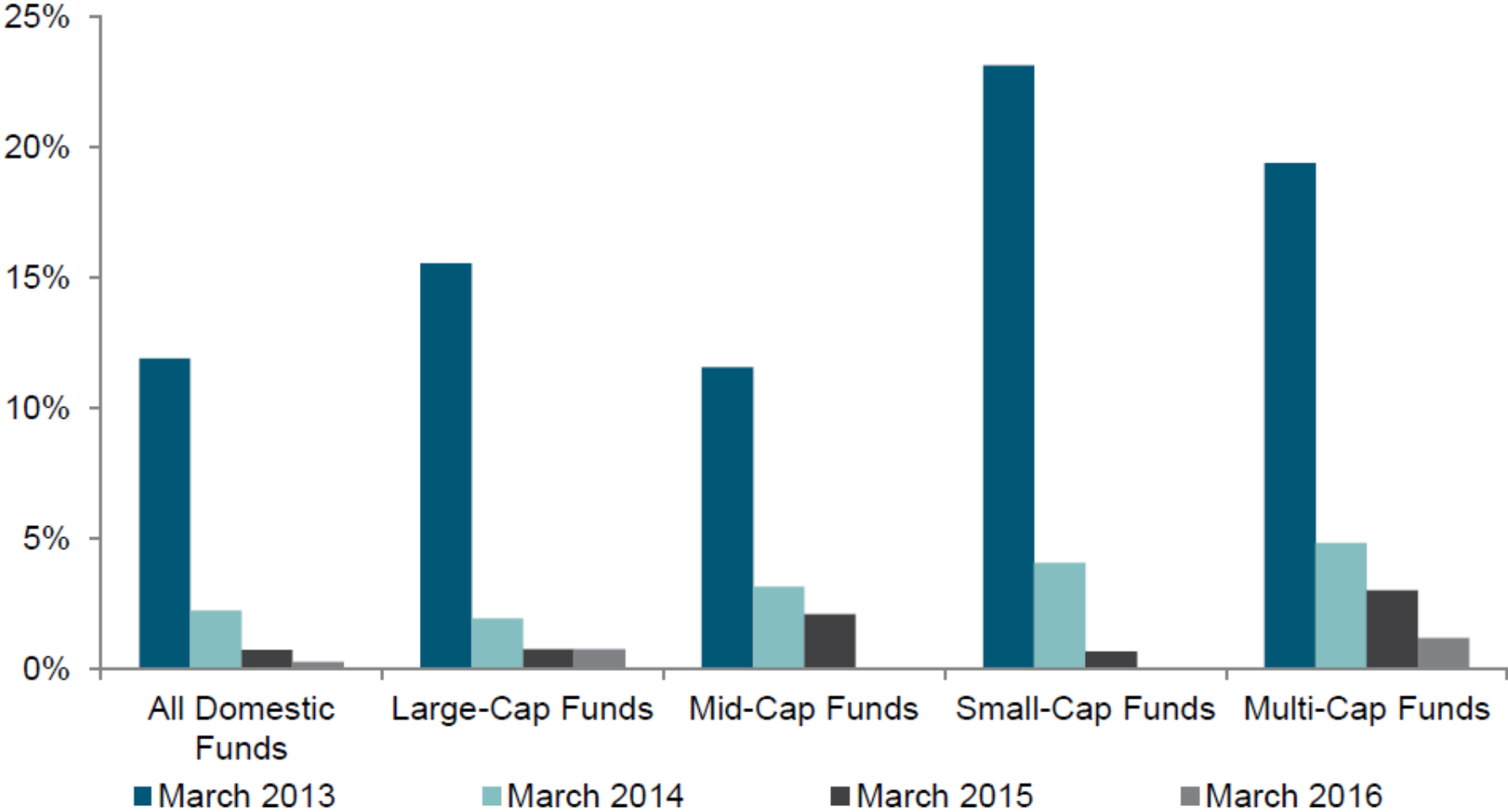
Source: S&P Dow Jones Indices LLC, SPIVA Australia Mid-Year 2016 Scorecard. Data as of June 30, 2016. Chart is provided for illustrative purposes. Past performance is no guarantee of future results. It is not possible to invest directly in an index.

### Exhibit 2: Percentage of U.S. and Global Indices That Outperformed Comparable Active Funds



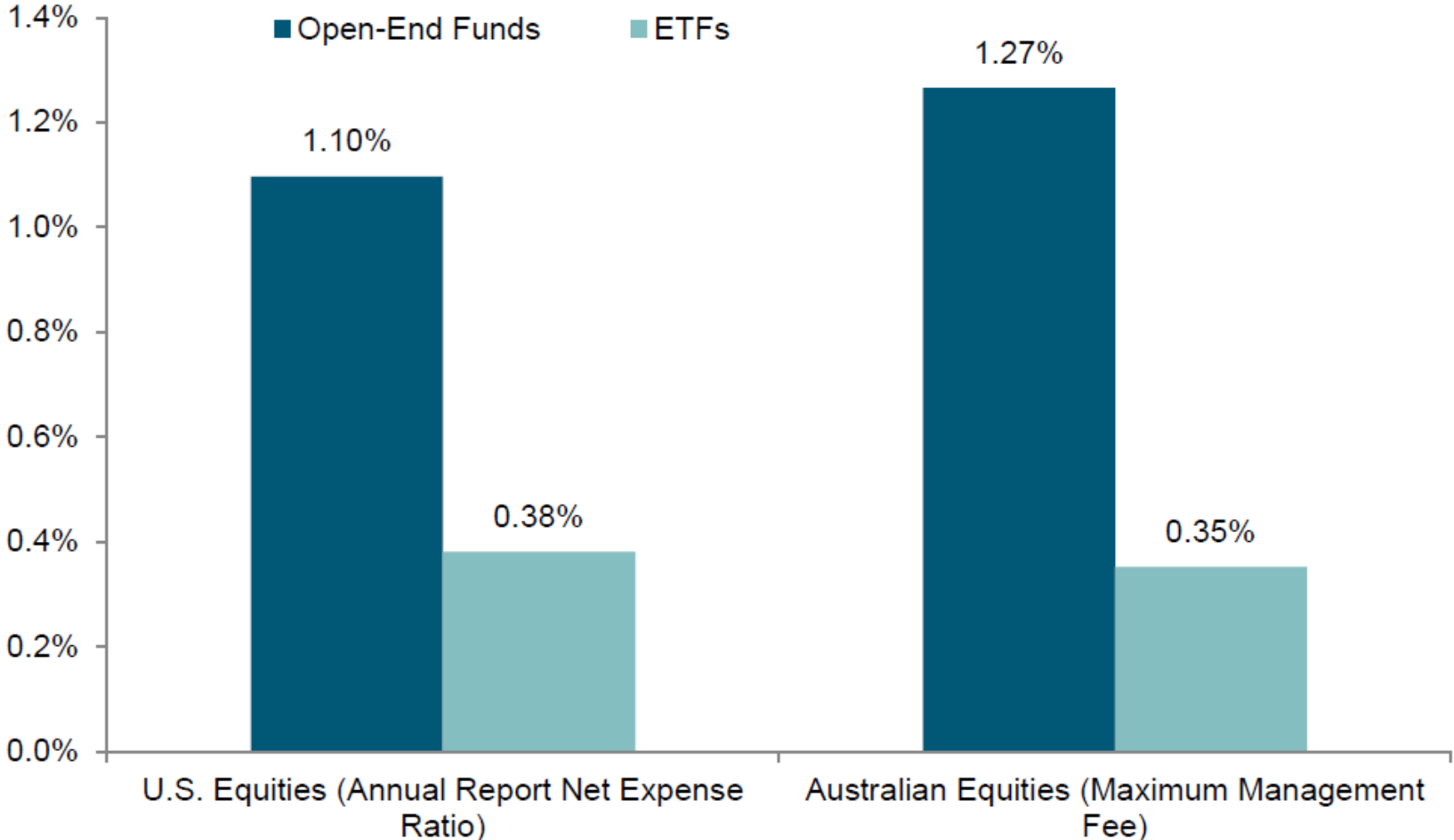
Source: S&P Dow Jones Indices LLC, SPIVA U.S. Mid-Year 2016 Scorecard. Data as of June 30, 2016. Chart is provided for illustrative purposes. Past performance is no guarantee of future results. It is not possible to invest directly in an index.

### Exhibit 3: Performance Persistence of U.S. Active Funds Over 5 Consecutive 12-Month Periods



Source: S&P Dow Jones Indices LLC, S&P Persistence Scorecard: August 2016. Data as of March 31, 2016. Chart is provided for illustrative purposes. Past performance is no guarantee of future results.

### Exhibit 5: Average Fees of Open-End Active Funds Versus ETFs



Source: S&P Dow Jones Indices LLC, Morningstar. Data as of Sept. 30, 2016. U.S. equities: Only open-end funds (excluding index and leveraged funds) and ETFs classified in the U.S. large-, mid-, and small-cap categories are included in the universe. Australian equities: Only open-end funds (excluding index and leveraged funds) and ETFs classified in the Australian large- and mid-, & small-cap categories are included in the universe. Figures for the U.S. are averages of funds' latest annual report net expense ratios. Figures for Australia are averages of funds' latest maximum management fees. Chart is provided for illustrative purposes.

# A brief history of Hedge Funds (1990-2017)

## 1. Classical Period (1990-1999)

Steady linear growth of number of funds, performance very superior to index

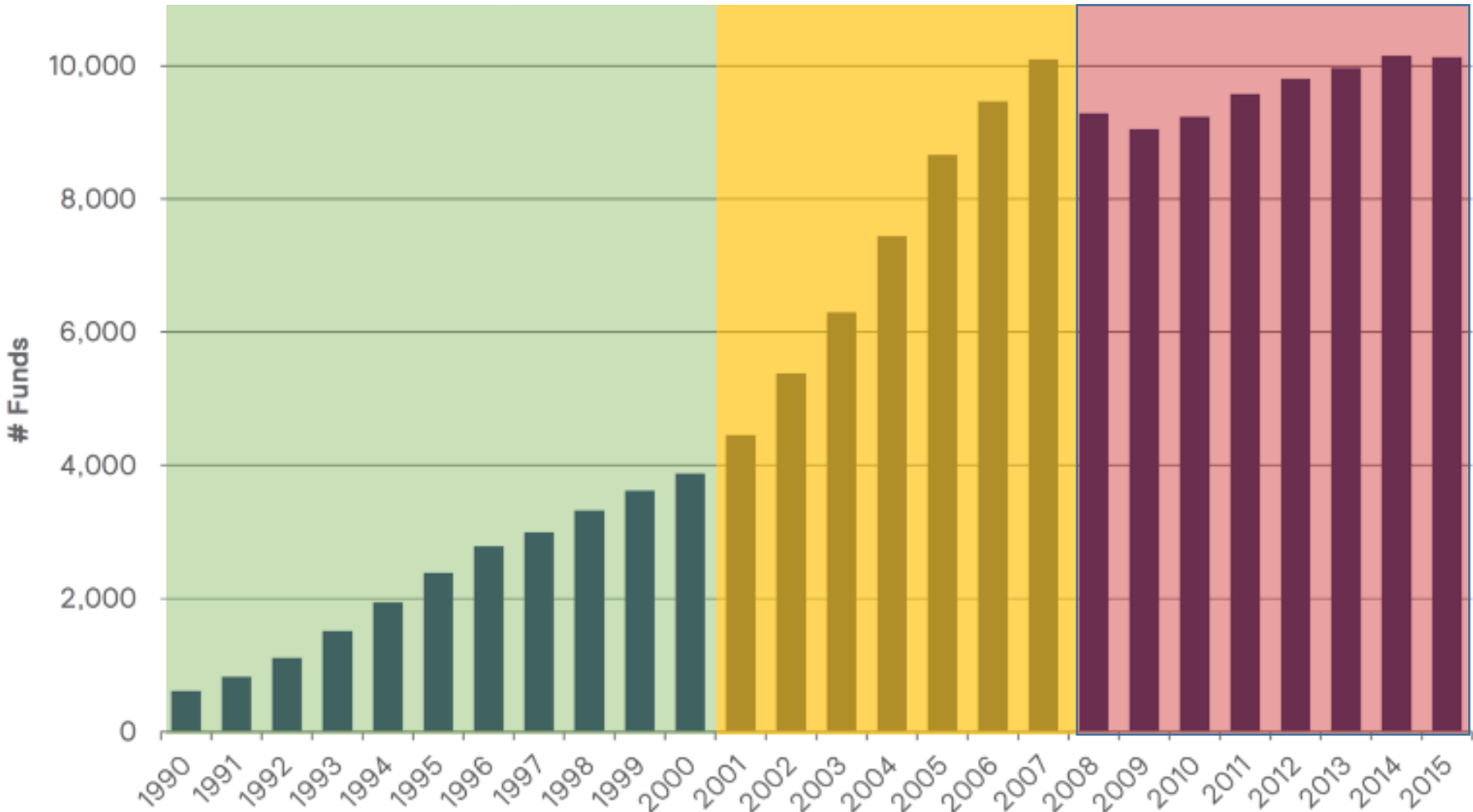
## 2. Modern Period (2000-2007)

Exponential growth of #funds, performance not much better than index. Proliferation of quant funds.

## 3. Post-modern Period (2008-2017)

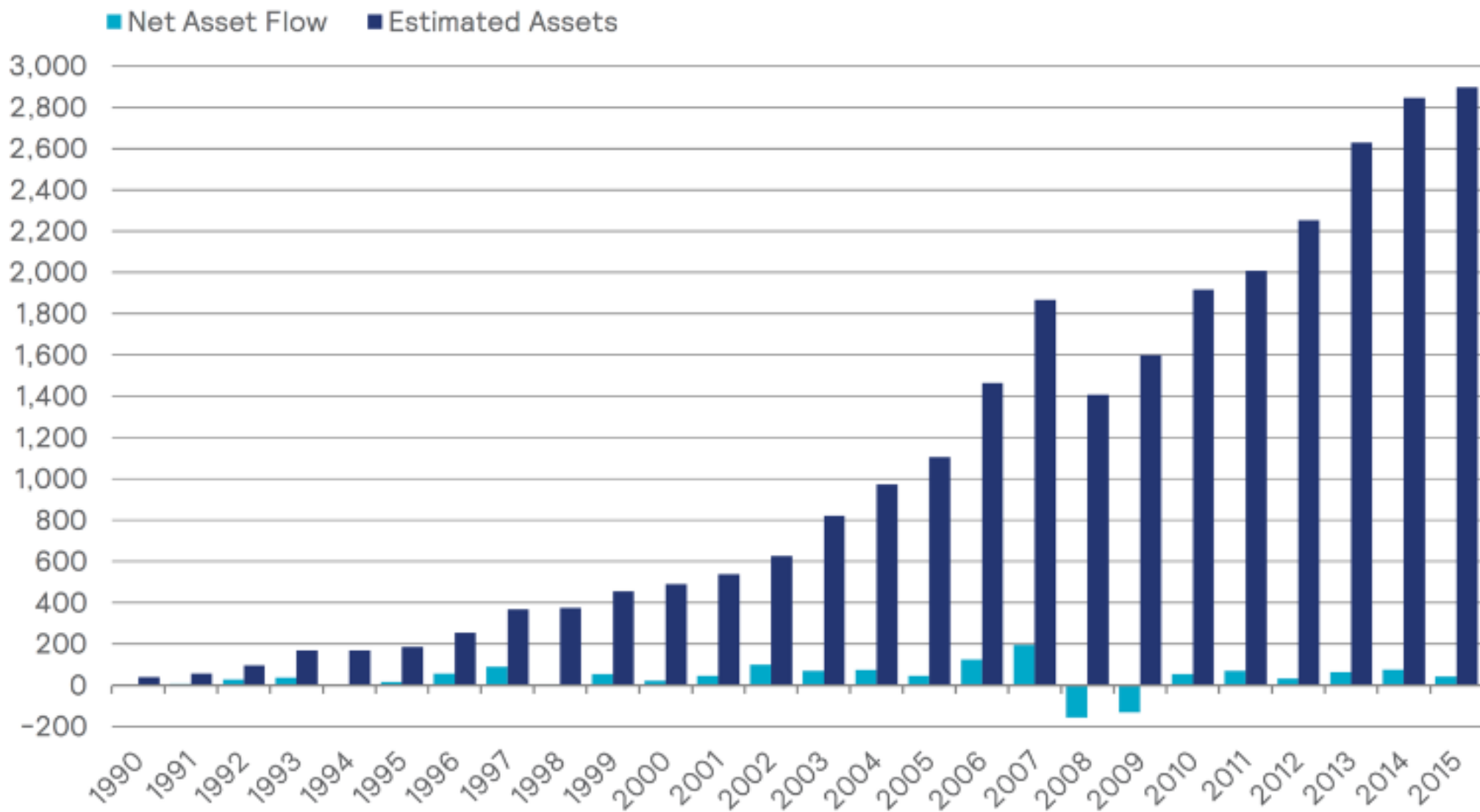
Modest to no growth in #funds. Performance inferior to index. Consolidation of assets in fewer, large, HFs.

### 3. Number of funds in the industry



Since a peak in 2007, we see a steady number of hedge funds. This confirms with the previous graph 2, and combined with graph 1 means the funds are managing more money on average.

## 1. estimated AUM and asset flow

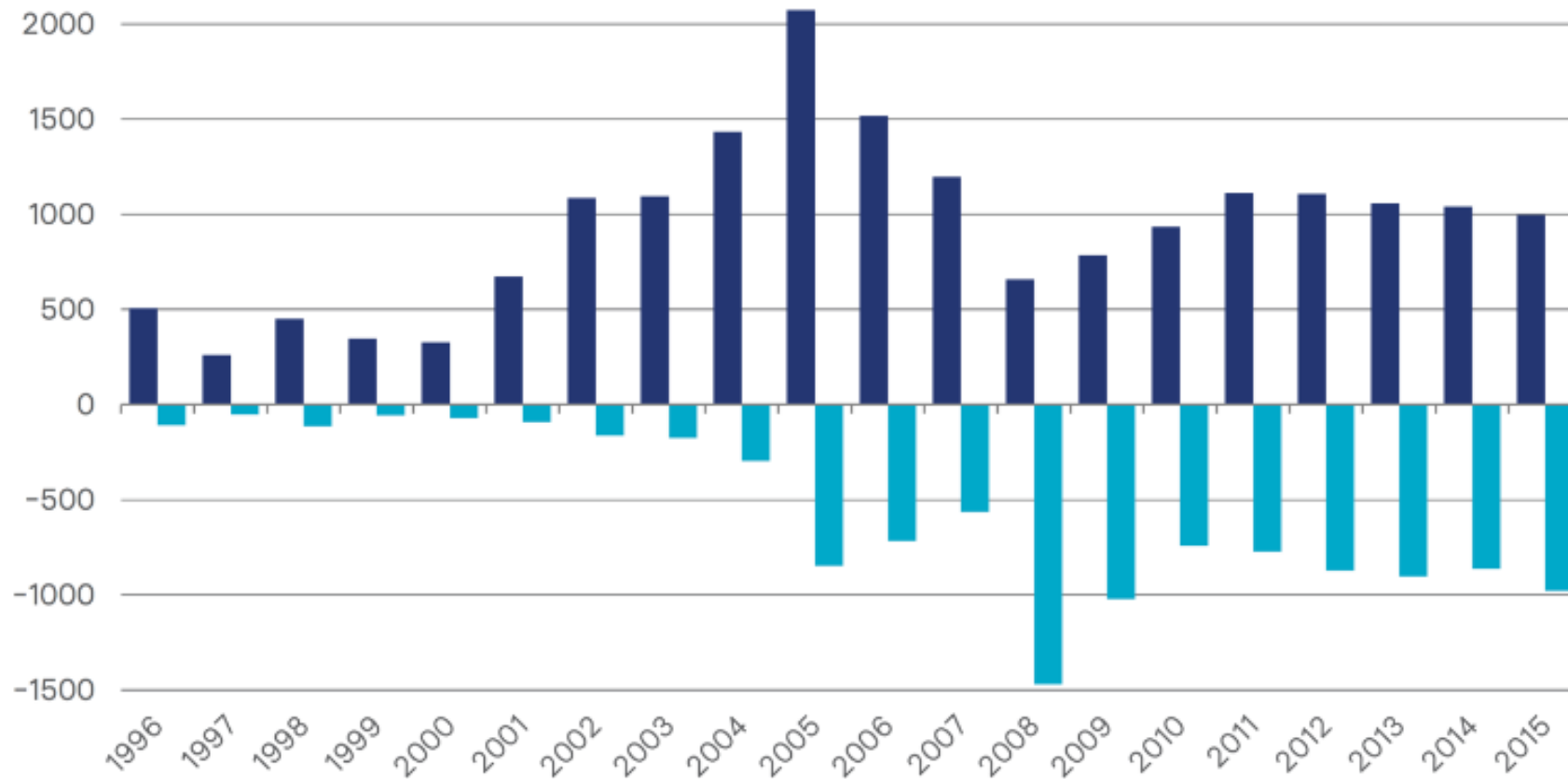


this graphs shows a general upward trend except for the 2007-2008 financial crisis



# Hedge Fund Creation & Liquidation

## 2. number of fund established vs liquidated



this graph shows a proportional trend of fund established over fund liquidated, exhibiting a trend of market saturation/skill saturation, since after the year 2010

# The concept of AUM-weighted returns

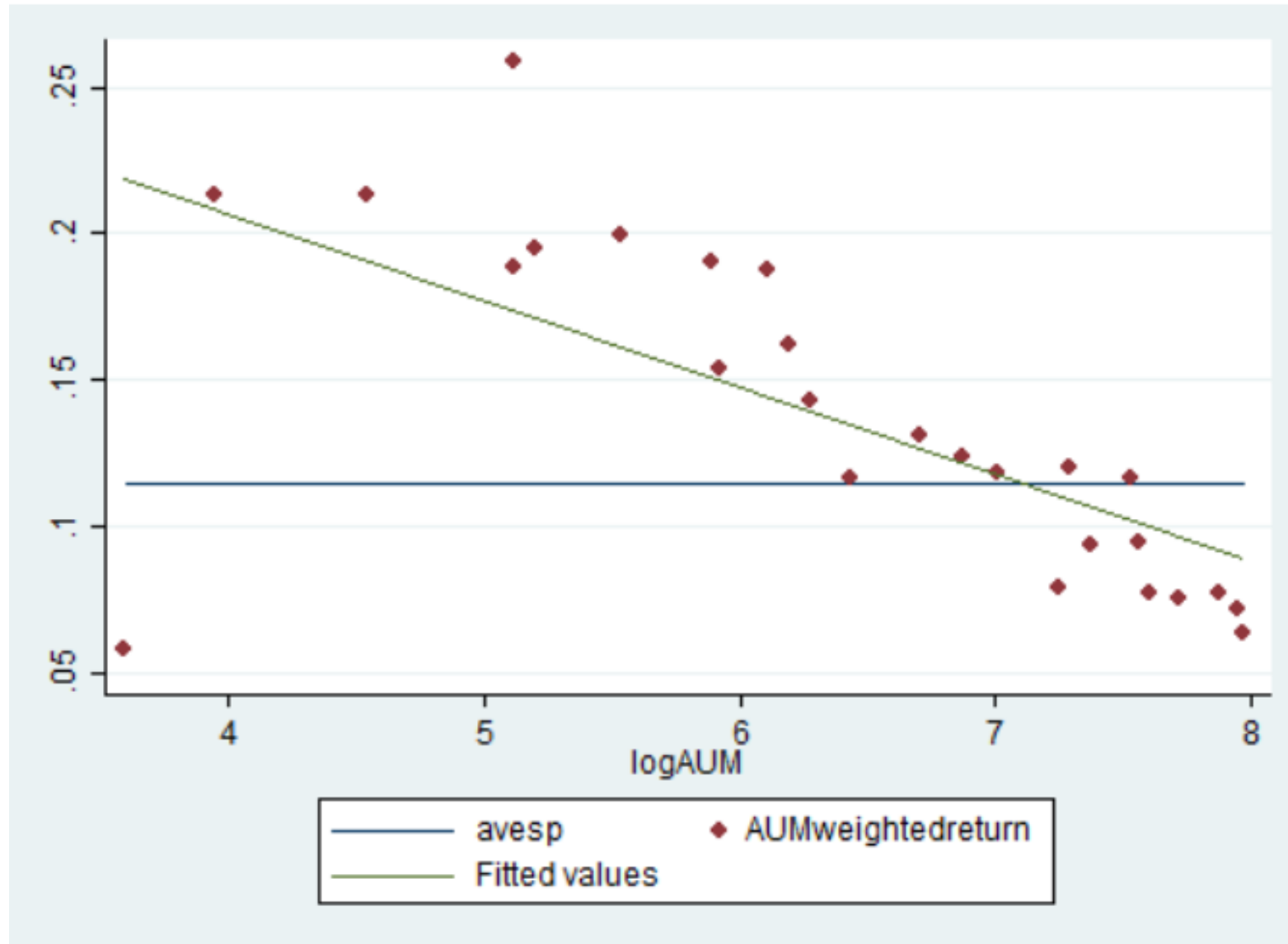
Imagine that each dollar is invested for 1 year and that we record the return for that year.

The impact of AUM on performance can be modeled as the average annual return of a dollar invested since the beginning of HFs.

Mathematically, this is the AUM-weighted return.

$$AUMWR(n) = \frac{\sum_{i=1}^n AUM(i) \times R(i)}{\sum_{i=1}^n AUM(i)}$$

# Comparing HF returns with Indexing returns



# Regression analysis: AUMWR vs log(AUM)

Source	SS	df	MS	Number of obs	=	26
Model	.034307363	1	.034307363	F(1, 24)	=	18.81
Residual	.043763881	24	.001823495	Prob > F	=	0.0002
Total	.078071245	25	.00312285	R-squared	=	0.4394
				Adj R-squared	=	0.4161
				Root MSE	=	.0427

AUMweighte~n	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logAUM	-.0294629	.0067926	-4.34	0.000	-.0434821	-.0154437
_cons	.3242558	.044315	7.32	0.000	.2327941	.4157176

# Performance of top 20 US HFs in 2016

Fund	PNL (B)	AUM (B)	NET RET (%)	GROSS PNL (EST, B)	FEE (EST, MM)
Elliott	3.3	31.3	10.5%	4.9	1,608
Baupost	2.7	31	8.7%	4.2	1,450
Caxton	0.5	8	6.3%	0.8	325
Farallon	1.2	19.3	6.2%	2.0	783
King Street	1.1	19	5.8%	1.9	750
DE Shaw	1.2	27	4.4%	2.2	975
Appaloosa	0.7	15.8	4.4%	1.3	570
Citadel	1	24	4.2%	1.9	850
Bridgewater	4.9	117.8	4.2%	9.1	4,170
Two Sigma	1.1	32	3.4%	2.2	1,075
Och Ziff	1.1	33.5	3.3%	2.2	1,113
Millennium	1.1	34.4	3.2%	2.2	1,135
Brevan H	0.5	16.7	3.0%	1.0	543
Moore	0.4	13.6	2.9%	0.8	440
SAC/P72	0.1	11.1	0.9%	0.4	303
Tudor	0	9.1	0.0%	0.2	228
Lone Pine	-0.1	26.3	-0.4%	0.5	633
Viking	-0.6	27.8	-2.2%	0.0	556
Soros	-1	28	-3.6%	-0.4	560
Paulson	-3	9.8	-30.6%	-2.8	196
<b>TOTAL</b>	<b>16.2</b>	<b>535.5</b>		<b>34.5</b>	<b>Billions 18.26</b>