

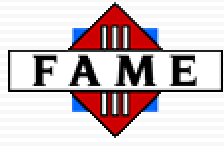
Quantitative Selection of Long-Short Hedge Funds

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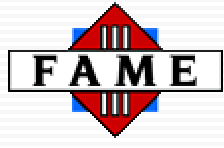
31 March, 2004, London

**Seminar at the Centre for Hedge Fund Research and
Education, London Business School**



Structure of the Presentation

- Introduction
- Main Results
- The Fama-French GSCI Selection Model
- Comparison Selected HFs versus total HF universe
- Conclusion
- Current Research Agenda



Introduction

- Why Interested in Hedge Funds?
 - J.Keynes at King's College;
 - LTCM;
 - Fung & Hsieh, 1997, 2001, 2002;
 - Ackermann, McEnally and Ravenscraft, 1999.

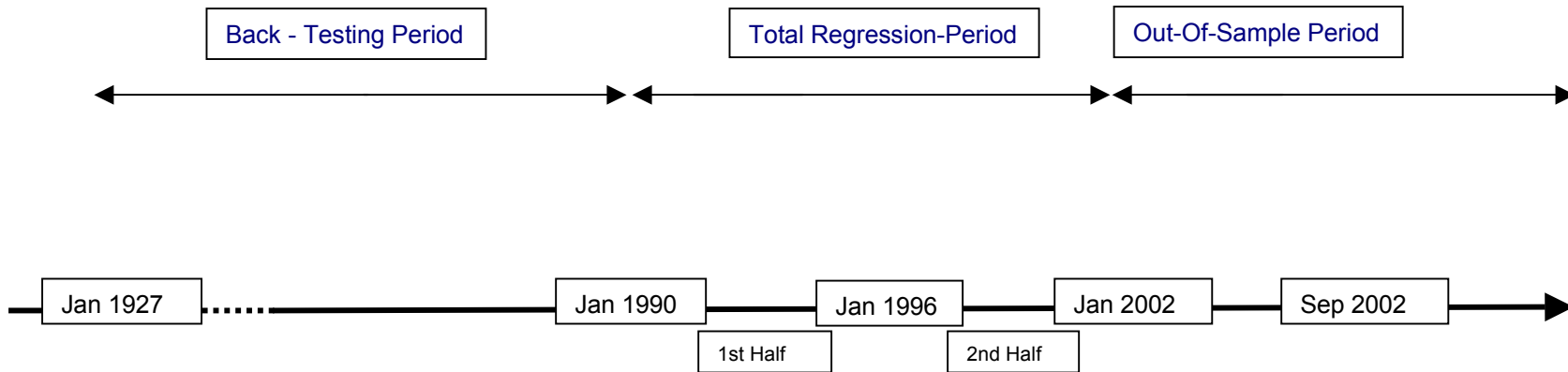
- Which Kind of Hedge Funds? (Agarwal,Naik, 2003)

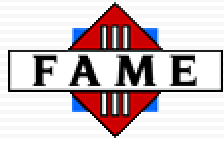
- Why Long-Short Equity Hedge Funds?

- Which Long-Short Equity Hedge Funds?



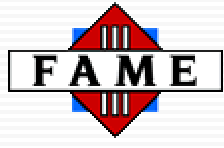
The Time Framework of Our Research





Main Results

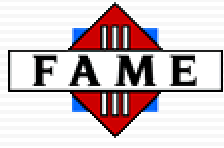
- When the market has a Sharpe ratio of -0.23 , LS hedge funds on average have 0.29 , our selected hedge funds achieve a Sharpe ratio greater than one.
- Absolute return also. In out-of-sample period, the market decreased 30% , on average the LS hedge funds generate -2.89% , and our selected hedge funds generate 8.24%
- Historical simulation of 1927 to 1990 confirms our finding.



Evaluation of Long Short Managers

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- What are the driving factors of past performance: “Luck” or “Skill”?
- “Luck”: The manager was exposed to fashionable risk factors just by coincidence.
- “Skill”: The manager picked appropriate stocks based on special information or proprietary research.



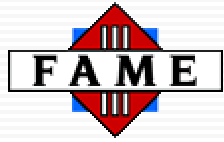
Types of Long Short Managers (I)

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First Type: “Market Timers”

- Opportunistic investment decisions drawn from publicly available information.
- Place “de facto bets”, on risk factors.
- Takes *excessive exposures* w.r.t. risk factors.

Ample evidence that “Market Timers” do not perform in the long run.



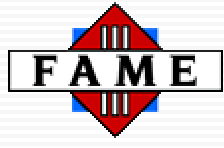
Types of Long Short Managers (II)

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Second Type: “Informed Traders”

- Select stocks individually across whole market, i.e. no sector preference per se.
- Interior research, fundamental approach.
- Investment decision based on special information.
- No “bets” on risk factors.
- Maintains *moderate exposure* to risk factors.

“Informed Traders” act skill-based and are expected to generate persistent returns across market cycles.



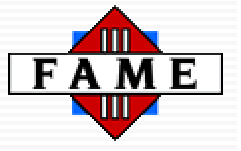
What are the Risk Factors?

Fama-French Factors

- Russell 3000 (widespread US equity index covers all sectors, caps, value and growth stocks)
- SmB (Return of a portfolio consisting of long “Small Caps” and short “Large Caps”)
- HmL (Return of a portfolio consisting of long high and short low “book-to-market” stocks)

Agarwal-Naik Factor

- GSCI (Goldman & Sachs Commodity index)

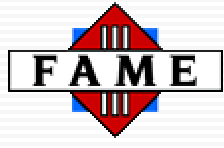


Data: Risk Factors

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Correlation					Ann. Return	Ann. Stdev
Market		1			9.66%	19.19%
SmB	0.318		1		2.08%	11.42%
HmL	0.240	0.10		1	3.47%	13.09%
GSCI	0.003	0.07	-0.10		3.39%	17.99%

- Calculation based on Data Jan. 1927-Dec. 2001 (GSCI Jan. 90-Dec. 01).
- Weak correlation among risk factors (orthogonality).
- Low returns of static long FF and GSCI exposure portfolios.
- Substantial volatility among all risk factors.

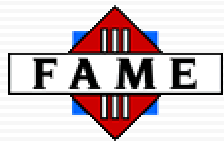


Selection Procedure

- Want to select “informed traders”
==> Select Funds with *moderate* exposure to risk factors.

- We consider 3 different models:
 - *Market Model* (Ross, 1976)
 - *Fama-French Model* (JoF, 1993)
 - *Agarwal-Naik Model* (RFS, 2003)

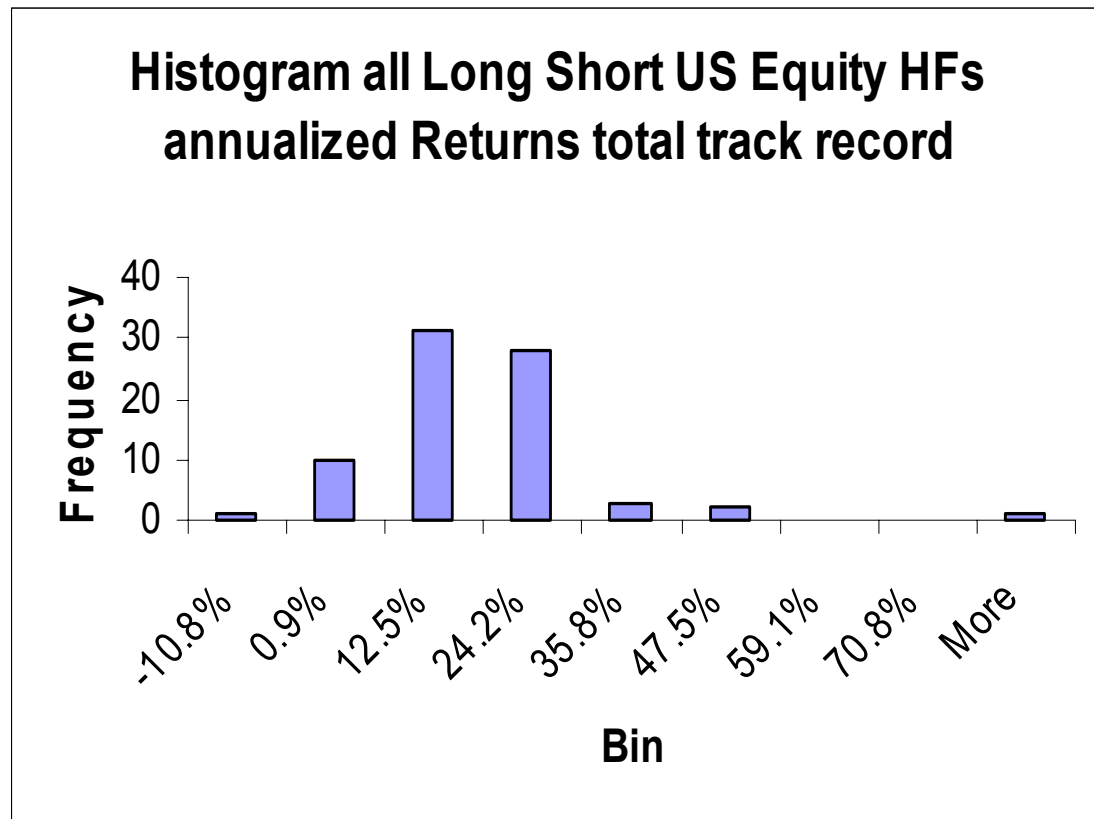
- *Objective:* Selected Funds outperform universe of HFs w.r.t.
 - Higher alpha significance.
 - Alpha persistent across market cycles.
 - Persistent absolute and risk-adjusted returns.



Summary Statistics: Hedge Funds

Average 12.26%
 Stdev 13.01%
 Skew 2.26
 Kurt 10.99

<i>Bin</i>	<i>Frequency</i>
-10.78%	1
0.87%	10
12.52%	31
24.17%	28
35.82%	3
47.47%	2
59.12%	0
70.77%	0
More	1
Total	76





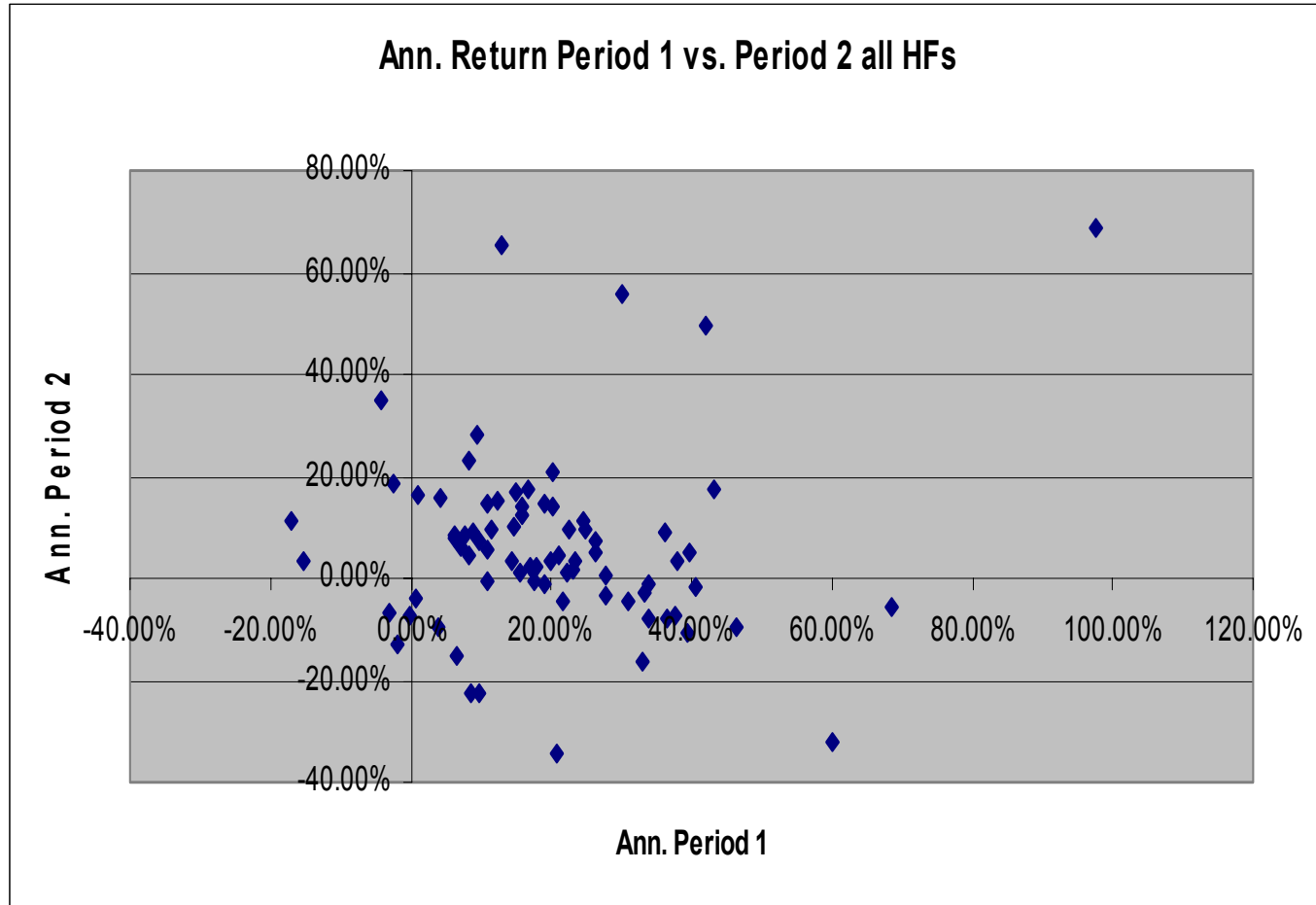
Performance Persistence: Total HF universe

1st Period

<i>Bin</i>	<i>Freq.</i>
-17.0%	1
-2.6%	3
11.7%	23
26.0%	26
40.3%	16
54.6%	4
68.9%	2
83.2%	0
More	1

2nd Period

<i>Bin</i>	<i>Freq.</i>
-34.2%	1
-21.3%	3
-8.5%	6
4.3%	27
17.2%	27
30.0%	7
42.8%	1
55.6%	1
More	3



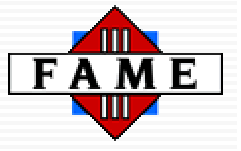


Results: Selected HFs vs. total HF universe

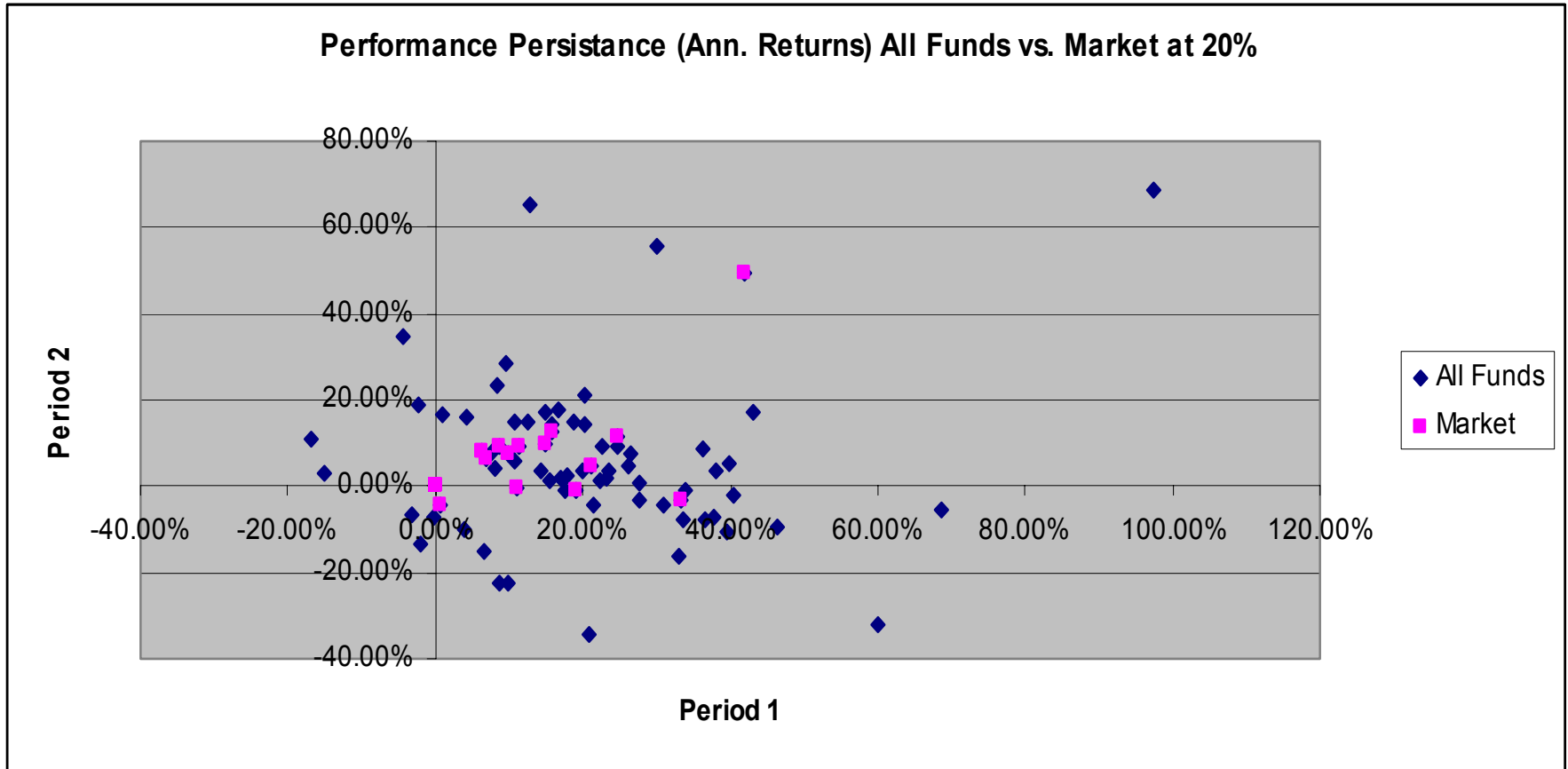
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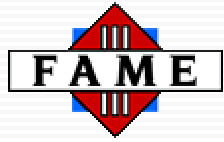
	#	Ann. Return			Ann. SR		
	funds	total	1st	2nd	total	1st	2nd
Market	n.a.	4.66%	10.55%	0.36%	-0.02	0.42	-0.23
All funds	76	12.26%	20.06%	6.06%	0.66	1.22	0.29
t_0		8.22	9.78	2.97	5.79	9.26	1.62
t_mkt		5.1	4.64	2.8	5.93	6.04	2.94
Sel_Mkt	15	11.83%	15.47%	8.54%	0.95	1.39	0.58
t_mkt		2.68	1.72	2.54	3.45	3.01	1.89
t_fds				0.52			0.66
Sel_FF	19	11.37%	15.14%	7.79%	1.21	1.84	0.76
t_mkt		5.45	3.07	4.18	4.37	4.98	2.73
t_fds				0.41			1.19
Sel_GSCI	12	10.86%	13.56%	8.28%	1.29	1.78	1.01
t_mkt		3.36	1.54	3.2	3.31	3.16	2.83
t_fds				0.42			1.52

- *Scenario*: 1st period market up. 2nd period market flat.
- All HFs outperform *market* at 95% C.L.
- FF-GSCI selected funds out-perform *risk-adjusted returns* of total universe at 85% C.L.
- FF-GSCI selected funds preferably for ST and MT *risk management*.

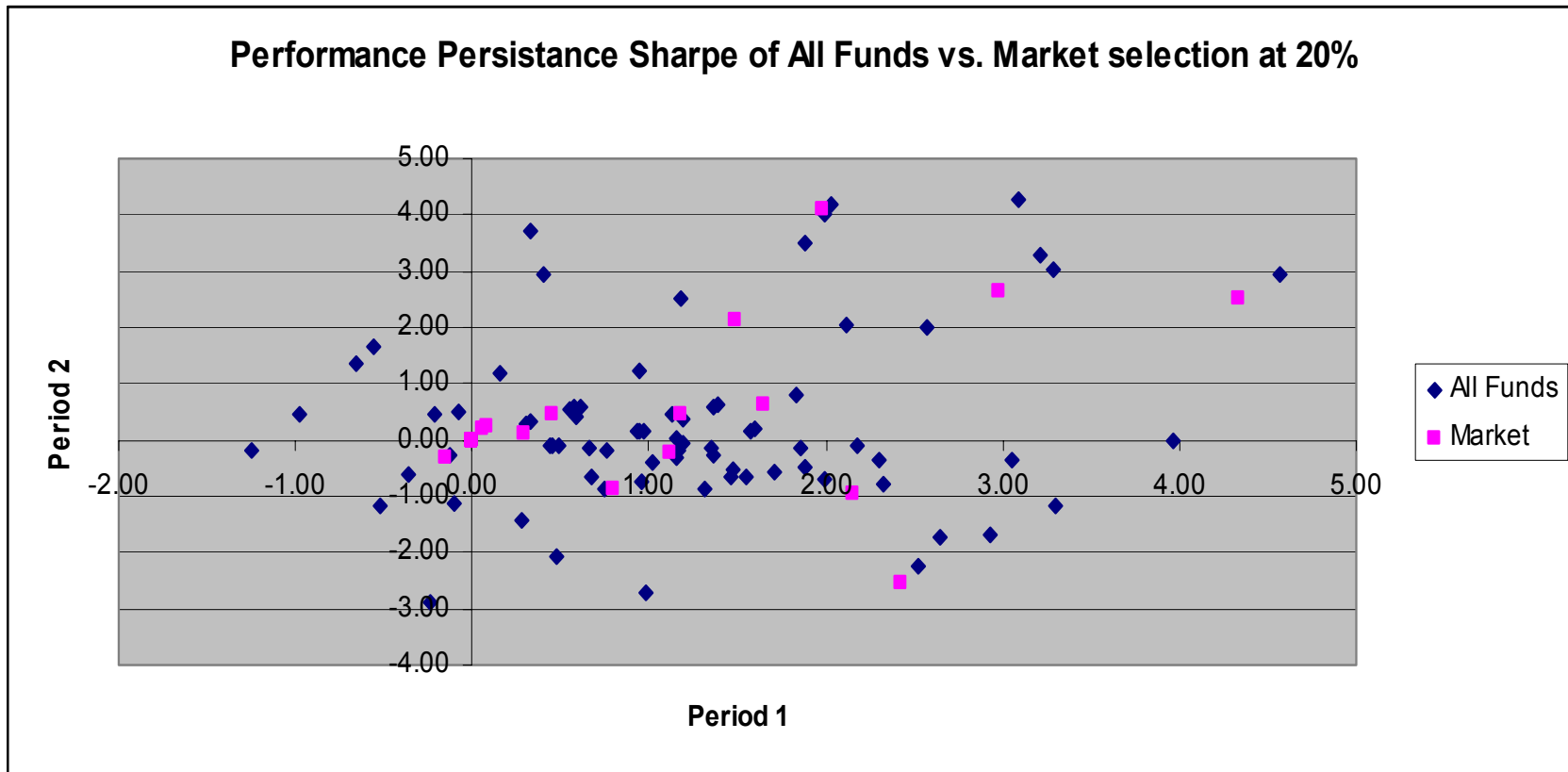


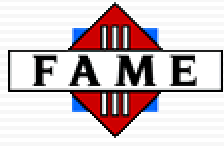
Persistence of annualized returns: Market Model



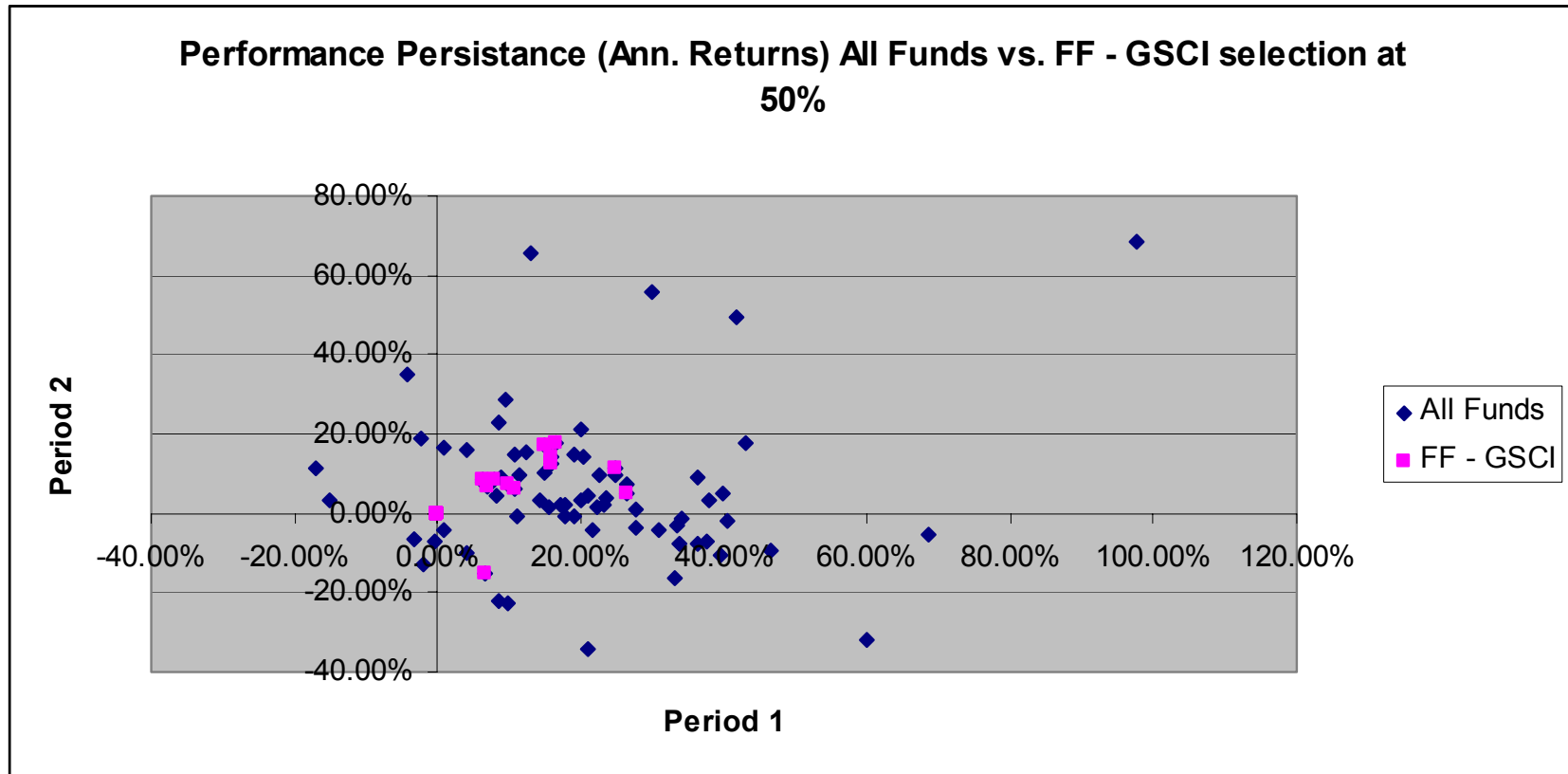


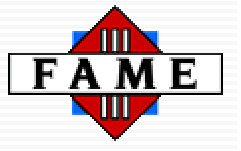
Persistence of annualized Sharpe: Market Model



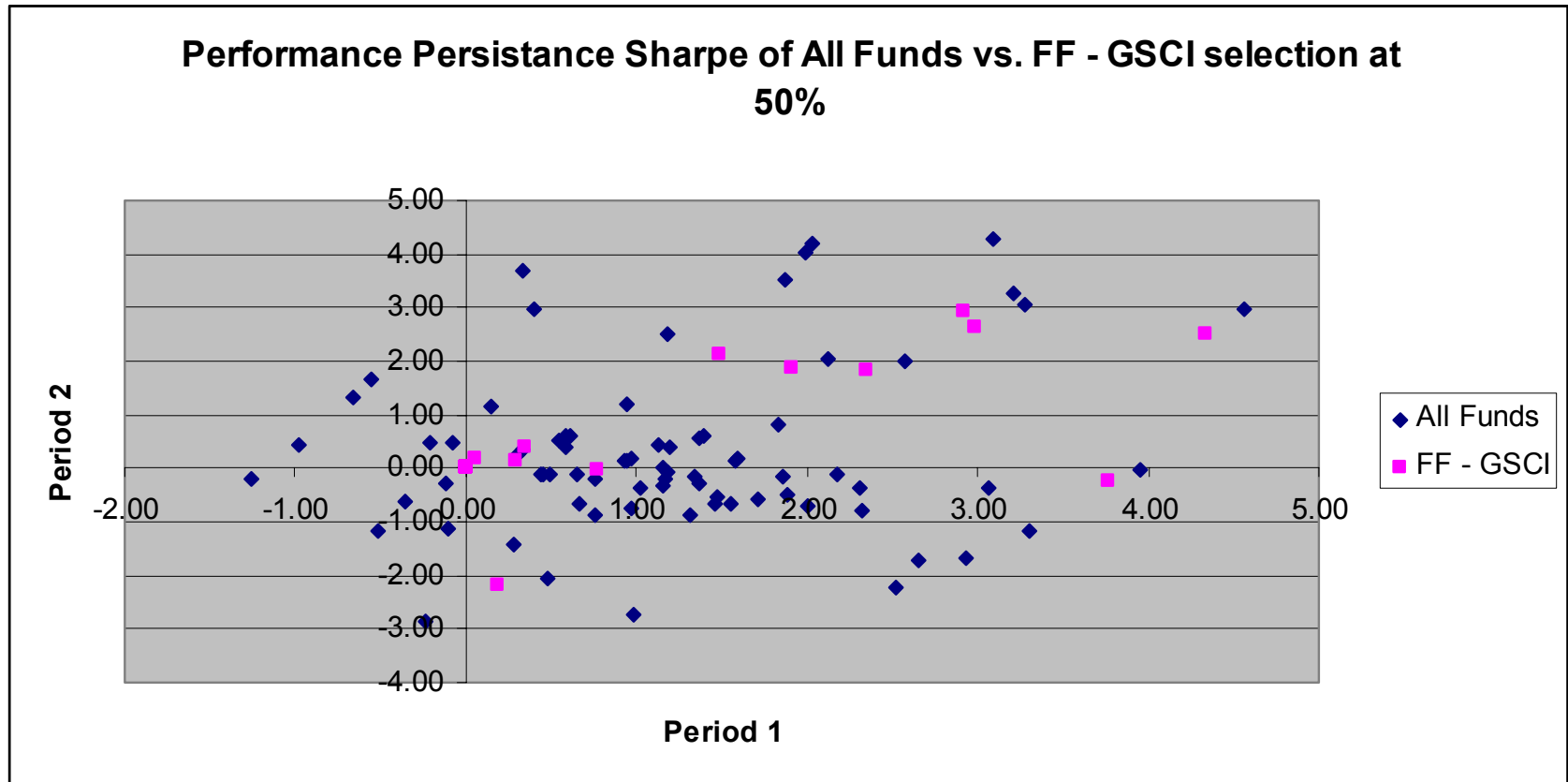


Persistence of annualized returns: FF-GSCI Model





Persistence of annualized Sharpe: FF-GSCI Model





Persistent Alpha Generation of (De-) Selected Hedge Funds

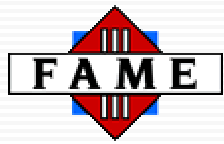
Selected

	# funds	total	1st	2nd
Mkt.mod	15	1.05%	1.22%	0.73%
t_0		5.8	6.15	3.61
FF.mod	17	1.01%	1.16%	0.84%
t_0		12.39	11.78	7.68
GSCI.mod	11	0.95%	1.00%	0.75%
t_0		13.03	6.78	9.81

De-Selected

	# funds	Total	1st	2nd
GSCI.mod	11	1.30%	1.70%	0.20%
t_0		1.43	2.55	0.42

- All funds selected generate significant alpha.
- FF-GSCI model selects those funds with highest significance.
- No significance of alpha for high exposure HFs.



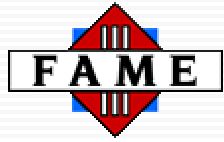
Out-of-Sample: Bear Market of 2002

	# funds	Annualized Return	Annualized Stdev	SR
All Funds	58	-2.89%	11.48%	-0.87
t_0		1.25	11.81	4.24
Mkt-Selected	10	8.24%	5.97%	0.07
t_0		2.61	7.24	0.14
FF-Selected	14	5.24%	5.76%	-0.46
t_0		2.1	8.68	1.18
FF-GSCI Selected	9	7.31%	4.90%	0.04
t_0		3.2	7.75	0.09

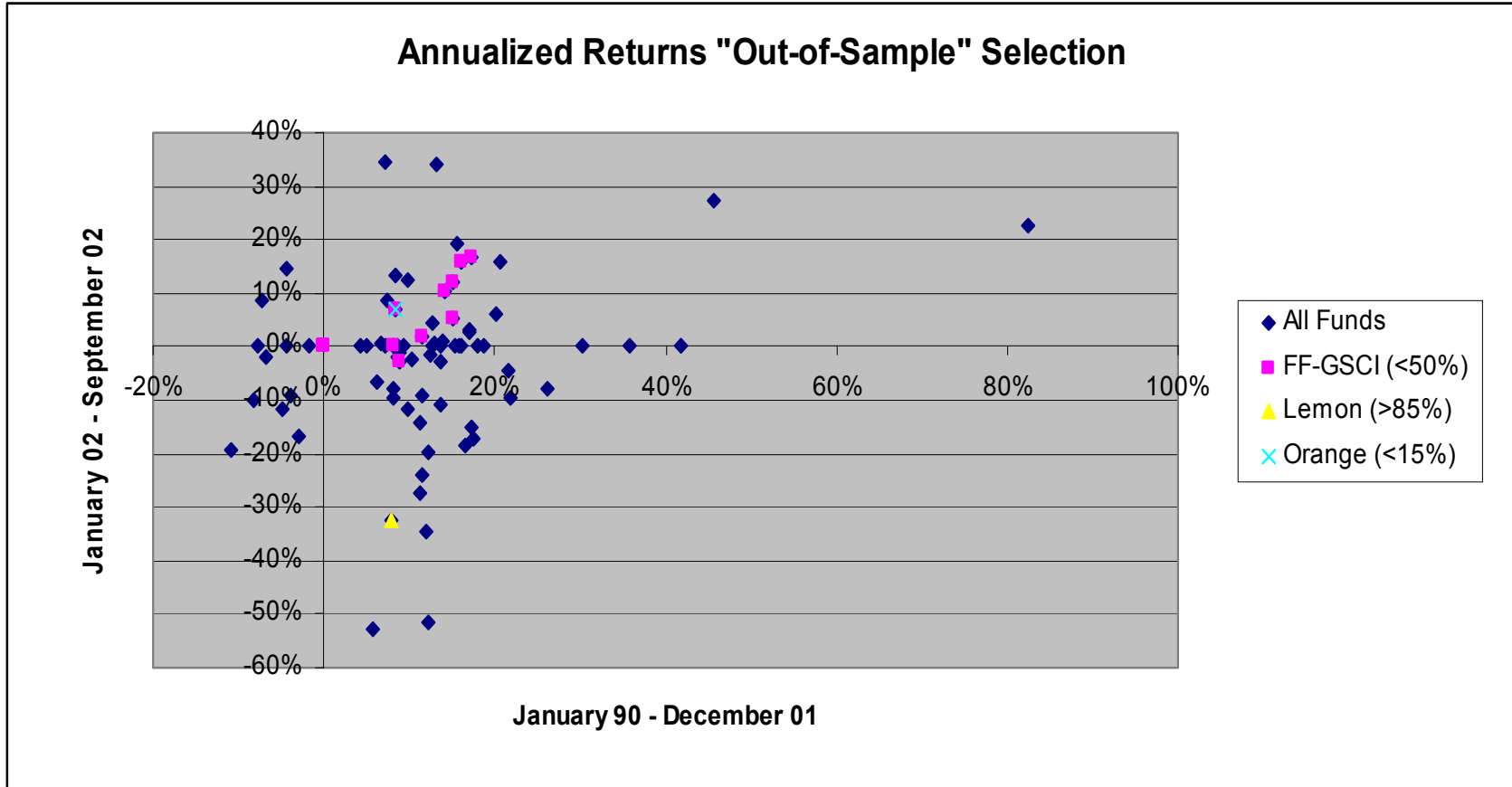
- Hedge fund universe dissapoints, significant negative (risk adjusted) returns.
- Market selected signif. at 95%.
- FF-GSCI selected signif. at 99%.
- *Surprise:* Despite -37% drawdown of S&P500 FF-GSCI returns have higher signif. than market selected HFs.

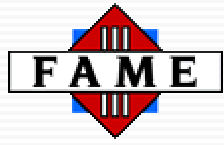
Lowest vs
Highest
exposure funds:

	Annualized	"Lemon"	"Sugar"
Return		-32.43%	6.84%
Stdev		26.99%	5.96%
SR		-1.42	0.14
last datapoint		Nov-02	Dec-02

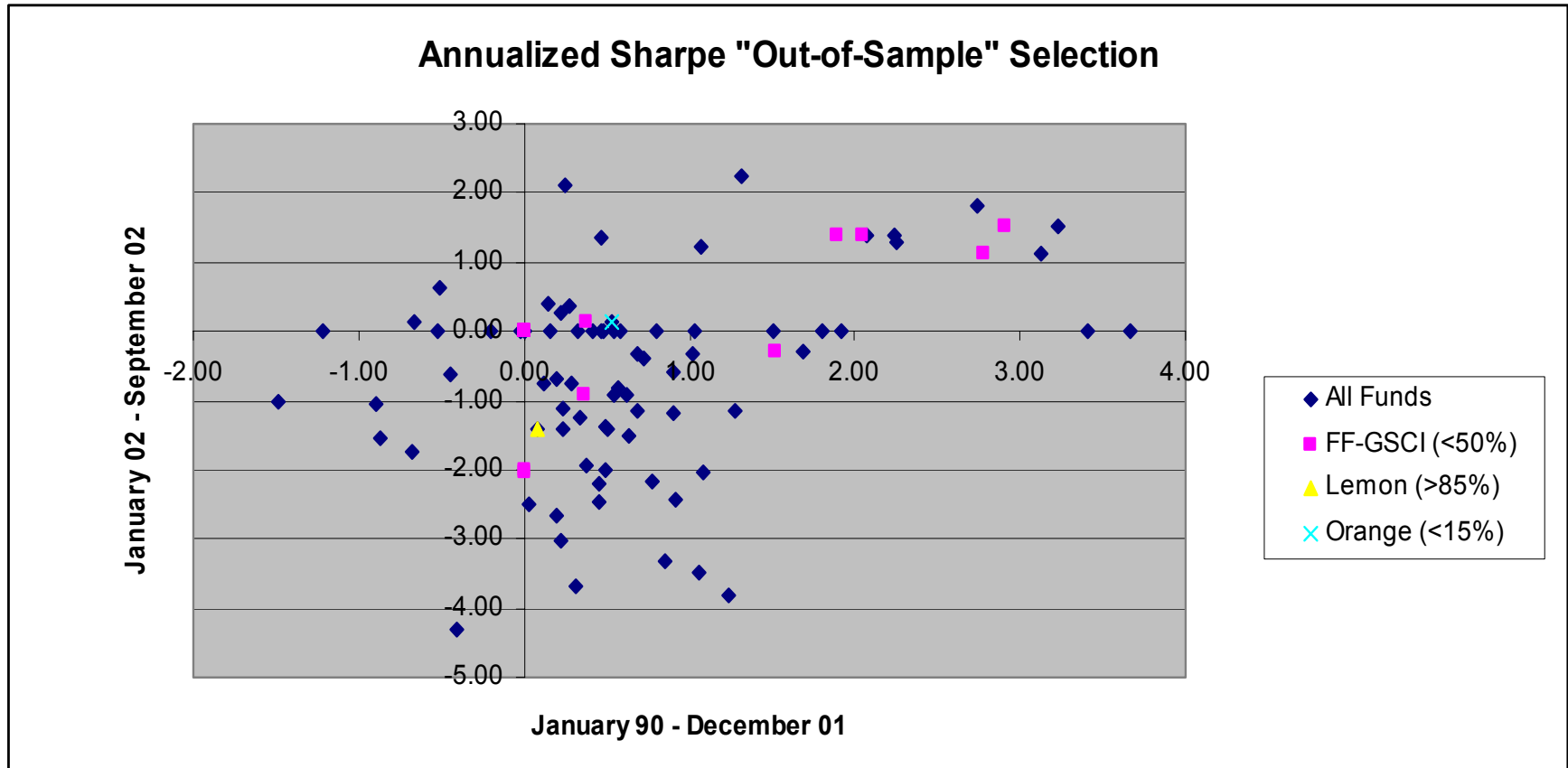


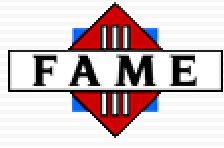
Persistence of annualized Return: Out-of-Sample, Bear Market





Persistence of annualized Sharpe: Out-of-Sample, Bear Market

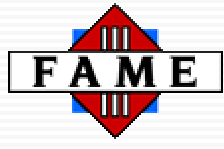




Out-of-Sample: Bull Market

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- To make our result more convincing, we also tested our strategy with the bull market.
- Time period: January 1999 to March 2000, which is an extremely bullish market.
- Our selected hedge funds perform well too. On average, they generate annual return of 9.7%

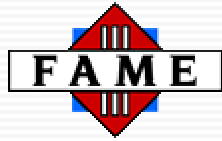


Historical Simulation of Jan. 1927 – Dec. 2001

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	Return	Stdev	SR
Market	9.66%	19.19%	0.19
FF Model all HFs	16.18%	10.36%	2.54
t_0	9.45	10.64	4.87
FF selected HFs	14.00%	2.08%	6.45
t_0	6,56	6.04	3.95

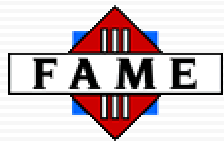
- Universe of Hedge Funds out-perform market even in the long run, in spite of Black Friday of 1929 and Black Monday of 1987.
- FF selected HFs show superior risk adjusted returns compared to total HF universe in the long term view.
- No significant skewness of returns for LS equity HFs.



Conclusion

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- Universe of hedge funds out-perform market across all market cycles
 - FF-GSCI selected LS hedge funds out-perform universe of HFs:
 - « Flat markets: » Risk-adjusted returns at C.L. 85%
 - « Bear markets: » Risk-adjusted and absolute returns at C.L. 95%
 - « Bull markets: » No discrimination of HFs with moderate exposure expects outperformance w.r.t. low market beta funds.
 - Selected HFs exhibit superior risk-adjusted returns in LT perspective
 - Outlook: Try to introduce other factors such as:
 - Analysts per share invested.
 - Average holding period per share, etc.
- To distinguish “type 1” and “type 2” managers. Furthermore, application to other geographic regions, benchmarks, e.g. Europe, MSCI world index.



Regression: Total Trackrecord Jan 90-Dec 01

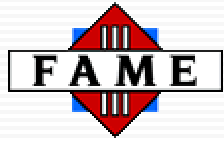
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Market	GSCI	HmL	SmB	Mkt	Alpha	R²	F	df	adj. R²
average				0.36	0.01	32.1%	98.06	67.39	
t_value				5.30	8.07	10.36	2.82	13.90	
Fama-French									
average		-0.03	0.09	0.31	0.98%	42.9%	56.67	65.39	39.6%
t_value		-0.98	2.14	5.20	9.06	13.38	2.58	13.49	
FF-GSCI									
average	0.05	-0.04	0.10	0.29	0.01	46.6%	39.09	57.37	41.0%
t_value	3.32	-1.20	2.24	4.86	8.48	14.65	2.88	11.88	



Splitting Regression: Half-Half Jan 90-Dec 01

Market	GSCI	HmL	SmB	beta	alpha	R ²	Adj.R2	F	df
1st				0.39	1.22%	34.5%		56.51	33
t_0				5.53	8.02	9.83		3.74	
2nd				0.31	0.88%	33.6%		56.16	35
t_0				4.50	6.54	9.58		2.55	
Fama-French									
1st		-0.03	0.09	0.36	1.28%	0.45	39.4%	29.18	32
t_0		-0.86	1.92	5.74	9.59	13.02	10.50	3.53	
2nd		-0.06	0.11	0.26	0.74%	0.48	44.0%	35.52	33
t_0		-1.46	2.78	4.07	5.98	13.75	11.57	2.36	
FF-GSCI									
1st	0.03	-0.05	0.15	0.37	1.18%	46.2%	37.5%	20.78	31
t_0	1.37	-1.13	2.72	4.79	6.80	13.39	9.22	3.70	
2nd	0.02	-0.06	0.09	0.27	0.91%	51.7%	45.1%	27.15	32
t_0	0.99	-1.66	1.95	3.64	5.52	14.88	11.52	2.59	



Current Research Agenda

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- **Theoretical Study.**
 - Calibrating the skewness and kurtosis preference of investors (joint with M.Rockinger).
 - Asset allocation with hedge funds.
 - VaR and Expected Shortfall Estimation (involving hedge funds).

- **Experimental Study.**
 - Investor's behavior toward strange returns pattern like hedge funds.

- **Corporate Governance.**
 - Governance structure matters to the performance and survival of hedge funds (empirical evidence).