Identifying Successful HF Strategies for Investing in Emerging Markets

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1. EMERGING MARKETS - A BEACON OF HOPE

The inevitable has finally happened. The sub-prime crisis that has resulted from the real estate bust in the US has destroyed investor wealth worth trillions of dollars across the world. The burst has claimed high profile investment banks like Bear Sterns, Lehman Brothers, AIG, one of the most venerable insurers in the world. The US government is planning to make provisions for an $700 billion bailout package that would buy all the bad loans and related products sold by US commercial and investment banks.

A downshift of US consumption growth will affect Asia unevenly. Rapidly growing emerging economies like India and China have ample cushion to withstand such a blow, whereas Asian countries like Japan, South Korea may see the downturn. Thus, hedge fund managers are lining up to hedge their investments in emerging markets. But emerging markets are in incubation stage with lack of proper regulatory measures and research options. This report gives overview of hedge fund strategies in emerging economies.

OBJECTIVES OF THE STUDY

- To identify and analyze HF strategies in emerging markets which have or are expected to provide superior returns in the near future.
- To study the pattern of emerging market hedge funds allocating their research budgets and sourcing the required research type for making an investment decision.

2. STRATEGIES PREVALENT IN EMERGING MARKETS

2.1) Long/ short Equity strategy involves equity orientated investing, on both the long and short side of the market, so as not to be market neutral. The manager has the ability to shift from value to growth, small, medium to large capitalization stocks, and net long to net short positions.

2.2) Convertible Arbitrage involves hedged investing in the convertible securities of a company. A typical investment position is long the convertible and shorts the common stock of the issuer, designed to generate profits from the bond and the short sale, while protecting principal from directional market moves.

2.3) Event Driven Strategies are characterized by equity-oriented investing designed to capture price movement generated by an anticipated corporate event including risk arbitrage, distressed securities investing, Regulation D investing and high-yield investing.

2.3.1) Risk Arbitrage specialists invest simultaneously in long and short positions in both companies involved in merger or acquisition. Risk arbitrageurs, typically long the stock of the company being acquired and short the stock of the acquiring company.

2.3.2) Distressed Securities funds invest in the debt, equity or trade claims of companies in financial distress and bankruptcy. In this context, distressed means companies in need of legal action or restructuring to revive them.

2.3.3) Regulation D involves investing in micro and small capitalization public companies who raise money in private capital markets. The fund manager can invest via stock, convertibles or other derivatives. Investments usually take the form of receiving a convertible bond or convertible preferred issue in return for an injection of capital.

2.3.4) High yield involves applying a buy/hold trading strategy to high yield securities fund. Managers may buy the high yield debt of a company that they think can credit upgrade or that might be in a position to redeem the outstanding high coupon issue. Portfolio securities are generally sold when they reach upside or downside price targets, or if the issuer of the securities, or industry fundamentals change materially.

2.4) Equity Market Neutral is designed to exploit equity market inefficiencies and usually involves being simultaneously long and short matched equity portfolios of the same size within a country. Market neutral portfolios are designed to be either beta or currency neutral or both.

2.5) Fixed Income Arbitrage attempts to profit from price anomalies between related interest rate instruments. The majority of managers trade globally, although a few just focus on the US market. In order to generate returns sufficient to exceed the transaction costs, leverage may range 10 to 150 times the NAV employed.

2.6) Emerging Markets Strategies involve equity or fixed income investing focusing on emerging markets

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around the world. Certain commentators regard emerging market hedge funds as a contradiction in terms of the above. Many of the emerging markets do not allow short selling, nor do they offer viable futures or other derivative products with which to hedge.

2.7) Managed Futures traders, also called commodity trading advisers (CTAs), trade in the listed financial and commodity futures markets around the world. They may also trade in the global currency markets. Most traders apply their individual disciplines to the markets using a systematic approach; while a small percentage uses a discretionary approach.

2.8) Relative Value Strategy covers a variety of low volatility trading strategies with the consistent theme of attempting to reduce market risk. In other words, the fund manager seeks to generate profit regardless of the direction in which the market is moving.

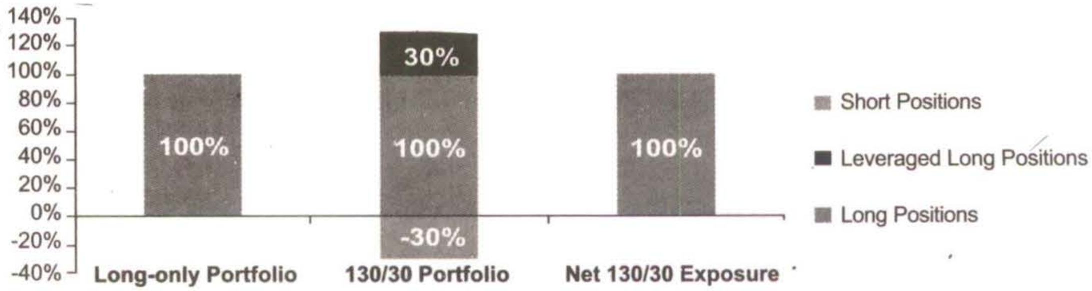
2.9) Multi Strategy hedge funds use several strategies within the same pool of assets. They might seek returns from running money focused on shorting equities, investing in global real estate projects, and seeking momentum focused event driven strategies. The diversification benefits help to smooth returns, reduce volatility and decrease asset-class and single-strategy risks.

3. STRATEGY EXPECTED TO PROVIDE SUPERIOR RETURNS IN EMERGING MARKETS

130/30 STRATEGY

Investors are increasingly considering 130/30 strategies as an alternative to long-only portfolios because:

1. Managers can take larger active weights in individual holdings, specifically when under- weighing stocks.
2. Assuming the manager is skillful, the risk-adjusted excess returns should be higher than long- only strategy.
3. The benefits of constrained shorting is palatable to some investors with limited experience investing in long/short equity strategies.



FORMULA OF TRACKING -ERROR

The information ratio (tracking error) measures the excess return generated by an investment manager to the amount of risk the manager takes relative to a benchmark (tracking error).

$$IR_a = \frac{\overline{R}_a - \overline{R}_m}{\sigma_{ER}}$$

Where:

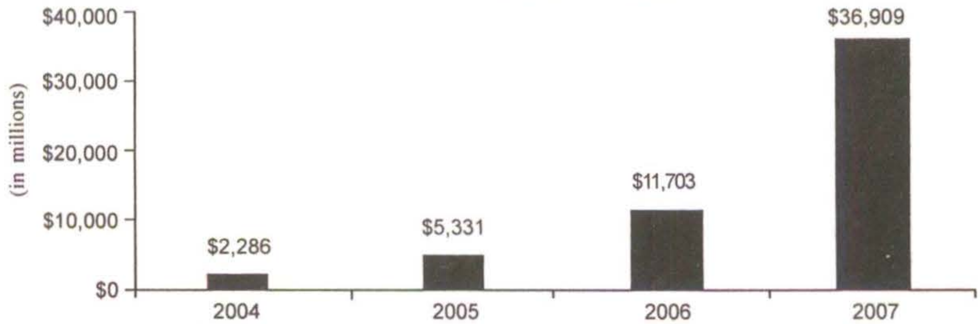
IR_a = Information Ratio of Asset

R_a = Annualized Asset Return

$\overline{R}_m$ = Annualized Benchmark Index Return

σ_{ER} = Annualized Standard Deviation of Excess Return (Tracking Error)

Growth in 130/30 Assets



PERFORMANCE- ANALYSIS OF 130/30 STRATEGY

The tracking error for different strategies obtained is as follows:

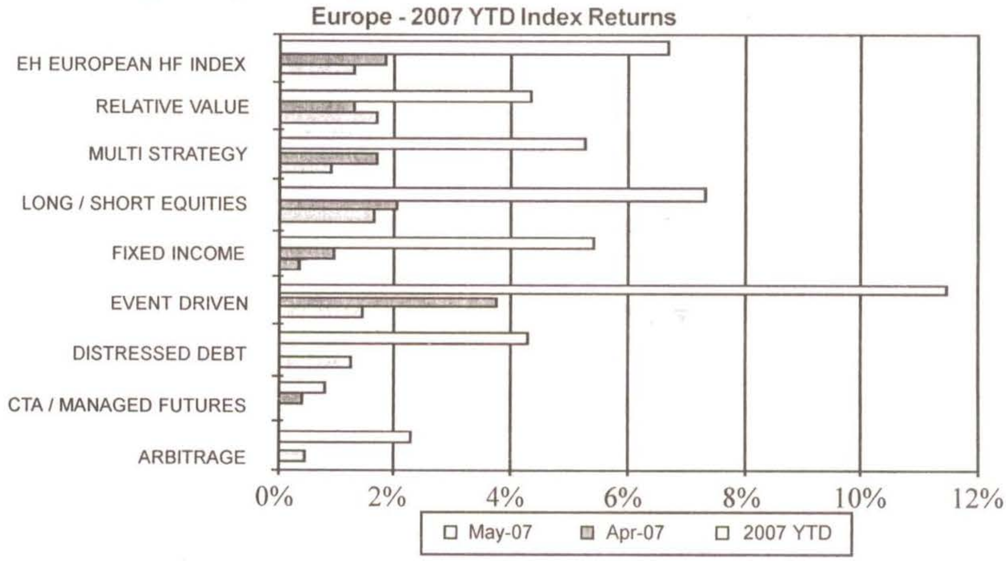
Measures	100/0	120/20	130/30	140/40
Total weight	1.0000	1.0000	1.0000	1
Total of negative weights	0.0000	0.2000	0.3000	0.400001
Portfolio				
Mean returns	0.0022	0.0093	0.0129	0.016452
Standard Deviation	0.0306	0.0291	0.0284	0.027638
SENSEX				
Mean returns	-0.0009	-0.0009	-0.0009	0.00086
Standard Deviation	0.0219	0.0219	0.021	0.021882
INFORMATION RATIO	0.1017	0.3509	0.4852	0.626504

1) **100/0**: The tracking error of 10.17% indicates that the excess return the manger gets over the benchmark by investing in 'long only' strategy.
2) **120/20:** As the manger is taking more risk as compared to the 'long-only'(100/0) strategy, the tracking ratio has increased to 35.09 % which indicates that as the proportion of risk increases, the excess return over the benchmark also increases.
3) **130/30**: This is a thumb rule strategy used in most of the emerging markets to benefit from the volatility existing in emerging markets. It is static in nature and needs to be altered in accordance with the market dynamics.
4) **140/40**: The tracking error of 62.65% indicates a much superior returns over long only strategy. But a manger is advised to remain within a limit according to the discretion of the manager beyond which there is a risk of loss.

4. PERFORMANCE OF HEDGE FUNDS IN EMERGING MARKETS (APRIL-MAY 2007)

4.1 Eastern Europe:

European equities rose considerably in May (2007), with major regional equity indices such as FTSE and DAX at multi-year highs, as strong economic growth and rising confidence in the region drove prices higher. This is naturally reflected in the performance of equity long/short funds (1.6%) in the region. "Event driven" was another of the better performing strategies during the month (1.5%), given the rise in M&A activity, particularly in the banking and utilities sectors coupled with the release of strong GDP data, the interest rate hike in the UK and signals of further monetary tightening by the European Central Bank led to a fall in debt prices and weakening of the Euro. Currency trading was not as profitable in May, with losses coming in from long-euro positions. These factors have somewhat dampened the overall performance of European hedge funds during this period, as reflected in the relatively modest 1.3% returned by the Eureka hedge European Hedge Fund Index for the month.



4.2 Asia ex-Japan (during the period April-May 2007)

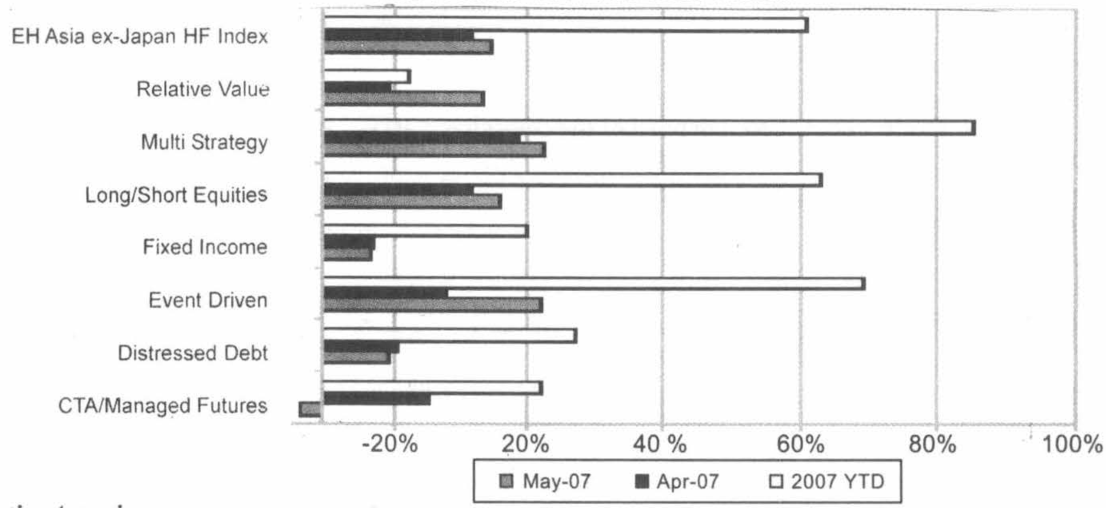
For the third month in a row, Asia ex-Japan contributed the most to hedge fund returns globally; the Eureka hedge Asia ex-Japan Hedge Fund Index advanced a whopping 4.9% in May. Again, these returns were also broad-based, with strategy-wise returns upwards of 1% almost across the board.

To reiterate what has been mentioned elsewhere in the write-up, market movements during the month were, for the most part, a continuation of those in April – strong corporate earnings data, ebbing inflation concerns and an influx of liquidity – coupled with the concentration of emerging market opportunities, explain hedge fund returns in the region.

In China, regulatory measures were stepped up in an effort to dilute speculation in the markets (such as tripling the stamp duty, raising the interest rate, etc). Although this resulted in a 6.5% fall in China's A-share market, it proved to be a mere blip as equity prices rebounded strongly to close the month up 7%. Also, unlike in February, this "blip" had little effect on other markets in the region or otherwise.

Indian equities, on the other hand, repeated their April performance by rising another 6.5% in May on the back of a strongly positive results season. In Australia too, the ASX 300 rose 2.6% in May, with M&A deal flow continuing at a high rate. In Korea, improving external (strong exports) and internal (industrial production) macro-conditions lent support to a continued rally in equities; the KOSPI rose 10.3% for May-2007.

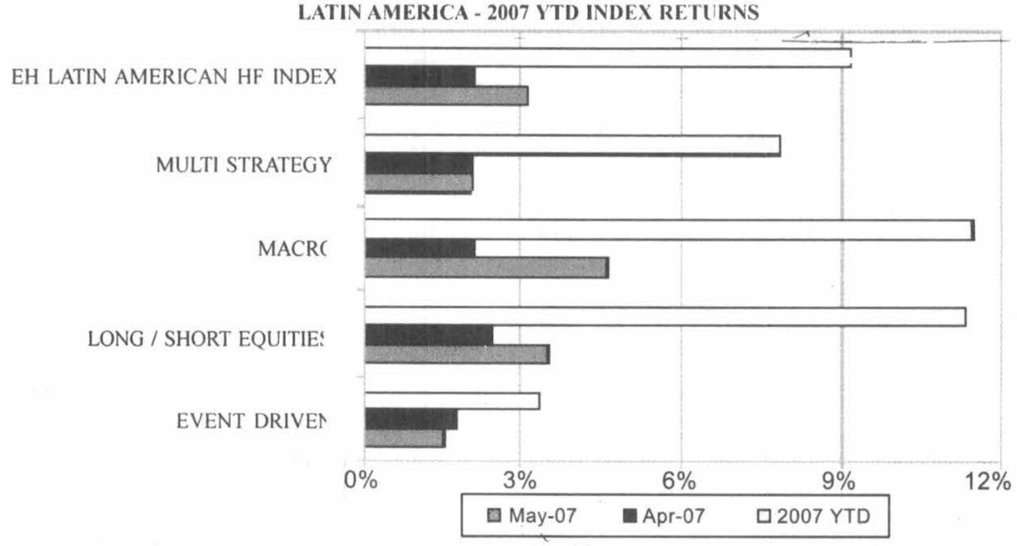
Asia ex-Japan - 2007 YTD Index Returns



4.3 Latin America

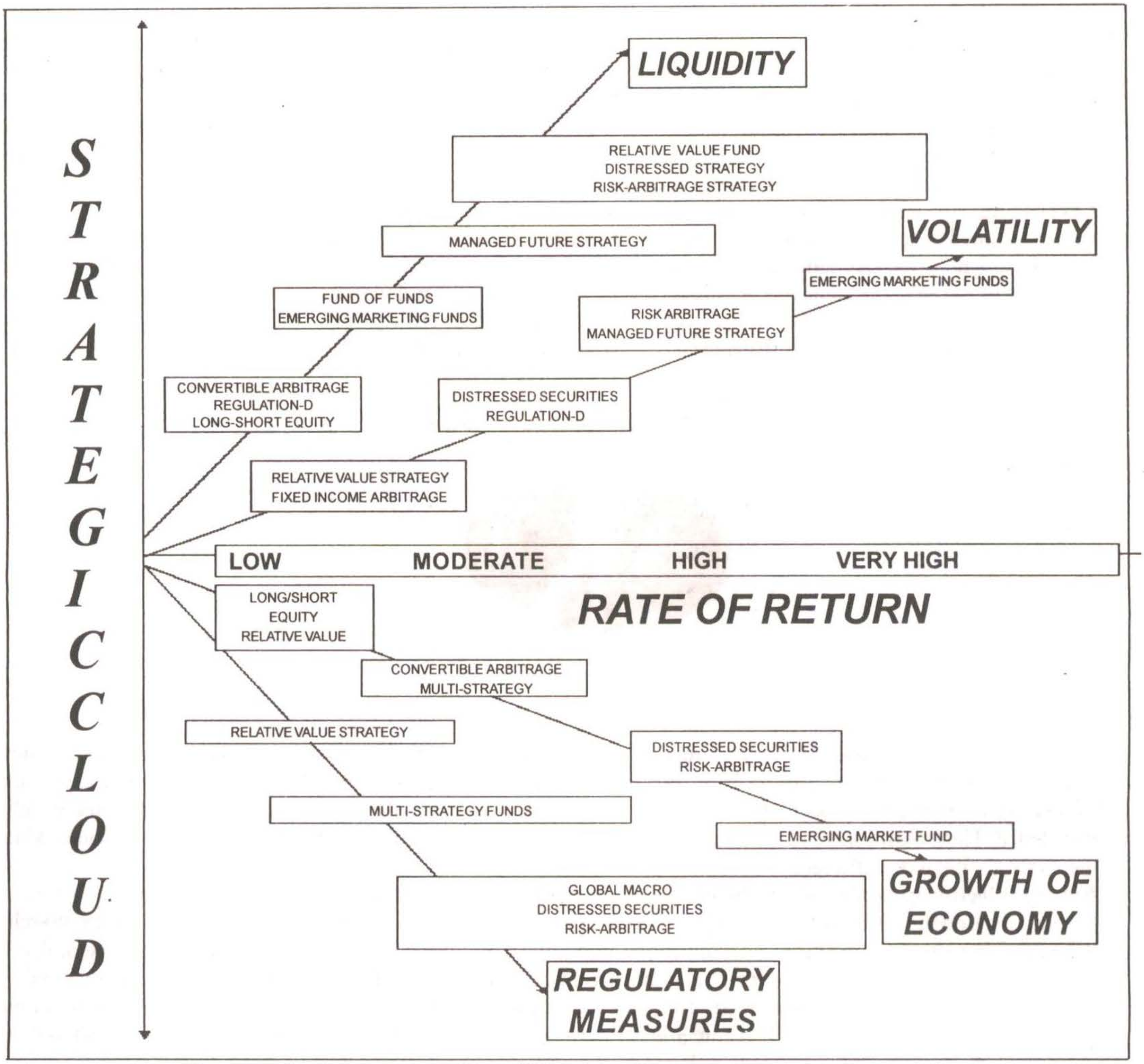
The Eureka hedge Latin American Hedge Fund Index posted a robust and broad-based return of 3.1% for May, as regional equities rallied on the back of strong earnings reports, expected earnings growth and capital inflows. The Brazilian equity index "Ibovespa" rose 12.8% in May. The region is also no exception to the global theme of buoyant M&A activity, with both Chile and Brazil witnessing consolidation in the retail sector. As a result, in line with global trends, this market environment was conducive for most related strategies such as long/short (3.5%), directional macro (4.6%) and event driven (1.5%).

LATIN AMERICA - 2007 YTD INDEX RETURNS



5. CURRENT PERFORMANCE OF HEDGE FUNDS

According to Chicago-based industry data provider Hedge Fund Research, hedge funds offering exposure to emerging markets saw their AUM fell by nearly 5% in the first quarter of 2008, with total capital declining from more than USD 115bn at the end of last year to about USD 110bn. The decline is in sharp contrast to recent trends that have seen



emerging market hedge funds boost their assets more than fourfold since 2002. Despite the weakness in performance, investors continued to allocate capital to the sector, which attracted nearly USD 600mn of net new inflows during this quarter. Latin America and African markets were popular among investors. The quarter ended with net increases in assets, while Russia and Eastern Europe also continued to attract capital, with investors allocating more than USD 400mn to these funds. In spite of the market volatility, the total number of funds investing in emerging markets rose from 1,020 to around 1,050.

6. STRATEGIC CLOUD MATRIX

The strategic cloud matrix represents the effect of four factors: liquidity and volatility of the market, growth of economy and regulatory measures. These factors affect the hedge fund strategies that are prevalent in the emerging markets and rate of return. The rate of return in this matrix is the underlying result that any investor in the fund would expect.

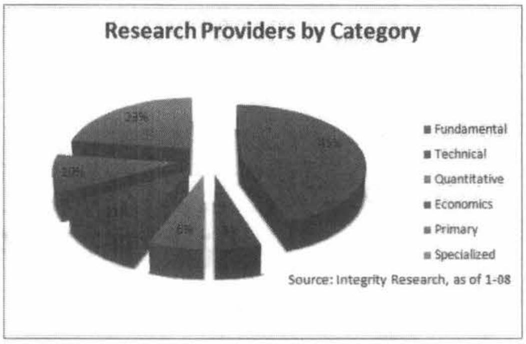
7. QUALITY RESEARCH OPTIONS AND RESEARCH BUDGETS IN EMERGING MARKETS

Over the years, there has been a proliferation of hedge funds looking to get an edge over its competitors. Research aspect of a company is one area where maximum cost cutting can be infused. Although overall spending is almost flat, proportion in-house spending has been increasing. Money managers are expected to spend $7.4 billion, 28% increase in 2011 from $5.8 billion in 2006.

Hedge funds - accounting for approximately 70% of equity based commissions, demand value for their research spend, and are finding less and less of this value emanating from the bulge bracket sell-side firms.

But there are certain stipulated ways through which the hedge funds use their research budget:

- **Building in-house research capabilities**. While not every firm has the budget and the scale to undertake such an effort, those who can do so are keeping idea generation inside the firm. By doing this, these firms are fully bi-furcating the research decision from the execution decision, maximizing quality control while minimizing costs.
- **Leveraging alternative research tools**. A new type of tool vendor has emerged over the past few years, one that is designed to aggregate, parse and analyze information from a wide range of disparate sources, with an eye towards mitigating the signal/noise problem that plagues the research analyst, portfolio manager and trader. Monitor 110 is one of the new-age financial intelligence vendors. It helps institutional investors cast wide information net without having the internal resources necessary to staff such an effort. According to Greenwich Associates, the average number of research firms used by hedge funds increased from 57 to 75 research providers in 2007.



- **Engaging expert networks.** Rather than relying on sell-side research analysts to do general legwork, which is then broadly disseminated across hundreds or thousands of clients, an increasing number of institutional investors are using targeted expert networks to mine for the data they really need. And their findings aren't published and widely distributed. This, like the alternative research tools, is a vehicle for maximizing return on human capital and making the analyst's job more efficient.
- **Buying selective independent research**. There are certain boutique research shops that are very good at what they do, so good that arrays of investors are willing to pay for their work. However, like classic sell-side research, this suffers from the "diminishing value of information" conundrum: as the company becomes more successful, the value of its research declines as its insights is more widely known, causing the information's value to decay rapidly.
- **Buying selective sell-side research:** There are some good options for this kind of research being put out by bulge market firms. Problem is, it is few and far between and not sufficiently pervasive such that it should be purchased on anything but an a *la carte* basis by the buy-side firms.

8. CONCLUSION

As emerging markets in emerging economies have become more efficient, managers are seeking innovative strategies that can deliver consistent alpha (excess return over their benchmarks). Strategies such as 130/30 portfolios, green-hedge funds, Litigation funding, which are among the most recent and most discussed, are receiving significant fund inflows. Investors are increasingly using these strategies as an alternative to long-only portfolios. It has also been seen that the emerging markets have become more dynamic and volatile which makes it necessary for the fund manager to be more flexible and adaptable in his hedge fund strategies.

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- **"Do hedge funds affect emerging markets?"** William Fung, David A.Hsieh,2000
- **"Hedge Funds, Concepts and Cases"**, Ravi S Madapati, ICFAI university.

LIST OF WEBSITES:

- www.hedgefundreserach.com
- www.E-Hedge.com
- www.eurekahedge.com
- www.hedgeblogger.com

ANNEXURE

RETURNS OBTAINED WITHOUT SHORT-SELLING (BULLISH MARKET- 100% LONG)

	Prices							daily returns							
DATE	NTPC	REL POW	GVK pow	AXIS BNK	HDFC	ICICI	SENSEX	NTPC	REL POW	GVK pow	AXIS BNK	HDFC	ICICI	SENSEX	portfolio returns
01/04/2008	195.15	200.81	38.40	721.65	1309.55	757.75	15626.62	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%		
02/04/2008	193.80	204.53	37.50	744.60	1328.00	784.55	15750.40	-0.0069	0.0185	-0.0234	0.0318	0.0141	0.0354	0.0079	0.0185
03/04/2008	193.95	206.78	40.25	744.20	1331.15	786.75	15832.55	0.0008	0.0110	0.0733	-0.0005	0.0024	0.0028	0.0052	0.0110
04/04/2008	189.30	201.66	39.20	714.45	1293.85	764.55	15343.12	-0.0240	-0.0248	-0.0261	-0.0400	-0.0280	-0.0282	-0.0309	-0.0248
07/04/2008	190.20	208.66	39.10	751.15	1303.40	811.30	15757.08	0.0048	0.0347	-0.0026	0.0514	0.0074	0.0611	0.0270	0.0347
08/04/2008	186.65	219.56	39.15	758.75	1308.55	814.00	15587.62	-0.0187	0.0522	0.0013	0.0101	0.0040	0.0033	-0.0108	0.0522
09/04/2008	187.55	226.56	38.90	797.70	1379.85	836.60	15790.51	0.0048	0.0319	-0.0064	0.0513	0.0545	0.0278	0.0130	0.0319
10/04/2008	186.00	224.06	43.10	777.95	1326.55	800.95	15695.10	-0.0083	-0.0110	0.1080	-0.0248	-0.0386	-0.0426	-0.0060	-0.0110
11/04/2008	186.85	226.94	44.45	759.95	1330.05	788.05	15807.64	0.0046	0.0129	0.0313	-0.0231	0.0026	-0.0161	0.0072	0.0129
15/04/2008	191.40	240.25	44.05	773.40	1303.30	807.75	16153.66	0.0244	0.0586	-0.0090	0.0177	-0.0201	0.0250	0.0219	0.0586
16/04/2008	187.35	234.53	45.25	785.75	1308.30	816.15	16244.19	-0.0212	-0.0238	0.0272	0.0160	0.0038	0.0104	0.0056	-0.0238
17/04/2008	189.40	240.47	45.05	824.40	1401.20	836.75	16481.20	0.0109	0.0253	-0.0044	0.0492	0.0710	0.0252	0.0146	0.0253
21/04/2008	194.20	233.88	44.80	881.55	1460.75	864.25	16739.33	0.0253	-0.0274	-0.0055	0.0693	0.0425	0.0329	0.0157	-0.0274
22/04/2008	195.90	236.34	45.00	909.00	1508.25	882.30	16783.87	0.0088	0.0105	0.0045	0.0311	0.0325	0.0209	0.0027	0.0105
23/04/2008	195.90	240.66	45.65	897.20	1445.35	864.75	16698.04	0.0000	0.0183	0.0144	-0.0130	-0.0417	-0.0199	-0.0051	0.0183
24/04/2008	190.30	242.28	45.35	898.55	1442.60	878.80	16721.08	-0.0286	0.0067	-0.0066	0.0015	-0.0019	0.0162	0.0014	0.0067
25/04/2008	192.65	251.31	44.50	907.70	1500.40	915.65	17125.98	0.0123	0.0373	-0.0187	0.0102	0.0401	0.0419	0.0242	0.0373
28/04/2008	193.00	251.97	43.40	918.90	1523.35	895.85	17015.96	0.0018	0.0026	-0.0247	0.0123	0.0153	-0.0216	-0.0064	0.0026
29/04/2008	194.75	251.16	44.00	945.65	1547.80	902.50	17378.46	0.0091	-0.0032	0.0138	0.0291	0.0161	0.0074	0.0213	-0.0032
30/04/2008	196.75	246.66	44.95	923.55	1524.15	879.60	17287.31	0.0103	-0.0179	0.0216	-0.0234	-0.0153	-0.0254	-0.0052	-0.0179
02/05/2008	200.75	247.28	46.85	935.65	1540.40	937.15	17600.12	0.0203	0.0025	0.0423	0.0131	0.0107	0.0654	0.0181	0.0025
05/05/2008	198.30	250.47	50.60	946.75	1528.55	933.85	17490.90	-0.0122	0.0129	0.0800	0.0119	-0.0077	-0.0035	-0.0062	0.0129
06/05/2008	196.10	252.28	50.65	948.10	1542.85	928.80	17373.01	-0.0111	0.0072	0.0010	0.0014	0.0094	-0.0054	-0.0067	0.0072
07/05/2008	194.90	257.19	54.20	907.45	1541.90	919.00	17339.31	-0.0061	0.0195	0.0701	-0.0429	-0.0006	-0.0106	-0.0019	0.0195
08/05/2008	192.75	262.78	54.50	863.20	1508.35	892.85	17080.65	-0.0110	0.0217	0.0055	-0.0488	-0.0218	-0.0285	-0.0149	0.0217
09/05/2008	191.95	255.59	52.45	835.85	1452.50	873.85	16737.07	-0.0042	-0.0274	-0.0376	-0.0317	-0.0370	-0.0213	-0.0201	-0.0274
12/05/2008	192.10	256.19	53.25	877.20	1468.05	880.55	16860.90	0.0008	0.0023	0.0153	0.0495	0.0107	0.0077	0.0074	0.0023
13/05/2008	191.55	254.22	53.85	869.20	1480.25	888.60	16752.86	-0.0029	-0.0077	0.0113	-0.0091	0.0083	0.0091	-0.0064	-0.0077
14/05/2008	190.05	255.78	53.30	862.50	1464.80	896.45	16978.35	-0.0078	0.0061	-0.0102	-0.0077	-0.0104	0.0088	0.0135	0.0061
15/05/2008	191.35	259.94	52.80	893.60	1478.50	928.35	17353.54	0.0068	0.0163	-0.0094	0.0361	0.0094	0.0356	0.0221	0.0163
16/05/2008	191.00	261.16	52.70	900.05	1500.40	942.85	17434.94	-0.0018	0.0047	-0.0019	0.0072	0.0148	0.0156	0.0047	0.0047
20/05/2008	186.00	271.69	51.15	869.35	1461.20	927.20	17230.18	-0.0262	0.0403	-0.0294	-0.0341	-0.0261	-0.0166	-0.0117	0.0403
21/05/2008	182.00	277.06	52.95	869.75	1410.05	911.55	17243.16	-0.0215	0.0198	0.0352	0.0005	-0.0350	-0.0169	0.0008	0.0198
22/05/2008	178.75	274.66	54.60	828.60	1383.75	880.55	16907.11	-0.0179	-0.0087	0.0312	-0.0473	-0.0187	-0.0340	-0.0195	-0.0087
23/05/2008	176.80	274.81	51.70	799.45	1381.50	862.05	16649.64	-0.0109	0.0005	-0.0531	-0.0352	-0.0016	-0.0210	-0.0152	0.0005
26/05/2008	175.55	263.56	50.40	762.90	1347.60	820.30	16348.50	-0.0071	-0.0409	-0.0251	-0.0457	-0.0245	-0.0484	-0.0181	-0.0409
27/05/2008	177.45	258.34	48.90	738.75	1332.70	810.35	16275.59	0.0108	-0.0198	-0.0298	-0.0317	-0.0111	-0.0121	-0.0045	-0.0198
28/05/2008	176.80	256.88	49.80	810.20	1351.35	820.45	16525.37	-0.0037	-0.0057	0.0184	0.0967	0.0140	0.0125	0.0153	-0.0057
29/05/2008	171.25	255.19	48.65	783.00	1319.55	796.25	16316.26	-0.0314	-0.0066	-0.0231	-0.0336	-0.0235	-0.0295	-0.0127	-0.0066
30/05/2008	172.35	234.20	47.75	793.25	1368.70	788.60	16415.57	0.0064	-0.0823	-0.0185	0.0131	0.0372	-0.0096	0.0061	-0.0823
02/06/2008	161.40	228.60	46.85	749.35	1310.50	765.05	16063.18	-0.0635	-0.0239	-0.0188	-0.0553	-0.0425	-0.0299	-0.0215	-0.0239
03/06/2008	159.90	218.75	45.90	757.40	1266.40	760.55	15962.56	-0.0093	-0.0431	-0.0203	0.0107	-0.0337	-0.0059	-0.0063	-0.0431
04/06/2008	157.85	202.60	43.90	736.80	1215.00	757.55	15514.79	-0.0128	-0.0738	-0.0436	-0.0272	-0.0406	-0.0039	-0.0281	-0.0738
05/06/2008	166.90	198.60	43.40	770.90	1248.15	778.20	15769.72	0.0573	-0.0197	-0.0114	0.0463	0.0273	0.0273	0.0164	-0.0197
06/06/2008	165.60	193.60	43.10	760.55	1232.45	769.40	15572.18	-0.0078	-0.0252	-0.0069	-0.0134	-0.0126	-0.0113	-0.0125	-0.0252
09/06/2008	163.30	185.15	42.30	703.10	1183.60	750.30	15066.10	-0.0139	-0.0436	-0.0186	-0.0755	-0.0396	-0.0248	-0.0325	-0.0436
10/06/2008	161.55	182.25	40.45	681.50	1132.35	730.95	14889.25	-0.0107	-0.0157	-0.0437	-0.0307	-0.0433	-0.0258	-0.0117	-0.0157
11/06/2008	165.70	182.30	40.40	705.80	1196.35	741.20	15185.32	0.0257	0.0003	-0.0012	0.0357	0.0565	0.0140	0.0199	0.0003
12/06/2008	163.15	186.15	40.45	714.35	1161.55	743.25	15250.20	-0.0154	0.0211	0.0012	0.0121	-0.0291	0.0028	0.0043	0.0211
13/06/2008	161.25	187.65	40.20	704.50	1122.15	765.30	15189.62	-0.0116	0.0081	-0.0062	-0.0138	-0.0339	0.0297	-0.0040	0.0081
16/06/2008	166.05	184.70	39.20	735.75	1149.25	797.45	15395.82	0.0298	-0.0157	-0.0249	0.0444	0.0242	0.0420	0.0136	-0.0157
17/06/2008	168.20	190.95	41.20	794.50	1213.65	820.65	15696.90	0.0129	0.0338	0.0510	0.0799	0.0560	0.0291	0.0196	0.0338
18/06/2008	167.30	186.35	43.00	750.50	1168.40	786.95	15422.31	-0.0054	-0.0241	0.0437	-0.0554	-0.0373	-0.0411	-0.0175	-0.0241
19/06/2008	165.80	180.90	41.15	718.10	1122.95	753.60	15087.99	-0.0090	-0.0292	-0.0430	-0.0432	-0.0389	-0.0424	-0.0217	-0.0292
20/06/2008	162.90	174.95	41.35	703.70	1098.25	732.95	14571.29	-0.0175	-0.0329	0.0049	-0.0201	-0.0220	-0.0274	-0.0342	-0.0329
23/06/2008	162.15	162.60	39.00	697.15	1095.55	720.70	14293.32	-0.0046	-0.0706	-0.0568	-0.0093	-0.0025	-0.0167	-0.0191	-0.0706
24/06/2008	155.60	152.70	38.00	678.65	1059.65	703.15	14106.58	-0.0404	-0.0609	-0.0256	-0.0265	-0.0328	-0.0244	-0.0131	-0.0609
25/06/2008	156.75	155.60	38.30	685.05	1074.35	698.20	14220.07	0.0074	0.0190	0.0079	0.0094	0.0139	-0.0070	0.0080	0.0190
26/06/2008	155.20	154.05	38.60	678.20	1060.50	697.55	14421.82	-0.0099	-0.0100	0.0078	-0.0100	-0.0129	-0.0009	0.0142	-0.0100
27/06/2008	150.80	145.00	36.50	628.60	1021.60	652.15	13802.22	-0.0284	-0.0587	-0.0544	-0.0731	-0.0367	-0.0651	-0.0430	-0.0587
30/06/2008	151.90	136.65	34.40	605.05	1007.40	630.20	13461.60	0.0073	-0.0576	-0.0575	-0.0375	-0.0139	-0.0337	-0.0247	-0.0576
01/07/2008	153.15	127.55	32.20	593.85	965.25	589.10	12961.68	0.0082	-0.0666	-0.0640	-0.0185	-0.0418	-0.0652	-0.0371	-0.0666
02/07/2008	158.90	132.35	31.65	634.45	1027.60	621.05	13664.62	0.0375	0.0376	-0.0171	0.0684	0.0646	0.0542	0.0542	0.0376
03/07/2008	152.55	130.35	30.35	580.20	984.45	571.90	13094.11	-0.0400	-0.0151	-0.0411	-0.0855	-0.0420	-0.0791	-0.0418	-0.0151
04/07/2008	153.90	135.95	32.05	600.45	1000.30	603.60	13454.00	0.0088	0.0430	0.0560	0.0349	0.0161	0.0554	0.0275	0.0430
07/07/2008	155.60	135.60	33.85	603.95	1005.40	605.15	13525.99	0.0110	-0.0026	0.0562	0.0058	0.0051	0.0026	0.0054	-0.0026
08/07/2008	161.30	136.90	32.95	606.95	1001.75	594.35	13349.65	0.0366	0.0096	-0.0266	0.0050	-0.0036	-0.0178	-0.0130	0.0096
09/07/2008	168.45	148.65	33.80	669.10	1058.25	621.70	13964.26	0.0443	0.0858	0.0258	0.1024	0.0564	0.0460	0.0460	0.0858
10/07/2008	166.95	147.75	34.25	678.45	1054.20	616.90	13926.24	-0.0089	-0.0061	0.0133	0.0140	-0.0038	-0.0077	-0.0027	-0.0061
11/07/2008	162.00	140.60	32.50	665.25	1067.80	591.60	13469.85	-0.0296	-0.0484	-0.0511	-0.0195	0.0129	-0.0410	-0.0328	-0.0484
14/07/2008	167.00	137.60	32.00	634.35	1031.65	578.90	13330.51	0.0309	-0.0213	-0.0154	-0.0464	-0.0339	-0.0215	-0.0103	-0.0213
15/07/2008	162.40	131.05	30.55	597.10	918.15	529.15	12676.19	-0.0275	-0.0476	-0.0453	-0.0587	-0.1100	-0.0859	-0.0491	-0.0476
16/07/2008	162.35	127.85	30.30	584.45	903.60	519.75	12575.80	-0.0003	-0.0244	-0.0082	-0.0212	-0.0158	-0.0178	-0.0079	-0.0244
17/07/2008	165.30	131.80	30.20	635.45	958.65	551.85	13111.85	0.0182	0.0309	-0.0033	0.0873	0.0609	0.0618	0.0426	0.0309
18/07/2008	173.80	132.30	30.05	685.60	1034.50	617.45	13635.40	0.0514	0.0038	-0.0050	0.0789	0.0791	0.1189	0.0399	0.0038
21/07/2008	181.50	132.20	31.15	697.40	1083.70	642.95	13850.04	0.0443	-0.0008	0.0366	0.0172	0.0476	0.0413	0.0157	-0.0008
22/07/2008	184.95	142.75	33.55	735.05	1101.30	661.70	14104.20	0.0190	0.0798	0.0770	0.0540	0.0162	0.0292	0.0184	0.0798
23/07/2008	190.45	171.10	37.80	763.65	1204.60	738.70	14942.28	0.0297	0.1986	0.1267	0.0389	0.0938	0.1164	0.0594	0.1986
24/07/2008	185.55	176.00	36.90	760.30	1213.90	730.20	14777.01	-0.0257	0.0286	-0.0238	-0.0044	0.0077	-0.0115	-0.0111	0.0286
25/07/2008	187.70	168.85	37.40	712.85	1126.45	656.75	14274.94	0.0116	-0.0406	0.0136	-0.0624	-0.0720	-0.1006	-0.0340	-0.0406
28/07/2008	184.75	169.20	39.50	697.30	1127.20	663.40	14349.11	-0.0157	0.0021	0.0561	-0.0218	0.0007	0.0101	0.0052	0.0021
29/07/2008	178.50	154.15	38.20	619.70	1029.30	607.70	13791.54	-0.0338	-0.0889	-0.0329	-0.1113	-0.0869	-0.0840	-0.0389	-0.0889
30/07/2008	170.90	163.15	38.95	679.25	1094.05	636.10	14287.21	-0.0426	0.0584	0.0196	0.0961	0.0629	0.0467	0.0359	0.0584
31/07/2008	170.35	165.60	39.40	653.90	1098.15	637.30	14355.75	-0.0032	0.0150	0.0116	-0.0373	0.0037	0.0019	0.0048	0.0150
01/08/2008	176.80	170.00	39.00	679.90	1108.30	642.40	14656.69	0.0379	0.0266	-0.0102	0.0398	0.0092	0.0080	0.0210	0.0266
04/08/2008	174.75	170.95	41.30	706.05	1108.75	640.45	14577.87	-0.0116	0.0056	0.0590	0.0385	0.0004	-0.0030	-0.0054	0.0056
05/08/2008	182.80	172.05	40.05	760.55	1184.50	694.10	14961.07	0.0461	0.0064	-0.0303	0.0772	0.0683	0.0838	0.0263	0.0064
06/08/2008	180.60	166.85	39.25	743.05	1216.40	706.65	15073.54	-0.0120	-0.0302	-0.0200	-0.0230	0.0269	0.0181	0.0075	-0.0302
07/08/2008	183.60	166.50	39.25	746.55	1252.65	707.95	15117.25	0.0166	-0.0021	0.0000	0.0047	0.0298	0.0018	0.0029	-0.0021
08/08/2008	184.95	169.30	38.85	735.15	1283.10	731.60	15167.82	0.0074	0.0168	-0.0102	-0.0153	0.0243	0.0334	0.0033	0.0168
11/08/2008	185.80	170.15	42.00	759.60	1311.50	771.15	15503.92	0.0046	0.0050	0.0811	0.0333	0.0221	0.0541	0.0222	0.0050
12/08/2008	185.15	171.15	40.85	720.55	1265.05	740.65	15212.13	-0.0035	0.0059	-0.0274	-0.0514	-0.0354	-0.0396	-0.0188	0.0059
13/08/2008	186.40	171.85	42.25	725.10	1217.35	710.70	15093.12	0.0068	0.0041	0.0343	0.0063	-0.0377	-0.0404	-0.0078	0.0041
14/08/2008	181.50	164.50	40.75	700.00	1174.80	673.45	14724.18	-0.0263	-0.0428	-0.0355	-0.0346	-0.0350	-0.0524	-0.0244	-0.0428
18/08/2008	180.35	161.75	41.30	692.50	1203.55	665.00	14645.66	-0.0063	-0.0167	0.0135	-0.0107	0.0245	-0.0125	-0.0053	-0.0167
19/08/2008	181.75	157.10	42.15	679.80	1206.85	677.70	14543.73	0.0078	-0.0287	0.0206	-0.0183	0.0027	0.0191	-0.0070	-0.0287
20/08/2008	183.90	160.65	42.20	673.80	1238.20	678.80	14678.23	0.0118	0.0226	0.0012	-0.0088	0.0260	0.0016	0.0092	0.0226
21/08/2008	173.50	155.40	40.05	649.10	1166.35	643.70	14243.73	-0.0566	-0.0327	-0.0509	-0.0367	-0.0580	-0.0517	-0.0296	-0.0327
22/08/2008	170.55	157.05	40.45	679.85	1194.00	644.55	14401.49	-0.0170	0.0106	0.0100	0.0474	0.0237	0.0013	0.0111	0.0106
25/08/2008	171.00	155.25	40.00	685.60	1207.70	657.15	14450.35	0.0026	-0.0115	-0.0111	0.0085	0.0115	0.0195	0.0034	-0.0115
26/08/2008	172.10	155.95	39.75	679.65	1251.30	666.55	14482.22	0.0064	0.0045	-0.0063	-0.0087	0.0361	0.0143	0.0022	0.0045
27/08/2008	171.30	154.50	38.70	677.35	1234.00	649.95	14296.79	-0.0046	-0.0093	-0.0264	-0.0034	-0.0138	-0.0249	-0.0128	-0.0093
28/08/2008	169.70	153.55	38.10	670.55	1213.10	632.55	14048.34	-0.0093	-0.0061	-0.0155	-0.0100	-0.0169	-0.0268	-0.0174	-0.0061
29/08/2008	174.90	157.35	39.65	723.40	1276.70	671.90	14564.53	0.0306	0.0247	0.0407	0.0788	0.0524	0.0622	0.0367	0.0247
01/09/2008	173.20	157.00	39.10	722.90	1298.30	665.00	14498.51	-0.0097	-0.0022	-0.0139	-0.0007	0.0169	-0.0103	-0.0045	-0.0022
02/09/2008	177.15	161.20	39.90	759.85	1339.65	714.05	15049.86	0.0228	0.0268	0.0205	0.0511	0.0318	0.0738	0.0380	0.0268
04/09/2008	174.10	159.45	39.90	734.20	1303.05	716.65	14899.10	-0.0172	-0.0109	0.0000	-0.0338	-0.0273	0.0036	-0.0100	-0.0109
05/09/2008	173.50	163.00	39.25	687.25	1248.50	686.75	14483.83	-0.0034	0.0223	-0.0163	-0.0639	-0.0419	-0.0417	-0.0279	0.0223
08/09/2008	181.55	168.75	40.45	711.25	1301.10	720.45	14944.97	0.0464	0.0353	0.0306	0.0349	0.0421	0.0491	0.0318	0.0353
09/09/2008	179.50	169.15	39.95	710.00	1293.60	712.10	14900.76	-0.0113	0.0024	-0.0124	-0.0018	-0.0058	-0.0116	-0.0030	0.0024
10/09/2008	178.10	170.10	39.05	710.45	1275.70	701.00	14662.81	-0.0078	0.0056	-0.0225	0.0006	-0.0138	-0.0156	-0.0160	0.0056
11/09/2008	173.25	168.70	38.40	704.15	1253.00	686.60	14324.29	-0.0272	-0.0082	-0.0166	-0.0089	-0.0178	-0.0205	-0.0231	-0.0082
12/09/2008	173.95	168.30	37.45	692.55	1244.70	652.80	14000.81	0.0040	-0.0024	-0.0247	-0.0165	-0.0066	-0.0492	-0.0226	-0.0024
15/09/2008	170.40	156.95	34.50	656.90	1203.40	627.50	13531.27	-0.0204	-0.0674	-0.0788	-0.0515	-0.0332	-0.0388	-0.0335	-0.0674
16/09/2008	170.40	160.65	33.90	695.80	1230.35	591.65	13518.80	0.0000	0.0236	-0.0174	0.0592	0.0224	-0.0571	-0.0009	0.0236
17/09/2008	169.10	157.15	33.05	666.45	1187.35	560.05	13262.90	-0.0076	-0.0218	-0.0251	-0.0422	-0.0349	-0.0534	-0.0189	-0.0218
18/09/2008	174.05	156.25	32.05	678.60	1223.75	577.15	13315.60	0.0293	-0.0057	-0.0303	0.0182	0.0307	0.0305	0.0040	-0.0057
19/09/2008	182.95	164.35	31.90	708.55	1299.55	627.50	14042.32	0.0511	0.0518	-0.0047	0.0441	0.0619	0.0872	0.0546	0.0518
22/09/2008	181.75	160.70	31.20	704.90	1300.70	635.75	13994.96	-0.0066	-0.0222	-0.0219	-0.0052	0.0009	0.0131	-0.0034	-0.0222
23/09/2008	179.55	160.15	30.45	683.35	1233.75	599.15	13570.31	-0.0121	-0.0034	-0.0240	-0.0306	-0.0515	-0.0576	-0.0303	-0.0034

Σw	1.0000
Σ(-w)	0.0000
portfolio	
mean	-0.0012
stdev	0.0366
SENSEX	
mean	-0.0009
stdev	0.0219
RATIO	-0.0083