Efficient Capital Market Hypothesis

Test of Independence of Select Company Stocks in Different Sectors
(Telecom, Banking, Energy, FMCG, Oil Sector, and PSUs)

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Abstract:

The efficiency of capital markets has implications for the investment analysis and management of funds. Over the years, an impressive literature has been developed describing empirical test of random walk. This research has been aimed at testing whether successive or lagged price changes are independent (pre-Recession, during recession and Post Recession) Investors must decide for themselves the market's degree of efficiency and whether the anomalies are grounds for particular strategies. Any investor who has a proclivity towards active investment information may see anomalies as an opportunity. An efficient Capital Market is one in which security prices adjust rapidly to the arrival of new information, and, therefore, the current prices of securities reflect all about the security. The Weak Form of Efficient Market Hypothesis states that stock prices fully reflect all market information, so any trading rule that uses past market data to predict future returns should have no value. They are presumed to be independent over time. Tests of independence have examined based on the frequency and extent of runs in stock price data. This also tends to indicate the stock price movements are independent over time .The results of most studies consistently supported this hypothesis.

The Efficient Market Hypothesis (EMH) has been consented as one of the cornerstones of modern financial economics. We first defined the term "efficient market" in financial literature in 1965 as one in which security prices fully reflect all available information. The market is efficient if the reaction of market prices to new information should be instantaneous and unbiased. Efficient market hypothesis is the idea that information is quickly and efficiently incorporated into asset prices at any point in time, so that old information cannot be used to foretell future price movements. Consequently, three versions of EMH are being distinguished depends on the level of available information.

The weak form EMH stipulates that current asset prices already reflected past price and volume information. The information contained in the past sequence of prices of a security is fully reflected in the current market price of that security. It is named weak form because the security prices are the most publicly and easily accessible pieces of information. It implies that no one should be able to outperform the market using something that "everybody else knows". Yet, there are still numbers of financial researchers who are studying the past stock price series and trading volume data in attempt to generate profit. This technique is so called technical analysis that is asserted by EMH as useless for predicting future price changes.

The semi strong form EMH states that all publicly available information is similarly already incorporated into asset prices. In another word, all publicly available information is fully reflected in a security's current market price. The public information stated not only past prices but also data reported in a

company's financial statements, company's announcement, economic factors and others. It also implies that no one should be able to outperform the market using something that "everybody else knows". This indicates that a company's financial statements are of no help in forecasting future price movements and securing high investment returns.

The strong form EMH stipulates that private information or insider information too, is quickly incorporated by market prices and therefore cannot be used to reap abnormal trading profits. Thus, all information, whether public or private, is fully reflected in a security's current market price. That's mean, even the company's management (insider) are not able to make gains from inside information they hold. They are not able to take the advantages to profit from information such as take over decision which has been made ten minutes ago. The rationale behind to support is that the market anticipates in an unbiased manner, future development and therefore information has been incorporated and evaluated into market price in much more objective and informative way than insiders.

The random walk model of asset prices is an extension of the EMH, as are the notions that the market cannot be consistently beaten, arbitrage is impossible, and "free lunches" are generally unavailable. The runs test is a non-parametric statistical test that checks a randomness hypothesis for a two-valued data sequence. More precisely, it can be used to test the hypothesis that the elements of the sequence are mutually independent.

A "run" of a sequence is a maximal non-empty segment of the sequence consisting of adjacent equal elements. For example, the sequence "++++−−−+++−−++++++−−−−" consists of six runs, three of which consist of +'s and the others of −'s. If +s and −s alternate randomly, the number of runs in the sequence N for which it is given that there are N_+ occurrences of + and N_- occurrences of – (so $N = N_+ + N_-$) is a random variable whose conditional distribution – given the observation of N_+ positive runs and N_- negative runs – is approximately normal with:

- mean

$$\mu = \frac{2\,N_+\,N_-}{N} + 1\,,$$

- variance $\sigma^2 = \frac{2\,N_+\,N_-\,(2\,N_+\,N_- - N)}{N^2\,(N-1)} = \frac{(\mu-1)(\mu-2)}{N-1}\,.$

These parameters do not depend on the "fairness" of the process generating the elements of the sequence in the sense that +'s and −'s must have equal probabilities, but only on the assumption that the elements are independent and identically distributed. If there are too many runs more or less than expected, the hypothesis of statistical independence of the elements may be rejected.

Runs Tests can be used to Test:

1. The randomness of a distribution, by taking the data in the given order and marking with + the data greater than the median, and with – the data less than the median; (Numbers equalling the median are omitted.)

2. Whether a function fits well to a data set, by marking the data exceeding the function value with + and the other data with −. For this use, the runs test, which takes into account the signs but not the distances, is complementary to the chi square test, which takes into account the distances but not the signs.

Run test statistics is a kind of non-parametric statistical test that checks a randomness hypothesis for a two-valued data sequences. More precisely, run test can be used to test the hypothesis that the elements of the sequence are mutually independent one. A run of a sequence is defined as a maximal non-empty segment of the data sequence consisting of adjacent equal elements.

(B) Mathematical Formulae:
Run Test can be Used to Perform

- Randomness of a distribution is found by taking the data in the given form or order and marking with + the data greater than the median and with – the data less than the median
- Numbers which equalling the median get omitted.
- It checks whether a function fits well to a data set values, by marking the data exceeding the function value with + and the other data with -.It mainly depends on signs.
- If the number of runs falls outside the interval of μ±1.46*σ(for this project only), universally accepted is* μ±*1.96*, then it is reasonable to reject the hypothesis and that the curve is a good description of the data.

Mean

$$\mu = \left(\frac{2(N_+)(N_-)}{N}\right)+1$$

Variance

$$\sigma^2 = \frac{2N_+N_-2N_+N_- - N}{(N^2)(N-1)} = \frac{(\mu-1)(\mu-2)}{N-1}$$

Where

$$N = (N_+)+(N_-)$$

N_+ = positive runs or number of occurrences of +'s

N_- =negative runs or number of occurrences of –'s

If the sample size is unequal and either n_1 and n_2 is larger than 20, or if the sample size is equal and larger than 100, then the test statistic is

$$z = \frac{r - \left(\frac{2n_1n_2}{n_1+n_2}+1\right)}{\sqrt{\frac{\left(2n_1n_2(2n_1n_2 - n_1 - n_2)\right)}{(n_1+n_2)^2(n_1+n_2-1)}}}$$

Where r (test statistic) is the number of runs or average of the most and fewest runs

(C) Objectives:

1. To check whether successive price changes are independent or not during the given time period
2. To check whether Indian capital markets are in weak form of efficiency semi-strong form of efficiency or strong from of efficiency
3. To check whether prices get affected by demand and supply to reflect equilibrium position
4. To prove whether Price change is Random or Not

Hypothesis:

Ho Null Hypothesis: Price change is random
Ha Alternate hypothesis: Price change is not random
Hypothesis was tested at 20 per cent significance level at which 'Z' value is 1.28

Research Methodology

Type of study	:	Empirical
Sample Design	:	Judgmental
Sample 5 Sectors	:	Telecom, Banking Sector, Energy, FMCG, and Oil Sector
Data Source	:	Stock market quotations
Type of Data	:	Secondary Data
Period of Data	:	2006 to 2010 monthly base

Research Plan

Scope of the study

The prices of the stocks are taken during calendar years 2006 to 2010 covering Pre- recession, Recession .and Post Recession period.

Literature Review

Meredith Beechey, David, Gruen, James, Vickery_the efficient market hypothesis states that assets prices in financial market should effect all available information; as a consequence prices should always be consistent with fundamentals. The paper discusses the main ideas behind the efficient market hypothesis and provided a guide as to which of its predictions seem to be borne out by empirical evidence and which do not. The evidence suggests, that it cannot explain some important and worrying features of asset market behavior.Investors inconsistency, transaction cost and unavailable information may all be source of market inefficiency,

study their impact, as well as the influences of other conditions, on the development of prices in the primary goal in the empirical literature. **(2005) Malkie**l shows that professional investment managers do not out perform their index bench marks and provides evidence that by and large market prices do seem to reflect all available in formation.**(2006) Toth and kertesz** found evidence of increasing efficiency in N.Y.S.E by the theoretical and empirical studies of the efficient market hypothesis have made an important contribution to the understanding of the stock market, and the present state of understanding is far from conclusive. Are emerging financial markets efficient by **Sardar M. N. Islam Sethapeng Watanapalachaikul and Colin Clark (2005) Sanford Gross** describes a model which shows that informational efficient price systems aggregates diverse information perfectly (1980) Beja (**1977**) showed that the efficiency of a real market is impressible **Le Roy** (**1981**) and porter showed that stock markets exhibit excess volatility and they reflect market efficiency. **Lawrence H Summers** (1986) argues that many statistical tests of market efficiency have very low power in discriminating against plausible forms of inefficiency. **Lo and Mackinley** strongly rejected the random walk hypothesis for weekly stock returns show positive auto correlation over short period and negative auto correlation over longer horizons (**1988**) **Elroy Dimson and Massoud Mussavian** give a brief history of market efficiency (**1998) Bernstein** criticizes the EMH and Claims that the marginal benefits of investors acting on information exceed the marginal costs. **Malkiel** shows that professional investment managers do not outperform their index benchmarks and provides evidence that by and large market prices do seem to reflect all available information(**2005) Blakey** looked at some of the causes and consequences of random price behavior (**2006) Toth and Kertesez** found evidence in creasing of efficiency in New York Stock Exchange (**2006) Stileifer** publishes inefficient markets; an introduction to behavioral finance, which questions the assumptions of investors rationality and perfect arbitrage.

(D) Data Pooling

Consolidated Run Test Results

From the tables shown, the following data has been derived. Positives here indicate the number of advances a company stock has made and Negatives indicates the number of declines a company stock has gone to. The Observed Runs are the number of changes that happened from positive to negative or vice versa

Telecom Sector (Table – I)

Bharti Airtel, RCL, TTL & IDEA

Parameters	Bharti Airtel	RCL	TTL	Idea
Positives	23	27	24	24
Negatives	21	17	20	20
Observed Runs	28	24	23	22

Note: *The data for dates and closing prices for each company were taken from one of the massive exchanges of India – Bombay Stock Exchange.*

When we look at the values derived from the calculations for observed runs and the range, the following points can be interpreted.

The Observations

Company	Observed Runs	Lower Limit	Upper Limit	Result (NH)
Bharti Airtel	28	19.78	24.36	Reject
Rel Communications Ltd	24	18.98	24.74	Accept
Tata Teleservices Ltd	23	19.80	24.88	Accept
Idea Cellular Ltd	22	19.80	24.88	Accept

Banking: (Table VI)

ICICI BANK, HDFC CANARA BANK, BOB, AXIS BANK & SBI

The Observations

Bank	Upper Limit	Lower Limit	Observed	Result (NH)
ICICI	39.2053	29.1376	32	Accept
HDFC	37.3258	27.76	33	Accept
CANARA BANK	40.7881	30.2976	29	Accept
BOB	39.2053	29.1376	32	Accept
AXIS	38.0182	28.2675	35	Accept
SBI	40.4913	30.0801	35	Accept

Energy Sector (Table – III)

Crompton Greaves, RIIL & Suzlon Energy

Observations:

Company	Positive	Negative	Observations	Result (NH)
Crompton Greaves	25	22	10	Reject
RIIL	22	25	25	Accept
Suzlon Energy	18	29	19	Accept

FMCG (Table – (Table – IV)

Nestle India, ITC & HUL

Observations:

Company	Positive	Negative	Observations	Result(NH)
Nestle India	37	10	13	Accept
ITC	29	18	20	Accept
HUL	26	21	20	Reject

Select PSUs (Table –V) NTPC, BHEL,SAIL&GAIL

***Four companies positive, negative and observed values*:**

	POSITIVE	NEGATIVE		OBSERVED RUNS		Result(NH)
NTPC	22	**NTPC**	28	**NTPC**	28	**Accept**
BHEL	31	**BHEL**	18	**BHEL**	25	**Accept**
SAIL	30	**SAIL**	19	**SAIL**	27	**Accept**
GAIL	34	**GAIL**	15	**GAIL**	23	**Accept**

Oil Sector (Table – IV) *BPCL, HPCL, OCTL & ONGC*

Four companies positive, negative and observation values

	Negatives	Positive	Observations	Result(NH)
BPCL	24 – Negative	23 – Positive	24	Accept
HPCL	23 - Negative	24 – Positive	26	Reject
OCTL	15 - Negative	32 – Positive	20	Accept
ONGC	24 - Negative	23 – Positive	25	Reject

(E) Calculations for Run Test

(Oil Sector)

BPCL Run Test:

OBSERVED RUNS = 24

POSSITIVE (+) N1 = 23

NEGITIVE (-) N2 = 24

$$\mu = \frac{2N1N2}{N1+N2} + 1$$

$$SD = \frac{\sqrt{2N1N2 * (2N1N2 - N1N2)}}{(N1 + N2)^2 * (N1 + N2 - 1)}$$

$\mu = \frac{2N1N2}{N1+N2} + 1$ = (2* 23*24/23+24) + 1

= 1104/47 + 1 = 23.48 + 1 = 24.48

$$SD = \frac{\sqrt{2N1N2 * (2N1N2 - N1N2)}}{\sqrt{(N1 + N2)^2 * (N1 + N2 - 1)}}$$

= √2* 19* 28 *(2 *19* 28 – 19* 28)/(19+28) ^2*(19+28 – 1)

= √1104.0* 552.0 /2209 * 46

= √609408 / 101614

= √5.99 = 2.44

SD= 2.44

UPPER LIMIT = μ + 1.28 SD

LOWER LIMIT = μ - 1.28 SD

UPPER LIMIT = 24.48 + 1.28 * 2.44 = 23.6 + 3.1 = 26.7

LOWER LIMIT = 24.48 – 1.28 * 2.44 = 23.6 – 3.1 = 20.5

The Observed Runs fall between the Upper and Lower limit.

HPCL Run Test:

OBSERVED RUNS = 26

POSSITIVE (+) N1 = 24

NEGITIVE (-) N2 = 23

$$\mu = \frac{2N1N2}{N1+N2} + 1$$

$$SD = \frac{\sqrt{2N1N2 * (2N1N2 - N1N2)}}{(N1 + N2)^2 * (N1 + N2 - 1)}$$

$\mu = \frac{2N1N2}{N1+N2} + 1$ = (2* 24*23/24+23) + 1

= 1104.0/47 + 1 = 23.5 + 1 = 24.5

$$SD = \frac{\sqrt{2N1N2 * (2N1N2 - N1N2)}}{\sqrt{(N1 + N2)^2 * (N1 + N2 - 1)}}$$

= √2* 24* 23 *(2 *24* 23 – 24* 23)/(24+23) ^2*(24+23 – 1)

= √1104.0* 552.0 /2209 * 46

= √609408 / 101614

= √6.0 = 2.4

SD= 2.4

UPPER LIMIT = μ + 1.28 SD

LOWER LIMIT = μ - 1.28 SD

UPPER LIMIT = 24.5 + 1.28 * 2.4 = 24.5 + 3.1 = 27.6

LOWER LIMIT = 24.5 – 1.28 * 2.4 = 24.5 – 3.1 =2 1.4.

The Observed Runs fall between the Upper and Lower limit.

OCTL RUN TEST:

OBSERVED RUNS = 20

POSSITIVE (+) N1 = 32

NEGITIVE (-) N2 = 15

$$\mu = \frac{2N1N2}{N1+N2} + 1$$

$$SD = \frac{\sqrt{2N1N2 * (2N1N2 - N1N2)}}{(N1+N2)\text{^}2 * (N1+N2-1)}$$

$$\mu = \frac{2N1N2}{N1+N2} + 1 = (2* 32*15/32+15) + 1$$

= 960/47 + 1 =2 0.4 + 1 = 21.4

$$SD = \frac{\sqrt{2N1N2 * (2N1N2 - N1N2)}}{\sqrt{(N1 + N2)\text{^}2 * (N1+N2-1)}}$$

= √2* 30*15 *(2 *30* 15 – 30* 15)/(30+15) ^2*(30+15 – 1)

= √960* 480 /2209 * 46

= √460800 / 101614

= √4.5 = 2.1

SD= 2.1

UPPER LIMIT = μ + 1.28 SD

LOWER LIMIT = μ - 1.28 SD

UPPER LIMIT = 21.4 + 1.28 * 2.1 = 21.4 + 2.7 = 24.1

LOWER LIMIT = 21.4 – 1.28 * 2.1 = 21.4 –2.7 = 18.7.

The Observed Runs fall between the Upper and Lower limit.

ONGC Run Test:

OBSERVED RUNS = 25

POSSITIVE (+) N1 = 23

NEGITIVE (-) N2 = 24

$$\mu = \frac{2N1N2}{N1+N2} + 1$$

$$SD = \frac{\sqrt{2N1N2 * (2N1N2 - N1N2)}}{(N1 + N2)^2 * (N1 + N2 - 1)}$$

$\mu = \frac{2N1N2}{N1+N2} + 1$ = (2* 23*24/26+21) + 1

= 1104.0/47 + 1 = 23.5 + 1 = 24.5

$$SD = \frac{\sqrt{2N1N2 * (2N1N2 - N1N2)}}{\sqrt{(N1 + N2)^2 * (N1 + N2 - 1)}}$$

= √2* 23*24 *(2 *23* 24 – 23* 24)/(23+24) ^2*(23+24 – 1)

= √1104* 552 /2209 * 46

= √609408/ 101614

= √6.0 = 2.4

SD= 2.4

UPPER LIMIT = μ + 1.28 SD

LOWER LIMIT = μ - 1.28 SD

UPPER LIMIT = 24.5 + 1.28 * 2.4 = 24.5+ 3.1 = 27.6

LOWER LIMIT = 24.5 – 1.28 * 2.4 = 24.5 – 3.1 = 21.4.

Note: Run Test calculations for the Companies in other sectors are similar like above.

The Observed Runs fall between the Upper and Lower limit.

(F) Interpretations

In almost all the companies across different sectors viz. Bharti Airtel, Reliance Communications, Tata Tele Services and Idea Cellular Under telecom Sector, ICICI Bank, HDFC, Canara Bank, BOB, Axis Bank, and SBI under Banking Sector, Crompton Greaves, RIIL, Suzlon Energy under Energy Sector, Nestle, ITC, HUL in FMCG Sector and BPCL, HPCL, OCIL, ONGC under Oil and Gas, the observed runs falls between Positive and Negative returns which testifies that null hypothesis is accepted, i.e. stock prices change is random.

(G) Conclusions

Efficient Market Hypothesis is used to test whether capital markets are informational efficient. Having the results of numerous calculations done on different sectors, it is concluded that Indian Capital Markets are efficient in Weak Form by reflecting the changes in market information on security prices in a competitive environment. In all most all the companies in different sectors NULL Hypothesis has been accepted, which supports the findings that the Indian Capital Market is efficient in weak form i.e. share prices change randomly. This is valid across different periods i.e. Pre-Recession period, during Recession Period and Post Recession Period specific to Indian capital Markets.

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Tables

Telecom Sector: Bharti Airtel, Reliance Communications, Tata Tele Services & Idea Cellular

Months	Closing Price of Stocks					Analysis - Table Showing Calculation of Run			
Date	Bharti Airtel	Reliance Communications Limited	Tata Tele Services Limited	Idea Cellular Limited		Bharti Airtel	Reliance Communications Limited	Tata Tele services Limited	Idea Cellular Limited
Apr-07	812.05	477.1	28.9	114.5		812.05	477.1	28.9	114.5
May-07	847.8	505.05	27.2	126.1		+	+	-	+
Jun-07	835.95	517.05	28.25	124.6		-	+	+	-
Jul-07	903.45	558.8	28.6	129.55		+	+	+	+
Aug-07	879.9	543	31.9	122.7		-	-	+	-
Sep-07	941.2	585.65	43.5	125.15		+	+	+	+
Oct-07	1006.6	771.95	45.3	135.2		+	-	+	+
Nov-07	939.45	674.85	48.2	122.4		-	-	+	-
Dec-07	994.55	746.5	62.25	138.7		+	+	+	+
Jan-08	864.45	601.95	35.15	123.65		-	-	-	-
Feb-08	825.6	574.75	35.25	110.15		-	-	+	-
Mar-08	826.1	508.3	28.1	102.75		+	-	-	-
Apr-08	898.8	549.34	35.8	105.5		+	+	+	+
May-08	876.45	577.15	31.45	108.9		-	-	-	+
Jun-08	721.65	442.4	24.15	93.1		-	-	-	-
Jul-08	799.15	500.05	24.9	88.3		+	+	+	-
Aug-08	837.2	395.7	26.45	82.5		+	-	+	-
Sep-08	785.05	333.9	21.7	75.35		-	-	-	-
Oct-08	649	220.7	13.5	42.75		-	-	-	-
Nov-08	671.05	195.5	19.61	47		+	-	+	+
Dec-08	715.1	227.25	21.75	52.65		+	+	+	+
Jan-09	633.85	170.2	22.7	47		-	-	+	-
Feb-09	636.65	155.45	23.55	46.9		+	-	+	-
Mar-09	625.8	174.6	22.8	50.15		-	+	-	+
Apr-09	749.3	214.95	24	58.05		+	+	+	+
May-09	819.65	305.8	32.9	83.35		+	+	+	+

Jun-09	802.1	289.9	35.9	71.3		-	-	+	-
Jul-09	410.55	275.65	34.55	78.9		-	-	-	+
Aug-09	424.7	260.5	33.7	81.05		+	-	-	+
Sep-09	418.55	308	36.1	75.35		-	+	+	-
Oct-09	292.15	175.95	26.55	52.05		-	-	-	-
Nov-09	299.7	171.95	25.7	50.95		+	-	-	-
Dec-09	328.8	172.9	26.75	58.2		+	+	+	+
Jan-10	306.5	169.85	25.35	58.45		-	-	-	+
Feb-10	279.25	157.35	23.2	60.85		-	-	-	+
Mar-10	311.9	170.7	23.65	65.45		+	+	+	+
Apr-10	298.4	163.65	23.25	61.2		-	-	-	-
May-10	262.3	144.85	19.65	50.5		-	-	-	-
Jun-10	263.25	198.3	22.3	59.2		+	+	+	+
Jul-10	306.9	178.45	22.5	70.25		+	-	+	+
Aug-10	327.15	156	22.4	71.45		+	-	-	+
Sep-10	365.9	168.25	22.05	73.6		+	+	-	+
Oct-10	325.7	179.55	22.5	67.2		-	+	+	-
Nov-10	360.4	132.05	19.45	72.5		+	-	-	+
Dec-10	330.9	126.15	18.65	69.95		-	-	-	-

Energy Sector; Crompton Greaves. Riil, Suzlon Energy

Date	Crompton Greaves		Observations	RIIL		Observations	Suzlon Energy		Observations
Nov,2006	249			548.725			1376.5		
Dec,2006	240.475	-	1	555.85	+	1	1385.95	+	1
Jan,2007	206.6	-		550.175	-	2	1220.95	-	2
Feb,2007	198.375	-		498.05	-		1105.85	-	
Mar,2007	200.15	+	2	419.675	-		1036.175	-	
Apr,2007	205.25	+		426.325	+	3	1069.875	+	3
May,2007	234.675	+		478.575	+		1243.85	+	
Jun,2007	251.65	+		473.7	-	4	1389.475	+	
July,2007	277.025	+		506.8	+	5	1380.1	-	4
Aug,2007	289.75	+		489.025	-	6	1231.725	-	
Sep,2007	322.25	+		941.075	+	7	1353.725	+	5
Oct,2007	376.95	+		2187.4	+		1723.95	+	
Nov,2007	419.75	+		2327.175	+		1929.4	+	
Dec,2007	411.35	-	3	2067.6	-	8	1908.7	-	6
Jan,2008	359.675	-		1971.375	-		1129.075	-	
Feb,2008	316.825	-		1505.4	-		301.45	-	
Mar,2008	292.55	-		1107.85	-		257.825	-	
Apr,2008	251.475	-		1210.975	+	9	283.95	+	7
May,2008	242.85	-		1401.125	+		283.1	-	8
Jun,2008	228.55	-		961.8	-	10	241.975	-	
Jul,2008	224.325	-		848.5	-		209.4	-	
Aug,2008	260.475	+	4	939.75	+	11	228.35	+	9
Sep,2008	250.425	-	5	751.725	-	12	184.525	-	10
Oct,2008	195.275	-		464.075	-		97.65	-	
Nov,2008	143.275	-		364.725	-		43.8	-	
Dec,2008	125.475	-		339.95	-		50.875	+	11
Jan,2009	136.45	+	6	346.525	+	13	56.8	+	
Feb,2009	127.375	-	7	293	-	14	42.525	-	12
Mar,2009	122.7	-		278.4	-		40.45	-	
Apr,2009	145.175	+	8	517.175	+	15	55.125	+	13
May,2009	219.775	+		939.35	+		81.8	+	
Jun,2009	286.8	+		1074.675	+		108.475	+	
Jul,2009	293.95	+		1006.775	-	16	103.275	-	14
Aug,2009	309	+		1071.325	+	17	94.7	-	
Sep,2009	313.325	+		1084.325	+		93.425	-	
Oct,2009	351.375	+		971.625	-	18	79.55	-	
Nov,2009	378.6	+		849.35	-		68.35	-	

Dec,2009	416.3	+		946.35	+	19	85.725	+	15
Jan,2010	433.9	+		920.95	-		83.575	-	
Feb,2010	427.975	-		858.5	-	20	75.175	-	
Mar,2010	354.175	-		818.925	-		72.275	-	16
Apr,2010	268.225	-	9	845.175	+	21	70.825	-	
May,2010	250.65	-		799.35	-	22	62.75	-	
Jun,2010	249.35	-		869.8	+		56.825	-	
Jul,2010	266.325	+		916.6	+	23	56.95	+	17
Aug,2010	277.1	+	10	918.65	+		57.1	+	
sep,2010	306.1	+		857.35	-	24	49.45	-	18
Oct,2010	317.65	+		868.175	+	25	54.9	+	19

FMCG; Nestle India, ITC, HUL

Date	Nestle India		Observations	ITC		Observations	HUL		Observations
Nov,2006	1074.55			187.6			236.4		
Dec,2006	1125.35	+	1	181.925	-		228.53	-	
Jan,2007	1120.875	-		175.275	-		213.71	-	1
Feb,2007	1033.875	-	2	173.35	-	1	192.86	-	
mar,2007	947.175	-		161.45	-		190.62	-	
apr,2007	973.95	+		153.3	-		197.6	+	2
may,2007	1105.2	+		162.7	+	2	199.65	+	
jun,2007	1149.975	+		158.075	-	3	195.05	-	3
july,2007	1175.95	+	3	162.35	+		197.9	+	
Aug,2007	1240.7	+		168.825	+	4	205.15	+	4
Sep,2007	1309.25	+		181.775	+		214.27	+	
Oct,2007	1422.1	+		182.55	+		215	+	
Nov,2007	1429.775	+		180.225	-	5	200.7	-	5
Dec,2007	1413.775	-	4	200.8	+	6	210.05	+	
Jan,2008	1440.1	+	5	206.4	+		212.3	+	
Feb,2008	1367.325	-	6	203.5	-	7	217.57	+	6
Mar,2008	1448.875	+		199.675	-		230.25	+	
Apr,2008	1623.5	+	7	215.475	+	8	244.02	+	
May,2008	1755.95	+		219.2	+		243.3	-	
Jun,2008	1681.05	-	8	203.425	-	9	219.85	-	7
Jul,2008	1585.85	-		185.625	-		218.7	-	
Aug,2008	1688.525	+	9	188.15	+	10	240.27	+	8
Sep,2008	1731	+		189.825	+		246.75	+	
Oct,2008	1567.075	-	10	173.1	-	11	238.02	-	9

Nov,2008	1425.225	-		166.05	-		237	-	
Dec,2008	1441.65	+		168.475	+		241.35	+	
Jan,2009	1460.8	+		175.55	+		255.92	+	10
Feb,2009	1492.55	+		180.425	+	12	257.72	+	
Mar,2009	1516.4	+		181.75	+		241.4	-	
Apr,2009	1648.5	+		186.525	+		235.67	-	11
May,2009	1741.125	+		194.65	+		235.5	-	
Jun,2009	1858.35	+	11	191.675	-	13	249.97	+	12
Jul,2009	2097.95	+		220.7	+	14	281.95	+	
Aug,2009	2178.85	+		239.75	+		272.25	-	13
Sep,2009	2220.4	+		230.875	-	15	262.27	-	
Oct,2009	2477.525	+		243.825	+		274.05	+	14
Nov,2009	2548.05	+		253.1	+	16	279	+	
Dec,2009	2557.275	+		254.65	+		272.25	-	
Jan,2010	2553.175	-	12	251.925	-	17	254	-	15
Feb,2010	2585.6	+		239.225	-		236.42	-	
Mar,2010	2648.8	+		252.55	+		236.5	+	16
Apr,2010	2736.675	+		264.7	+		234.85	-	17
May,2010	2820.25	+		273.675	+	18	235.25	+	
Jun,2010	2870.125	+	13	293.75	+		250.3	+	18
Jul,2010	2980.025	+		305.825	+		261.7	+	
Aug,2010	3016.8	+		312.75	+		253.55	-	19
sep,2010	3209.3	+		170.6	-	19	287.37	+	20
Oct,2010	3417.425	+		174.975	+	20	301.95	+	

OIL Sector: BPCL, HPCL, OCTL, ONGC

Dates	**BPCL**	**HPCL**	**OCTL**	**ONGC**	**BPCL**	**HPCL**	**OCTL**	**ONGC**
6-Apr	**436.35**	**320**	**14.5**	**1312**				
6-May	397.35	306.05	15.95	1322.9	-	-	+	+
6-Jun	334.5	235.5	12.15	1149.9	-	-	-	-
6-Jul	311.05	224.65	13.32	1111	-	-	+	-
6-Aug	362.8	277.95	14	1175	+	+	+	+
6-Sep	366.75	279.65	15	1215	+	+	+	+
6-Oct	400.55	324.85	17.2	1165.85	+	+	+	+
6-Nov	344.75	281.45	21	818	-	-	+	-
6-Dec	336.8	278.4	20.4	864.4	-	-	-	+
7-Jan	359.9	311.7	21.55	878	+	+	+	+
7-Feb	310.95	270.8	22	907.7	-	-	+	+
7-Mar	302.25	246.7	20.9	795	-	-	-	-
7-Apr	333.35	270.1	28.1	868	+	+	+	+
7-May	359.8	290.7	34	920	+	+	+	+
7-Jun	340.05	267.85	46.65	919	-	-	+	-
7-Jul	321	257.4	60	910	-	-	+	-

7-Aug	311.05	234.2	73.1	910	-	-	+	-
7-Sep	355.85	266	79	860	+	+	+	-
7-Oct	342.85	239.55	66	970	-	-	-	+
7-Nov	386.2	273.1	78.1	1260	+	+	+	+
7-Dec	523.55	369.2	83.1	1175	+	+	+	-
8-Jan	363.55	255.8	83.3	1248.8	-	-	+	+
8-Feb	459.95	299.15	72.95	1009	+	+	-	-
8-Mar	411.25	255.6	50.1	1008	+	-	-	-
8-Apr	409.6	257.25	59.6	998	-	+	+	-
8-May	357.7	244.65	63.45	1045	-	-	+	+
8-Jun	231.35	175.35	54.1	872	-	-	-	-
8-Jul	327.3	219.95	51	816	-	+	-	-
8-Aug	303.35	200.95	59	990	-	+	+	+
8-Sep	360.5	242.35	38	1030	+	+	-	-
8-Oct	286.2	190.85	35	1042	-	-	-	+
8-Nov	354.1	236.9	33.7	703.6	+	+	-	-
8-Dec	375.95	272.7	31.65	700	+	+	-	-
9-Jan	391.7	285.75	32	675	+	+	+	-
9-Feb	383.45	279.65	35	660	-	-	+	-
9-Mar	376.65	269.1	30.15	684	-	-	-	+
9-Apr	387.25	275.5	36.45	779.7	+	-	+	+
9-May	464.95	363.3	41.7	876.05	+	+	+	+
9-Jun	430.1	299.05	53.85	1190	-	-	+	+
9-Jul	473	349	55.5	1067	+	+	+	-
9-Aug	508.45	354.15	63.75	1169.75	+	+	+	+
9-Sep	573.8	400.65	78.65	1194.75	+	+	+	+
9-Oct	509.25	346.05	74.65	1174.9	-	-	+	-
9-Nov	590.6	352.05	100.05	1135.1	+	+	+	-
9-Dec	632.8	390.7	117.15	1205	+	+	+	+
10-Jan	541.6	333.85	101.5	1188	-	-	-	-
10-Feb	562.45	346.65	108	1120	+	+	+	-
10-Mar	516.7	318.45	100.5	1124	-	-	-	+

PSUs: NTPC, BHEL, SAIL, GAIL

Month	**Closing Price of Stocks**					**Analysis - Table Showing Calculation of Run**			
	NTPC	BHEL	SAIL	GAIL		NTPC	BHEL	SAIL	GAIL
Oct-06	129.6	2259	77.95	256.1		129.6	2259	77.95	256.1
Nov-06	147.2	2367	86.3	267.2		+	+	+	+
Dec-06	136.4	2232	87.65	261.6		-	-	+	-
Jan-07	142	2105	89.2	281.3		+	-	+	+

Feb-07	140	2107	108.2	283		-	+	+	+
Mar-07	149.8	1940	109	264.6		+	-	+	-
Apr-07	159.2	2145	114.1	295.7		+	+	+	+
May-07	158.4	1351	130.4	302.9		+	-	+	+
Jun-07	152.4	1301	140.1	308.5		-	-	+	+
Jul-07	165.7	1520	131.1	337.6		+	+	-	+
Aug-07	173.3	1540	150.1	309.3		+	+	+	-
Sep-07	193.5	1856	168.3	378.8		+	+	+	+
Oct-07	239.4	1970	207.1	411.7		+	+	+	+
Nov-07	236.7	2380	261.2	428.5		-	+	+	+
Dec-07	250.1	2348	258.5	542.1		+	-	-	+
Jan-08	197.9	1800	284.4	416.2		-	-	+	-
Feb-08	201.8	1850	214.2	422.6		+	+	-	+
Mar-08	197	1765	255.5	424.9		-	-	+	+
Apr-08	196.8	1571	184.8	441		-	-	-	+
May-08	172.3	1581	185.1	400.3		-	+	+	-
Jun-08	151.7	1325	159.7	333		-	-	-	-
Jul-08	170.5	1340	139.5	376.4		+	+	-	+
Aug-08	175.2	1610	140.7	394.9		+	+	+	+
Sep-08	171.8	1430	156.1	407.8		-	-	+	+
Oct-08	140.6	984.1	128	213.4		-	-	-	-
Nov-08	159.6	1160	85.25	196.1		+	+	-	-
Dec-08	181	1212	66.75	206		+	+	-	+
Jan-09	189.5	1250	77.45	195.2		+	+	+	-
Feb-09	184.2	1297	82.8	203.3		-	+	+	+
Mar-09	180.2	1251	76	244.3		-	-	-	+
Apr-09	190.2	1450	96.45	256.7		+	+	+	+
May-09	215.5	1572	109.3	300.7		+	+	+	+
Jun-09	195.1	2008	172.9	288		-	+	+	-
Jul-09	215.6	1940	151.1	331.3		+	-	-	+
Aug-09	212.7	2106	175.5	336.6		-	+	+	+
Sep-09	213.7	2180	162.6	358.8		+	+	-	+
Oct-09	211.4	2185	170.8	347.7		-	+	+	-
Nov-09	209.8	2105	164.5	419.3		-	-	-	+
Dec-09	235.7	2190	197.3	413.1		+	+	+	-
Jan-10	214.3	2240	240.7	394.5		-	+	+	-

Feb-10	203	2271	214.4	399.2		-	+	-	+
Mar-10	207	2323	218.5	409.8		+	+	+	+
Apr-10	207	2382	251.8	429.1		-	+	+	+
May-10	202	2232	218.6	453.7		-	-	-	+
Jun-10	199.2	2251	205.8	467.2		-	+	-	+
Jul-10	198.6	2352	192.7	438.2		-	+	-	-
Aug-10	195.8	2400	203.7	461.3		-	+	+	+
Sep-10	216.9	2382	186.8	475.7		+	-	-	+
Oct-10	203.5	2489	205	499.9		-	+	+	+

BANKING Sector: ICICI, HDFC, CANARA Bank, BOB, AXIS Bank, SBI

Date	**ICICI**	**HDFC**	**Canara Bank**	**BOB**	**Axis Bank**	**SBI**
	Close Price	Close Price	Close Price	Close Price	Close Price	Close Price
Jan-05	360.6	564.4	209.15	205.05	206.2	642.8
Feb-05	380.75	586.9	218.25	218.05	241.05	714.4
Mar-05	393	544.25	200.4	218.05	242.05	656.95
Apr-05	360.2	537.2	174.95	172.25	230.1	584.8
May-05	392.05	540.05	199.55	195.65	239.8	670.7
Jun-05	421.55	634.1	210.9	196.3	247.15	681.55
Jul-05	536	685.5	252.1	257.05	259.9	800.8
Aug-05	481.7	640.15	224.6	245.05	250	796.65
Sep-05	600.35	687.55	231.95	248.95	265.5	938.6
Oct-05	497.7	606	201.95	218.85	238.3	838.25
Nov-05	537.15	687.55	209.75	230.5	271.4	896.25
Dec-05	584.7	707.45	240.55	240.85	286.35	907.45
Jan-06	609.15	762.55	249.15	249.75	337.15	886.8
Feb-06	615.1	736.05	286.15	223.2	328.35	877.2
Mar-06	589.25	773.5	266.9	230.3	356.35	968.05
Apr-06	590.25	826.6	254.1	231.5	347.05	913.65
May-06	536.05	740.2	229.25	227.05	285.8	831
Jun-06	487.4	791.15	200.8	198.8	266.75	727.4
Jul-06	554.05	795.05	196.65	222	297.85	810.05
Aug-06	596.5	853.15	221.2	250.6	342.9	930
Sep-06	699.05	926	284.15	288.25	379.2	1028.3

Oct-06	776.85	1004.05	294	279.05	433.75	1095.5
Nov-06	871.45	1118.4	297.75	262.15	474.05	1314
Dec-06	890.4	1069.75	276.2	239.9	469.05	1245.9
Jan-07	940.5	1078.15	241.1	249.85	534	1138.05
Feb-07	831.9	932.6	210.5	219.75	460	1039.15
Mar-07	853.1	949.4	194.7	215.4	490.15	992.9
Apr-07	865.9	1026.15	217.65	235.95	467.85	1105.25
May-07	918.9	1139.75	244.2	275.2	579.55	1352.4
Jun-07	955.3	1144.1	269.65	270.25	605	1525.3
Jul-07	927.05	1198.65	261.75	299.95	626.7	1624.5
Aug-07	884.65	1171.3	244	267.6	634.1	1599.5
Sep-07	1063.15	1439.05	278.2	326.6	764.4	1950.7
Oct-07	1257	1653.1	292.95	342.35	918.8	2068.15
Nov-07	1184.65	1719	271.45	381.9	931.25	2300.3
Dec-07	1232.4	1727.8	332.05	459.6	967.1	2371
Jan-08	1145.65	1568	289.45	388.9	1110.8	2162.25
Feb-08	1090.95	1453.45	278.1	365.75	1018.75	2109.7
Mar-08	770.1	1319.95	225.2	283.9	781.15	1598.85
Apr-08	879.4	1514.85	237.1	315.15	924.3	1776.35
May-08	788.3	1357.85	216	270.05	794.05	1443.35
Jun-08	630.2	1002.3	178	203.25	603.65	1111.45
Jul-08	634.85	1095.25	183.75	255.5	653.85	1414.75
Aug-08	671.5	1277.25	215.5	284.3	723.3	1403.6
Sep-08	534.85	1229	188.75	297.55	720.5	1465.65
Oct-08	399.35	1023.65	165.25	241.7	562.6	1109.5
Nov-08	351.4	920.4	169.05	257.85	406.85	1086.85
Dec-08	448.35	997.6	187.8	280.45	504.65	1288.25
Jan-09	416.3	924.6	180.25	252.55	433	1152.2
Feb-09	328.1	884.85	165.35	220.4	347.95	1027.1
Mar-09	332.6	967.85	165.9	234.55	414.5	1066.55
Apr-09	477.75	1100.7	197.55	327	555.65	1277.7
May-09	740.7	1442.35	283.95	438.3	783.4	1869.1
Jun-09	722	1491.75	262.45	445.3	833.65	1742.05
Jul-09	759.05	1499.6	285.5	436	917.7	1814
Aug-09	749.5	1469.35	266.35	433.35	906.7	1743.05
Sep-09	904.8	1642.25	321.75	482.4	981.55	2195.7
Oct-09	789.6	1621.3	341.2	509.15	907.9	2191

Nov-09	864.3	1772.55	396.25	523.35	997.45	2238.15
Dec-09	875.7	1700.4	390.75	511.3	988.7	2269.45
Jan-10	830.4	1630.85	390.45	575.9	1025.5	2058
Feb-10	871.85	1704.65	391.95	583.9	1124.85	1975.85
Mar-10	952.7	1932.5	410.35	639.25	1169.1	2079
Apr-10	950.5	1991.6	429.55	691.55	1268.2	2297.95
May-10	867.05	1885.4	408.2	710.4	1228.4	2268.35
Jun-10	862	1914.65	448.85	701.95	1242.95	2302.1
Jul-10	904.45	2127.45	478.45	753.05	1345.4	2503.8
Aug-10	977.3	2132.45	514	804.9	1324.85	2764.85
Sep-10	1110.35	2480.8	582.65	872.8	1531.2	3233.2
Oct-10	1157.75	2493.65	585.1	903.75	1576.95	3256.35