

# **Market Spread an Indicator of Systemic Risk in India**

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## **A study of Top 100 Firms in India**

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## **MARKET SPREAD AN INDICATOR OF SYSTEMIC RISK IN INDIA**

### **Abstract**

The Estimation of systemic risk in India is still in its infancy stage. There are several methods which are available but none of the methods are fully compatible to forecast the systemic risk since under different circumstances the factors responsible for the risk differs.

In this paper the systemic risk estimation in India being carried out based on spread in daily stock market price(Difference between the bid and ask price of a share) of the top 100 firms in India according to market capitalization for the period of July2007 to March 2016. The results were compared with the Financial Stability Report published by Reserve Bank Of India for the period of March 2010 to June 2016.The results clearly indicates that there exists relationship between market illiquidity represented by spread and risks associated with the Financial System. In most of the cases the Z score (deviation from the mean/Standard Deviation) of the spread has become negative which provides the spread which is farther from the mean, also a good indicator of volatility in market and risk to financial system. It is also seen that the Systemic Risk Survey conducted by Reserve Bank of India which started during October 2011 has supported the results.

### **Keywords**

**Systemic risk:** Risk that Financial instability becomes so widespread that it impairs the functioning of the financial system

**Systemically Important Firms(SIFs):** Those firms both financial and non financial which are the contributors of Systemic risk

**Stock Price:** If a stock is currently trading, e.g. the Stock Exchange on which it is being traded is open, and then you will see the Last Price. This is the price at which the stock last changed hands from seller to buyer.

**Stock Price (Close):** This is the stock price of the last transaction of the previous day's trading.

**Stock Price (Open):** The open price is the price at which the first share was traded for the current trading day.

**Stock Price: Bid** – The Price a Buyer Bids to buy a stock: The Bid Price is the current market price offered for the stock.

**Stock Price: Ask:** The Ask or Asking Price is the opposite side of the trade to the Bid Price. If you want to buy a stock this is the price that someone else is ASKING for it. The Ask is the current price that it will cost you to buy each stock.

**Stock Price: Spread:** The difference between the bid and ask price is the spread. When a stock is traded a lot, it means it is very *liquid*, or has a lot of *Liquidity*. A very liquid stock generally means there is a low *BID / ASK Spread*. When a stock is very rarely traded and the buyers and sellers cannot agree on a price to make a trade, then the spreads tend to be larger. The spread is usually the fee for the Market Maker / Broker or Specialist handling the transaction.

**Joint Probability of Distress(JPoD):** The joint probability of default, which represents the probability of all the banks in the system becoming distressed. The JPoD captures changes in the distress dependence among the banks, which increases in times of financial distress; therefore, in such periods, the banking system's JPoD may experience larger and nonlinear increases than those experienced by the (Average) PoDs of individual banks.

**Banking Stability Index (BSI):** The banking stability index reflects the expected number of banks becoming distressed given that at least one bank has become distressed. A higher number signifies increased instability.

**Co-Risk Model:** This methodology draws from market data, but focuses on assessing systemic linkages at an institutional level. Such linkages may arise from common risk factors such as similar business models or common accounting/valuation practices across institutions.

## **Introduction**

The recent financial crisis has focused attention on systemic risk to the financial system and led to an explosion of research in the field. Financial firms play a crucial role in the economy, acting as intermediaries between parties that need to borrow and parties willing to lend or invest. Without such intermediation it is difficult for firms to get credit and conduct business, and for people to get auto loans, education loan, housing loans etc.

Systemic Risk is the risk which is embedded in the complexity and globalizations of financial services. The widespread losses and failures of the financial institutions can impose an externality on the rest of the economy and the recent global crisis provides ample evidence of systemic risk associated with it.

One definition of Systemic Risk is "Any set of circumstances that threatens the stability of the Public confidence in the Financial System"(Billo,Getmansky,Lo and Pelizzon 2010).

The European Central Bank (ECB) 2010 defines as a risk of financial instability so widespread that it impairs the functioning of a financial system to the point where economic growth and welfare suffers materially.

Though there has been development of methods which are related to the estimation of systemic risk but in India still the estimation of systemic risk has been in Infancy stage. Moreover, there has been no methods to predict the systemic risk or no indicator of the systemic risk.

The measurement of systemic risk can be helpful to forecast the risk and the measurement is also a challenging task.

The systemic risk measures are based on market observed data on daily basis such as stock prices of financial institutions, major firms which are contributing the BSE-sensex figures etc. So, stock market data play an important role in prediction or estimation of systemic risk. The methods which are used for estimation of the systemic risk are also based on equity prices. Some of the methods which are used in systemic risk estimation like Tail Measures (Brownlees and Engle, 2012) is based on equity returns of financial institutions, Marginal Expected Shortfall (MES) one of the popular methods of estimation of systemic risk is based on Bank's Stock Prices.

In India, one of the first attempts has been made by Natasha Aggarwal et al (2013) in their paper "A Systematic Approach to identify Systemically Important Firms" for estimation of systemic risk in India. This paper uses the average percentile ranking of three measures of systemic risk Granger Causality, Marginal Expected Shortfall and Conditional Value at Risk to calculate a single systemic Risk Index for a firm. This paper captures the cumulative risk of the SIFs (Systemically Important Firms), tracks the changes in systemic Risk in India during the 2008 crisis.

Naval B.Varma(2014) in his paper “A State Approach to Estimate Systemic Risk” has proposed Systemic Expected Shortfall introduced by Acharya et al(2010) to measure systemic risk.

Acharya and Kulkarni(2012) analyzes the performance of Banks in India during the period of 2007-2009 in order to study the impact of ownership structure on Bank Vulnerability to a crisis in their Paper “State ownership and Systemic Risk: Evidence from Indian Financial Sector during 2007-2009” and found that Private Sector and Vulnerable Private Sector Banks based on ex-ante measures of exposures to crisis performed worse than safer banks,however,the opposite was true for State owned Banks. The vulnerable Private sector Banks experienced deposit withdrawals and shortening of deposit maturity relative to other Private Sector Banks. In contrast, Vulnerable State Owned Banks relatively grew their deposit base more so in term deposits, increased their loan and advances at cheaper rates especially in Public sector firms.

All these papers are focused on estimation of systemic risk and estimation is done after the crisis event has occurred.Besides, estimation of systemic risk it is important to predict the systemic risk or financial turbulence though prediction cannot be done with certainty since systemic risk is affected by a large number of factors besides the market forces.

The Reserve Bank of India (RBI) carries out Systemic Risk Survey every year on half yearly basis which perceives the factors which are posing risk to the financial system as a whole. The first such survey was conducted during October 2011.

Apart from the survey, RBI also publishes Financial Stability Report for the country which elaborates comprehensive reports on macroeconomic and microeconomic factors affecting the financial stability.

The methodology adopted by RBI to identify Domestic Systemically Important Banks(D-SIBs) where banks having size as a percentage of GDP beyond 2% will be selected as sample Banks. The indicators to be used to assess D-SIBs are as follows:

1. Size
2. Interconnectedness
3. Lack of readily available substitutes or financial institution infrastructure
4. Complexity

RBI would give more weight to size as it is felt size is most important indicator of systemic importance which is given 40% weightage(RBI Draft Paper on DSIBs,2012).Recently SBI and ICICI Bank Ltd. are the two DSIBs in India according to RBI Reports(Live Mint,Feb 14,2016).

In this paper we would nurture the prediction of systemic risk or more precise financial turbulence in India since India has been immune to Systemic Risk and more precise failure of Banks due to the fact that Indian Economy is to some extent controlled by State.

It is evident from the research papers devoted for estimation of Systemic Risk that there is relationship between equity market and systemic risk. In this paper we would like to establish this relationship but in a different aspect.

Indian Stock Market consists of the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE).The Bombay Stock Exchange was established in 1875 and is the Asia’s first and fastest Stock Exchange in the world. More than 5500 companies are listed on BSE making it world's No. 1 exchange in terms of listed companies. The companies listed on BSE command a total market capitalization of USD 1.64 Trillion as of Sep 2015. It is also one

of the world's leading exchanges (5th largest in September 2015) for Index options trading (Source: World Federation of Exchanges). BSE's popular equity index - the S&P BSE SENSEX - is India's most widely tracked stock market benchmark index. It is traded internationally on the EUREX as well as leading exchanges of the BRICS nations (Brazil, Russia, China and South Africa). (Source: BSE website introduction).

One of the major reasons attributing to the Systemic crisis of 2008 was liquidity crunch in the market. The literature distinguishes between three sub-forms of market liquidity (Kyle, 1985): 1) the bid-ask spread, which measures how much traders lose if they sell one unit of an asset and then buy it back right away; 2) market depth, which shows how many units traders can sell or buy at the current bid or ask price without moving the price; and 3) market resiliency, which tells us how long it will take for prices that have temporarily fallen to bounce back. (Markus K Brunnermeier, 2009). Bid-ask spread is one of the measures of market liquidity (Bervas, 2006). The bid-ask spread is also an important indicator of the financial stability of the stock market. Its sudden widening is a cause of concern and may generate systemic crisis. As bid ask spread reduces the return on investment, all investors would like to face minimum bid-ask spread. (Priyanka Singh and Ajay Pandey, IIM-Ahmedabad).

So, Bid-ask spread in the stock market forms an important part of the market liquidity and is also influencing the systemic risk. In India there has been nascent literature establishing the relationship between bid-ask spread and systemic risk. This paper is one of the first attempts to establish the same.

### **Estimation of Bid-ask Spread**

Markets are categorized as Order driven markets and quote driven markets. The quote driven market has a dealer or third party providing the liquidity and in order driven market the liquidity is provided in limit orders. The Indian stock market which is dominated by BSE and NSE is predominantly order driven market.

The bid-ask spread is the difference between the lowest ask price and the highest bid price for a stock. It represents the variable cost that an investor pays for a trade. The bid ask spread depends on several factors like Volume of trade, Share price, Probability of information based trading and pricing grid (tick size).

Our Study in this paper is based on the quarterly Bid-ask spread (Closing price-Opening price) of top 100 firms according to market capitalization in India which has been obtained from Bombay Stock Exchange website. In this paper we calculate the average of the quarterly spread of top 100 firms (As on 31-03-2016) according to market capitalization from 1<sup>st</sup> July, 2007 to 31<sup>st</sup> March, 2016. The total/summation of average quarterly spread data reveals that higher spread was during 2007Q4 (January, 2008- March 2008) which also represents the period of financial crisis. During the post crisis period (January 2009 to June 2010) the market was more or less stable with a positive spread representing liquidity in the market. As evident from the literature that the Indian Economy was affected due to financial crisis which erupted in 2007 had its impact on the Indian economy beginning only 2008. At the peak of the financial crisis, the Indian government announced a series of stimulus packages with the aim of restoring the economy. While the global impact on the financial sectors has been severe, Indian financial firms have fared much better (Acharya and Kulkarni, 2012).

Thereafter highest spread was during 2015Q2 (July 2015-Sep 2015) which is followed by higher spreads during 2015Q3 (Oct 2015-Dec 2015), 2015Q4 (Jan 2016-March 2016). The higher spreads during 2015-16 (Q2, Q3, Q4) is represented in financial turbulence in India where most of the public sector Banks and financial firms reported losses or sharp decline in profits at the end of 2015-16 Q4 due to large growth in Non performing assets which is attributed to poor performance of the corporate sector where funds were lent out.

So there has been clear cut evidence of financial turbulence and spread in the stock market.

This paper is distributed in five sections where Section I presents the data and methodology, Section II represents the data in timeline, Section III discusses the literature review, Section IV discusses the results summary and comparisons with standard data/results available and summary of results and section V Concludes.

### I. Data and Methodology:

The data consists of the daily spread data of 100 firms in India according to market capitalization as on 31-03-2016 which is obtained from Bombay Stock Exchange Historical Data.

The quarterly spread are being calculated as average spread in a quarter from July 2007 to March 2016. The periods have been classified as Crisis(July 2007-Dec 2008), Post-Crisis(Jan2009-Dec2013) and Recent(Jan2014-March2016) periods. The data is presented in Table no:1 to Table no:6.

The daily spread data from 1<sup>st</sup> July,2007 to 31<sup>st</sup> March,2016 is further analyzed in quarterly data of average spread. The summation of average quarterly data of the 100 firms is used to obtain the total spread in a quarter. Finally Table no:7 gives the deviation of the average quarterly spread from the mean and standard deviation.

**Table no: 1**

s no	Name of Firm	july07- sep07	oct07-dec07	jan08- march08	april08- june08	july08- sep08	sep08- dec08
		2007	2007	2007	2008	2008	2008
		Q2	Q3	Q4	Q1	Q2	Q3
1	TCS	-5.4203125	-4.9634921	-5.303225806	-1.052459016	-4.890625	-2.179661
2	RELIANCE	9.5453125	5.9952381	-9.163709677	1.093442623	3.1734375	-9.0389831
3	HDFC BANK	4.6734375	-0.0396825	-6.913709677	-8.01147541	2.8421875	-6.3474576
4	ITC	0.12890625	-0.3769841	-0.617741935	-0.654918033	0.2203125	-0.2372881
5	INFOSYS	-5.98828125	-13.940476	-7.622580645	2.525409836	-5.80625	-1.2864407
6	COAL INDIA	NA	NA	NA	NA	NA	NA
7	HDFC	5.328125	7.90714286	-11.86290323	-8.633606557	6.2921875	-12.369492
8	HUL	-0.1265625	-0.5992063	-0.233870968	-0.101639344	0.97421875	0.08983051
9	SUN PHARMA	-1.36328125	4.35714286	3.000806452	1.824590164	4.82265625	-3.4313559
10	ONGC	-3.68125	-2.3111111	-4.691129032	-5.182786885	4.02421875	-4.7415254
11	SBI	-0.63671875	-3.2873016	-16.18951613	-8.386065574	9.35390625	-5.6169492
12	BHARTI AIRTEL LTD	-0.74765625	-3.4857143	-4.285483871	-3.754098361	0.58515625	-0.9838983
13	WIPRO LTD	-2.7171875	1.04603175	-2.167741935	0.118852459	-1.8953125	-0.8381356
14	ICICI BANK LTD	-0.8125	-1.6444444	-10.45887097	-0.86147541	1.45625	-2.0923729
15	KOTAK MAHINDRA BANK LTD	2.4796875	2.00079365	-17.24032258	-2.901639344	2.50390625	-3.4779661
16	LARSEN & TOUBRO LTD	2.90234375	6.63333333	-23.46209677	-18.94918033	3.2421875	-9.0135593
17	TATA MOTORS LTD	-2.9171875	-3.2492063	-3.259677419	-3.513934426	-0.821875	-4.9415254
18	NTPC LTD	-0.02265625	-0.2261905	-1.795967742	-0.924590164	0.1953125	0.31525424
19	MARUTI SUZUKI INDIA LTD	0.46171875	-1.2888889	-5.581451613	-2.895081967	3.09453125	-0.970339
20	AXIS BANK LTD	0.40546875	0.16746032	-8.838709677	-3.666393443	1.85234375	-4.1533898
21	HCL TECHNOLOGIES LTD	-2.97265625	0.14206349	-2.398387097	-1.443442623	-1.0296875	-1.9457627
22	INDIAN OIL CORPORATION LTD	-1.79765625	0.52460317	-7.718548387	-3.083606557	1.16328125	-1.5711864
23	ASIAN PAINTS LTD	0.98359375	-0.9706349	6.449193548	-2.554098361	1.02109375	-3.0347458
24	ULTRATECH CEMENT	1.00234375	-3.1428571	0.197580645	-4.6	-1.30859375	-2.3483051
25	MAHINDRA & MAHINDRA	-2.35546875	-2.4912698	-2.636290323	-4.267213115	3.3015625	-4.3881356
26	POWER GRID CORPORATION	NA	0.06333333	-1.124193548	-0.580327869	0.17578125	0.08389831

27	BAJAJ AUTO	NA	NA	NA	-17.44347826	7.28359375	-0.8830508
28	BPCL	-0.77578125	1.13174603	-1.378225806	-3.4	1.8578125	-0.2398305
29	HIND ZINC	-1.59140625	-1.447619	-7.22016129	-1.521311475	-1.77890625	-0.1483051
30	BOSCH	-7.06875	-39.870635	-30.83709677	16.14016393	-1.63515625	7.14915254
31	LUPIN	-5.39375	-2.3595238	-3.815322581	1.62704918	-0.03671875	1.56186441
32	INDUSIND BANK	-0.0859375	-0.0222222	-1.162903226	-0.500819672	-0.05859375	-0.3237288
33	NESTLE	3.3234375	-4.6166667	-0.347580645	2.740163934	1.10625	-3.0194915
34	BHARTI INFRA TEL	NA	NA	NA	NA	NA	NA
35	HERO MOTOCORP	-0.0921875	-2.6992063	-1.312903226	0.742622951	4.43359375	2.26525424
36	DABUR INDIA	-0.03359375	-0.4746032	-0.508064516	-0.763934426	-0.04296875	0.11355932
37	DR REDDYS LAB	-0.68359375	0.53730159	-2.467741935	1.233606557	-2.25234375	-0.2745763
38	GODREJ CONSUMER	-0.36953125	-1.2801587	-0.566935484	0.504098361	-0.7359375	-0.2245763
39	EICHER MOTORS	-0.9828125	-2.3928571	-2.169354839	-0.168852459	0.71640625	-0.3584746
40	SHREE CEMENTS	4.35703125	-2.7150794	1.037096774	-14.09098361	-1.134375	2.43135593
41	TECH MAHINDRA	-4.228125	-6.7047619	-15.6733871	-1.546721311	-3.8984375	-5.5211864
42	GAIL	-0.16953125	-0.1095238	-3.518548387	-3.417213115	0.6	-1.9542373
43	YES BANK	-0.64609375	-0.4404762	-1.8	-1.359836066	-0.1	-0.9677966
44	SIEMENS	-5.51015625	-3.3849206	-15.62016129	-4.695081967	0.03125	-3.0550847
45	ZEE ENTERTAINMENT	-0.1859375	-1.7753968	-0.924193548	-0.910655738	0.4078125	-0.9559322
46	ADANI PORTS	NA	13.4282609	-15.17096774	-2.58852459	-0.59140625	-2.4661017
47	AUROBINDO PHARMA	-5.8859375	-2.5571429	-7.127419355	-1.159836066	0.49609375	-2.3669492
48	BAJAJ FINANCE	-1.6515625	-0.168254	-0.349193548	-3.767213115	-1.18828125	-0.7059322
49	GRASIM	12.1734375	-0.8365079	-26.18951613	-11.26311475	0.984375	-3.9669492
50	AMBUJA CEMENTS	-0.00234375	-0.3452381	-0.434677419	-0.944262295	-0.10703125	-0.1110169
51	CIPLA	-1.16171875	-0.8626984	-0.465322581	-0.430327869	0.4390625	-0.440678
52	MOTHERSON SUMI	0.3421875	0.37142857	0.883064516	-0.516666667	0.08984375	-0.7381356
53	INTERGLOBE AVI	NA	NA	NA	NA	NA	NA
54	NMDC	-42.9809524	32.4916667	-25.24344262	-32.54590164	-3.40078125	-0.9355932
55	IDEA CELLULAR	-0.64453125	-0.2166667	-1.026612903	-0.517213115	-0.40078125	-0.3144068
56	PIDILITE IND	-0.6796875	-0.8380952	-0.748387097	-0.310655738	-0.23671875	-0.5279661
57	VEDANTA	12.3664063	2.26031746	-25.2733871	-5.473770492	-6.15390625	-0.8491525
58	TITAN COMPANY	-1.6078125	-10.269048	-13.13387097	-2.768032787	2.43125	-2.1059322
59	UNITED SPIRITS	0.1046875	-7.5349206	-10.54516129	-6.051639344	-1.5703125	-4.5415254
60	BANK OF BARODA	-0.04765625	0.52380952	-2.520967742	-1.509016393	2.34140625	-0.6822034
61	JSW STEEL	-3.94296875	-10.146032	-15.37822581	-2.228688525	-10.8039063	-5.2898305
62	MARICO	-0.1765625	-0.2753968	-0.05483871	-0.257377049	0.0296875	-0.0932203
63	BAJAJ FINSERV	NA	NA	NA	-5.469230769	0.90625	-4.0762712
64	CADILA HEALTH	-2.47734375	-1.9825397	-2.277419355	2.236885246	2.046875	0.02542373
65	HPCL	-1.3359375	0.35555556	-3.183064516	-1.313934426	0.503125	-0.570339
66	BRITANNIA	-11.1382813	-9.9761905	-1.416935484	-1.591803279	-1.4703125	-4.3881356
67	TATA STEEL	2.4234375	-1.4404762	-5.508064516	1.867213115	-6.23125	-2.8754237
68	BHARAT ELEC	-3.2046875	-3.4285714	-21.86532258	-1.708196721	-2.6109375	0.03644068
69	ACC	-1.29765625	-6.3746032	-9.453225806	-6.468852459	0.975	-2.8762712

70	DIVIS LAB	-0.1765625	-0.2753968	-0.05483871	-0.257377049	0.0296875	-0.0932203
71	GLAXO SMITHKLINE	-2.128125	-3.9785714	-3.730645161	0.981967213	5.5828125	6.86440678
72	BHEL	0.2265625	-5.115873	-12.5	-14.10491803	4.221875	-5.7194915
73	ORACLE FIN SERV	-24.2882813	-9.847619	-16.43225806	0.991803279	-13.553125	-4.9262712
74	INDIA BULLS HSG	NA	NA	NA	NA	NA	NA
75	ASHOK LEYLAND	-0.17734375	-0.2531746	-0.563709677	-0.16557377	-0.08125	-0.2077966
76	NHPC	NA	NA	NA	NA	NA	NA
77	CONTAINER CORPORATION	-13.20625	-20.513492	-17.97822581	-0.117213115	3.728125	2.10254237
78	SHRIRAM TRANS	0.2453125	1.0984127	2.125806452	-2.346721311	2.43984375	-0.4169492
79	ABB INDIA	0.96875	-4.4769841	-8.206451613	-8.647540984	0.08515625	-4.429661
80	GLAXO SMITH CON	3.20625	3.12698413	-1.241935484	5.130327869	-1.6140625	1.38474576
81	CAIRN INDIA	0.159375	-0.1142857	-1.185483871	-0.191803279	-0.58359375	0.59745763
82	PIRAMAL ENTER	-2.403125	-1.0968254	-2.012096774	-0.460655738	0.95703125	-1.3957627
83	HINDALCO	-0.49375	0.06507937	-0.97983871	-0.801639344	-0.43125	-0.9610169
84	EMAMI	-1.634375	-0.1079365	1.89516129	-0.053278689	1.9234375	-0.9271186
85	LIC HOUSING FIN	-0.40703125	0.61666667	-2.695967742	-0.821311475	0.4875	-1.570339
86	COLGATE	-0.7859375	-2.2147059	-1.220967742	-1.150819672	0.984375	0.02711864
87	DLF	1.10245902	-0.6634921	-9.278225806	-4.871311475	0.56171875	-0.0737288
88	UPL	-0.74921875	-1.9833333	-1.37016129	0.431147541	0.6125	-2.5271186
89	TORRENT PHARMA	-2.25390625	-1.8595238	-1.232258065	0.241803279	-0.0109375	-0.9152542
90	HAVELLS INDIA	-2.2875	-2.0261905	-4.078225806	-3.22704918	-2.42109375	-3.3466102
91	CUMMINS	0.27578125	-1.7563492	-3.19516129	-2.28442623	1.31484375	-1.3516949
92	PETRONET LNG	-0.0328125	-0.3452381	-0.778225806	-0.43442623	-0.06796875	-0.470339
93	POWER FINANCE	-0.2265625	-0.9230159	-3.173387097	-1.159836066	0.19296875	-0.1923729
94	GLENMARK	-0.38984375	0.41746032	-0.999193548	1.467213115	-0.5328125	-2.9330508
95	OIL INDIA	NA	NA	NA	NA	NA	NA
96	P & G	-2.47265625	-2.3706349	-3.375806452	2.405737705	2.840625	-0.5559322
97	PNB	-1.09140625	0.3015873	-5.678225806	-2.623770492	2.2421875	0.52372881
98	TATA POWER	0.97109375	4.86428571	-5.815322581	-1.77295082	-3.7671875	-1.8364407
99	BERGER PAINTS	-0.07890625	-0.1579365	-0.820967742	0.027868852	0.06640625	0.14067797
100	UNITED BREWERIE	0.26640625	-3.0134921	-4.611290323	-2.123770492	-0.29921875	-2.0347458
	Total	-122.472243	-142.22986	-527.8748942	-228.0056052	20.6914063	-155.02898



**Table no: 2**

s no	Name of Firm	Jan 2009- Mar2009	APR 09-JUNE09	July09-Sep09	Oct 09-dec 09	Jan 10- March 10	April 2010- June2010
		2008 Q4	2009 Q1	2009 Q2	2009 Q3	2009 Q4	2010 Q1
1	TCS	3.187288136	11.72966102	2.25859375	0.4	0.23916667	0.827777778
2	RELIANCE	5.499152542	2.062711864	3.24765625	-1.351639344	-0.97666667	-0.622222222
3	HDFC BANK	-3.93220339	3.492372881	-2.07890625	0.73852459	3.85666667	1.661904762
4	ITC	-0.222033898	-0.952542373	-0.046875	-0.52704918	-0.34666667	0.353174603
5	INFOSYS	3.521186441	3.540677966	6.2515625	-0.43852459	-2.2825	2.801587302
6	COAL INDIA	NA	NA	NA	NA	NA	NA
7	HDFC	-0.650847458	7.619491525	4.375	1.9	0.64333333	4.236507937
8	HUL	0.150847458	-0.448305085	-0.81796875	-0.513934426	-0.6525	0.21984127
9	SUN PHARMA	-2.997457627	-4.673728814	3.290625	-5.116393443	4.88	-2.592857143
10	ONGC	1.203389831	1.205084746	-2.34296875	-4.016393443	-3.64916667	0.817460317
11	SBI	-5.543220339	-1.561016949	1.2078125	-1.585245902	-4.16583333	5.325396825
12	BHARTI AIRTEL LTD	-2.4	-5.516101695	-1.21171875	-2.807377049	-1.26833333	-0.954761905
13	WIPRO LTD	0.550847458	0.85	3.128125	-0.013114754	-1.78	-1.7
14	ICICI BANK LTD	-2.678813559	5.106779661	0.02109375	-2.732786885	0.95666667	-0.678571429
15	KOTAK MAHINDRA BANK LTD	-1.753389831	2.615254237	-1.6984375	-3.152459016	-2.56833333	-0.404761905
16	LARSEN & TOUBRO LTD	-2.471186441	3.48220339	-1.165625	-1.987704918	-4.455	2.230952381
17	TATA MOTORS LTD	-0.678813559	0.086440678	4.76875	1.001639344	-2.49416667	-0.414285714
18	NTPC LTD	0.191525424	-1.144915254	-0.38046875	-0.21557377	-1.02833333	-0.192857143
19	MARUTI SUZUKI INDIA LTD	7.86440678	4.040677966	8.53203125	-8.43852459	-6.80666667	-2.638095238
20	AXIS BANK LTD	-3.057627119	1.427966102	-1.075	-3.691803279	1.7675	1.273015873
21	HCL TECHNOLOGIES LTD	-0.997457627	0.18220339	1.10703125	-1.523770492	-1.3375	0.207142857
22	INDIAN OIL CORPORATION LTD	-0.049152542	2.768644068	-0.465625	-1.945901639	-1.28666667	0.338888889
23	ASIAN PAINTS LTD	-1.924576271	3.81637931	-1.534375	2.814754098	3.72666667	4.265079365
24	ULTRATECH CEMENT MAHINDRA & MAHINDRA	3.477966102	-0.204237288	-0.4359375	-3.035245902	7.0275	-0.477777778
25	POWER GRID CORPORATION	2.704237288	1.348305085	0.86796875	0.968852459	-2.72416667	0.018253968
26	BAJAJ AUTO	0.295762712	-0.641525424	-0.21953125	-0.043442623	-0.27583333	-0.221428571
27	BPCL	4.986440678	5.837288136	4.58671875	-0.250819672	4.48083333	8.09047619
28	HIND ZINC	0.057627119	0.165254237	0.7546875	0.030327869	-4.6625	-0.054761905
29	BOSCH	0.125423729	-0.450847458	0.6625	3.303278689	-1.16083333	-6.247619048
30	LUPIN	1.023728814	-21.59661017	-2.26171875	0.323770492	-0.06666667	-3.282539683
31	INDUSIND BANK	-0.712711864	-0.831355932	4.3203125	1.633606557	0.9675	4.611111111
32	NESTLE	-0.21779661	0.261016949	-0.19375	-0.252459016	0.1925	0.317460317
33	BHARTI INFRATEL	1.972033898	7.005084746	2.515625	-2.723770492	-0.19916667	9.465079365
34	HERO MOTOCORP	NA	NA	NA	NA	NA	NA
35	DABUR INDIA	5.694067797	-2.277966102	-2.89140625	-2.312295082	0.95833333	-0.584920635
36		0.409322034	-0.209322034	-0.45546875	-0.139344262	-0.25583333	0.279365079

37	DR REDDYS LAB	-0.340677966	0.875423729	1.4609375	0.308196721	1.99416667	1.123809524
38	GODREJ CONSUMER	-0.091525424	-0.542241379	0.3203125	-0.668852459	-1.52416667	0.123015873
39	EICHER MOTORS	0.029661017	2.616101695	5.096875	2.386065574	-1.32666667	4.296825397
40	SHREE CEMENTS	2.323728814	2.072881356	2.56953125	5.340163934	-4.63333333	-8.678571429
41	TECH MAHINDRA	-0.991525424	6.156779661	-1.25	-0.754918033	-6.19333333	-4.080952381
42	GAIL	0.411016949	-1.777966102	-0.76015625	0.445081967	-1.20833333	0.355555556
43	YES BANK	-0.619491525	0.777118644	0.32890625	0.149180328	-0.69333333	0.408730159
44	SIEMENS	-0.645762712	1.959322034	-0.26875	-1.335245902	1.09666667	0.907142857
45	ZEE ENTERTAINMENT	-0.725423729	0.277966102	0.30625	0.263114754	-0.47	0.232539683
46	ADANI PORTS	0.024576271	0.458474576	-4.4234375	-1.549180328	5.065	-1.115873016
47	AUROBINDO PHARMA	-0.027118644	2.551694915	3.53203125	-0.456557377	1.00833333	2.676984127
48	BAJAJ FINANCE	-0.108474576	-0.153448276	-0.1828125	1.337704918	-1.8575	1.591269841
49	GRASIM	8.027966102	5.440677966	5.15859375	-8.794262295	1.66333333	-13.99920635
50	AMBUJA CEMENTS	-0.094067797	-0.398305085	-0.290625	-0.209016393	0.315	0.253968254
51	CIPLA	0.361864407	-0.722881356	-0.5828125	-0.162295082	-0.99583333	-0.936507937
52	MOTHERSON SUMI	0.088135593	-0.439830508	0.115625	-0.451639344	-0.54583333	-0.145238095
53	INTERGLOBE AVI	NA	NA	NA	NA	NA	NA
54	NMDC	-0.206779661	-0.954237288	-3.46328125	-1.309836066	-1.75916667	-0.844444444
55	IDEA CELLULAR	-0.163559322	-0.365254237	-0.365625	-0.567213115	0.01	-0.108730159
56	PIDILITE IND	-0.426271186	-0.719827586	-0.525	-0.336065574	-0.73916667	0.015079365
57	VEDANTA	0.239830508	0.008474576	0.30390625	2.618032787	0.06833333	-2.014285714
58	TITAN COMPANY	-1.952542373	0.252542373	-4.84375	-0.767213115	5.46	8.295238095
59	UNITED SPIRITS	-4.912711864	0.218644068	-4.03359375	2.657377049	-3.44333333	-1.188095238
60	BANK OF BARODA	-1.263559322	1.689830508	-0.79765625	-1.168852459	1.70166667	1.026984127
61	JSW STEEL	-1.046610169	4.370338983	-0.12890625	-0.263934426	1.26333333	-3.83968254
62	MARICO	-0.012711864	-0.23559322	-0.4109375	-0.377868852	-0.16166667	-0.004761905
63	BAJAJ FINSERV	0.195762712	1.483898305	-1.79609375	-0.214754098	-1.73	-0.120634921
64	CADILA HEALTH	-1.716101695	-0.360169492	2.0390625	0.463934426	0.72	-0.757936508
65	HPCL	0.244067797	-1.542372881	-0.43203125	-1.425409836	-2.43333333	1.107142857
66	BRITANNIA	4.330508475	-6.360344828	-4.17421875	-2.042622951	-7.49666667	-1.228571429
67	TATA STEEL	-0.383898305	1.340677966	1.77734375	0.804098361	-1.34166667	-1.673809524
68	BHARAT ELEC	1.977966102	1.658474576	-7.29921875	5.186885246	0.325	-8.901587302
69	ACC	1.187288136	0.347457627	-1.30234375	-0.522131148	0.295	3.028571429
70	DIVIS LAB	-7.250847458	-5.962711864	-3.7015625	-0.924590164	-1.20416667	0.469047619
71	GLAXO SMITHKLINE	-1.897457627	1.665254237	2.54609375	1.903278689	2.61083333	-5.105555556
72	BHEL	2.666101695	1.853389831	-5.82734375	-2.889344262	-2.97333333	0.401587302
73	ORACLE FIN SERV	3.804237288	-0.379661017	6.709375	2.489344262	-2.98333333	-0.165079365
74	INDIA BULLS HSG	NA	NA	NA	NA	NA	NA
75	ASHOK LEYLAND	-0.000677966	0.068644068	0.1015625	-0.08442623	-0.09083333	0.054761905
76	NHPC CONTAINER	NA	NA	-0.4125	-0.116393443	-0.19	-0.075396825
77	CORPORATION	2.165254237	2.377118644	4.115625	-0.06147541	-1.25	-2.142063492
78	SHRIRAM TRANS	1.494915254	0.686440678	0.82890625	0.110655738	-1.455	-0.569047619

79	ABB INDIA	-1.689830508	3.291525424	-3.12734375	-2.793442623	-0.6625	-0.403968254
80	GLAXO SMITH CON	3.520338983	3.468965517	3.7203125	-2.851639344	3.20833333	-2.51984127
81	CAIRN INDIA	-0.187288136	-1.219491525	-1.17734375	-0.524590164	-0.2925	-0.437301587
82	PIRAMAL ENTER	-2.51440678	0.294067797	-0.634375	-1.164754098	2.1094E-16	-0.964285714
83	HINDALCO	-0.244915254	-0.001694915	0.38515625	-0.080327869	0.18833333	-0.653968254
84	EMAMI	-0.268644068	1.945689655	-0.42265625	-0.839344262	2.2275	0.735714286
85	LIC HOUSING FIN	-0.655084746	3.872033898	4.98046875	4.249180328	2.96	0.793650794
86	COLGATE	0.623728814	-0.218644068	-1.1421875	-0.885245902	-2.33666667	3.042063492
87	DLF	-1.333050847	1.513559322	1.92578125	-1.735245902	-1.22916667	-0.278571429
88	UPL	-0.53559322	-0.963559322	-0.9421875	-0.622131148	-1.105	0.04047619
89	TORRENT PHARMA	-0.668644068	-0.528448276	1.4109375	-0.037704918	1.2125	-0.707936508
90	HAVELLS INDIA	0.137288136	-0.362711864	-0.78203125	0.974590164	-0.88083333	-0.237301587
91	CUMMINS	-1.794067797	-0.330508475	-0.0609375	-1.174590164	0.73416667	1.283333333
92	PETRONET LNG	-0.16779661	-0.11779661	-0.2796875	-0.389344262	-0.0925	-0.119047619
93	POWER FINANCE	0.165254237	-0.539830508	-0.30625	-0.310655738	-0.85083333	0.181746032
94	GLENMARK	-2.354237288	-1.010169492	-0.19921875	-0.340163934	-0.9575	-1.121428571
95	OIL INDIA	NA	NA	121.55	2.368852459	-4.40333333	-0.231746032
96	P & G	1.238135593	1.351694915	7.7546875	3.551639344	6.0825	-5.915873016
97	PNB	-2.187288136	1.505932203	0.4375	0.370491803	1.08	0.437301587
98	TATA POWER	2.116949153	3.894915254	0.6203125	-0.160655738	-1.57833333	-0.854761905
99	BERGER PAINTS	0.144067797	-0.279310345	-0.1171875	-0.429508197	-0.26583333	-0.03968254
100	UNITED BREWERIE	0.336440678	-1.168644068	-0.3984375	-0.148360656	-0.33	-0.288095238
		11.00440678	62.82537989	155.8539063	-39.6647541	-37.1416667	-13.31428571

Table no: 3

s no	Name of Firm	July10-Sep10	oct 2010- Dec2010	Jan11- March11	April 2011- June11	July11- Sep11	oct11-Dec11
		2010 Q2	2010 Q3	2010 Q4	2011 Q1	2011 Q2	2011 Q3
1	TCS	-0.272307692	1.42890625	-0.595967742	-1.95	-2.661111111	1.9625
2	RELIANCE	-4.789230769	-1.696875	-2.744354839	-3.228225806	-2.4547619	-2.339166667
3	HDFC BANK	6.865384615	-7.2203125	-3.041129032	1.048387097	-2.33015873	-2.043333333
4	ITC	-0.173846154	-0.7125	-0.246774194	-0.031451613	-0.30634921	-0.131666667
5	INFOSYS	3.923076923	6.140625	-0.970967742	-5.413709677	-3.81507937	5.1275
6	COAL INDIA	NA	-0.15375	0.304032258	-0.203225806	-1.31190476	-1.371666667
7	HDFC	-0.025384615	-3.06640625	-2.62016129	-1.258870968	-1.90634921	-0.7025
8	HUL	0.094615385	-0.81484375	-1.142741935	1.084677419	-0.07698413	0.855
9	SUN PHARMA	-2.2	0.0125	-2.191129032	-0.125806452	-2.29126984	-0.183333333
10	ONGC	-2.63	-9.040625	-4.940322581	-1.404032258	-0.15952381	-0.806666667
11	SBI	12.88384615	-12.05859375	-4.212903226	-8.357258065	-7.47301587	-8.826666667
12	BHARTI AIRTEL LTD	1.018461538	-1.01484375	0.326612903	0.890322581	-0.25873016	-0.4225
13	WIPRO LTD	0.751538462	0.03828125	-0.358870968	-0.612096774	-1.05396825	0.815833333
14	ICICI BANK LTD	3.876923077	-1.00390625	-1.575806452	-1.066935484	-3.72063492	-4.785833333
15	KOTAK MAHINDRA BANK LTD	-0.469230769	-2.61640625	-1.537903226	-0.302419355	-0.01031746	-0.609166667
16	LARSEN & TOUBRO LTD	0.23	-3.64296875	-16.52419355	1.308870968	-7.85079365	-8.44
17	TATA MOTORS LTD	3.654615385	-1.11484375	-2.825806452	-4.793548387	-3.47063492	0.215833333
18	NTPC LTD	-0.036153846	-0.97890625	-0.677419355	-0.296774194	-0.51190476	-0.360833333
19	MARUTI SUZUKI INDIA LTD	-0.019230769	-5.225	-4.264516129	0.026612903	0.605555556	-4
20	AXIS BANK LTD	3.203076923	-8.35	-1.182258065	-3.098387097	-4.00793651	-6.824166667
21	HCL TECHNOLOGIES LTD	-1.017692308	-0.11953125	-0.366935484	0.052419355	-1.516666667	-1.4775
22	INDIAN OIL CORPORATION LTD	-1.444615385	-3.7109375	-0.418548387	-1.546774194	-1.14365079	-0.75
23	ASIAN PAINTS LTD	3.897692308	-1.34296875	-8.391129032	12.86451613	-6.06587302	-16.42083333
24	ULTRATECH CEMENT MAHINDRA & MAHINDRA	2.06	1.08984375	0.05483871	-2.476612903	5.044444444	3.12
25	POWER GRID CORPORATION	-0.668461538	-2.04765625	-5.140322581	-0.543548387	2.20952381	-3.156666667
26	BAJAJ AUTO	-0.348461538	-0.24140625	0.004032258	0.235483871	-0.04126984	-0.006666667
27	BPL	-0.36	-3.19296875	-6.071774194	-4.116129032	2.28888889	-1.3325
28	BPCL	0.452307692	-4.97109375	-1.116935484	-2.162903226	-1.91746032	-2.41
29	HIND ZINC	-3.029230769	2.0875	-1.194354839	-0.666935484	-0.26587302	-0.284166667
30	BOSCH	0.165384615	-22.42265625	-11.96693548	-12.57822581	-12.6436508	-19.30166667
31	LUPIN	-4.246923077	-1.07890625	-1.481451613	-0.960483871	-1.05	-2.0475
32	INDUSIND BANK	-0.26	-1.36875	-0.234677419	-0.141129032	-0.31904762	-0.524166667
33	NESTLE	-4.676153846	2.321875	-5.081451613	3.47983871	-1.93412698	-0.7125
34	BHARTI INFRATEL	NA	NA	NA	NA	NA	NA
35	HERO MOTOCORP	-6.300769231	1.05234375	-9.028225806	7.775806452	8.31269841	-3.129166667

36	DABUR INDIA	-0.682307692	-0.7953125	-0.173387097	0.027419355	-0.63412698	-0.483333333
37	DR REDDYS LAB	-4.133076923	0.09296875	-3.02983871	-4.49516129	-1.50238095	1.6575
38	GODREJ CONSUMER	0.978461538	-3.996875	-1.222580645	-0.138709677	-1.62857143	-0.2425
39	EICHER MOTORS	-0.057692308	-2.803125	6.235483871	-5.787096774	6.28730159	-4.91
40	SHREE CEMENTS	-6.070769231	-7.428125	-0.218548387	-8.72016129	-2.42619048	8.6325
41	TECH MAHINDRA	-1.985384615	-1.71640625	-1.630645161	1.35483871	-3.48253968	-1.468333333
42	GAIL	-0.251538462	-0.8125	-2.525806452	-1.865322581	-2.23650794	-1.4625
43	YES BANK	0.227692308	-1.44296875	-0.881451613	-0.679032258	-0.81269841	-0.795833333
44	SIEMENS	0.086153846	-2.6109375	-1.07983871	0.502419355	-0.18412698	-4.981666667
45	ZEE ENTERTAINMENT	-1.332307692	-1.28125	-0.493548387	-0.229032258	-0.20079365	-0.145
46	ADANI PORTS	0.399230769	-1.35625	-0.803225806	-0.032258065	-0.03492063	-0.981666667
47	AUROBINDO PHARMA	-2.239230769	1.83359375	-6.406451613	-0.876612903	-1.2	-0.991666667
48	BAJAJ FINANCE	2.238461538	-3.3875	1.458064516	-2.016935484	-2.26111111	-2.225
49	GRASIM	1.66	3.51875	2.003225806	-13.45241935	4.59444444	5.719166667
50	AMBUJA CEMENTS	0.215384615	-0.0390625	-0.086290323	-0.175806452	0.24444444	0.463333333
51	CIPLA	-1.453846154	-0.49296875	-1.358870968	-0.322580645	-1.48253968	0.116666667
52	MOTHERSON SUMI	-0.234615385	-0.52421875	-0.01147541	-0.228225806	-1.10634921	-0.895
53	INTERGLOBE AVI	NA	NA	NA	NA	NA	NA
54	NMDC	-1.152307692	-0.9125	-0.325806452	-1.029032258	-1.24365079	-1.883333333
55	IDEA CELLULAR	0.196923077	-0.30078125	-0.065322581	0.124193548	0.28968254	-0.403333333
56	PIDILITE IND	-0.163846154	-0.37578125	-0.476612903	-0.4	-0.51904762	-0.641666667
57	VEDANTA	-1.343076923	-1.2890625	-1.327419355	-0.722580645	-0.84920635	-0.571666667
58	TITAN COMPANY	4.164615385	-6.77578125	-5.429032258	1.132258065	-0.52380952	-0.955
59	UNITED SPIRITS	2.995384615	-4.4453125	-13.00887097	-3.412903226	-3.46428571	-7.033333333
60	BANK OF BARODA	1.016153846	-2.27265625	0.468548387	-2.398387097	-1.71031746	-4.153333333
61	JSW STEEL	-0.796923077	-6.078125	-6.864516129	-1.507258065	-5.6984127	-1.21
62	MARICO	-0.590769231	-0.7484375	-0.282258065	-0.131451613	-0.5468254	-0.480833333
63	BAJAJ FINSERV	-0.887692308	-1.6	-0.664516129	-1.95483871	-1.16428571	-3.34
64	CADILA HEALTH	-3.101538462	-0.12578125	-3.675806452	0.682258065	-4.18888889	-2.933333333
65	HPCL	-1.155384615	-4.65390625	-0.741129032	-0.939516129	-1.73571429	-2.314166667
66	BRITANNIA	-6.869230769	-1.25234375	-2.145967742	0.486290323	-0.51666667	-1.943333333
67	TATA STEEL	2.645384615	-2.30546875	-1.526612903	-1.601612903	-3.21111111	-1.569166667
68	BHARAT ELEC	-7.316923077	-3.51484375	-0.473387097	-8.923387097	-4.21746032	-5.661666667
69	ACC	0.710769231	0.9625	0.206451613	0.534677419	2.70793651	2.51
70	DIVIS LAB	-2.769230769	-1.8203125	0.317741935	1	-1.56269841	-0.395833333
71	GLAXO SMITHKLINE	-6.779230769	-2.16484375	-5.781451613	3.89516129	-2.59206349	-0.235833333
72	BHEL	-5.053076923	-9.090625	-12.02096774	-5.282258065	-9.78253968	-2.655
73	ORACLE FIN SERV	-11.94769231	-0.91015625	-6.945967742	-0.844354839	-5.40793651	-3.918333333
74	INDIA BULLS HSG	NA	NA	NA	NA	NA	NA
75	ASHOK LEYLAND	-0.226153846	-0.475	-0.216129032	-0.452419355	-0.00714286	-0.1725
76	NHPC CONTAINER CORPORATION	-0.115384615	-0.1828125	-0.081451613	-0.062903226	0.02698413	-0.1525
77		-5.690769231	-4.00859375	1.562096774	-3.014516129	-5.983333333	-3.115

78	SHRIRAM TRANS	-0.28	-2.60859375	-1.487903226	-5.312096774	-1.88333333	-4.975
79	ABB INDIA	-0.769230769	-3.3125	-2.078225806	1.531451613	-3.03730159	-4.366666667
80	GLAXO SMITH CON	-8.103846154	2.0453125	-3.100806452	3.89516129	-2.59206349	-0.235833333
81	CAIRN INDIA	-0.353846154	-1.43125	-0.789516129	-0.918548387	-0.9031746	-0.06
82	PIRAMAL ENTER	-0.043076923	-1.9359375	-1.781451613	-1.785483871	-1.40873016	0.086666667
83	HINDALCO	0.339230769	0.259375	-0.891129032	-0.785483871	-0.877777778	-0.596666667
84	EMAMI	-0.905384615	-2.69375	-0.610483871	-0.517741935	-2.43968254	-2.1275
85	LIC HOUSING FIN	3.539230769	-13.3609375	0.266129032	0.051612903	-0.41746032	0.2125
86	COLGATE	-1.751538462	-4.496875	-2.929032258	0.772580645	-0.71428571	-0.1325
87	DLF	0.436923077	-2.04609375	-0.692741935	-1.008064516	-0.133333333	-0.55
88	UPL	-0.916153846	-1.01484375	-1.052419355	-0.153225806	-0.56746032	-0.501666667
89	TORRENT PHARMA	-2.396923077	-0.26953125	-5.07016129	1.403225806	-1.36587302	-1.13
90	HAVELLS INDIA	-0.654615385	-1.48515625	-1.798387097	-1.116935484	-0.34126984	-0.174166667
91	CUMMINS	0.628461538	-2.5515625	-2.830645161	-3.54516129	-1.727777778	-1.921666667
92	PETRONET LNG	0.153846154	-0.10703125	-0.335483871	-0.121774194	-0.0452381	-0.4875
93	POWER FINANCE	0.442307692	-1.56484375	-1.780645161	-0.365322581	-1.1468254	-0.461666667
94	GLENMARK	-0.756153846	-0.35234375	-1.646774194	-0.133064516	-0.7015873	-1.435833333
95	OIL INDIA	-2.452307692	-4.19609375	-3.423387097	-0.57016129	-0.844444444	-6.6325
96	P & G	-4.506153846	-17.02890625	-3.571774194	2.137096774	-3.01587302	-2.245833333
97	PNB	2.747692308	-3.21015625	-1.8	-3.335483871	-1.79603175	-3.873333333
98	TATA POWER	-1.905384615	-3.925	-1.894354839	-1.593548387	-5.95396825	-0.536666667
99	BERGER PAINTS	-0.027692308	-0.515625	-0.412903226	0.059677419	-0.17063492	-0.568333333
100	UNITED BREWERIE	2.106153846	-0.5328125	-3.09516129	-3.555645161	-4.81507937	-2.786666667
		-62.18461538	-228.95375	-213.9872819	-105.4927419	-150.974603	-163.0275







**Table no:4**

Name of Firm	April12-June12	July12-Sep12	Oct12-Dec12	Jan13-March13	April13-June13	July13-Sep13
	2012	2012	2012	2012	2013	2013
	Q1	Q2	Q3	Q4	Q1	Q2
1 TCS	4.230952381	-0.857142857	-2.545081967	4.434677419	-0.015873016	5.501587302
2 RELIANCE	-0.094444444	1.458730159	-0.87295082	-2.917741935	-0.178571429	-1.126190476
3 HDFC BANK	0.257936508	0.404761905	-0.044262295	-1.763709677	0.633333333	-3.144444444
4 ITC	0.411111111	0.080952381	0.031147541	-0.044354839	0.280952381	-0.366666667
5 INFOSYS	0.063492063	2.743650794	0.960655738	7.355645161	-3.78968254	7.322222222
6 COAL INDIA	-0.002380952	0.502380952	-0.281967213	-0.80483871	-0.728571429	-0.08968254
7 HDFC	-0.092063492	1.323809524	-0.18852459	-0.849193548	0.863492063	-4.256349206
8 HUL	0.215079365	1.036507937	-1.017213115	-1.473387097	1.081746032	0.097619048
9 SUN PHARMA	-0.477777778	-0.486507937	-0.859016393	-0.816129032	2.438095238	-0.153968254
10 ONGC	-0.086507937	-0.593650794	-0.627868852	0.324193548	-0.519047619	-1.523809524
11 SBI	0.108730159	-2.945238095	-0.471311475	-8.778225806	-3.953174603	-8.261904762
12 BHARTI AIRTEL LTD	-0.734126984	-1.668253968	0.509836066	-0.702419355	-0.471428571	-0.153174603
13 WIPRO LTD	-0.120634921	-1.573015873	-0.736065574	-0.606451613	0.894444444	-0.615079365
14 ICICI BANK LTD	0.414285714	0.334920635	-1.47295082	-4.100806452	0.914285714	-5.093650794
15 KOTAK MAHINDRA BANK	0.546031746	1.007936508	-1.004918033	-0.483870968	2.214285714	-1.73968254
16 LARSEN & TOUBRO LTD	2.696825397	2.317460317	-1.63442623	-4.064516129	-0.112698413	-5.446825397
17 TATA MOTORS LTD	-0.011111111	0.06031746	0.213934426	-1.044354839	0.427777778	0.830952381
18 NTPC LTD	-0.138095238	0.085714286	-0.279508197	-0.42983871	0.063492063	-0.181746032
19 MARUTI SUZUKI INDIA LTD	-4.007142857	2.508730159	1.12704918	-5.316129032	4.479365079	-5.613492063
20 AXIS BANK LTD	-2.484126984	-0.707936508	2.179508197	-1.537096774	1.098412698	-8.672222222
21 HCL TECHNOLOGIES LTD	-0.129365079	0.785714286	-0.281967213	1.379032258	-1.413492063	3.293650794
22 INDIAN OIL CORPORATION	-0.676190476	-0.54047619	-0.32704918	-0.473387097	-1.905555556	-0.897619048
23 ASIAN PAINTS LTD	13.23730159	-2.086507937	-0.229508197	6.280645161	-10.2047619	6.888888889
24 ULTRATECH CEMENT	4.946031746	9.121428571	-1.876229508	-1.887903226	0.648412698	-4.333333333
25 MAHINDRA & MAHINDRA	-0.774603175	1.557936508	-0.993442623	-2.390322581	0.991269841	-4.711111111
26 POWER GRID CORPORAT	-0.041269841	0.071428571	-0.279508197	-0.264516129	0.426984127	-0.020634921
27 BAJAJ AUTO	-0.88968254	6.649206349	5.01557377	-7.009677419	-0.438888889	-0.392857143
28 BPCL	-1.45	-1.761904762	-0.913114754	-1.655645161	-1.928571429	-1.463492063
29 HIND ZINC	-0.245238095	-0.445238095	-0.62704918	-0.599193548	-0.870634921	0.092857143
30 BOSCH	2.426190476	-33.31190476	0.080327869	-51.95241935	-15.22857143	-20.63174603
31 LUPIN	-0.796031746	-0.915079365	-1.97295082	-1.226612903	0.337301587	-1.683333333
32 INDUSIND BANK	-0.302380952	-0.279365079	0.170491803	-0.225	0.76031746	-2.747619048

33	NESTLE	-7.484920635	-9.161904762	5.969672131	-16.43467742	4.171428571	-1.416666667
34	BHARTI INFRATEL	NA	NA	-0.425	-0.340322581	-0.648412698	-0.48015873
35	HERO MOTOCORP	4.157936508	-5.384126984	-1.42295082	-5.90483871	-0.55952381	6.063492063
36	DABUR INDIA	-0.115079365	-0.052380952	-0.708196721	-0.072580645	0.21984127	0.180952381
37	DR REDDYS LAB	-1.953174603	-2.362698413	-0.083606557	-1.481451613	5.043650794	3.402380952
38	GODREJ CONSUMER	3.706349206	-0.168253968	0.404098361	-1.114516129	-0.301587302	-0.193650794
39	EICHER MOTORS	3.834126984	0.593650794	5.991803279	-9.159677419	18.3984127	-8.542063492
40	SHREE CEMENTS	-11.5733871	14.27222222	3.831967213	-24.32580645	-0.214516129	-12.31111111
41	TECH MAHINDRA	-1.903968254	3.064285714	-1.01557377	0.438709677	-3.96031746	1.729365079
42	GAIL	-1.142857143	-0.084920635	-0.964754098	-1.536290323	-0.536507937	0.1
43	YES BANK	-0.624603175	-0.096031746	0.360655738	-1.722580645	0.105555556	-4.203174603
44	SIEMENS	-0.679365079	-0.591269841	-2.037704918	-3.681451613	-0.416666667	-2.266666667
45	ZEE ENTERTAINMENT	-0.023015873	0.53968254	-0.129508197	-0.845967742	0.220634921	-0.33968254
46	ADANI PORTS	-0.395238095	-0.08968254	-0.474590164	-0.32016129	-0.100793651	-0.51984127
47	AUROBINDO PHARMA	-0.31984127	0.09047619	0.181967213	-1.220967742	0.245238095	-0.184126984
48	BAJAJ FINANCE	1.23015873	3.81984127	0.586885246	-6.958064516	3.621428571	-7.428571429
49	GRASIM	3.102380952	12.57539683	-6.823770492	-5.226612903	1.470634921	-3.877777778
50	AMBUJA CEMENTS	0.361111111	0.383333333	-0.507377049	-0.337903226	0.301587302	0.537301587
51	CIPLA	-0.792063492	0.126984127	-0.652459016	-1.358870968	-0.394444444	-0.024603175
52	MOTHERSON SUMI	-0.996825397	0.721428571	0.11557377	-0.537903226	-0.53015873	0.142857143
53	INTERGLOBE AVI	NA	NA	NA	NA	NA	NA
54	NMDC	-0.081746032	-0.366666667	-0.898360656	-0.985483871	-0.979365079	-0.252380952
55	IDEA CELLULAR	-0.371428571	-0.033333333	0.054918033	0.027419355	0.450793651	-0.134920635
56	PIDILITE IND	-0.742063492	-0.098412698	-0.600819672	-0.04516129	-0.453174603	-1.380952381
57	VEDANTA	-0.231746032	-0.192857143	0.264754098	-0.853225806	-0.334126984	0.53968254
58	TITAN COMPANY	-0.445238095	0.196031746	0.258196721	-0.504032258	0.087301587	0.437301587
59	UNITED SPIRITS	1.616666667	7.481746032	1.96557377	-4.012096774	1.015873016	-0.350793651
60	BANK OF BARODA	-1.917460317	-0.313492063	-1.1	-5.143548387	-2.512698413	-2.398412698
61	JSW STEEL	-1.653968254	1.578571429	-0.676229508	-3.57016129	-0.506349206	0.530952381
62	MARICO	0.201587302	-0.419047619	-0.682786885	-0.55483871	-0.532539683	-0.23968254
63	BAJAJ FINSERV	-0.48015873	1.798412698	-2.392622951	-6.141935484	-4.467460317	-2.278571429
64	CADILA HEALTH	-0.074603175	-1.193650794	-2.142622951	-4.771774194	-1.499206349	-3.269047619
65	HPCL	0.044444444	-1.287301587	-1.21557377	-1.037903226	-1.645238095	-2.017460317
66	BRITANNIA	-1.731746032	-1.888095238	0.059016393	-1.690322581	1.599206349	0.51984127
67	TATA STEEL	-0.395238095	-1.308730159	-0.544262295	-2.491935484	-1.432539683	-0.901587302
68	BHARAT ELEC	-3.875396825	-8.058730159	-4.525409836	-6.358064516	0.411904762	-6.886507937
69	ACC	-0.298412698	2.352380952	-4.001639344	-5.346774194	0.882539683	-3.129365079
70	DIVIS LAB	2.66031746	-0.252380952	-2.559836066	-4.364516129	-2.002380952	-3.765079365
71	GLAXO SMITHKLINE	-8.757142857	-0.272222222	-9.269672131	11.82983871	-0.757142857	-21.71666667
72	BHEL	-0.694444444	-0.298412698	-0.709016393	-1.17016129	-0.336507937	-0.794444444
73	ORACLE FIN SERV	-3.98968254	3.073809524	-0.852459016	-20.92258065	-3.102380952	7.892857143
74	INDIA BULLS HSG	NA	NA	NA	NA	NA	-0.317021277
75	ASHOK LEYLAND	-0.179365079	-0.120634921	-0.058196721	-0.133064516	-0.051587302	-0.203492063

	NA	NA	NA	NA	NA	NA
76 NHPC CONTAINER CORPORATION	-0.915873016	-0.751587302	-2.895081967	-1.608064516	-1.568253968	-3.80952381
78 SHRIRAM TRANS	-1.11031746	-0.161111111	0.312295082	-1.408064516	-0.051587302	-1.89047619
79 ABB INDIA	-1.357142857	-1.477777778	-3.716393443	-5.037096774	0.746031746	-1.255555556
80 GLAXO SMITH CON	-8.757142857	-0.272222222	-9.269672131	11.82983871	-0.757142857	-21.71666667
81 CAIRN INDIA	-0.406349206	-0.354761905	-1.142622951	-2.000806452	-0.318253968	-0.201587302
82 PIRAMAL ENTER	0.469047619	-1.255555556	0.825409836	0.159677419	-1.203174603	0.053968254
83 HINDALCO	-0.346825397	-0.36031746	0.004098361	-0.745967742	-0.00952381	0.112698413
84 EMAMI	0.576190476	-2.681746032	-0.242622951	-0.857258065	0.131746032	-1.407142857
85 LIC HOUSING FIN	-0.204761905	-0.696825397	-0.881147541	-2.416129032	-0.058730159	-1.671428571
86 COLGATE	0.861904762	-0.253968254	3.571311475	-8.45483871	-0.666666667	-5.59047619
87 DLF	-0.021428571	0.26031746	-0.268032787	0.024193548	-1.216666667	-0.834126984
88 UPL	-0.171428571	-0.362698413	-0.530327869	-0.603225806	0.081746032	-0.191269841
89 TORRENT PHARMA	-1.592741935	-1.819047619	-3.344262295	-1.443548387	0.753968254	-1.152380952
90 HAVELLS INDIA	0.096031746	-1.178571429	-1.42295082	-2.263709677	0.350793651	-1.908730159
91 CUMMINS	-1.232539683	-0.222222222	-0.640163934	-2.496774194	-2.094444444	-2.19047619
92 PETRONET LNG	-0.623015873	-0.135714286	-0.343442623	-0.637903226	-0.376190476	-0.294444444
93 POWER FINANCE	-0.282539683	-0.336507937	-0.577868852	-0.666935484	-0.907936508	-0.624603175
94 GLENMARK	0.496031746	0.282539683	0.262295082	-2.591935484	0.041269841	-2.156349206
95 OIL INDIA	-0.796825397	-0.808730159	-1.177868852	0.066129032	-0.526190476	-2.984920635
96 P & G	1.146031746	8.365873016	0.233606557	-4.863709677	0.958730159	-11.36666667
97 PNB	-3.817460317	-1.643650794	-0.53852459	-5.241935484	-2.054761905	-4.974603175
98 TATA POWER	-0.107936508	-0.281746032	-0.191803279	-0.533064516	-0.423809524	-0.430952381
99 BERGER PAINTS	0.166666667	-0.26031746	-0.451639344	-0.340322581	0.003174603	-0.865873016
100 UNITED BREWERIE	-2.476984127	-2.481746032	0.391803279	-8.116935484	-1.714285714	-0.167460317
Total	-37.41771633	-6.435714286	-58.71188525	-264.2741935	-24.11530978	-196.5594022

**Table no:5**

s no	Name of Firm	July13-Sep13	Oct13-Dec13	Jan14-Mar14	APR 2014- JUN14	JULY14- SEP14	OCT14-DEC14
		2013	2013	2013	2014	2014	2014
		Q2	Q3	Q4	Q1	Q2	Q3
1	TCS	5.501587302	-1.481451613	-1.975396825	0.1975	-1.7968254	-5.530172414
2	RELIANCE	-1.126190476	-0.394354839	0.378571429	-1.081666667	-2.78571429	-2.256034483
3	HDFC BANK	-3.144444444	0.592741935	0.592857143	-0.285833333	-0.95714286	0.252586207
4	ITC	-0.366666667	-0.977419355	0.461111111	-1.030833333	0.11904762	-0.532758621
5	INFOSYS	7.322222222	8.159677419	1.68968254	-6.614166667	5.55238095	3.822413793
6	COAL INDIA	-0.08968254	0.035483871	-0.007142857	0.031666667	-1.56190476	0.518965517
7	HDFC	-4.256349206	-1.112096774	0.557936508	-1.911666667	-0.87619048	0.09137931
8	HUL	0.097619048	-1.820967742	-0.152380952	-0.4675	1.35634921	-0.520689655
9	SUN PHARMA	-0.153968254	-2.137903226	-2.284126984	-1.2175	1.4031746	-1.642241379
10	ONGC	-1.523809524	-0.314516129	0.451587302	0.406666667	-1.494444444	-2.370689655
11	SBI	-8.261904762	-0.456451613	-0.004761905	5.826666667	-6.333333333	4.162931034
12	BHARTI AIRTEL LTD	-0.153174603	-0.263709677	-1.241269841	-0.811666667	0.16507937	-1.699137931
13	WIPRO LTD	-0.615079365	1.385483871	0.224603175	-0.750833333	-1.79285714	0.142241379
14	ICICI BANK LTD	-5.093650794	0.986290323	1.903174603	0.209166667	-2.23650794	4.062931034
15	KOTAK MAHINDRA BANK LTD	-1.73968254	-0.183870968	0.186507937	1.135833333	2.10555556	1.835344828
16	LARSEN & TOUBRO LTD	-5.446825397	4.388709677	3.830952381	0.839166667	-6.05396825	-1.365517241
17	TATA MOTORS LTD	0.830952381	0.137903226	-0.423015873	-0.140833333	-0.2952381	-0.874137931
18	NTPC LTD	-0.181746032	-0.159677419	-0.402380952	-0.120833333	-0.59206349	-0.243965517
19	MARUTI SUZUKI INDIA LTD	-5.613492063	3.158064516	-0.932539683	4.375	5.02301587	3.5
20	AXIS BANK LTD	-8.672222222	0.266129032	1.59047619	6.334166667	-1.494444444	0.972413793
21	HCL TECHNOLOGIES LTD	3.293650794	1.418548387	-1.402380952	-4.463333333	-0.283333333	-3.50862069
22	INDIAN OIL CORPORATION LTD	-0.897619048	-0.864516129	0.834126984	0.231666667	-1.22380952	-1.987931034
23	ASIAN PAINTS LTD	6.888888889	-0.771774194	0.033333333	-0.736666667	-1.28650794	-0.928448276
24	ULTRATECH CEMENT MAHINDRA & MAHINDRA	-4.333333333	-2.316129032	4.653968254	-0.195	-2.70079365	-6.868965517
25	POWER GRID CORPORATION	-4.711111111	0.727419355	-0.772222222	0.579166667	2.25396825	-4.475
26		-0.020634921	0.286290323	0.232539683	0.324166667	-0.23888889	0.025
27	BAJAJ AUTO	-0.392857143	-7.587903226	1.011904762	-2.920833333	-3.76825397	0.293965517
28	BPCL	-1.463492063	-0.916129032	1.658730159	0.6775	-1.05793651	-2.596551724
29	HIND ZINC	0.092857143	-0.032258065	-0.592857143	-0.070833333	-0.4452381	-0.65
30	BOSCH	-20.63174603	-14.72741935	-21.90714286	-10.86083333	-34.5492063	3.351724138
31	LUPIN	-1.683333333	-2.209677419	-1.651587302	-1.4325	2.98730159	-3.692241379
32	INDUSIND BANK	-2.747619048	-0.591129032	-0.080952381	-0.1575	-0.04603175	1.981034483
33	NESTLE	-1.416666667	-9.07016129	-19.7015873	-20.7225	11.6515873	-6.526724138
34	BHARTI INFRATEL	-0.48015873	-0.296774194	0.414285714	0.314166667	1.24126984	-0.618103448
35	HERO MOTOCORP	6.063492063	-0.969354839	2.448412698	2.715833333	2.93888889	-0.394827586

36	DABUR INDIA	0.180952381	-0.521774194	-0.081746032	-0.318333333	0.16269841	-0.177586207
37	DR REDDYS LAB	3.402380952	-0.107258065	-4.138095238	-6.55	10.2031746	-6.562068966
38	GODREJ CONSUMER	-0.193650794	-0.482258065	-2.636507937	-5.6525	-0.07619048	-2.098275862
39	EICHER MOTORS	-8.542063492	5.198387097	-3.121428571	19.94	28.95	28.15
40	SHREE CEMENTS	-12.31111111	-10.86774194	18.13015873	8.780833333	-13.1261905	4.13362069
41	TECH MAHINDRA	1.729365079	6.052419355	-4.217460317	3.460833333	5.14126984	-0.868103448
42	GAIL	0.1	-0.419354839	0.185714286	0.080833333	-0.82142857	-0.025862069
43	YES BANK	-4.203174603	-0.317741935	-0.132539683	0.205833333	0.12460317	2.445689655
44	SIEMENS	-2.266666667	1.818548387	0.638888889	-0.181666667	-5.66507937	-2.074137931
45	ZEE ENTERTAINMENT	-0.33968254	0.6	-0.16031746	-1.005	-0.66269841	0.518965517
46	ADANI PORTS	-0.51984127	-0.119354839	0.232539683	-0.549166667	-0.48253968	0.005172414
47	AUROBINDO PHARMA	-0.184126984	2.483064516	0.257936508	2.155	1.66904762	1.393965517
48	BAJAJ FINANCE	-7.428571429	1.412096774	1.632539683	-3.8675	5.49920635	5.045689655
49	GRASIM	-3.877777778	-5.178225806	-2.68015873	3.904166667	-1.25238095	-5.913793103
50	AMBUJA CEMENTS	0.537301587	0.254032258	0.36984127	-0.194166667	-0.59920635	-0.201724138
51	CIPLA	-0.024603175	-1.500806452	-0.942063492	-0.566666667	1.5952381	-1.775862069
52	MOTHERSON SUMI	0.142857143	-0.250806452	0.275396825	-0.86	-0.73253968	-0.920689655
53	INTERGLOBE AVI	NA	NA	NA	0	0	0
54	NMDC	-0.252380952	0.175	-0.287301587	-0.1825	-0.89603175	-0.765517241
55	IDEA CELLULAR	-0.134920635	-0.208064516	-0.758730159	-0.911666667	0.17698413	-0.596551724
56	PIDILITE IND	-1.380952381	-0.771774194	-0.513492063	-0.496666667	-0.03492063	0.656034483
57	VEDANTA	0.53968254	-0.261290323	-0.351587302	0.725833333	-0.35793651	-1.575862069
58	TITAN COMPANY	0.437301587	-0.621774194	-0.061904762	-0.261666667	-0.02619048	-1.869827586
59	UNITED SPIRITS	-0.350793651	-5.537096774	-7.878571429	-11.965	0.32698413	5.337068966
60	BANK OF BARODA	-2.398412698	1.539516129	-0.120634921	-0.1625	-0.81746032	1.386206897
61	JSW STEEL	0.530952381	3.762096774	-0.498412698	3.62	-2.57619048	-1.569827586
62	MARICO	-0.23968254	-1.033870968	-0.802380952	-0.329166667	0.02619048	0.237068966
63	BAJAJ FINSERV	-2.278571429	0.638709677	-1.681746032	4.679166667	-0.21111111	-0.823275862
64	CADILA HEALTH	-3.269047619	-1.054032258	0.926190476	-3.091666667	0.27460317	0.414655172
65	HPCL	-2.017460317	0.077419355	0.946031746	-0.3925	-1.16269841	-2.385344828
66	BRITANNIA	0.51984127	-1.557258065	-3.988095238	0.156666667	1.66746032	2.419827586
67	TATA STEEL	-0.901587302	1.687096774	-1.302380952	0.531666667	-2.19920635	-1.867241379
68	BHARAT ELEC	-6.886507937	-5.127419355	-2.255555556	8.114166667	-10.0753968	2.817241379
69	ACC	-3.129365079	-1.823387097	5.265079365	-1.741666667	-4.81825397	-2.406034483
70	DIVIS LAB	-3.765079365	1.596774194	-1.347619048	-3.419166667	2.43492063	-12.11896552
71	GLAXO SMITHKLINE	-21.71666667	-15.22177419	-13.01825397	-5.533333333	1.48253968	-3.131896552
72	BHEL	-0.794444444	0.364516129	0.299206349	0.1875	-1.04047619	0.688793103
73	ORACLE FIN SERV	7.892857143	1.544354839	-8.088095238	-8.874166667	-0.78888889	-4.105172414
74	INDIA BULLS HSG	-0.317021277	0.394354839	-0.507142857	1.031666667	-0.86746032	-1.264655172
75	ASHOK LEYLAND	-0.203492063	-0.057258065	0.038095238	0.054166667	-0.06825397	0.011206897
76	NHPC CONTAINER CORPORATION	-0.086507937	-0.075	-0.01031746	0.0625	-0.166666667	-0.060344828
77		-3.80952381	-1.42983871	0.601587302	0.38	-1.69047619	-1.725

78	SHRIRAM TRANS	-1.89047619	-0.779032258	1.370634921	-0.2075	-1.69126984	0.925
79	ABB INDIA	-1.255555556	1.427419355	0.66031746	0.796666667	-2.32936508	-0.228448276
80	GLAXO SMITH CON	-21.71666667	-15.22177419	-13.01825397	-11.26916667	4.68174603	-7.684482759
81	CAIRN INDIA	-0.201587302	-0.737903226	0.086507937	-0.64	-1.12619048	-1.310344828
82	PIRAMAL ENTER	0.053968254	-2.691129032	-1.378571429	0.54	-2.11746032	-1.144827586
83	HINDALCO	0.112698413	0.124193548	0.348412698	0.003333333	-0.17142857	-0.396551724
84	EMAMI	-1.407142857	-2.715322581	-1.777777778	-0.631666667	1.677777778	-0.593103448
85	LIC HOUSING FIN	-1.671428571	-0.355645161	-0.411111111	0.385	-0.50952381	1.025862069
86	COLGATE	-5.59047619	0.428225806	0.486507937	-2.52	-2.54047619	-3.643965517
87	DLF	-0.834126984	0.159677419	-0.084920635	-0.136666667	-0.97222222	0.046551724
88	UPL	-0.191269841	0.470967742	-0.581746032	1.359166667	-0.17936508	-1.004310345
89	TORRENT PHARMA	-1.152380952	-1.725806452	-1.186507937	-0.698333333	-0.83650794	1.428448276
90	HAVELLS INDIA	-1.908730159	1.349193548	-0.276984127	-0.4025	-1.78095238	-0.6
91	CUMMINS	-2.19047619	-0.383870968	-0.197619048	0.521666667	-1.62539683	1.006034483
92	PETRONET LNG	-0.294444444	0.00483871	0.275396825	0.306666667	0.35952381	0.154310345
93	POWER FINANCE	-0.624603175	0.137903226	0.415079365	0.825	-2.13730159	0.71637931
94	GLENMARK	-2.156349206	-1.588709677	-0.40952381	-2.004166667	-0.28412698	-1.392241379
95	OIL INDIA	-2.984920635	-0.253225806	-0.235714286	-0.479166667	-1.22698413	-2.056034483
96	P & G	-11.36666667	1.742741935	-1.146825397	-0.966666667	4.8452381	1.115517241
97	PNB	-4.974603175	0.825806452	0.853968254	1.623333333	-4.03888889	1.976724138
98	TATA POWER	-0.430952381	0.02016129	-0.307142857	-0.175833333	-0.70396825	-0.05862069
99	BERGER PAINTS	-0.865873016	-0.562096774	-0.502380952	-0.341666667	-0.04444444	-1.556896552
100	UNITED BREWERIE	-0.167460317	-4.989516129	-1.121428571	-9.105	-3.46428571	-3.309482759
		-196.6459102	-78.37258065	-80.3	-54.04833333	-44.7698413	-42.07672414

**Table no:6**

s no	Name of Firm	JAN15-MAR15	APR15-JUNE15	JULY15- SEP15	OCT15-DEC15	JAN 16-MARCH16
		2014	2015	2015	2015	2015
		Q4	Q1	Q2	Q3	Q4
1	TCS	-3.862096774	-3.92295082	-5.16484375	-5.818032787	0.483606557
2	RELIANCE	-2.833870968	1.554918033	-3.30546875	1.408196721	-1.260655738
3	HDFC BANK	-2.043548387	-0.844262295	-0.91953125	-0.924590164	-1.663114754
4	ITC	-1.178225806	-0.677868852	-0.16015625	-0.205737705	-0.468032787
5	INFOSYS	1.299193548	-8.829508197	-1.69765625	-1.427868852	0.391803279
6	COAL INDIA	-0.131451613	0.263114754	-2.43515625	-0.558196721	-0.893442623
7	HDFC	0.091129032	-1.190163934	-3.63984375	-1.005737705	-4.166393443
8	HUL	-0.2	-0.467213115	-2.5859375	-0.300819672	-0.482786885
9	SUN PHARMA	0.089516129	-3.141803279	-2.8984375	-2.43852459	-2.408196721
10	ONGC	-1.300806452	-1.013114754	-2.0109375	0.108196721	-0.901639344
11	SBI	-2.472580645	-0.75	-0.91796875	-0.87295082	-1.333606557
12	BHARTI AIRTEL LTD	-0.308064516	0.757377049	-2.9671875	-0.310655738	0.363934426
13	WIPRO LTD	-1.34516129	-0.923770492	-1.834375	-0.454918033	-1.116393443
14	ICICI BANK LTD	-2.038709677	-0.974590164	-0.87421875	-0.446721311	-0.537704918
15	KOTAK MAHINDRA BANK LTD	-2.904032258	-0.249180328	-2.4890625	0.536065574	-2.177868852
16	LARSEN & TOUBRO LTD	-2.091935484	-3.198360656	-5.7984375	-7.358196721	-4.736065574
17	TATA MOTORS LTD	-0.076612903	-2.217213115	-1.88828125	1.12295082	-1.603278689
18	NTPC LTD	-0.243548387	-0.555737705	-0.45703125	0.090163934	-0.372131148
19	MARUTI SUZUKI INDIA LTD	-1.308870968	2.792622951	3.91953125	-7.976229508	-16.95327869
20	AXIS BANK LTD	-1.761290323	-0.769672131	-1.184375	-1.362295082	-1.310655738
21	HCL TECHNOLOGIES LTD	1.589516129	0.08442623	-0.11875	-2.513114754	-1.33442623
22	INDIAN OIL CORPORATION LTD	0.242741935	-0.354918033	-1.10390625	-0.713114754	-2.691803279
23	ASIAN PAINTS LTD	-2.187903226	-3.079508197	-1.2515625	-0.562295082	-2.245081967
24	ULTRATECH CEMENT MAHINDRA & MAHINDRA	-10.32983871	-0.186885246	-10.42890625	-5.51557377	-0.53442623
25	POWER GRID CORPORATION	-4.29516129	-1.079508197	-4.1828125	0.216393443	-3.371311475
26	BAJAJ AUTO	-0.099193548	-0.236065574	-0.3171875	-0.147540984	-0.467213115
27	BPCL	-10.70725806	8.267213115	-8.2203125	-0.036885246	-6.38852459
28	HIND ZINC	1.432258065	-0.927868852	-3.97890625	-1.442622951	-2.175409836
29	BOSCH	-0.832258065	-0.036885246	-0.53359375	-0.286065574	0.381147541
30	LUPIN	43.15322581	-159.7131148	-85.51484375	-54.6352459	-18.7942623
31	INDUSIND BANK	3.367741935	-6.404918033	-4.7015625	-7.146721311	-12.33114754
32	NESTLE	-0.078225806	-1.942622951	0.96484375	0.660655738	-0.343442623
33	BHARTI INFRATEL	-10.49596774	-6.968852459	-32.76875	-27.55081967	-13.79836066
34	HERO MOTOCORP	0.642741935	0.901639344	-2.35859375	0.07704918	-1.943442623
35	DABUR INDIA	-9.482258065	-6.72704918	-5.2625	2.83442623	2.223770492
36		-0.596774194	-0.573770492	-0.63125	-1.018032787	-0.41557377

37	DR REDDYS LAB	-2.247580645	-7.78852459	1.721875	-18.27540984	-8.262295082
38	GODREJ CONSUMER	-3.290322581	0.577868852	-5.6984375	-0.148360656	-0.396721311
39	EICHER MOTORS	-12.96693548	38.04918033	-84.5015625	-82.11803279	-14.25245902
40	SHREE CEMENTS	-2.238709677	-9.48442623	-28.6234375	-18.43196721	-27.92295082
41	TECH MAHINDRA	-5.319354839	-1.905737705	-0.703125	-2.017213115	-1.810655738
42	GAIL	-1.067741935	-0.110655738	-2.14296875	0.4	-1.52704918
43	YES BANK	-2.604032258	-0.633606557	-2.97578125	-1.482786885	0.659836066
44	SIEMENS	6.172580645	0.82704918	-5.5515625	-5.386065574	-4.355737705
45	ZEE ENTERTAINMENT	-1.614516129	-0.346721311	-0.18828125	0.486065574	-1.275409836
46	ADANI PORTS	-1.483870968	-1	-0.859375	-1.269672131	-0.673770492
47	AUROBINDO PHARMA	0.014516129	0.168852459	-2.26953125	0.476229508	-3.530327869
48	BAJAJ FINANCE	-4.978225806	14.57704918	-14.8078125	4.816393443	6.031147541
49	GRASIM	-4.7	-6.497540984	-1.26875	0.028688525	-5.52295082
50	AMBUJA CEMENTS	-0.37983871	-0.575409836	-0.54296875	-0.527868852	0.142622951
51	CIPLA	-1.004032258	-2.18852459	-1.43359375	-0.942622951	-3.633606557
52	MOTHERSON SUMI	-0.551612903	-1.096721311	-2.63828125	0.209016393	-1.433333333
53	INTERGLOBE AVI	0	0	0	9.095714286	-9.696721311
54	NMDC	-0.672580645	-0.377868852	-0.60625	-0.263114754	-0.203278689
55	IDEA CELLULAR	-0.212096774	-0.536065574	-0.9578125	-0.504918033	-0.881147541
56	PIDILITE IND	-1.595967742	-1.61147541	-1.765625	-1.663114754	-1.690163934
57	VEDANTA	-1.312096774	-0.23442623	-1.6140625	-0.173770492	-0.292622951
58	TITAN COMPANY	-1.271774194	-0.145901639	-1.253125	0.504918033	-1.05
59	UNITED SPIRITS	4.233870968	-11.42459016	-11.784375	-8.280327869	-14.87213115
60	BANK OF BARODA	-2.042741935	-0.322131148	0.45625	-0.277868852	-0.772131148
61	JSW STEEL	-4.775806452	-1.619672131	-0.92734375	2.453278689	3.702459016
62	MARICO	-0.394354839	1.309016393	-1.996875	0.08442623	-0.825409836
63	BAJAJ FINSERV	-4.674193548	0.360655738	1.0390625	-2.329508197	-5.942622951
64	CADILA HEALTH	-6.093548387	-5.940983607	-2.58359375	-4.440163934	-0.883606557
65	HPCL	-0.336290323	-0.113934426	-2.6375	-0.690983607	-5.173770492
66	BRITANNIA	-1.815322581	0.086065574	-3.65859375	-7.036885246	-13.09098361
67	TATA STEEL	-2.57983871	-0.707377049	-2.08515625	0.147540984	0.756557377
68	BHARAT ELEC	-11.31048387	-8.71147541	-13.7140625	-0.656557377	-5.919672131
69	ACC	-0.201612903	-3.163114754	-2.01171875	-1.37295082	-1.125409836
70	DIVIS LAB	-12.86532258	-7.976229508	-5.84609375	-7.917213115	-11.98606557
71	GLAXO SMITHKLINE	-5.775	-8.418852459	-6.87734375	-2.822131148	7.875409836
72	BHEL	-0.765322581	0.048360656	-0.7796875	-1.273770492	-1.347540984
73	ORACLE FIN SERV	-10.81129032	2.000819672	-9.684375	-9.3	-13.98196721
74	INDIA BULLS HSG	-0.684677419	0.868852459	2.53359375	-2.736065574	-3.046721311
75	ASHOK LEYLAND	0.049193548	-0.186885246	0.02578125	-0.368852459	-0.133606557
76	NHPC CONTAINER CORPORATION	-0.002419355	-0.031967213	-0.071875	0.036885246	0.026229508
77		-1.092741935	-1.090983607	-5.5890625	-7.990983607	-88.7279661
78	SHRIRAM TRANS	-3.975	-6.416393443	-1.04765625	-3.106557377	-0.705737705



79	ABB INDIA	-6.237096774	-2.147540984	-10.04375	-5.424590164	-1.63442623
80	GLAXO SMITH CON	-4.564516129	-0.641803279	-7.77890625	2.629508197	-12.9942623
81	CAIRN INDIA	-1.016129032	-0.862295082	-1.06015625	-0.32295082	-0.042622951
82	PIRAMAL ENTER	-3.246774194	0.51557377	-5.0609375	0.737704918	-1.604098361
83	HINDALCO	-1.177419355	-0.422131148	-0.76875	0.079508197	-0.397540984
84	EMAMI	-1.235483871	1.321311475	-3.68125	-4.742622951	-0.657377049
85	LIC HOUSING FIN	-1.846774194	-1.048360656	-0.65546875	-0.707377049	-1.682786885
86	COLGATE	-0.287903226	-4.28852459	-6.5703125	-2.763934426	-5.010655738
87	DLF	-0.073387097	-1.070491803	0.09375	-0.810655738	-0.26147541
88	UPL	0.589516129	1.567213115	-1.6078125	-1.101639344	-0.21557377
89	TORRENT PHARMA	-4.22983871	-2.16557377	-4.43046875	-7.481967213	-5.396721311
90	HAVELLS INDIA	-0.597580645	-1.145081967	-1.1078125	-0.376229508	-1.059016393
91	CUMMINS	-2.403225806	-2.06147541	1.04609375	-4.945081967	-5.737704918
92	PETRONET LNG	-0.892741935	0.505737705	0.16484375	1.156557377	-0.364754098
93	POWER FINANCE	-1.399193548	-0.850819672	-0.4765625	-1.233606557	-0.900819672
94	GLENMARK	-2.981451613	-1.030327869	-2.49375	-4.47704918	-5.451639344
95	OIL INDIA	-3.620967742	-1.271311475	-1.29453125	-1.510655738	-2.395901639
96	P & G	0.223387097	-28.59918033	-18.86015625	-19.15983607	-3.004918033
97	PNB	-2.331451613	-0.278688525	-0.2125	-0.478688525	-0.813114754
98	TATA POWER	-0.412903226	-0.429508197	-0.3234375	-0.225409836	-0.250819672
99	BERGER PAINTS	-0.650806452	-0.870491803	-0.33671875	0.286885246	-0.812295082
100	UNITED BREWERIE	-8.581451613	-9.527868852	-6.0671875	-7.536885246	-9.863934426
		-179.508871	-289.9221311	-497.1648438	-359.451007	-403.6801519

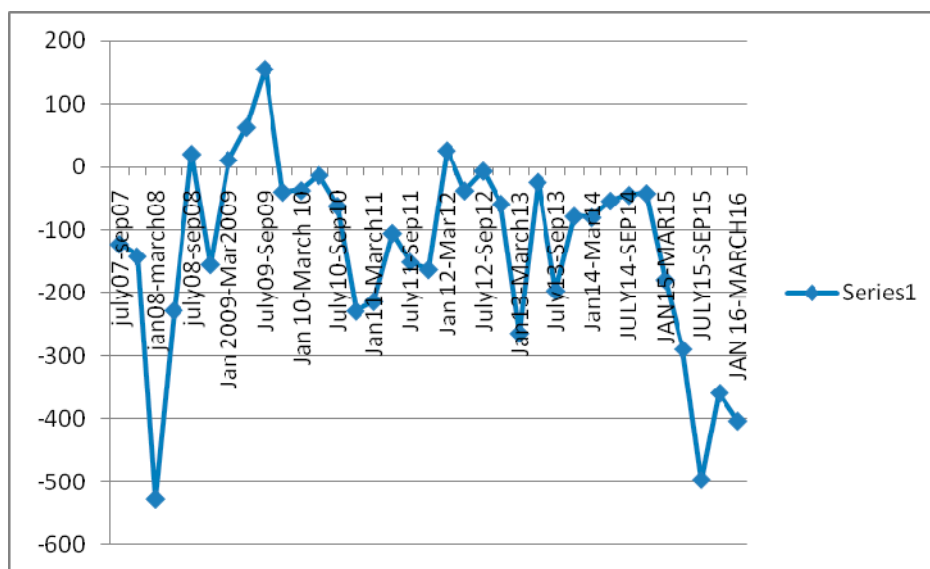
**Table no:7**

	YEAR	QTR	AVG	DEVIATION FROM	Z-score Standardized value
			SPREAD	MEAN	
			A	A-B	C
july07-sep07	2007-2008	Q2	-122.4722434	6.981007803	0.045873359
oct07-dec07	2007-08	Q3	-142.2298577	-12.77660654	-0.083957199
jan08-march08	2007-08	Q4	-527.8748942	-398.4216431	-2.618094645
april08-june08	2008-09	Q1	-228.0056052	-98.55235404	-0.647603851
july08-sep08	2008-09	Q2	20.69140625	150.1446574	0.986625427
sep08-dec08	2008-09	Q3	-155.0289831	-25.57573188	-0.168062373
Jan 2009-Mar2009	2008-09	Q4	11.00440678	140.4576579	0.922970548
APR 09-JUNE09	2009-10	Q1	62.82537989	192.2786311	1.26349475
July09-Sep09	2009-10	Q2	155.8539063	285.3071574	1.874800614
Oct 09-dec 09	2009-10	Q3	-39.6647541	89.78849707	0.590015094
Jan 10-March 10	2009-10	Q4	-37.14166667	92.3115845	0.60659472
April 2010-June2010	2010-11	Q1	-13.31428571	116.1389655	0.763168389
July10-Sep10	2010-11	Q2	-62.18461538	67.26863578	0.442033354
oct 2010-Dec2010	2010-11	Q3	-228.95375	-99.50049883	-0.653834268
Jan11-March11	2010-11	Q4	-213.9872819	-84.53403069	-0.555487125
April 2011-June11	2011-12	Q1	-105.4927419	23.96050923	0.157448477
July11-Sep11	2011-12	Q2	-150.9746032	-21.52135201	-0.141420371
oct11-Dec11	2011-12	Q3	-163.0275	-33.57424883	-0.220621953
Jan 12-Mar12	2011-12	Q4	26.22678571	155.6800369	1.022999322
April12-June12	2012-13	Q1	-37.51533538	91.93791579	0.604139281
July12-Sep12	2012-13	Q2	-6.441269841	123.0119813	0.808332115
Oct12-Dec12	2012-13	Q3	-58.69057377	70.7626774	0.46499328
Jan13-March13	2012-13	Q4	-264.3306452	-134.877394	-0.886301708
April13-June13	2013-14	Q1	-24.19467486	105.2585763	0.691671549
July13-Sep13	2013-14	Q2	-196.6459102	-67.192659	-0.441534098
Oct13-Dec13	2013-14	Q3	-78.37258065	51.08067052	0.335659551
Jan14-Mar14	2013-14	Q4	-80.3	49.15325117	0.322994159
APR 2014-JUN14	2014-15	Q1	-54.04833333	75.40491783	0.495498212
JULY14-SEP14	2014-15	Q2	-44.76984127	84.6834099	0.556468721
OCT14-DEC14	2014-15	Q3	-42.07672414	87.37652703	0.57416564
JAN15-MAR15	2014-15	Q4	-179.508871	-50.0556198	-0.328923773
APR15-JUNE15	2015-16	Q1	-289.9221311	-160.46888	-1.054467604
JULY15-SEP15	2015-16	Q2	-497.1648438	-367.7115926	-2.416293814
OCT15-DEC15	2015-16	Q3	-359.451007	-229.9977559	-1.51135337
JAN 16-MARCH16	2015-16	Q4	-403.6801519	-274.2269007	-1.801990411
			-129.4532512	0.00	



## Section II

**Figure no:1**



### **Quarter wise Average Spread in Rupees**

The above figure gives the data in the time line where it is seen that there are two downwards peaks one during January 2008-March 2008 and another during July 2015-September 2015. The movements are much more frequent with more ups and down during the period of January 2008 to January 2010-March 2010 representing the global financial crisis period. The period of January 2008 to October 2008 has been very vital where the spread was -527.87 during January 2008-March 2008 followed by -228.00 during April 2008-June 2008 where there is fall of Bear Stearns and another negative spread of -155.02 during September 2008-December 2008 representing Lehmann Brothers and AIG fall episodes. The upward movements represent liquidity in the market with positive spread and downward movement represents the negative spread with volatile market.

### **Section III**

#### **Literature Review**

Very few literatures are available to correlate the stock prices/spread with systemic risk. Several authors have used different methods for estimation of the systemic risk.

*Miguel A. Segoviano and Charles Goodhart in their paper Banking Stability Measures*(IMF Working paper:WP/09/4)analyzed common distress in the banks comprising the system and they propose the *Joint Probability of Distress* (JPoD) and the *Banking Stability Index* (BSI). defines a set of banking stability measures which take account of distress dependence among the banks in a system, thereby providing a set of tools to analyze stability from complementary perspectives by allowing the measurement of (i) common distress of the banks in a system, (ii) distress between specific banks, and (iii) distress in the system associated with a specific bank. Our approach defines the banking system as a portfolio of banks and infers the system's multivariate density (BSMD) from which the proposed measures are estimated. The BSMD embeds the banks' default inter-dependence structure that captures linear and non-linear distress dependencies among the banks in the system, and its changes at different times of the economic cycle.

The BSMD is recovered using the CIMDO-approach, a new approach that in the presence of restricted data, improves density specification without explicitly imposing parametric forms that, under restricted data sets, are difficult to model. Thus, the proposed measures can be constructed from a very limited set of publicly available data and can be provided for a wide range of both developing and developed countries.

Pioneering work done by Viral V Acharya,Lasse H.Pederson,Thomas Philippon and Mathew Richardson(May 2010) to measure systemic risk based on Daily returns of Financial firms from June 2006 to June 2007 was analyzed along with the market value of each firm's equity and book value was analyzed. They observed that Current financial regulations seek to limit each institution's risk. Unless the external costs of systemic risk are internalized by each financial institution, the institution will have the incentive to take risks that are borne by all. In this paper, the authors argue that financial regulation be focused on limiting systemic risk, that is, the risk of a crisis in the financial sector and its spillover to the economy at large. They provide a simple and intuitive way to measure each bank's contribution to systemic risk, Suggesting ways to limit it. In a variety of tests (stress test outcomes of 2009 and performance during 2007-08) and markets (equity and CDS), the systemic risk measures appear to be able to predict the financial firms with the worst contributions in the systemic crisis.

Several extensions of the work are worthy of pursuit in future. While they estimated and tested the proposed systemic risk measure using equity and CDS data, another way to obtain such information is through prices of out-of-the-money equity options and insurances against losses of individual firms when the system as a whole is in stress. While such insurances are not yet traded, data on firm equity options as well as market options is available and can be used to construct measures of tail dependence such as the MES.Finally, they investigated the role of leverage (measured as assets to common equity ratio) in determining systemic risk of firms. The form of leverage that had the most pernicious effect in the crisis of 2007-09 was short-term debt: the overnight secured borrowing (repo") against risky assets (Adrian and Shin, 2008) employed heavily by the investment banks, and the short-term (overnight to week maturity) asset-backed commercial paper issued by conduits that were backed by commercial banks (Acharya, Schnabl and Suarez, 2009). In contrast, even though deposits are in principle demandable and thus short-term too, the presence of deposit insurance meant that commercial banks with access to insured deposits were in fact relatively stable in the crisis. It seems important to empirically understand how Short-term leverage contributes to market-based measures of systemic risk of financial firms.

One of the first works in India regarding measurement of Systemic Risk by Natasha Aggarwal,Sanchit Arora,Akhil Behl,Rohini Grover,Shaswat Khanna,Susan Thomas(2012) to calculate a Systemic Risk Index of firms in India and identify Systemically Important firms. This paper uses the average of the percentile ranking of three measures of systemic risk: Granger Causality, Marginal Expected Shortfall and Conditional Value at Risk to calculate the Systemic Risk Index of the firms for the period of 2000 to 2012. In this paper, authors measure systemic risk of a given firm at a given point in time using three measures of systemic risk: GC, MES, and CoVaR. They then aggregate these measures to create a single measure of systemic risk for the firm (the SRI), which is computed by averaging the percentile rankings across the three Individual measures of systemic risk. The measures are computed for the 50 largest firms in the country, by market capitalization, between 2000 and 2012.The set of firms include both financial and non-financial firms. The results include the identities of the 20 most systemically important firms

in the country each quarter, when ranked by their Systemic Risk Index (SRI) which is an aggregation of the three individual risk measures for the firm. Along with the identities of the firms, they also report the aggregate loss to the system if these firms were to fail. In the analysis, they present a time series performance analysis of the measures and the SRI rankings of the firms around the period of the 2008 financial crisis.

Viral V Acharya and Nirupama Kulkarni (2012) in their paper *State Ownership and Systemic Risk: Evidence from Indian Financial Sector during 2007-2009* (IGC Working Paper) studied the intervention of state ownership in Indian financial system during global financial crisis. In this paper, the authors have made an attempt to explain the relatively strong performance of public sector banks versus their private sector counterparts. The global crisis which erupted in 2007 had its impact on the Indian economy beginning only 2008. While the global impact on the financial sectors has been severe, Indian financial firms have fared much better. Much of this has been credited to the public sector firms which lent stability during the crisis period. The analysis shows that while this may be true, public sector firms benefitted significantly from government guarantees. At the peak of the financial crisis, the Indian government announced a series of stimulus packages with the aim of restoring the economy. As a result even some risky public sector banks performed better than their less risky public sector counterparts and overall they fared better than the private sector counterparts. Interpreting this lack of a level-playing field as the relative stability and efficiency of public sector banks relative to private sector banks appears questionable.

## **Section IV**

### **Summary of results and comparison**

Year and qtr	Systemic risk indicators	Other indicators	Spread movement
RBI Financial Stability Report March 2010	The financial stress indicator suggests that Indian Economy experienced stress which peaked in October 2008 and lasted till March 2009. The financial stress indicator increased from January 2008 to July 2008.	According to Rajya Sabha Report on Global Economic Crisis and its Impact on India (June 2009) With the volatility in portfolio flows having been large during 2007 and 2008, the impact of global financial turmoil has been felt particularly in the Equity market. Indian stock prices have been severely affected by foreign Institutional investors' (FIIs') withdrawals. FIIs had invested over Rs 10,00,000 crore between January 2006 and January 2008, driving the Sensex 20,000 Over the period. But from January, 2008 to January, 2009 this year, FIIs pulled out from the equity market partly as a flight to safety and partly to meet their	The spread has been highest with a figure of -527.87 during January 2008-March 2008 and thereafter where monitoring was required or it may be considered as warning signal, -228.00 during April 2008-June 2008. The figure moderated during July 2008-Sep 2008 and again increased to -155.02 during October 2008-Dec 2008. It is also seen that the markets were recovering after April 2008 and attained positive spread during July 2008-Sep 2008 which temporary but suddenly became illiquid with -155.02 during October 2008-Dec 2008 which is the vulnerable stage marked by fall of AIG and Lehmann Brothers. So, the period of January 2008 to December 2008 is indication of financial turmoil of which the highest negative spread figures during January to March, 2008 can be considered as warning signal. The Z score from the table indicates a negative score during January 2008-March 2008, April

		<p>redemption obligations at home. These withdrawals drove the Sensex down from over 20,000 to less than 9,000 in a year. It has seriously crippled the Liquidity in the stock market. The stock prices have tanked to more than 70 per cent from their peaks in January 2008 and some have even lost to around 90 per cent of their value.</p>	<p>2008-June 2008 and Sep2008-Dec 2008 indicating stress periods. The observations are supported by Co-risk measures, first proposed in IMF's 2009 Global Financial Stability Review where the authors find that in March 2008, when Citigroup's CDS spreads were at their 95th percentile, this would have led to an increase of 135% in Bear Stearns' CDS spread and 103% in Lehman's CDS spread. Furthermore, the risk of Bear Stearns conditional on the risk of AIG is 248% higher than that corresponding to the 95th percentile of Bear Stearns' Empirical distribution. Thus, these results suggest that AIG, Bear Stearns, and Lehman, Should have been closely monitored in March 2008. The authors also find that in March 2008(CO-risk measure by IMF's 2009 Global Financial Stability Review (International Monetary Fund, 2009a)(Ref:Bisias et. Al paper page no:114)</p>
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			During Q1 2009-10(April 09-June 09) the spread was positive after a long period of volatility to 62.82
	The liquidity injection by RBI ensured that the domestic market stabilized by Q1 2009-10		
RBI Financial Stability Report December 2010	The Financial Stress Indicator(FSI) mirrored the Heightened global stress scenario in the third quarter of 2008-09 in the wake of the failure of Lehman Brothers. In response to the swift and calibrated monetary and fiscal measures initiated in India, the FSI has been on the downward trajectory since November 2008. The recent period, as manifested in the FSI has been stress-free barring two occasions in which small and temporary stress levels were discerned. In May 2010, tensions in European sovereign bond market caused volatility across global financial markets while in November 2010, it was Volatility in the foreign exchange market as reflected in rise in Exchange Market Pressure (EMP). Going forward, the financial		From April 2009 more or less the Spreads are within reasonable limits;62.82 during April –June 2009,155.85 during July-Sep 2009,-39.66 during Oct-Dec 2009,-37.14 during Jan 2010-March 2010, -13.31 during April 2010-June2010 and thereafter increasing to -62.18 and -228.95 during the last two quarters of 2010-11.  The Z score has been negative during October 2010 to Dec2010 indicating some stress period otherwise it has been positive during the rest of period indicating a stress free period.



	markets as a whole are expected to remain Stress-free during last quarter of 2010-11.		
RBI,Financial Stability Report,June,2011	The projected Financial Stress Indicator for the period until August,2011 is well below the constructed threshold value of 0.90	The Joint Probability of Distress (JPOD) and Banking Stability Index (BSI) were estimated for the period of October 2007 upto February, 2011.It may be observed that the expected number of banks (Out of a sample of 20) which was under distress was 4 during crisis has declined to 1 by last quarter of 2010.But it has again increased to 2 during first quarter of 2011.	The spread has been negative and -213.98 during Jan-March2011 and thereafter decreased to -105.49 during April 2011-June2011.  The z score has been negative during Jan 2011-March 2011 indicating some sort of stress as indicated in BSI estimation.
RBI,Financial Stability Report,December,2011	According to the systemic risk survey October,2011,the majority of respondents identified deterioration of asset quality of Banks as most significant risk to financial system followed by risks from heightened market volatility.	Banking stability measures, which attempt to model the distress dependencies in the banking sector, point to continued low levels of such dependencies though a marginal uptrend is noticeable in case of the Banking Stability Index. The banking system's Expected Shortfall (i.e. the estimated loss of assets in the extreme loss region) has also been declining continuously in recent periods implying that the banking system would be resilient even to the extreme systemic losses derived from the model	The volatility in the market is indicated due to the spread which was negative during the period of January 2011 to December 2011.The spread was -213.98 during Jan 2011-March 2011, -105.49 during April 2011-June 2011 and finally -163.02 during October2011-December 2011.  The Z score has been negative throughout the period except during April to June 2011 when it was 0.157.So, the volatility in market and illiquidity is reflected.  If we compare the spread in the Banking Sector it is found that during January 2009-March 2009 5 banks were figuring in top 12 largest negative spreads, thereafter only State Bank Of India is appearing in the top ten negative spread during the period of April 2009 to December 2011 excepting during the period of October 2009-

			December 2009 when Axis Bank and Kotak Mahindra Bank were appearing in 5 <sup>th</sup> and 6 <sup>th</sup> positions.
RBI,Financial Stability Report,June,2012	<p>The second systemic Risk survey was conducted during April 2012 where the stakeholders perceived volatility in market as single most important risk facing the financial system followed by deterioration in asset quality of banks.</p> <p>During Q4 2011-12 the liquidity position tightened further and RBI reduced CRR by 50bps from January,28,2012 and further by another 75bps from March 10,2012 thereby injecting primary liquidity to the extent of Rs800bn.</p>	The probability of distress of entire banking system as measured by JPOD has been showing an upward trend over the last two years. The Banking Stability Index which measures the expected number of banks which could become distressed given at least one bank becomes distressed declined from high registered during 2008-09 till the end of October 2010. Thereafter it is showing increasing trend.	<p>The spread has been negative during October-December 2011 when it was</p> <p>-163.02 which has improved to 26.22 due to RBI rate cuts in CRR during January 2012-March 2012. During the period of October 2012 to June 2012 the spread has been negative excepting during January 2012-March 2012 (2011-12 Q4)</p> <p>From the banking spread data we observe that during July-September 2010 no banks were figuring in top 10 negative spreads but thereafter during October-December 2010 three banks were figuring in top ten thereafter barring January –March 2012 State Bank of India appeared amongst to ten. But, during April-June 2012 Punjab National Bank, Axis Bank Ltd followed by Bank Of Baroda occupied amongst top 12 slots. So, there was stress in the Banking sector during the period.</p>
RBI,Financial Stability Report,December,2012	According to systemic Risk Survey October 2012 global risk emerged as most important factor affecting financial system. The survey indicates that the participants had high confidence in the stability of Indian Financial System.	The JPOD seems to have reversed its upward trend and registered marginal decline since November, 2012. The BSI has also registered similar movement of JPOD.	<p>The spread during the period was more or less stable as</p> <p>-6.44 during July-Sep 2012. The Z-Score has been positive during the period of July 2012 to December 2012.</p> <p>It is seen that no banks are occupying the top ten slots in highest negative spreads during September-December 2012.</p>
RBI,Financial Stability Report,June,2013	According to the systemic risk survey April 2013 deterioration in the asset quality of Banks and market	The JPOD has registered a marginal decline during last six months. The BSI showed upward trend	The spread has been negative - 264.33 during January –March 2013 and again -24.19 during April-June 2013. The Z-score is

	volatility were perceived to be important factors.	(Deteriorating conditions) from December 2010 till September, 2012 which has again reversed in February 2013.	having negative figure -0.886 during January-March 2013 indicating volatility in market.  During January-March 2013 State Bank On India (SBI) has occupied the sixth position (-8.67) in top slots of negative spreads. During April-June 2013 SBI has occupied fifth position  (-3.95) indicating the reversal trend as indicated by BSI from February 2013.
RBI, Financial Stability Report,December,2013	The Systemic Risk Survey carried out by RBI during April 2013 to October 2013 observed Global Risk as the most important factor of Systemic Risk on account of global slowdown. Market risks and institution risks were under Medium category.  The market risks have increased and there has been deterioration in domestic economic outlook from medium to risk category.	The BSI has risen sharply since August 2013.	The spread has been negative during the period of April 2013-June 2013 and was -24.19 which gradually increased to -196.64 during July-September 2013 and during October-December 2013 it was-78.37.The Z score was negative during July-September 2013 indicating volatility in markets.  During April-June 2013 only SBI was figuring in the top ten slots for negative spreads but during July-September 2013 two banks viz. SBI and Axis Bank Ltd. occupied the top ten slots indicating deterioration of BSI since August 2013.
RBI, Financial Stability Report,June,2014	The systemic Risk Survey April 2014 which was conducted for the period of November – April 2014 perceived Global risks and domestic macroeconomic risks as major risks affecting financial system. The market risks receded.	The BSI remained at same level.	It is observed that during the period of October-December 2013 the spread was -78.37 which further worsened during January-March 2014 to -80.30.But, the Z score was positive during the survey period indicating less risk.  It is seen that no banks are occupying the top slots of negative spreads during the period

RBI, Financial Stability Report,December,2014	The systemic Risk Survey was conducted during October 2014 and it perceived global risk and macroeconomic risks as major risks affecting the financial system.	The BSI remained same though the liquidity improved during March and September 2014.	The spread during the survey period was negative but the Z-score was positive during the survey period indicating a more or less stable market as the market risk has been perceived under medium risk category.  Except State Bank Of India no other Banks are figuring in top ten slots during the survey period indicating same results as the previous survey.
RBI, Financial Stability Report,June,2015	<p>The systemic Risk Survey was conducted in April 2015(October 2014 to April 2015).The results indicate global risks and macroeconomic risks continued to be major risks affecting the financial system.</p> <p>There has been deterioration in domestic outlook which increased to high risk category in present survey.</p> <p>The risks from Infrastructure development, capital inflows/outflows and corporate sector were still perceived to remain in high risk category. Amongst institutional factors asset quality of banks was still perceived as high risk factor. The survey shows a decrease in confidence in the stability of Indian Financial System.</p>	The Banking Stability Indicator (BSI),4 shows that risks to the banking sector moderated marginally since the publication of the previous FSR, though the Levels of risks continue to be a matter of concern.	<p>It is seen that the spread gradually worsened during the Survey Period from</p> <p>-42.07 during October-December 2014 and then a abrupt increase to -179.50 during January-March 2015 to -289.92 during April-June2015.The Z score was negative and it was -0.32 during January-March 2015 and thereafter -1.05 during April-June 2015 indicating volatility in market.</p> <p>It is also seen that during the survey period all the Banks spread have become negative indicating liquidity crunch in Banking Sector though they are not figuring in the top slots.</p>
RBI, Financial Stability Report,December,2015	The survey was conducted in October 2015 and the results indicate that global risks continued to be perceived as major risk affecting financial system. The capital flows and corporate sector risks	BSI shows that risks to Banking sector have increased. The stability condition of Banking sector deteriorated since Mid 2010.	During July-September 2015 the spread was -497.16 indicating highest volatility in market as corporate risk was placed in high risk category. The deteriorating qualities of corporate loans were affecting the asset quality of Banks. The Z score was negative

	remained elevated in high risk category. Amongst institutional risks asset quality of Banks was in high risk category.		<p>with -2.41 during the period also indicating volatility. It is also seen that during January – March 2015 50% of the top ten slots of highest negative spread is occupied by top 50 companies in market and in July-September 2015 40% of the top slots in negative spread occupied by top 30 companies.</p> <p>It is seen that except Kotak Mahindra Bank Ltd, Indusind Bank all the Banks were having negative spread during the period of July-September 2015.</p>
RBI, Financial Stability Report, June, 2016	The systemic risk survey conducted during April-May 2016 perceived Global risk as major risk contributor to financial system. Corporate sector was under high risk category.	BSI has sharply increased and now worsened significantly.	<p>The spread was -359.45 during October-December 2015 and -403.68 during January-March 2016. The z score was negative with -1.51 and -1.80 during the two respective quarters.</p> <p>During January-March 2016 all the banks were having negative spread excepting Yes Bank. During October-December 2015 the top 60% slots of negative spreads were occupied by top 40 big companies according to market capitalization and during January-March 2016 the top 50% slots by top 40 big companies. These results indicate volatility in market conditions.</p>

## **Conclusion**

The results clearly indicates that there exists relationship between market illiquidity and risks associated with the Financial System. In most of the cases the Z score (deviation from the mean/Standard Deviation) has become negative which provides the spread which is farther from the mean, also a good indicator of volatility in market and risk to financial system. It is also seen that the Systemic Risk Survey conducted by Reserve Bank of India which started during October 2011 has supported the results. The results also are supported by the Co-risk measures. The Z score is easy to calculate and can be a powerful tool in measurement of market volatility which ultimately affects the financial system. This paper is one of the first attempts, but; still there may several extensions of this paper which includes comparing the results with GDP growth and including the entire financial companies for a better understanding of financial stress. Another extension is to find out sector wise systemically important firms in India according to monthly or quarterly analysis of spread and GDP percentage which shall give early warning signal for loss to banking system and the whole financial system.

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