
Investor's sentiment and purposes of S&P CNX Nifty

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Abstract

S&P CNX Nifty represents the expectation of investors at National Stock Exchange of India (NSE) and Indian economy, because it bears only news about National Stock Exchange of India and it eliminates the effects of its individual contained stocks. This will be possible if these contained shares reflect all news immediately and perfectly. But Indian stock markets are well known for their weak form of efficiency. Therefore possibly investor's sentiment will present at the Indian stock markets and it may control the movement of S&P CNX Nifty. Then the purposes of this index will not be fulfilled properly. Present study has made a sentiment index with the help of published data of the contained stocks of this index and observed that sentiment index can explain nearly sixty nine percent movements of S&P CNX Nifty.

Key words: S&P CNX Nifty, Weak form of efficient market, Investor's Sentiment and Sentiment Index

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Introduction

The S&P CNX Nifty is the headline index on the National Stock Exchange of India Ltd. (NSE). The Index tracks the behavior of a portfolio of blue chip companies, the largest and most liquid Indian securities. Fifty highly liquid stocks, listed at National Stock Exchange of India (NSE) and belong to key sectors of Indian economy form S&P CNX Nifty with free float market capitalization method. Stock price moves for two possible reasons – news about the company and news about the country. On any one day there would be good news for few companies and

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bad for others. According to theory free float market capitalization method ensures the elimination of these good and bad effects of individual stocks from S&P CNX Nifty. News about the country affects all stocks in same way. None of the index compilation methods would be able to eliminate this from an index. Hence S&P CNX Nifty bears only the news of India. This increases the use of this index in many folds. Some of these are:-

- It provides a historical comparison of returns on money invested in the NSE against other forms of investments such as gold or debt.
- It can be used as a standard against which to compare the performance of an equity fund.
- It is a lead indicator of the performance of the Indian economy.
- It is getting used in the form of index funds and index derivatives.

The individual stock's effect will be eliminated from this index if all of its contained stocks reflect all news perfectly and immediately. This implies that NSE needs to be efficient. But all stock exchanges of India are well known for their weak form of efficiency, because all news are not available to all traders here. Hence there will be two kinds of stock traders in NSE. One group will try to assess the stock price of a company based on publicly available information in the market and this price will be either higher or lower than the intrinsic value of the same stock. This group is called noise traders. Second group will find out the intrinsic value easily because they will be able to collect and analyse all informations from various sources, like news bulletins, company's financial statements etc. This kinds of investors are professional money managers and fund managers of various mutual funds, pension funds etc. Behavioural decision making process says that noise traders will follow each others' mistakes by listening to rumors or intimating their neighbours, and will wait for establishment of a trend (Shiller 1984). Fama (1970) agreed with the presence of noise traders at the stock market but drew two considerations to eliminate their effects from the stock price. First consideration said that all traders will trade randomly with each other. Second stated that professional money managers of pension funds or mutual funds, who know the intrinsic value of a stock, will arbitrage and put the price back to its intrinsic value. Human decision making process identified by behavioural science says that all people do not deviate from rationality randomly, but all of them behave in same manner i.e. they will buy or sell the same security at the same time. Again it will be very difficult to predict the

mental behavior of these noise traders (De Long, Shleifer, Summers and Waldmann 1990). Fear of which will stop proper arbitrage at the market (Lakonishok et al. 1992). Therefore all good or bad news of contained stocks of S&P CNX Nifty may not be reflected on the immediately and perfectly in them. Therefore at a certain point of time this index may not bear only the news of India. As a result sentiment created by noise traders may exist and may influence the return of S&P CNX Nifty. In this backdrop the present study has build up a sentiment index and tried to show it's relationship with the return of S&P CNX Nifty.

Literature review

News is random hence the associated price of a stock at stock market will also be random. Probability distribution of huge amount of random data will be normal. But deviations have been recorded many times (Fama 1965, Turner and Weigel 1990, Niarchos and Alexarkis 2003). An efficient stock market must ensure rapid information access so that it can instantaneously process the information to reflect on security prices. This information transmission mechanism ensures that the stock returns across all days of the week are equal. Hence no market participant will be able to earn any extra profit and identical mean return will be observed across all days of the week. Fields (1934) and Jaffe and Westerfield (1985) examined the deviation of this theory in Dow Jones Industrial Average (DJIA), Standard & Poor 500 (1962-1983) and London Stock Exchange (LSE) (1950-1983). Irrational investment decisions of noise traders are responsible for this kind of anomalies of efficient market hypothesis (Black 1986, De Long, Shleifer, Summers and Waldmann 1990, Zweig 1973). De Bondt and Thaler (1985) compared the performances of two groups of companies, extreme losers and extreme winners, and found that the returns of extreme losers were higher than those of the extreme winners. Same behavior has also been observed with price earnings ratio (P/E) ratio (Basu 1977) and market to book value ratio (De Bondt and Thaler 1987, Fama and French 1992). This was the downfall of mental biases of investors. Some of the recorded mental biases, which influence the financial decisions, are over confidence (De Bondt and Thaler 1987, Fama and French 1992), regret (Shefrin and Statman 1985), optimistic beliefs (Thaler, 1999) and loss aversion (Kahneman and Tversky 1979). These mental biases will create bullish or bearish sentiment at the market (Brown and Cliff 2004).

This sentiment has been measured in two ways – direct and indirect. Direct methods include the survey of American Association of Individual Investors (AAII) (Fisher and Statman 2000, 2003)

and Investors Intelligence (II) (Fisher and Statman 2000). These surveys distinguish the investors into bullish and bearish at a certain point of time. A long time survey data series provides a direct relationship with the stock price (Brown and Cliff 2004, Fisher and Statman 2000). Michigan Consumer Confidence Index, Conference Board Consumer Confidence Index and index of investor Optimism can also explain the return of indices (Fisher and Statman 2003). Alongside the direct sentiment indicators a vast amount of literature has been developed to measure sentiment in indirect ways. Neal and Wheatley (1998) and Swaminathan (1996) used closed-end mutual fund's premium and discount as a proxy for individual investor's sentiment. This sentiment index can predict small firms' return. Elton, Gruber and Busse (1998), Doukas and Milonas (2004) presented evidence against this theory. Trading statistics (Jegadeesh and Titman 2001), orders from individual investors in the New York Stock Exchange (Kaniel, Saar and Titman 2004) and mutual fund flows (Goetzmann, Massa, Rouwenhorst 1999) also can explain stock return. Baker and Wurgler (2000) constructed a composite sentiment index based on six variables - closed-end fund discounts, turnover, number of IPOs, initial returns of IPOs, equity shares in new issues and the dividend premium. He observed that sentiment index is able to explain the future prices of stocks. Bandopadhyay and Jones (2006) build up a sentiment index with risk and return trade off of the stocks included in Massachusetts Bloomberg Index and showed that it can explain a good number of returns of this Index.

All researchers do not provide same conclusion about the behaviour of share price at Indian stock market. Ray (1976) studied seven daily index series by conducting runs test, serial correlation test and spectral analysis for the period from January 1966 to July 1972 and found that the random walk model held only for iron, steel and cement industries. Gupta (1985) used same tests on week-end closing prices of 39 shares from January 1971 to March 1976 and supported the weak form of efficiency. With 93 actively traded shares data for the period January 1988 to April 1990, Chaudhuri (1991a) found that random walk behavior does not exist. Madhusoodanan (1998) applied variance ratio test on Indian individual stocks, Bombay Stock Exchange sensitive index and S&P CNX Nifty and observed that data were persistent in nature. Using Kruskal-Wallis test on BSE sensitive index between June 1988 and January 1990 Chaudhuri (1991 b) saw that average returns on Mondays were negative and highest returns were on Fridays. This kind of anomalies had been recorded by both Broca (1992) and Arumugam (1999) also. This backdrop provides a good motivation to pursue the present research.

Construction of Sentiment index

According to risk return trade off theory stock with high risk should provide high return and low risk will be associated with low return. In short run a company's risk profile does not change but investors' appetite for risk changes (Persaud, 1996). This appetite may not have any relationship with the risk characteristics of the company. In short run the share price of a company increases or decreases with the increase or decrease with this appetite for risk. Bandopadhyay and Jones measured this risk by using Spearman rank correlation between ranks of return and historic volatility of each firm of two hundred and forty two constituent stocks of Massachusetts Bloomberg Index. This study had adopted this method. Hence to create sentiment index, the daily compounded return and volatility of fifty constituents stocks of S&P CNX Nifty had been considered.

Three years (1st January 2008 to 31st December 2010) daily closing price of these fifty constituents stocks of S&P CNX Nifty had been used for this research. For each of the constituent stocks, daily return had been calculated by $r_t = \ln \frac{p_t}{p_{t-1}}$

Where p_t is the close price of t th day and p_{t-1} is the same of t-1 th day.

The historic volatility had been measured by the average standard deviation of the daily returns over the previous five days. The formula for sentiment index is -

$$\frac{\sum (R_{ir} - \bar{R}_r)(R_{iv} - \bar{R}_v)}{\left[\sum (R_{ir} - \bar{R}_r)^2 \sum (R_{iv} - \bar{R}_v)^2 \right]^{1/2}}$$

where R_{ir} and R_{iv} are the rank of the daily return and the historical volatility for security i, and \bar{R}_r and \bar{R}_v are the population mean of return and historical volatility rankings, respectively.

Empirical results:

Sentiment index values ranged between 95.54 percent to – 88.99 percent. This spread is much higher than the spread (48.09 and -35.44) of the same made by Bandopadhyay and Jones. The reason could be the lower sample period (only one year) taken by them. Negative correlation values imply that in some days higher risky stocks provided lower returns and vice a versa.

According to the risk and return trade of theory investors will prefer higher return with higher risk. But this did not hold nearly fifty percent days (49.53). Therefore appetite for risk does not always follow risk and return trade off theory.

Table-1 Risk Classification of Sentiment index

Correlation values	Number of days	Risk Category
-30% and below	176	Highly risk averse
-10% to -30%	130	Moderate risk averse
10% to -10%	135	Risk neutral
10% to 30%	122	Moderate risk seeker
30% and above	178	High risk seeker
Total observation	741	

Table one shows that only one hundred and thirty five days (18.22 percent) out of total seven hundred and forty one trading days investors were not affected with appetite for risk. On these days the investors in the constituents stocks of S&P CNX Nifty may be able to find out the intrinsic value of these stocks. Good and bad news of constituent stocks of S&P CNX Nifty would have been eliminated and the index reflects the news of India. Rest eighty two percent days this did not happen. Information assimilation in stock price were not be immediate and perfect at National Stock Exchange on these days. As Indian stock exchanges are not efficient so the noise traders will follow the price line of previous days as an indicator of the same for present days along with appetite of risk.

Therefore a relationship between sentiment index, lagged value and daily return of S&P CNX Nifty has been developed.

$$r_t = \beta_0 + \beta_1 r_{t-1} + SI_t + \varepsilon \text{ ----- (1)}$$

Where r_t is the return of the indices and r_{t-1} is one day lag value of S&P CNX Nifty and SI_t is the sentiment index at the day t .

Table 2 Regression Result of equation 1 for S&P CNX Nifty

Variable	Coefficient	t-statistics	p-value
Constant	-0.0001	-0.20762	0.835582
r_{t-1}	0.10561	4.873371	0.0000
SI_t	0.045868	37.40717	0.0000
<i>R – squared</i>	0.6558		
<i>Adjusted R – squared</i>	0.6559		
F statistics	1186.845		

Value F statistics	0.0000		
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It was not possible to confirm whether sentiment index granger causes indices returns but the results in table 2 indicate that many changes of r_t ($R-squared$ is 0.6558) could be explained by both lagged value of indices and sentiment index (p value is mostly zero). This implies that returns of S&P CNX Nifty for any given day were primarily driven not only by returns of previous day, but also by the sentiment of market participants for that particular day.

To investigate more intuitively the impact of the sentiment index on the index return, the following equation is estimated, which includes additional lagged values of the sentiment index and indices-

$$r_t = \beta_0 + \beta_1 r_{t-1} + \beta_2 r_{t-2} + \beta_3 r_{t-3} + \beta_4 r_{t-4} + \beta_5 r_{t-5} + \beta_6 r_{t-6} + \partial_0 SI_t + \partial_1 SI_{t-1} + \partial_2 SI_{t-2} + \partial_3 SI_{t-3} + \partial_4 SI_{t-4} + \partial_5 SI_{t-5} + \varepsilon_t \quad \text{-----}(2)$$

Table 3 Regression Result of equation 2 for S&P CNX Nifty

	Coefficients	t Stat	P-value
Constant	-0.00013	-0.29373	0.769047
r_{t-1}	0.071711	1.92706	0.054364
r_{t-2}	0.078123	2.10897	0.035291
r_{t-3}	0.015203	0.414028	0.678976
r_{t-4}	-0.02024	-0.55346	0.580121
r_{t-5}	0.031687	0.872716	0.383108
r_{t-6}	-0.01617	-0.7189	0.472437
SI_t	0.048192	39.5447	0.000000
SI_{t-1}	0.002224	1.024666	0.305864
SI_{t-2}	0.001698	0.791505	0.42891
SI_{t-3}	0.004594	2.187257	0.029044
SI_{t-4}	0.007953	3.815263	0.000148
SI_{t-5}	-0.00079	-0.38369	0.701323

$R-squared$	F statistics	Value F statistics
0.688874	133.2169	0.0000

Again Durbin Watson value is 1.992. This confirms that there is no auto correlation. Many lag values (except r_{t-3} , r_{t-4} and SI_{t-5} are not significant, because p values are more then 0.5) of daily returns of S&P CNX Nifty and sentiment index can explain daily return of S&P CNX Nifty.

Conclusion

This study has proved that both sentiment index and earlier days' returns of S&P CNX Nifty can explain present return of the same index. This study has again showed that nearly eighty two percent of the trading days of sample three years, investors considered appetite of risk as a factor for trading stocks. This appetite of risk does not have any relationship with the risk characteristics of the company. This was created by the mental biases of noise traders. Indian rational traders also can not predict the mental behavior of noise traders and proper arbitrage was not possible.

Random walk hypothesis does not hold for S&P CNX Nifty, because many lagged values of daily returns of S&P CNX Nifty are statistically significant to explain the present return of this index. Hence information assimilation in the stock price at National Stock Exchange will not be immediate and perfect. Therefore at a certain point of time S&P CNX Nifty not only bears the news of stock market or news of India but also the company related news and the purpose of S&P CNX Nifty will not be fulfilled properly.

This study has analysed only one index. Before coming to more generalized conclusion some more indices' returns need to be analysed.

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