

# Impact of Sectoral Indices' Fluctuation on SENSEX.



Debasis Mohanty, Mayadhar Satpathy, Shakti Ranjan Mohaptra

**Abstract** In the last few years performances of Indian exchanges are satisfactory. Last 5-6 years witnessed a massive growth in SENSEX and NIFTY. But a growth in stock indices may not provide profit to the investors unless and until they read it much before. Nobody knows when the Black swan kind of situation comes. In this backdrop, an attempt is made to analyze the correlation among all the sectors of BSE and performances of all these sectors, which may help the investors and portfolio managers to construct the portfolio by selecting the right kind of sectors. This analysis is going to exhibit risk (standard deviation and Beta) associated with all sectors and the correlation among them.

**Objective of the study:** The main objective of the study is to find the performance of the indices and correlation among them, so that it will be an aid to the investors for selecting appropriate sectors to be involved in a particular portfolio.

**Research Methodology:** The data collected for the analysis is from secondary sources. Kumar D. B., Sophia S, and Jucunda E. M. Suggested that there is a significant relationship of stock market with lok sabha election and from the last five years after formation of new Govt. in India, the indices like NIFTY and SENSEX are in an upward trend. So data collected for last five years. Sharpe and Treynor ratio are used to calculate the performance of all the sectors. To get the correlation among the indices Pearson's correlation is used.

**Findings:** Most of the existing researches explained the relationship among different indices by selecting some of the indices. So this study got the fuel to involve the most active 7 indices to correlate with the oldest index of Asia. Pearson's Correlation is one of the most trusted tool used by current researchers.

**Limitations of the Study:** The data used in this study is of five years and to get the correlation Pearson correlation is used

**Key words:** SENSEX, NIFTY, Portfolio, Index, Investment.

## I. INTRODUCTION

"You cannot lead unless you are future oriented" A life changing quote by corporate strategist and Professor by C K Prahalad, Which says it is very important to foresee the future for a better and organized future. Investors/Portfolio managers/Speculators use their own analytical ability to prepare efficient portfolio.

Manuscript published on November 30, 2019.

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Market participants always have a dire of jeopardy on the market becoming Bearish. Technical analysis is not that popular among Indian individual investors and a few are aware about the bands and oscillators. Because of which it becomes difficult for the rural individual investors to find the performing sectors to be involved in their portfolio. Though institution like NSE and BSE are conducting their awareness programs and workshops to disseminate information about the right way of investment, still people are becoming out of pocket with their wrong stock selection. Nicely said by Benjamin G. "An investment operation is one which, upon thorough analysis, promises safety of principal and an adequate return. Operations not meeting these requirements are speculative." So to have a good return someone should take care of the safety of his principal and use a good solid analysis. This analysis will give a comparative analysis of sector wise stocks' performance and will provide a inter correlation among them, which will be helpful to the investors to construct efficient a portfolio.

**1.1 Bombay Stock Exchange:** As per Security Exchange Board of India(SEBI) there are 6 active stock exchanges and 3 active derivative exchanges in India. BSE is one among these. It is the stock exchange with a global figure. As per the BSE pitch book 2018: BSE is the no 1 stock exchange in currency option with approximately 30 million contracts. 3<sup>rd</sup> in terms of future contract in currency with approximately 20 million contracts. 11<sup>th</sup> in the world with 2.3 USD trillion market capitalization. One of the biggest stock exchanges of the world deals with so many underlying.

## II. LITERATURE REVIEW

A numerous work has been done to identify the interdependence between stock index and sectoral indices all over the world by using different tools. There are authors who voice that there is positive correlation among the indices and some argue about negative correlation. R Radhika(2009) concluded that stock market is very mush sensitive and this volatility impacts the market as a whole. By calculating the correlation coefficient of the different sectors, she tried to prove it. Dingmu Cao, Wen Long, Wenning Yang(2013) made an attempt to find the correlation among different sectors of China's stock exchange. They divided the whole period of analysis into phases that is in the period of 2007 and 2008 and the second one is after 2008 and concluded that during the period of more volatility in the stocks,

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all the indices are very closely correlated and less correlation in the second phase.

Tihana Škrinjarić(2015) had taken 6 sectors into consideration for research and by using mgarch tried to measure the performance of all the indices of Zagreb stock exchange. Padma Kurisetti, Swapna Yeldandi and Swamy Perumandla(2018) considered six different sectors of NSE to analyzed their co- integration, short and long term equilibrium. Suhana binti Mohamed, Alizah binti Ali (2011) made an attempt to get the correlation among the micro economic factors and the sectoral indices of Malaysian stock exchange. U. Raghavendra Prasad examined the relationship among NIFTY50 and some selected shares, where he concluded that some shares are positively and some are negatively correlated with NIFTY50. M.Anbukarasi and B Nathiya(2014) examined the impact of sectoral indices return on CNX NIFTY and concluded that there is a significant relationship.

### III. RATIONALE OF THE STUDY

The study conducted in this article to analyze the performance of stocks and the index as well. Some researchers have examined the correlation among some selected shares and Indices. None of the researchers have examined the co integration among the sectoral indices and the Stock index so as to recommend the investor for constructing a well performing portfolio.

### IV. OBJECTIVE

This paper is intended to find the relationship among indices of BSE.The main objectives of this study are as follow:-

- To identify the index based investment opportunity by analyzing their performance.
- To examine the inter-relationship among selected indices to find their suitability to be involved in the same portfolio.

### VIII. DATA ANALYSIS AND INTERPRETATION

- To introspect the correlation of the indices with SENSEX.

### V. LIMITATION AND SCOPE OF THE STUDY

The study covers the analysis of selected indices' prices of sectoral indices traded in BSE for the study period. The study is completely based on secondary data therefore the quality of the study is completely dependent on accuracy, reliability, quality of the data sources and quantity of data. The study is conducted for a period of 5 years which may give a different result than analysis data of more.

### VI. RESEARCH METHODOLOGY

This paper is an attempt to find the correlation among different sectoral indices and SENSEX. So following are the research methodology adapted to study.

#### 6.1 Data collection

In this study, data is collected from secondary sources. The daily stock returns of seven different sectors of BSE and SENSEX of last five years is collected for analysis (From 13<sup>th</sup> April 2015 to 13<sup>th</sup> April 2019). Ten year bond's return is taken as the risk free return to calculate the ratios.

#### 6.2 Tools used

Skewness and Kurtosis has been calculated to estimate the normal distribution of the data. Sharpe and Traynor ratio are used to get the performance of all the 7 sectors and SENSEX. Pearson's Correlation is used to calculate the inter correlations among them

### VII. HYPOTHESIS

- H1: Sectoral indices are positively correlated with each other  
 H2: SENSEX is positively correlated with sectoral Indices.  
 H3: Indices returns are greater than the the return of SENSEX.

**Table-1(Performance of Indices)**

ANALYSIS								
	SENSEX	AUTO	BANKEX	FMCG	HEALTH CARE	IT	OIL&GAS	TEL ECO M
<b>TOTAL RETURN</b>	32.92%	-0.44%	54.87%	39.84%	-21.68%	32.30%	51.95%	36.80 %
<b>OUTPERFORMANCE</b>		33.37%	-21.95%	-6.92%	54.60%	0.63%	-19.02%	69.73 %
<b>STANDARD DEVIATION(DAILY)</b>	0.82%	1.15%	1.13%	0.95%	1.11%	1.09%	1.23%	1.44 %
<b>STANDARD DEVIATION(ANNUALIZED)</b>	<b>25.95%</b>	<b>36.21%</b>	<b>35.70%</b>	<b>29.79%</b>	<b>35.00%</b>	<b>34.22%</b>	<b>38.85%</b>	<b>45.51 %</b>
<b>VARRIANCE</b>	6.74%	13.11%	12.74%	8.88%	12.25%	11.71%	15.10%	20.71 %

G SEC RETURN(10 years Bond)	7.55%	7.55%	7.55%	7.55%	7.55%	7.55%	7.55%	7.55%
Beta		111.03%	118.11%	80.64%	82.42%	66.80%	98.83%	86.08%
SHARPE	Rm-Rf/sd	-21.29%	33.72%	14.50%	-43.25%	10.23%	32.51%	53.39%
TRAYNOR	Rm-Rf/Beta	-7.24%	48.48%	30.48%	-30.84%	20.99%	44.31%	45.57%
SKEWNESS	0.22899088	0.08457	-0.016	0.1859	0.481520206	0.9632	-0.20127	0.161319
KURTOSIS	-1.265358	-1.3019	-1.3103	-1.392	-0.405436047	-0.405	-1.41197	0.47604

Standard deviation is something which says about the risk associated with a particular invest avenue, which is shown in the above table(table-1). In this parameter Telecom index has the highest risk associated with annualized standard deviation of 45.51%, which means it is riskier to invest in the stocks of this index and SENSEX is most diversified among all with lowest standard deviation. Other indices are having risk range from 29.79% to 38.85%. Systematic risk of Bank index is the highest among all and IT is the lowest. Except Bank and Auto other indices are having beta less than of 100%. Sharpe ratio is called as the return to volatility and Treynor is called as return to variability. The components of the former is market return of the index, risk free rate and standard deviation whereas the later has the components like market return, risk free rate and beta(Systematic risk). Higher the Sharpe and Treynor ration better is the performance of share. Bank index has the highest Sharpe and Treynor ratio which indicates; out of all the indices the performance of Bankex is better than others after adjustment of risks (Systematic and Unsystematic). Telecom index is lowest in this regard as it has the lowest ratio.

Return(Index Wise)

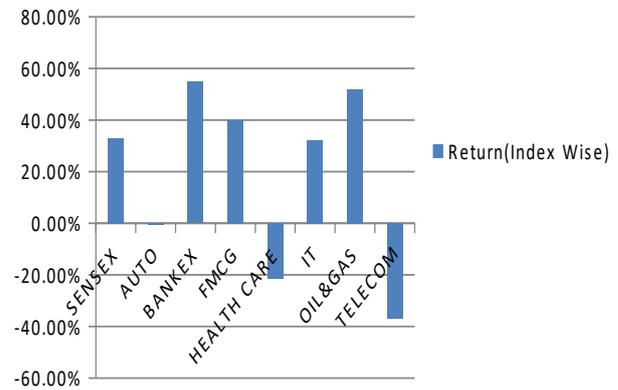


Figure-1(Source table -1)

The above figure(figure-1) depicts the total returns of all the indices including SENSEX. They have shown a very unequal pattern of return over the selected period of five years. The return of the indices and SENSEX are calculated by taking care the current date previous close and the previous date previous close of all the indices. Bankex gives highest return among all, whereas Telecom is lowest in this parameter. FMCG and IT are providing nearly equal to the returns of SENSEX. Auto, Telecom and Health Care performances are below par as these are giving negative returns in the period of analysis.

Correlation Matrix

Table-2(Correlation among sectoral indices and SENSEX)

		SENSEX	AUTO	BANK	FMCG	HEALTH	IT	OIL	TELECOM
SENSEX	Pearson Correlation	1	.620**	.983**	.981**	-.646**	.757**	.832**	-.298**
	Sig. (2-tailed)		.000	0.000	0.000	.000	.000	.000	.000
	N	992	992	992	992	992	992	992	992
	Pearson Correlation	.620**	1	.685**	.639**	-.569**	.057	.856**	.182**

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AUTO	Sig. (2-tailed)	.000		.000	.000	.000	.071	.000	.000
	N	992	992	992	992	992	992	992	992
BANK	Pearson Correlation	.983**	.685**	1	.971**	-.699**	.643**	.893**	-.255**
	Sig. (2-tailed)	0.000	.000		0.000	.000	.000	0.000	.000
	N	992	992	992	992	992	992	992	992
FMCG	Pearson Correlation	.981**	.639**	.971**	1	-.701**	.728**	.839**	-.374**
	Sig. (2-tailed)	0.000	.000	0.000		.000	.000	.000	.000
	N	992	992	992	992	992	992	992	992
HEALTH	Pearson Correlation	-.646**	-.569**	-.699**	-.701**	1	-.329**	-.746**	.302**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000
	N	992	992	992	992	992	992	992	992
IT	Pearson Correlation	.757**	.057	.643**	.728**	-.329**	1	.324**	-.548**
	Sig. (2-tailed)	.000	.071	.000	.000	.000		.000	.000
	N	992	992	992	992	992	992	992	992
OIL	Pearson Correlation	.832**	.856**	.893**	.839**	-.746**	.324**	1	-.080*
	Sig. (2-tailed)	.000	.000	0.000	.000	.000	.000		.011
	N	992	992	992	992	992	992	992	992
TELECOM	Pearson Correlation	-.298**	.182**	-.255**	-.374**	.302**	-.548**	-.080*	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.011	
	N	992	992	992	992	992	992	992	992

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

The total no of data selected for five consecutive years is 992. We got two levels of significance one is at 0.01 and 0.05 level. The Pearson's correlation test given the correlation among all the indices at two different level of significance. SENSEX correlation test is significant with all other indices at 0.01 level. Auto index's test of correlation is significant with all the indices at 0.01 level other than IT(0.71), which is very close to 0.05 so it is consider to be significant at 0.05 level. Bank index is significant with all other indices. FMCG index correlation test is significant at 0.01 level with all selected indices. Health care index is also significant with other indices at 0.01 level while testing the inter correlation. IT is also significant at 0.01 level with all other indices other than Auto. Oil's test of significance is 0.01 with all the indices other than Telecom which is 0.011

means significant at 0.05 level. Telecom's test of significance is 0.01 level with all the indices other than Oil. SENSEX is moderately correlated with Auto index(0.620) but very highly correlated with Bank, FMCG, IT and oil with correlation of 0.983,0.981,0.757,0.832 and negatively correlated with Health (-0.646) and Telecom(-0.298). Auto index has a moderate correlation with Bank, FMCG, IT, Telecom at correlation of 0.685,0.639,0.057,0.182 and high correlation with Oil at 0.865. But Auto index is negatively correlated with Health(-0.569). Bank index has a very high correlation with FMCG(0.971) and Oil(0.893), Moderate correlation with IT index(0.643) and Negative correlation with Health (-0.699).

FMCG index is negatively correlated with Health and Telecom(-0.701,-0.374). IT and Oil indices are strongly correlated with FMCG at 0.728 and 0.839 correlation coefficients.

Health Care is moderately correlated with telecom (0.302) and negatively correlated with IT and Oil(-0.329,-0.746). IT index has a average correlation with Oil and a negative correlation with Telecom(0.324 , -0.548). Oil index is negatively correlated with Telecom with coefficient of -0.080.

### IX. CONCLUSION AND RECOMMENDATION

This study is a quantitative analysis, which is conducted by collecting data of five yours . The data is collected for seven different sectors of Indian stock market and SENSEX.

An index's performance increases when most of the shares of that particular index increases. From the return analysis of all the selected indices and SENSEX , it is clear that all the five indices have less return than SENSEX except Bankex and FMCG. The study reveals inter-relationship among indices and their relation with SENSEX. All the indices have positive correlations with SENSEX except Health and Telecom indices. Some of the positively correlated indices are moderately and some are highly correlated with SENSEX.It is noticed in the above study that most of the indices have positive correlations among themselves. Health Care has a negative correlations with all others (FMCG,IT,Oil, Auto and Bank). Telecom on the other hand has negative correlation with Bank, FMCG, IT and Oil indices. Interestingly telecom has positive correlations with Healthcare and Auto indices. The above analysis concludes a positive correlations among most of the indices. Hence H1,H2and H3 are selected. It is brought to the notice of investors and portfolio managers that performance of the indices must be taken into account while investing in any sector where as to construct a good portfolio the correlations must be considered. The indices have positive correlations move together technically, so investing in positively correlated portfolio may give positive and negative return together. But when negatively correlated indices or shares can be involved to avoid it. The future recommendation for research scholars can use some other tolls and more data with some more indices can be included for study which may give some other result than the current.

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**Mr. Debasis Mohanty** a PhD scholar in finance stream of Biju Pattanaik University of Technology, Odisha, India is currently working in ITM University Raipur as an Assistant professor. He has a working experience of 6 years educational and 3 years industrial experience. Mr. Mohanty after completing his MBA, started working in a leading brooking firm in India and then started his career as a teacher. He is a certified NISM currency dealer and has worked as financial advisor for one of the MNCs. His interest towards stock market helps him to do research in stock market related topics. Mr. Mohanty has published some research papers in the field of derivatives and banking and some papers are under review process. He also has interest in social service and he is currently associated with one NGO.



**Dr Mayadhar Satpathy** is a retired principal of Institute of Management and Information Technology, Cuttack Odisha. Dr. Satpathy got awarded his PhD in 1995 and M.Phil from Utkal University, Odisha in 1988. He served in some Govt. colleges in the department of Commerce and Management as lecturer, professor, reader, Head of the department and as principal. He has 38 years of teaching experience and apart from teaching he has served as Director examination in one of the Government universities of Odisha. Mr Satpathy has guided 7 doctoral students. He has participated in more than 15 seminars, conferences and FDPs as a participant and as guest of honor/speaker in 10 events.

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Dr. Satpathy has more than 20 research publications in different qualitative journals, which shows his proficiency and interest in research. He has published 10 books in accounting, statistics etc. Other than teaching he has been recognized as a social servant and associated with so many social service organizations.



**Prof. Shakti Ranjan Mohapatra** is currently holding the position of Dean, Faculty of Management of the Biju Patnaik University of Technology, Rourkela, (BPUT), the only Government Affiliating University in Odisha State, India. Prof. Mohapatra has a wide range of experience of over 36 years in Corporates and Academics. He had held various top level positions in the State Public Sector Units of Odisha before his joining back to Academics. He has to his credit numerous articles published in

National and International journals. Two of his scholars have obtained Ph. D in Management from BPUT and Utkal University in the area of Finance. Now, seven scholars are about to submit their theses under his guidance. Prof. Mohapatra had his MBA education from Xavier Institute of Management, Bhubaneswar. Besides, he is a Fellow Member of the Institute of Company Secretaries of India as well as that of Institute of Cost Accountants of India. He has visited many countries like South Korea and China and has delivered talks before many conferences.