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STOCK MARKET VOLATILITY IN RETURN AND RISK OF SELECTED SECTORS OF BOMBAY STOCK EXCHANGE OF INDIA

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***Abstract*:** The main objective of the study is to give investors basic idea of investing in the sectors in BSE and encourage them to invest in these areas where they can maximize the return on their investment. The research provides interesting insights into the selected sectors of BSE, the risk-taking abilities of investors and investment options, etc. Here, the study investigates about risk and return, volatility of the selected sectors of BSE. The Indian stock market has been fluctuating vastly during the last few years. With reforms and investment policies, the economy has been opened up and many developments have been taking place in the stock market. This study helps us to understand how the companies diversify themselves in different sectors and different companies to maximize the return and minimize the risks involved in it.

***IndexTerms* -** Investment, Stock Market, Sectors, Risk and Return.

1. Introduction

In making an investment, chance and return are fairly correlated. Improved capacity returns on investment usually cross hand-in-hand with expanded danger. Exceptional varieties of risks include venture-unique threat, enterprise-particular chance, aggressive risk, worldwide threat, and market risk. Return refers to both gains and losses crafted from trading protection. The go back on funding is expressed as a percent and considered a random variable that takes any fee inside a given range. Several elements impact the form of returns that traders can anticipate from buying and selling inside the markets. Diversification permits buyers to reduce the general threat related to their portfolio however may also restrict ability returns. Making investments in best one marketplace sector may additionally, if that area extensively outperforms the overall marketplace, generate superior returns, however ought to the sector decline then you may enjoy lower returns than could have been done with a broadly different portfolio. College students ought to keep in mind that each saving and investment product has specific risks and returns. Variations consist of how quite simply investors can get their cash when they want it, how speedy their money will grow, and how safe their money can be.

1.1 Market Risk Premium

The market risk premium is the additional return an investor will receive (or expects to get hold of) from keeping a risky marketplace portfolio instead of threat-loose assets. The marketplace risk top class is part of the Capital Asset Pricing (CAPM) which analysts and buyers use to calculate the ideal fee of return for an investment. At the center of the CAPM is the concept of risk (volatility of returns) and reward (the price of returns). Investors continually choose to have the highest possible charge of going back combined with the lowest viable volatility of returns.

1.2 Basic Risk

Simple risk is described because of the inherent danger a dealer takes when hedging a position with the aid of taking a contrary role in a by-product of the asset, together with a futures settlement. Basic risk is widespread in attempts to hedge away rate risk.

1.3 Expected Return

The anticipated return on funding is the expected cost of the opportunity distribution of feasible returns it may offer to traders. The go back at the funding is an unknown variable that has exclusive values associated with unique probabilities.

2. Review of literature

WalidBakry, Peter John Kavalmthara, Vivienne Saverimuttu, Yiyang Liu and Sajan Cyril (2022) investigated the relationship between the daily release of COVID-19 related announcements, defensive government interventions, and stock market volatility, drawing upon an extended time period of one year, to independently test, confirm and iteratively improve on previous research findings. We categorize stock markets into emerging and developed markets and consider differences and similarities utilizing an asymmetric measure of volatility

Dr. Mitesh Chowdhary and War Bilal Ahmed (2019), attempted to find out the effect of financial performance on the overall performance of the company. This research study is to provide various fruitful suggestions not for only the company under study but for all those companies comprising of similar kind of business.

Dr.M.Anbukarasi and M.Devaki (2017) tried to test the Foreign Institutional Investments on Stock return of selected Banking companies listed in BSE. The study concludes with Foreign Institutional Investments are influencing the stock return of selected banking companies and also the result reveals that GARCH (1, 1) model satisfactorily explains volatility and is the most appropriate model for explaining volatility clustering of the series.

Manish Roy Tirkey and Naeem Sabah Khilkhal (2014), Conducted to analyse the performance of ONGC Ltd and we can easily find out the strength and weakness of the company and their position in the market. Different ratios are used in this study and particularly those which are related to the financial statement for this purpose balance sheet of 2010-2013 of ONGC Ltd. are used and from them ratios are calculated so according to which we can easily compare the performance.

Dr.M.Anbukarasi and B.Nithya (2013), identified the volatility in sectoral indices and CNX Nifty index. This study found that the correlation is significant for most of the indices except the CNX metal index, CNX

pharma index, CNX PSU bank index and CNX Realty index and further found that the indices CNX pharma index and CNX PSU Bank index have more impact.

3. Statement of Problem

While investor is making investment in stock market, they are losing their money. This is due to the unawareness of the market condition. When they are aware of the market, then there will be no loss for their investment. There is no guarantee about market condition or price will go up and the company will pay dividends. A stock price can change often and for many reasons. The Return and Risk is common in the stock market. The investor should understand the risk and could invest the money for the better return in the future.

4. Objectives of the Study

- To assess the Risk & Return of BSE Sensex and Selected Sectors in Bombay Stock Exchange.
- To evaluate the volatility in the selected sectors of Bombay Stock Exchange.

5. Research Methodology

5.1 Sources of Data

This study is representing on the portfolio of sectors. The data taken for the study is secondary in nature. The data used for analysis have been collected from monthly report of BSE sectors through Bombay Stock Exchange (BSE) official website, Money Control and also Journals.

5.2 Period of the Study

The study is conducted with the financial data for a period of ten years from 1st January 2011 to 31st December 2020.

5.3 Sampling Technique

The Bombay Stock Exchange consist many sectors and indices, among that only Top Six Sectors and one Index has selected for study. According to market capitalization as on 21st January 2021 this top ten sectors are chosen.

5.4 Tools Used

For analysis the data, the researcher has used Descriptive Statistics, ARCH and GARCH model.

6. Analysis and Interpretation

6.1 Return and Risk

Table 1: Risk and Return of BSE Sensex for the period of January2011 to December 2020

Year	Return	Risk
2011	-2.16	1.78
2012	2.03	1.67
2013	0.79	1.26
2014	2.26	1.61
2015	-0.37	1.09
2016	0.26	2.22
2017	2.11	1.82
2018	0.58	1.81
2019	1.17	1.67
2020	1.72	1.69

Source: Complied and Calculated from Bombay Stock Exchange

The above table displays the monthly return and risk of BSE SENSEX. The return for BSE SENSEX is high 2.26 in 2014 and low in -2.16 in 2011. And it is focused to find risk also for this same BSE SENSEX. Here, the risk is too high 2.22 in 2016 and low 1.09 in 2015.

Table 2.Return of Selected Sectors of BSE for the period of January2011 to December2020

Year	Bankex	Consumer Durable	Information Technology	Auto	Health Care	Capital Goods
2011	-2.85	-1.31	-1.20	-1.60	-1.03	-4.97
2012	4.14	3.43	0.00	3.17	2.79	2.90
2013	-0.42	-2.00	4.35	0.73	1.76	-0.05
2014	4.53	4.56	1.43	3.66	3.43	3.88
2015	-0.79	1.90	0.49	0.04	1.31	-0.59
2016	0.83	-0.41	-0.59	0.95	-1.08	-0.01
2017	2.85	6.15	0.99	2.41	0.15	2.94
2018	0.61	-0.62	2.02	-1.91	-0.33	0.02
2019	1.73	1.83	0.85	-0.76	-0.24	-0.64
2020	0.97	2.20	4.21	1.98	4.42	1.61

Source: Complied and Calculated from Bombay Stock Exchange

The above table displays the monthly returns of selected sectors of Bombay Stock Exchange in India. The return for Bankex sector is high (4.53) in 2014 and low (-2.85) in 2011, Consumer Durable high (6.15) in 2017 and low (-2.00) in 2013, Information Technology return is high (4.35) in 2013 and low return (-1.20) in 2011, Auto the return is high (3.66) in 2014 and low returns (-1.91) in 2018, Healthcare the return is high (4.42) in 2020 and low returns (-1.08) in 2016 and capital goods the return is high (3.88) in 2014 and low returns (-4.97) in 2011.

Table 3.Risk of Selected Sectors of BSE for the period of January2011 to December2020

Year	Bankex	Consumer Durable	Information Technology	Auto	Health Care	Capital Goods
2011	1.96	1.97	1.88	1.37	1.69	2.21
2012	1.33	1.19	2.10	1.39	1.29	1.78
2013	1.90	1.19	1.44	1.37	1.59	2.01
2014	1.67	1.60	1.53	1.55	1.15	1.90
2015	1.28	0.96	1.63	1.77	1.51	1.65
2016	2.09	1.47	1.40	1.87	1.74	2.08
2017	1.92	1.47	1.36	1.45	1.65	1.98
2018	1.63	1.59	1.59	1.70	1.61	1.62
2019	1.61	1.60	1.75	1.99	1.48	1.07
2020	1.12	1.28	1.30	2.00	1.63	1.38

* Source: Complied and Calculated from Bombay Stock Exchange

The above table displays the monthly risks' of selected sectors of Bombay Stock Exchange in India. The Bankex sector risk is too high (2.09) in 2016 and low (1.12) in 2020, Consumer Durable risk is too high (1.97) in 2011 and low (0.96) in 2015, Information Technology risk is too high (2.10) in 2012 and low (1.30) in 2020, Auto risk is too high (2.00) in 2020 and low (1.37) in 2013, Healthcare the risk is too high (1.69) in 2011 and low (1.15) in 2014 and the risk for Capital Goods sector is too high (2.21) in 2011 and low (1.07) in 2019.

6.2 Volatility in ARCH and GARCH Model

Augmented Dickey-Fuller Test (Unit Root Test) for Sensex and selected sectors in Bombay Stock Exchange

Table 4: Unit Root Test result for the period January- 2011 to December-2020

Sectors	Level	
	t-statistic	Prob*
Sensex	-4.5518	0.000
Bankex	-4.3817	0.000
Consumer Durable	-4.2945	0.000
Information Technology	-4.5469	0.000
Auto	-4.3353	0.000
Healthcare	-4.7151	0.000
Capital Goods	-3.9769	0.000

*Significant at 5% level

Sources: Complied and Calculated from BSE

The above table shows the results of the ADF unit root test of return for BSE SENSEX and selected sectors in BSE for the period of January 2011 to December 2020. It shows that there is a stationary for the selected index and the sectoral indices. According to the results, BSE Sensex, Bankex, Consumer Durable, Information Technology, Auto, Healthcare, and Capital Goods are stationary at the level, the degree of integration is I(0). It is found that the null hypothesis is rejected for all the variables and there is a Unit Root Test effect in return of BSE SENSEX and Selected Sectors.

Table 4: Volatility changes in Arch effects for SENSEX and selected sectors in BSE

Heteroskedasticity Test: ARCH for the period January -2011 to December-2020

Variables	ARCH Effect			
	F-Statistic	Prob.F	Obs*R-squared	Prob.Chi-Square
SENSEX	397.1517	0.0000	91.92044	0.0000
Bankex	368.3116	0.0000	90.31122	0.0000
Consumer Durable	387.7778	0.0000	91.41756	0.0000
Information Technology	315.0841	0.0000	86.77711	0.0000
Auto	572.5959	0.0000	98.80991	0.0000
Health Care	580.8839	0.0000	99.04969	0.0000
Capital Goods	413.8567	0.0000	92.77258	0.0000

*Significant at 5% level

Sources: Complied and Calculated from BSE

The above table explains the ARCH Effects of BSE SENSEX and selected sectors of BSE for the period of January 2011 to December 2020. Here, the calculation shows that the observed R squared the corresponding P-value is significant, that is less than 0.05 for all variables and there is clustering volatility and ARCH effect in these variables. Hence, the null hypothesis is rejected. This makes the GARCH family model suitable for modeling volatility.

Table 5: Sector wise Volatility changes in GARCH effects model for BSE Index and Selected Sectoral Indices for the period of January 2011 to December 2020

Sectors	Variables	Coefficient	Std.Error	z-Statistic	Prob.
Bankex	GARCH(-1)	0.61614	0.21509	2.86452	0.0042
Consumer Durable	GARCH(-1)	0.59926	0.30939	1.93692	0.0528
Information Technology	GARCH(-1)	0.91527	0.11021	8.30502	0.000
Auto	GARCH(-1)	-0.77102	0.19835	-3.8871	0.0001
HealthCare	GARCH(-1)	0.35093	1.0906	0.32178	0.7476
Capital Goods	GARCH(-1)	0.75909	0.24842	3.05563	0.0022

*Significant at 5% level

**Complied and Calculated from BSE

***Dependent Variable: BSE SENSEX

Bankex:

The above table inferred that there is a GARCH effect. The P-value of GARCH is less than 0.05. Thus, BANKEX return volatility can influence SENSEX return volatility. So, the result concluded that the volatility of BANKEX is influenced by GARCH factors or own shocks. Hence there is a GARCH effect in the BSE SENSEX return among BSE Bankex.

Consumer Durable:

From the Table, it can be inferred the result reveals there is no GARCH effect. The P-value of GARCH is more than 0.05. Thus BSE Consumer Durable return volatility can influence SENSEX return volatility. It concluded that the volatility of consumer durable return is not influenced by its own GARCH factors or own shocks.

Information Technology:

The table shows that GARCH is significant. The P-value of GARCH is less than 0.05. Thus, BSE IT return volatility can influence BSE SENSEX return volatility. So, the result decided that volatility of IT return is influenced by GARCH factors or own shocks.

Auto:

From above Table shows the GARCH effect. The P-value of GARCH is less than 0.05. Thus, BSE AUTO sector return volatility can influence BSE SENSEX return volatility. So, the outcome resolved that volatility of BSE AUTO return is influenced by GARCH factors or own shocks.

Health Care:

The above Table shows that there is no GARCH effect in the above model. The P-value of GARCH is more than 0.05. The BSE HEALTH CARE return volatility cannot influence BSE SENSEX return volatility. So, it has been concluded that the volatility of BSE HEALTH CARE return is not influenced by its own GARCH factors or own shocks.

Capital Goods:

From the Table, it can be inferred that the GARCH effect. The P-value of GARCH is more than 0.05. The BSE Capital Goods return volatility can influence BSE Sensex return volatility. So, the result finished that the volatility of consumer durable return is influenced by its own GARCH factors or own shocks.

Conclusion:

The present study has undertaken the risk and return and volatility of selected sectors and BSE SENSEX in India. Here the study shows the investors' activities and causes of the investment due to without proper knowledge about the stock market. Only certain sectors are doing well and the remaining fluctuates frequently. The investment in the stock market may get more profit and sometimes falls down frequently. We cannot predict the market conditions. In this study, only in particular situations, do the investors have to face frequent loss and in the majority of times, they gain more.

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