*Original Article*

# Performance of Healthcare Industry in Indian Stock Market

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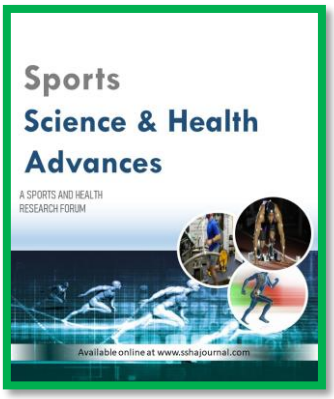


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## Abstract

COVID-19 has created an uneasy scenario in India and throughout the world. It has also halted business in India and had a significant negative impact on the Indian stock market. The Indian stock market also entered into recession. This article examines the time variation in volatility and stock returns in the BSE Healthcare index in the Indian stock market from 2019 to 2023 for a pre and post covid comparison of stock returns and volatility. This study has utilized all three possible returns (Day, Month, and Year) to get a complete image. An asymmetric GARCH model was used to evaluate the temporal variation in volatility. The findings of the paper confirm the literature that volatility does have an adverse impact on stock returns. During the pandemic, there was a lot of volatility in stock prices, poor market conditions, and a losing portfolio.

**Keywords:** Stock return, S&P BSE Healthcare index, Volatility, India, Covid-19

## Introduction

Healthcare, along with pharmaceutical industries, is becoming increasingly important as life expectancy rises from 64.2 years back in 1990 to 72.6 years in 2019 (Mittal and Sharma 2021). The pharmaceutical industry of India is the globe third-largest in terms of size (McKinsey & Co. Report, 2020), making it an appealing location for developing generic research and development centres with manufacturing facilities due to cheap operating costs and high-quality goods across the value chain. Healthcare is now India's largest source of revenue and employment industry (Mittal and Sharma 2021). This growth trajectory was predicted in 2019, when the sector registered the highest growth. However, with the spread of COVID-19, everything came to a standstill. It is inevitable that many sectors reported poor output volume and income for FY20 and the next year, as the whole economy has been shut down except for the provision of necessary services (Singh and Shaik 2021). For the same reason, the stock return along with the volatility of S&P BSE Healthcare Index is undertaken to measure the impact of COVID-19 and comparative analysis of pre and post-COVID-19 pandemic conditions. The BSE Healthcare sectoral index on the Bombay Stock Exchange (BSE) represents the economic growth of the healthcare industry in the Indian economy. This diversified index, derived from the S&P BSE All-Cap index, includes 99 firms representing the health sector, reflecting the accurate picture of the healthcare industry and it comprises two fundamental subsectors: pharmaceuticals & biotechnology and healthcare services.

It firstly was launched on August 9, 1999, and its initial value date was February 1, 1999. As of March 31, 2024, it has 99 constituents with a maximum market cap of ₹ 3,60,443.23 Cr. and a mean market cap of ₹22,656.32 Cr. ESG carbon parameters include Carbon to Revenue (157.98), Carbon to Value Invested (29.2), and weighted average carbon intensity (167.12). Interestingly, fossil fuel reserve emissions were measured at zero (Asia Index n.d.). However, NIFTY Healthcare was introduced in 2020 and has just 20 constituents. As a result, the former index is more diversified than the latter. During this time frame, S&P BSE Healthcare has beaten its NIFTY equivalent. Having this background and providing a snapshot to investors and analysts, this study makes an effort to explore the return behaviour of the BSE healthcare sector index both before and after the pandemic.

## *Literature Review*

Certainly, numerous evidences related to stock market behaviour were produced during and after Covid 19 and healthcare industry has been considered a performing industry. Following studies reflect the research outcomes in this regard:

P. Bhanu Sireesha and T. Haripriya (2021) analysed the impact of the pandemic ( Covid-19) on different sector indexes of the Indian stock market. The study evaluates the influence of the pandemic on each of the NSE's 14 sectoral indices. This article utilized the Wilcoxon matched pairs test, a non-parametric test, on sectoral indicators over three short, medium, and long-term periods. Positive impact was seen in the Pharmaceutical, Health Care, and FMCG industries, whereas negative impact was recorded in the other sectors.

Mittal and Sharma (2021) investigate the effects of Covid-19 on healthcare and pharmaceutical stocks. A sample of 233 days covering daily closing prices of different sector-specific indices, starting May 15, 2019, to April 24, 2020 were collected, in order to compare various sectors with our test sector according to various standards. The study indicates that there have been both cumulative abnormal returns and large abnormal returns.

Singh and Shaik (2021) examine the impacts of 6 distinct announcements of WHO on COVID-19 virus on 5 discrete sectors (information technology, healthcare, pharmaceuticals, airlines, and hotels) using indices from different economies including developed, and emerging. Author also tries to examines the stock prices movement as well as volume in 9 distinct global indexes (defined as developed and developing) in relation new cases registered and fatalities caused by COVID-19 virus. The findings indicate that COVID-19 has had a considerable influence on worldwide financial stock markets. However, the impact varies according on whether an economy is mature or developing.

Hatmanu and Cautisanu (2021) work on how COVID-19 has affected the stock market in Romania. In order to do this, the research considered the impact of many factors on the Bucharest Exchange Trading (BET) index, including the quantity of new COVID-19 cases and fatalities, the actions taken by the government, and the global economic environment. The finding suggests that the pandemic had a considerable long-term negative impact on Romania's BET index, according to the data, but the European economic environment had a beneficial effect.

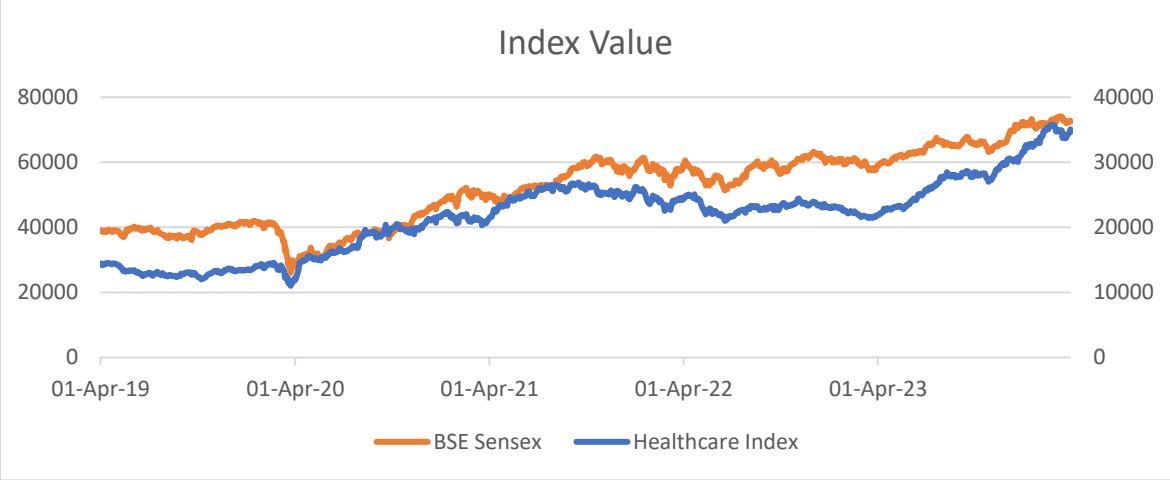
## Objective and Research Methodology

This research addresses performance of healthcare industry and for this, S&P BSE Healthcare index has been considered and return behaviour and volatility pattern during and after the pandemic is assessed. Descriptive statistics have been deployed by employing secondary data of five years from April 2019 to March 2024. Results have been acquired using E-views and Excel data analysis tools.

## Results and Discussion

Figure 1 consists of the BSE Healthcare index value marked in blue colour, along with the BSE Sensex value marked in orange colour to provide a comparative analysis. The Healthcare index began trading at 14,454 on April 1, 2019 and moved in a defined range before ending at 12,148 on March 31, 2020. The lowest level was recorded at 11007 on March 23, 2020, owing to the announcement of a state-wide lockdown. Moving on to the fiscal year 2020-21, it proved to be a magnificent year, as it not only recovered from its low of 11969 but also surpassed the peak value of 14450 of the COVID period and closed at 21328, generating a 78.19% return in this financial year. Similarly, if we look at the whole

picture, it was observed that the market went on a rollercoaster ride starting from the 14K mark in 2019, hitting a low of 11K, and then surpassing the 35K level in 2024, offering a 225.4% return from its low.




Source: BSE

**Figure 1** Index Value of S&P BSE Sensex and S&P BSE Healthcare Index

**Table 1** Top 10 Constituents of Index

| Company | Symbol | Sector |
|---|---|---|
| Sun Pharmaceutical Industries Ltd | 524715 | Healthcare |
| Cipla Ltd/India | 500087 | Healthcare |
| Dr Reddy's Laboratories Ltd | 500124 | Healthcare |
| Max Healthcare Institute Ltd | 543220 | Healthcare |
| Apollo Hospitals Enterprise Ltd | 508869 | Healthcare |
| Divi's Laboratories Ltd | 532488 | Healthcare |
| Lupin Ltd | 500257 | Healthcare |
| Aurobindo Pharma Ltd | 524804 | Healthcare |
| Zydus Lifesciences Ltd | 532321 | Healthcare |
| Torrent Pharmaceuticals Ltd | 500420 | Healthcare |

Source: BSE (https://www.asiaindex.co.in/indices/equity/sp-bse-healthcare)

Table 1 shows the top ten constituent companies by weightage in the healthcare index. Sun Pharmaceutical Industries Ltd. leads the list, followed by Cipla Ltd. and Dr. Reddy's Laboratories Ltd. Torrent Pharmaceuticals Ltd. was ranked tenth. However, the index's weightage limit was set at 33% for individual constituents and 63% for the top three constituents.

Figures 2 and 3 illustrate the index return of the S&P BSE healthcare index from April 1, 2019, to March 31, 2024. Figure 2 represents daily stock returns, whereas Figure 3 shows monthly and yearly stock returns. The ARCH model has been applied to the data to mimic actual markets and quantify risk. Running the ARCH model on stock returns revealed that clustering was apparent in Figure 2. This indicates that high volatility intervals are followed by more high volatility, while low volatility intervals are followed by more low volatility. Figure 3 confirms that there was no clustering in either monthly or annual data. Figure 2 shows higher upside and downside movement in addition to clustering, but Figure 3 does not.

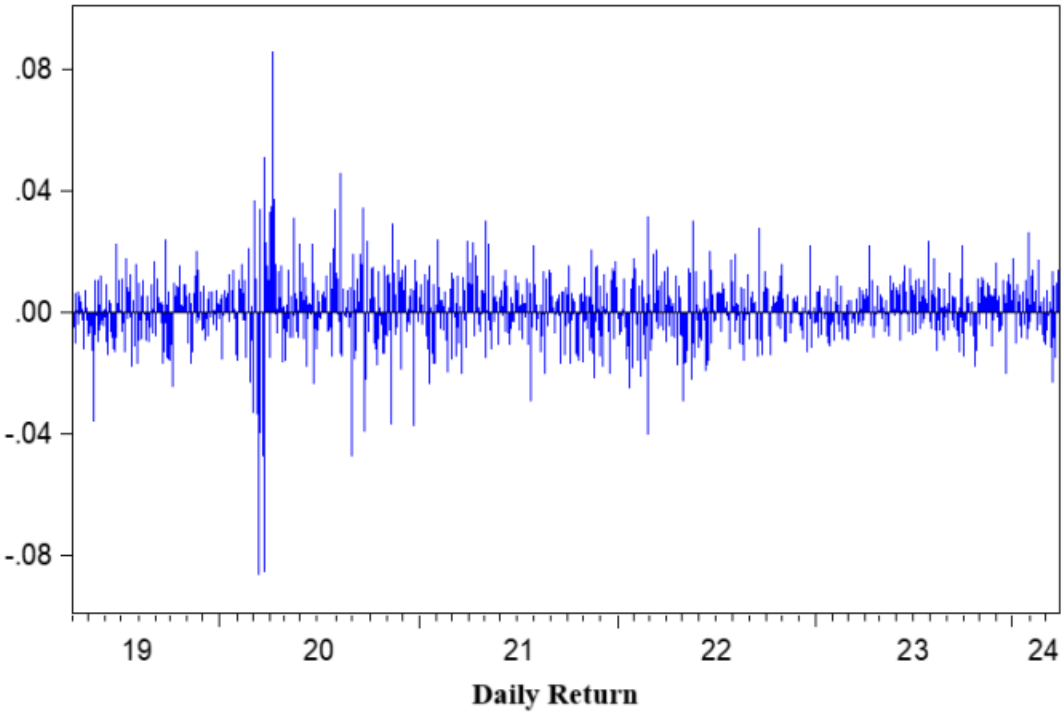



**Figure 2**: Daily Log Return of S&P BSE Healthcare Index

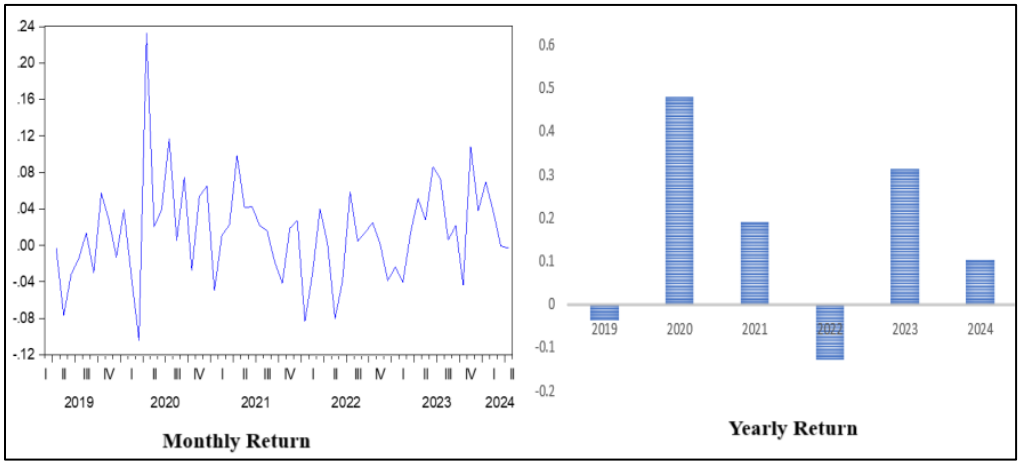



**Figure 3** Monthly and Yearly Log Return of S&P BSE Healthcare Index

Table 2 depicts the daily variance equation of daily, monthly, and yearly returns obtained after applying the Generalized Auto Regressive Conditional Heteroskedasticity (GARCH) model. This statistical model is used to examine many kinds of financial data, including macroeconomic data. Financial organizations commonly use it to predict return volatility for bonds, stocks, and market indexes (KENTON 2024). The model suggests that data is persistent over time if the sum of the coefficients of RESID(-1)^2 and GARCH(-1) is less than one. If this total is smaller than one, the impact of previous volatility diminishes with time, and projections finally settle. If the aggregate is higher than or equal to one, the effect of previous volatilities grows, potentially leading to explosive projections in which volatility increases eternally. The return volatility data in all three scenarios (daily, monthly, and annual) follows this requirement.

**Table 2** Return Volatility

| Variable | Coefficient | Std. Error | z-Statistics | Prob. |
|---|---|---|---|---|
| ***Variance Equation of Daily Returns*** | | | | |
| C | 3.24E-06 | 6.22E-07 | 5.198829 | 0.0000 |
| RESID(-1)^2 | 0.080042 | 0.008674 | 9.227968 | 0.0000 |
| GARCH(-1) | 0.892330 | 0.010542 | 84.64180 | 0.0000 |
| ***Variance Equation of Monthly Returns*** | | | | |
| C | 0.001414 | 0.000881 | 1.604422 | 0.1086 |
| RESID(-1)^2 | 0.328102 | 0.134878 | 2.432589 | 0.0150 |
| GARCH(-1) | 0.260495 | 0.275512 | 0.945493 | 0.3444 |
| ***Variance Equation of Yearly Returns*** | | | | |
| C | 0.023050 | 0.774295 | 0.029769 | 0.9763 |
| RESID(-1)^2 | -2.414158 | 14.62219 | -0.165102 | 0.8689 |
| GARCH(-1) | 2.923307 | 2.560064 | 1.141888 | 0.2535 |

Source: Authors' Calculations

**Table 3** Statistical Results of Different Returns

| | Daily Returns | Monthly Returns | Yearly Returns |
|---|---|---|---|
| Included Observation | 1236 | 61 | 6 |
| R-squared | -0.004181 | -.0.071633 | -0.560751 |
| Adjusted R-squared | -0.003368 | -0.054065 | -0.300626 |
| S.E. of regression | 0.011107 | 0.056173 | 0.255845 |
| Sum squared resid | 0.152493 | 0.192482 | 0.392739 |
| Log-likelihood | 3954.123 | 91.00823 | 1.157988 |
| Durbin-Watson stat | 1.963934 | 1.860971 | 1.763527 |
| Mean dependent var | 0.000717 | 0.014523 | 0.153354 |
| S.D. dependent var | 0.011089 | 0.054714 | 0.224337 |
| Akaike info criterion | 0.011089 | -2.885516 | 0.614004 |
| Schwarz criterion | -6.393404 | -2.781702 | 0.509884 |
| Hannan-Quinn criter. | -6.388730 | -2.844830 | 0.197202 |

Sources; Authors' Calculations

Table 3 contains the observations obtained from e-views of all three returns. It includes R-squared, a statistical tool used to check the goodness of fit, which means how much variation in the dependent variable is explained in the context of the independent variable. However, it does not disclose the causality between the independent and dependent variables (Taylor n.d.). R-squared is followed by various other statistics such as the Durbin-Watson stat, that checks autocorrelation in regression analysis or statistical model residuals, Akaike info criterion used as estimator of prediction error, Akaike info criterion used to choose between two or more alternative models. According to the table, 1236 daily return observations were analyzed, followed by 61 and 6 monthly and yearly return observations, respectively. Among the three returns, only daily return data was shown to be Significant in all three situations, the R-squared and Adjusted R-squared were found to be negative, indicating that the specified time period was unsuitable for assessing the volatility of the healthcare index. By looking at the value of S.E. of regression and Sum squared reside value in a more extended time frame, it was observed that these values continue to increase significantly as we move from daily to monthly and later to yearly returns, indicating an increment in unexplained variance or error in this model. Looking at the Log-likelihood value, only daily return is found to be significant, or we can say the most effective model in capturing volatility as compared to the rest of the two models, and the Durbin-Watson stat value was found near to 2, demonstrating a lack of autocorrelation in the model.

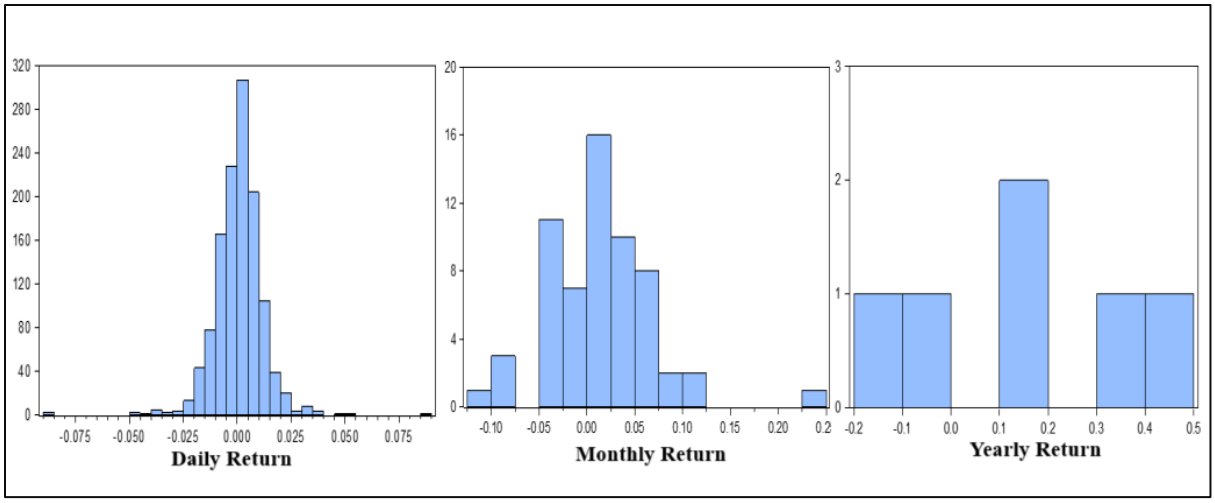



**Figure 4** Distribution of Returns

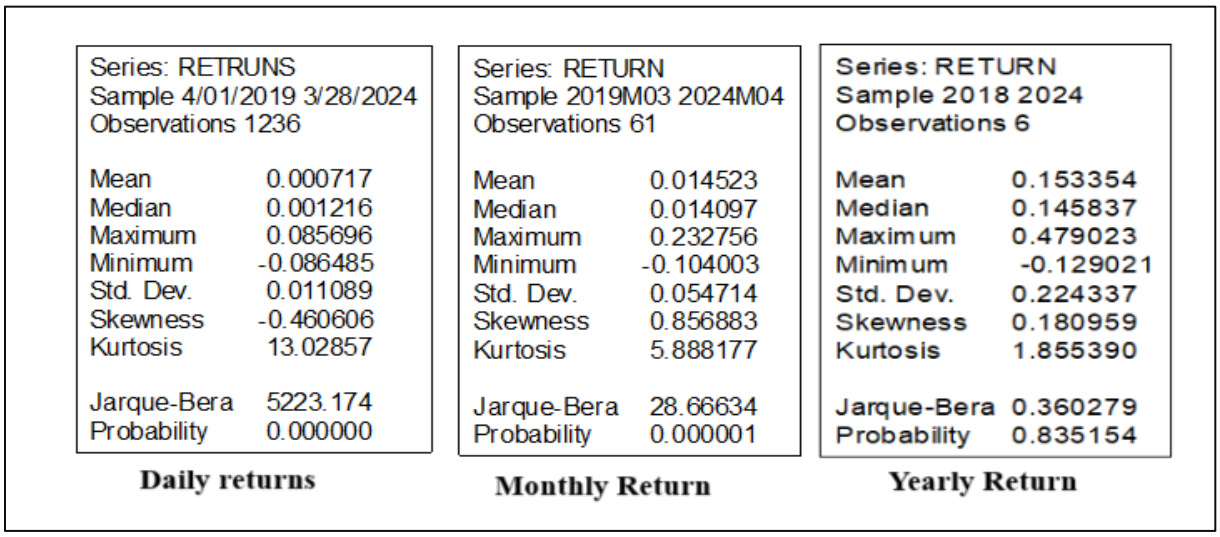



**Figure 5** Statistics of Return

Figure 5 shows that the mean return continues to grow as we move from daily to yearly returns, suggesting better returns in the long term. Additionally, all three values were recorded as positive, indicating an overall upward trend of the BSE Healthcare index as verified from Figure 1, as over these years overall 225.4% return was recorded from its lowest point. The standard deviation value, like the mean return value, increases as we move from daily to annual returns, indicating an increase in volatility. This demonstrates that daily returns are less volatile than the other two returns.

Table 4 breaks out the return on a yearly basis and compares it to the benchmark. Looking at the overall return, it was found that the return percentage in 2019 was -2.8%, which increased dramatically to 62.61% in 2020, the best overall return over the previous five years. In 2022, the return was negative by 11.5%. However, the figure climbed to 37.97% by 2023. Looking at the benchmark total return, the greatest total return was obtained in 2021 at 32.81%.

**Table 4** Return Analysis

| Year | Total Return (%) | Price Return (%) | Benchmark Total Return (%) | Benchmark Price Return (%) |
|---|---|---|---|---|
| 2023 | 37.97 | 36.97 | 28.1 | 26.41 |
| 2022 | -11.5 | -12.1 | 4.7 | 3.3 |
| 2021 | 21.54 | 20.87 | 32.81 | 31.29 |
| 2020 | 62.61 | 61.45 | 18.81 | 17.2 |
| 2019 | -2.8 | -3.55 | 8.09 | 6.87 |

Source: BSE

## Conclusion

In this research, we used daily, monthly, and yearly stock returns as well as the GARCH approach to investigate the time-varying pattern of S&P BSE Healthcare return and volatility between 2019 and 2024. The study included 1236 daily return observations, followed by 61 and 6 monthly and annual returns, respectively. By looking at the larger picture of the index following information was recorded, the price-earnings ratio (Trailing) of the index as of 31 March 2024 was found to be 43.6, the projected price-earnings ratio is 37.41, the price to book ratio was found at 5.65, and the dividend yield was indicated at .56%. According to the study, the standard deviation suggests that daily return was found to be less volatile and continue to increase if we move toward yearly returns. The mean value from figure 5 suggests that high return can be traced in yearly return, which keeps decreasing as we move towards daily return. Log-likelihood confirms that only the daily return data model was found to be significant. Lack of autocorrelation in the model as confirmed by Durbin-Watson. The distribution of daily return was found to be positively skewed, as confirmed by Figure 4. The ARCH model on stock returns revealed that clustering was apparent in Figure 2. This indicates that high volatility intervals are followed by more high volatility, while low volatility intervals are followed by more low volatility. Figure 3 confirms no clustering in either monthly or annual data. Figure 2 shows higher upside and downside movement besides clustering, but Figure 3 does not. Apart from that, while analyzing, it was observed that the impact of previous volatility diminishes with time, and projections finally settle over a long period.

**Conflict of Interest**: No Conflict of Interest declared among authors

## References

Asia Index. Accessed 4 28, 2024. https://www.asiaindex.co.in/indices/equity/sp-bse-healthcare.

Batra, Amita. 2004. "STOCK RETURN VOLATILITY PATTERNS IN INDIA." Indian Council for Research on International Economic Relations (ICRIER). Accessed 4 28, 2024. https://www.econstor.eu/handle/10419/176146.

Dutt, Tanuj , and Mark Humphery-Jenner. 2013. "Stock return volatility, operating performance and stock returns: International evidence on drivers of the 'low volatility' anomaly." Journal of Banking and Finance 37 (3): 999-1017. Accessed 4 28, 2024. doi:10.1016/j.jbankfin.2012.11.001 .

Hatmanu , Mariana, and Cristina Cautisanu. 2021. "The Impact of COVID-19 Pandemic on Stock Market: Evidence from Romania." International Journal of Environmental Research and Public Health 18 (17). Accessed 04 27, 2024. doi:https://doi.org/10.3390/ijerph18179315.

KENTON, WILL. 2024. FINANCIAL ANALYSIS. 5 1. https://www.investopedia.com/terms/g/generalalizedautoregressiveconditionalheteroskedasticity.asp#:~:text=GARCH%20is%20a%20statistical%20model,%2C%20bonds%2C%20and%20market%20indices.

Mittal, Shivam, and Dipasha Sharma. 2021. "The Impact of COVID-19 on Stock Returns of the Indian Healthcare and Pharmaceutical Sector." Australian Accounting, Business and Finance Journal 15 (1). Accessed 04 27, 2024. https://ro.uow.edu.au/cgi/viewcontent.cgi?article=2193&context=aabfj.

Singh, Gurmeet, and Muneer Shaik. 2021. "The Short-Term Impact of COVID-19 on Global Stock Market Indices." Contemporary Economics 15 (1): 1-18. Accessed 04 27, 2024. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3848616.

Singh, Vijay, Pooja, and Ankit Yadav. 2024. “Mapping of Academic Literature on Corporate Governance and Firm Performance: Application of Bibliometric Analysis.” Pacific Business Review (International) 16 (7): 58-69. Accessed 06 26, 2024. http://www.pbr.co.in/2024/2024_month/January/6.pdf.