Comparative Analysis of Volatility and Sensitivity in FMCG and IT Stocks: An Empirical Study

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ABSTRACT

Purpose: *This research paper investigates the volatility of sectoral indices within the Indian stock market, focusing on the Bombay Stock Exchange (BSE). Volatility, a crucial aspect of financial markets, reflects the degree of fluctuation in asset prices over time, influencing investment decisions and risk management strategies. By analyzing the volatility of sectoral indices, this study aims to uncover the underlying patterns and dynamics of different sectors within the Indian economy and their impact on overall market stability. Employing a combination of statistical techniques and empirical data from historical stock market data, the research examines the magnitude and characteristics of volatility across various sectors. Through a comprehensive analysis of sectoral volatility, the paper provides insights into the factors driving fluctuations in sectoral indices, such as economic indicators, regulatory changes, and global market trends, offering valuable implications for investors, policymakers, and market regulators seeking to navigate the complexities of the Indian stock market.*
Methodology: *Ten BSE listed FMCG, IT companies are considered for the present research work and analysed by using statistical tools.*
Findings/Result: *The findings of the research hold significance for investors seeking to manage risk and optimize portfolio allocation, as well as policymakers aiming to formulate effective market regulations and interventions to promote market stability. By identifying the factors influencing sectoral volatility and recommending risk management strategies, the paper offers actionable insights for market participants to navigate the challenges and opportunities presented by the Indian stock market. Additionally, the study sets a foundation for future research endeavours aimed at further exploring the complexities of sectoral volatility and its implications for the broader financial landscape.*
Originality/Value: *This study contributes to the existing literature by filling a gap in the understanding of sectoral volatility within the Indian context, shedding light on the unique dynamics of different sectors and their implications for overall market performance.*
Paper Type: *Empirical study*
Keywords: Volatility, Risk Management, Economic Indicators, Portfolio Allocation, Market Stability

1. INTRODUCTION :

The Indian stock market, particularly the Bombay Stock Exchange (BSE), plays a pivotal role in the country's economic landscape, serving as a barometer of its financial health and investor sentiment (Venkata Lakshmi Suneetha et. al., (2024). [1], [2]). Within this dynamic market, sectoral indices provide valuable insights into the performance and trends of specific industry segments, such as IT, banking, and pharmaceuticals. Volatility, defined as the degree of fluctuation in asset prices over time, is a crucial aspect of financial markets that significantly influences investment decisions and risk management strategies. (Venkata Lakshmi Suneetha et. al., (2023]. [3]).
Understanding the volatility of sectoral indices is essential for investors, policymakers, and market regulators to navigate the complexities of the stock market effectively. Volatility can be influenced by

various factors, including economic indicators, regulatory changes, and global market trends. Analyzing the volatility patterns and characteristics across different sectors can provide valuable insights into the underlying dynamics of the Indian economy and its impact on overall market stability.

Despite the significance of volatility in shaping market behaviour and investment strategies, there is limited comprehensive research focusing on the volatility of sectoral indices within the Indian stock market. This research paper aims to fill this gap by investigating the volatility of sectoral indices on the BSE and uncovering the factors driving fluctuations in these indices.

The study employs a combination of statistical techniques and empirical data from historical stock market data to analyze the magnitude and characteristics of volatility across various sectors. By doing so, this research seeks to provide a deeper understanding of the sectoral dynamics within the Indian economy and offer valuable implications for stakeholders in the financial market [4], [5].

The companies selected for the study are:

FMCG Sector – Hindustan Unilever Ltd. (HUL), Nestle India Ltd., ITC Ltd., Dabur India Ltd., Britannia Industries Ltd.

IT Sector - Infosys Ltd., Tata Consultancy Services (TCS), Wipro Ltd., HCL Technologies Ltd., Tech Mahindra Ltd.

2. REVIEW OF LITERATURE :

The volatility and sensitivity of stock markets have been extensively studied in financial literature. Volatility, often described as the degree of variation in trading prices over time, is a crucial measure of risk. Sensitivity, commonly quantified by the beta coefficient, indicates a stock's responsiveness to market movements. Research indicates that volatility in different sectors, such as FMCG and IT, can exhibit distinct characteristics due to varying business cycles, regulatory environments, and market dynamics. For instance, FMCG stocks are generally considered stable and less volatile, reflecting the sector's essential goods nature, whereas IT stocks may display higher volatility due to rapid technological changes and innovation.

Table 1: Summary of papers reviewed using the keyword “Volatility”

S. No.	Area/Topic	Findings/Outcome	References
1	Stock Market Volatility	Volatility is a crucial factor influencing stock market behaviour and investor decisions.	Schwert, G. W. et al. (1990). [6]
2	Foreign Exchange Volatility	High volatility in foreign exchange markets can lead to increased risk for international investors.	Jorion, P. et al. (1995). [7]
3	Commodity Price Volatility	Volatility in commodity prices affects global trade and economic stability, impacting both producers and consumers.	De V. Cavalcanti, T. V., Mohaddes, K., & Raissi, M. et al. (2015). [8]
4	Real Estate Market Volatility	Volatility in the real estate market can influence housing affordability and mortgage rates.	Wheaton, W. C. et al., (2015). [9]
5	Interest Rate Volatility	Fluctuations in interest rates can lead to increased volatility in financial markets and affect borrowing costs.	Thakor, A. et al. (1981) [10]
6	Credit Market Volatility	Credit market volatility can impact lending conditions, affecting businesses and consumers.	Rodriguez-Nieto, J. A., & Mollick, A. V. et al. (2021). [11]
7	Economic Policy and Volatility	Policy changes can influence market volatility, requiring adaptive strategies from investors.	Krol, R. et al. (2014). [12]
8	Technology Sector Volatility	Volatility in the technology sector can be influenced by innovation cycles and regulatory changes.	Sadorsky, P. et al. (2003). [13]

9	Energy Market Volatility	Energy market volatility is affected by geopolitical tensions, supply-demand dynamics, and policy changes.	Efimova, O., & Serletis, A. et al. (2014). [14]
10	Emerging Markets Volatility	Volatility in emerging markets can be higher due to factors like political instability and currency fluctuations.	Blitz, D., Pang, J., & Van Vliet, P. et al. (2013). [15]
11	Cryptocurrency Volatility	Cryptocurrency markets exhibit high volatility, influenced by market sentiment and regulatory news.	Conrad, C., Custovic, A., & Ghysels, E. et al. (2018). [16]
12	Bond Market Volatility	Bond market volatility can be affected by interest rate changes, inflation expectations, and credit risk.	Jones, C. M., Lamont, O., & Lumsdaine, R. L. et al, (1998). [17]
13	Equity Market Volatility	Equity market volatility is influenced by factors like earnings reports, macroeconomic indicators, and investor sentiment.	Bekaert, G., & Harvey, C. R. et al., (1997). [18]
14	Risk and Volatility	Understanding the relationship between risk and volatility is essential for effective portfolio management.	Engle, R. et al. (2004). [19]
15	Financial Crises and Volatility	Financial crises often lead to increased volatility in financial markets, posing challenges for policymakers.	Danielsson, J., Valenzuela, M., & Zer, I. et al. (2018). [20]

Research Gap:

Despite the extensive research on volatility in financial markets, there remains a noticeable gap in the literature concerning the sector-specific volatility dynamics within the Indian stock market, with particular emphasis on the Bombay Stock Exchange (BSE). Existing studies often focus on aggregate market indices or individual stock prices, overlooking the nuanced variations in volatility levels among different industry sectors. Consequently, there is limited understanding of how sectoral factors such as industry performance, regulatory changes, and economic indicators influence volatility within specific sectors and their subsequent impact on overall market stability.

3. OBJECTIVES :

The objectives of this research paper are multifaceted, aiming to delve into the intricacies of sectoral volatility within the Indian stock market, particularly focusing on the Bombay Stock Exchange (BSE). Firstly, the study seeks to conduct a thorough analysis of historical volatility patterns exhibited by sectoral indices, providing insights into the temporal dynamics of volatility within different industry segments. Secondly, it endeavours to identify and assess the determinants driving fluctuations in sectoral indices, ranging from macroeconomic factors to regulatory changes, and their implications for market stability. Additionally, the research aims to compare the levels of volatility across various sectors, elucidating the relative risk exposures of each sector within the Indian economy. Furthermore, it endeavours to explore the interplay between sectoral volatility and overall market performance, elucidating the influence of sectoral fluctuations on investor sentiment and market dynamics [21]. Ultimately, the paper strives to offer practical recommendations and strategies for investors, policymakers, and market regulators to navigate sectoral volatility effectively and foster a more resilient and efficient Indian stock market ecosystem.

(1) To analyze the historical volatility patterns of sectoral indices within the Indian stock market, with a specific focus on the Bombay Stock Exchange (BSE).
(2) To identify the key determinants and factors contributing to the volatility of sectoral indices, including economic indicators, regulatory changes, and global market trends.
(3) To compare and contrast the levels of volatility across different sectors within the Indian economy, shedding light on the relative risk exposure of each sector.
(4) To examine the relationship between sectoral volatility and overall market performance, exploring how fluctuations in sectoral indices influence market sentiment and investor behaviour.

(5) To provide actionable insights and recommendations for investors, policymakers, and market regulators to effectively manage sectoral volatility and enhance market stability in the Indian stock market context.

4. METHODOLOGY :

4.1 Sources of Data:

The data for this research paper will be sourced from multiple reliable sources to ensure accuracy and comprehensiveness in analyzing the volatility of sectoral indices in the Indian stock market with specific reference to the Bombay Stock Exchange (BSE). Additionally, the Reserve Bank of India (RBI) provides valuable economic and financial data, including interest rates, exchange rates, and macroeconomic indicators. The Ministry of Finance, Government of India, offers budgetary and economic data, policy documents, and reports related to the Indian economy. Regulatory insights and market statistics can be sourced from the Securities and Exchange Board of India (SEBI). For more extensive financial market data and analytics, platforms like Thomson Reuters Eikon, Bloomberg Terminal, and Datastream offer real-time and historical data on stocks, indices, commodities, and economic indicators. Moreover, websites such as Yahoo Finance, Google Finance, provide access to historical stock prices, financial statements, and alternative datasets for companies listed on various stock exchanges, including the BSE. For global economic indicators and forecasts, the World Bank Open Data, International Monetary Fund (IMF) Data, and Trading Economics offer comprehensive datasets covering various aspects of economic development and financial markets, including India.

4.2 Sample Design:

(1) Selection of Sectoral Indices: The sample will encompass a diverse range of sectoral indices representing various industry segments within the Indian economy. Sectors such as FMCG and information technology are included to provide a comprehensive overview of sectoral volatility.
(2) Time Period: The study will cover a sufficient time horizon to capture different market conditions and economic cycles. A period of three-year data is examined to assess volatility dynamics.
(3) Sampling Method: A purposive sampling method will be employed to select sectoral indices based on their significance and representation within the Indian stock market. Priority is given to widely recognized and heavily traded indices to ensure the relevance and reliability of the analysis. The selection criteria include market capitalization, sectoral importance, and liquidity.

4.3 Hypothesis:

- Ho1: There is no significant difference in the volatility levels among different sectorial indices on the Bombay Stock Exchange.
- Ho2: Economic indicators and regulatory changes do not significantly impact the volatility of sectoral indices on the Bombay Stock Exchange.
- Ho3: There is no relationship between sectoral volatility and overall market performance on the Bombay Stock Exchange.

4.4 Implications of the Study:

The findings of the research can provide valuable insights for investors seeking to optimize their portfolio allocation strategies and manage sector-specific risks more effectively. By understanding the volatility patterns exhibited by different sectors, investors can make informed decisions regarding asset allocation and risk diversification, thereby enhancing the resilience and stability of their investment portfolios. Additionally, policymakers and market regulators can leverage the insights from this study to formulate more targeted interventions and regulations aimed at promoting market stability and mitigating sectoral vulnerabilities. By identifying the factors driving fluctuations in sectoral indices and their impact on overall market dynamics, policymakers can design proactive measures to address systemic risks and foster a more robust and efficient stock market environment. Furthermore, market participants, including financial institutions, analysts, and researchers, can benefit from the research findings by gaining a deeper understanding of sectoral volatility dynamics and incorporating this knowledge into their risk management practices and investment strategies. Overall, the implications of this study extend beyond academia, offering actionable insights and recommendations to navigate the complexities of the Indian stock market landscape effectively.

4. 5 Tools of Analysis:

Descriptive statistics, Comparative analysis, correlation & Regression analysis techniques allow for the estimation and prediction of volatility patterns, facilitating a deeper understanding of sectoral dynamics.

5. DATA ANALYSIS :

The data analysis for this research paper will involve several steps to examine the volatility of sectoral indices in the Indian stock market with reference to the Bombay Stock Exchange (BSE).

(1) Descriptive Statistics: The first step will involve computing descriptive statistics for the sectoral indices under consideration. This includes calculating measures such as mean, median, standard deviation, and skewness to provide an overview of the distribution of returns and volatility for each sector.[22]-[24]

(2) Comparative Analysis: A comparative analysis will be conducted to assess the differences in volatility levels among different sectoral indices. This may involve visual representations such as line charts or bar graphs to illustrate the volatility trends across sectors and identify sectors with higher or lower volatility levels [25-27].

(3) Correlation Analysis: Correlation analysis will be performed to examine the relationships between sectoral volatility and other variables such as market indices, economic indicators, and regulatory changes. This will help identify factors that may influence sectoral volatility and their impact on overall market dynamics [28].

(4) Regression Analysis: Regression analysis may be employed to investigate the determinants of sectoral volatility, including factors such as economic indicators, regulatory changes, and global market trends. Multiple regression models may be used to assess the relative importance of different variables in explaining variations in sectoral volatility [29], [30].

(5) Time-Series Analysis: Time-series analysis techniques will be applied to examine the temporal patterns and dynamics of sectoral volatility over different time periods. This may involve plotting time-series graphs, conducting autocorrelation analysis, and identifying volatility clustering or persistence.

(6) Sensitivity Analysis: Sensitivity analysis will be conducted to assess the robustness of the results and conclusions derived from the data analysis. This may involve testing different assumptions or methodologies to evaluate their impact on the findings.

(1) Descriptive Statistics:

(a) FMCG Sector:

(i) HINDUSTAN UNI LEVER:

Table 2: Descriptive Statistics - HUL

Statistic	Open (₹)	High (₹)	Low (₹)	Close (₹)	Adj Close (₹)	Volume
Mean	2349.19	2461.35	2241.89	2355.33	2265.11	42.4M
Std	232.46	217.41	229.91	218.92	244.74	39.1M
Min	1721	1889	1706	1881.9	1743.03	1.4M
Max	2745	2859.3	2677	2724.1	2638.25	318.5M

(ii) NESTLE INDIA

Table 3: Descriptive Statistics – Nestle India

Metric	Open (₹)	High (₹)	Low (₹)	Close (₹)	Adj Close (₹)	Volume
Count	61	61	61	61	61	61
Mean	1919.88	2007.84	1837.32	1939.47	1896.54	17.83M
Std	351.43	351.38	350.63	345.76	368.72	8.57M
Min	1166.4	1294.88	1132.24	1287.52	1204.56	315.93K
Max	2665	2769.3	2540.7	2658.03	2650.55	39.32M

(iii) ITC INDIA

Table 4: Descriptive Statistics - ITC

Metric	Open (₹)	High (₹)	Low (₹)	Close (₹)	Adj Close (₹)	Volume
Count	61	61	61	61	61	61
Mean	294.94	311.49	282.53	296.85	274.74	402.97M
Std	99.36	100.94	99.27	100.63	108.37	212.12M
Min	166.8	175.2	134.6	165.25	140.44	7.16M
Max	466	499.7	450.05	465.7	450.96	998.53M

(iv) Britannia

Table 5: Descriptive Statistics - Britannia

Metric	Open (₹)	High (₹)	Low (₹)	Close (₹)	Adj Close (₹)	Volume
Count	61	61	61	61	61	61
Mean	3911.61	4117.92	3731.84	3950.23	3801.79	381.96K
Std	734.39	716.12	759.7	739.9	840.58	226.40K
Min	2600	2743	2100.55	2689.65	2424.85	6.69K
Max	5480	5725.8	5396.95	5475.55	5475.55	1.04M

(v) Dabur

Table 6: Descriptive Statistics - Dabur

Metric	Open (₹)	High (₹)	Low (₹)	Close (₹)	Adj Close (₹)	Volume
Count	61	61	61	61	61	61
Mean	534.49	559.06	510.13	536.22	526.19	48.26M
Std	46.37	44.88	49.12	45.41	48.47	20.44M
Min	424.45	450.35	386.05	447.25	430.62	1.79M
Max	622	658.95	615.65	621.5	609.7	100.94M

(b) IT Sector:

(i) TECH MAHINDRA

Table 7: Descriptive Statistics – Tech Mahindra

Metric	Open (₹)	High (₹)	Low (₹)	Close (₹)	Adj Close (₹)	Volume
Mean	1064.3	1147.24	1005.72	1074.98	1013.88	64.80M
Std	285.44	304.36	267.51	283.75	292.31	27.84M
Min	538.5	549.75	471.4	530.45	471.28	0.90M
Max	1795.05	1838	1536	1790.55	1672.37	156.65M

(ii) HCL TECHNOLOGIES

Table 8: Descriptive Statistics - HCL

Metric	Open (₹)	High (₹)	Low (₹)	Close (₹)	Adj Close (₹)	Volume
Mean	1007.22	1075.83	957.47	1020.47	943.64	87.31M
Std	304.07	311.73	291.04	302.08	320.24	46.88M
Min	433	555	375.25	436.4	375.37	2.07M

Max	1675.45	1697.35	1551.45	1663.85	1641.81	260.18M

(iii) WIPRO

Table 9: Descriptive Statistics - Wipro

Metric	Open (₹)	High (₹)	Low (₹)	Close (₹)	Adj Close (₹)	Volume
Mean	414.65	443.98	391.53	414.88	383.84	110.15M
Std	88.95	93.11	89.35	90.1	98.21	77.61M
Min	245	268.5	178.5	238.55	175.66	8.02M
Max	588	627	568	589.5	547.05	587.93M

(iv) TATA CONSULTANCY SERVICES

Table 10: Descriptive Statistics - Wipro

Metric	Open (₹)	High (₹)	Low (₹)	Close (₹)	Adj Close (₹)	Volume
Mean	3102.59	3273.91	2968.27	3123.81	2984.31	55.16M
Std	629.21	645.81	628.66	626.59	661.25	23.11M
Min	1825.9	2032	1506.05	1826.1	1675.97	1.82M
Max	4107.2	4254.75	3955	4095.1	4065.55	128.62M

(v) INFOSYS

Table 11: Descriptive Statistics - Infosys

Metric	Open (₹)	High (₹)	Low (₹)	Close (₹)	Adj Close (₹)	Volume
Mean	1321.03	1403.75	1255.71	1331.92	1271.58	157.59M
Std	351.01	362.14	340.51	345.99	351.5	67.72M
Min	634.35	715.5	509.25	641.5	582.2	7.27M
Max	1887.75	1953.9	1691.5	1906.85	1808	397.10M

(2) Risk Return Analysis:

(a) FMCG SECTOR:

Table 12: Risk – Return Analysis – FMCG Sector

Company	Average Monthly Return (%)	Risk/ Volatility (Standard Deviation) (%)
Hindustan Unilever Limited	0.66%	6.20%
NESTLE INDIA	1.27%	4.96%
ITC INDIA	1.12%	6.29%
Britannia	1.38%	6.61%

Dabur	0.64%	5.13%

(b) IT SECTOR:

Table 13: Risk – Return Analysis – IT Sector

Company	Average Monthly Return (%)	Volatility (Standard Deviation) (%)
Tech Mahindra	1.632	8.528
HCL Technologies	2.021	8.648
Wipro	1.604	8.484
TCS	1.116	6.024
Infosys	1.463	7.959

(3) Comparative Analysis:

(a) FMCG Sector

Table 14: Comparative Analysis – FMCG Sector

Company	Average Close Price (₹)	Average Monthly Return (%)	Volatility (Standard Deviation) (%)
Hindustan Unilever	2355.33	0.664	6.201
Nestle India	1939.47	1.265	4.961
ITC Limited	296.85	1.124	6.291
Britannia	3950.23	1.384	6.605
Dabur	536.22	0.638	5.129

Observations:

- **Price Levels:** Britannia has the highest average closing price among the five companies, indicating it might be positioned as a premium stock in this sector. In contrast, ITC Limited has the lowest average closing price, which may suggest a more accessible stock price for a broader range of investors.
- **Returns:** Britannia also leads in terms of average monthly returns, followed closely by Nestle India. These companies show stronger performance relative to the others in generating returns for investors on a monthly basis.
- **Volatility:** Britannia and ITC Limited exhibit the highest volatility, implying higher risk associated with their stock prices. Nestle India, while offering robust returns, maintains lower volatility, possibly making it an attractive option for risk-averse investors.

(b) IT Sector:

Table 15: Comparative Analysis – IT Sector

Company	Average Close Price (₹)	Average Monthly Return (%)	Volatility (Standard Deviation) (%)
Tech Mahindra	1074.98	1.632	8.528
HCL Technologies	1020.47	2.021	8.648
Wipro	414.88	1.604	8.484
TCS	3123.81	1.116	6.024
Infosys	1331.92	1.463	7.959

Observations:

- **Price Levels:** TCS has the highest average closing price, indicating it might be seen as a premium stock within the IT sector. In contrast, Wipro has the lowest average closing price, suggesting it might be more accessible to a broader range of investors.
- **Returns:** HCL Technologies leads in terms of average monthly returns, followed closely by Tech Mahindra. These companies show stronger performance relative to the others in generating returns for investors on a monthly basis.
- **Volatility:** HCL Technologies also shows the highest volatility, followed by Tech Mahindra and Wipro, indicating higher risk associated with their stock prices. TCS, while offering a premium stock price, maintains the lowest volatility, potentially making it an attractive option for risk-averse investors looking for stability in the IT sector.

Figure 1 presents a comparative analysis of the ten companies across three metrics: average close price, average monthly return, and volatility.

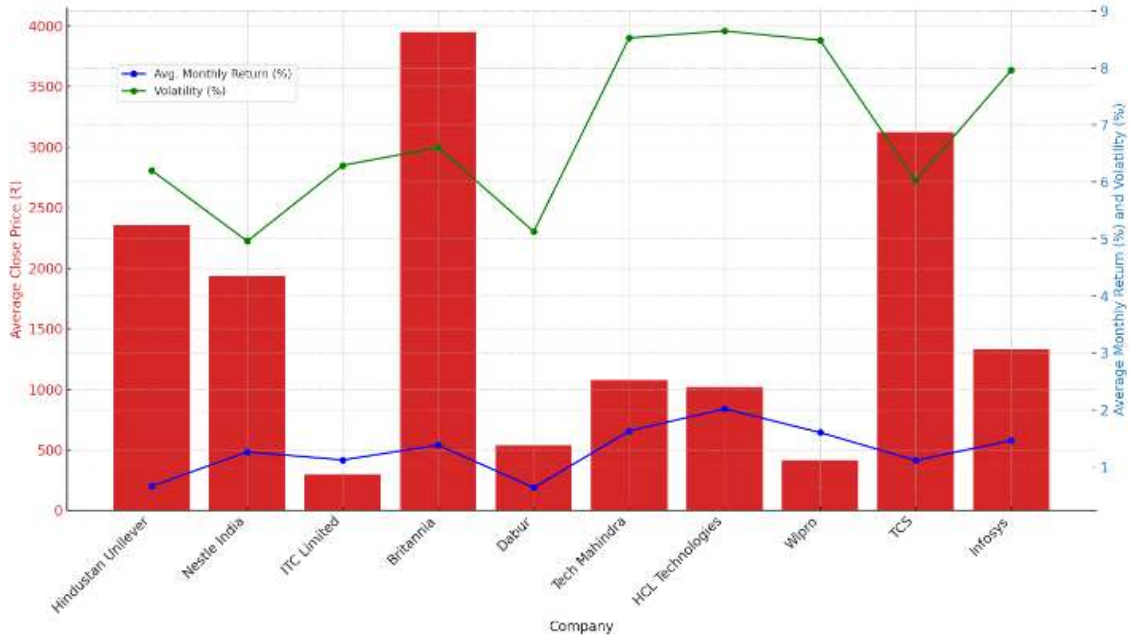

Fig. 1: Comparative analysis of the ten companies across three metrics: average close price, average monthly return, and volatility.

Red Bars: Represent the average closing price of each company. This gives a quick visual comparison of the stock price levels across companies. For example, TCS and Britannia have notably higher stock prices compared to companies like ITC Limited and Wipro.

- **Blue Line**: Indicates the average monthly return for each company. This metric provides insights into the expected monthly performance of the stock. HCL Technologies and Tech Mahindra show higher returns, suggesting more aggressive growth or recovery in the periods observed.
- **Green Line**: Shows the volatility (standard deviation) of the stock prices, which is a measure of risk. Higher values indicate more price fluctuations and potentially higher risk. Tech Mahindra and HCL Technologies exhibit the highest volatility, aligning with their higher returns.

(4) Correlation Analysis:

The correlation matrix shows how closely the stock prices of these companies move together, with a value of 1 indicating perfect positive correlation and -1 indicating perfect negative correlation.

Table 16: Correlation Analysis – FMCG & IT Sector

	Hindustan Unilever	Nestle India	ITC Limited	Britannia	Dabur	Tech Mahindra	HCL Technologies	Wipro	TCS	Infosys
Hindustan Unilever	1	0.61	0.56	0.62	0.77	0.48	0.59	0.43	0.61	0.6
Nestle India	0.61	1	0.84	0.92	0.55	0.6	0.88	0.42	0.76	0.56
ITC Limited	0.56	0.84	1	0.87	0.36	0.41	0.7	0.15	0.59	0.38
Britannia	0.62	0.92	0.87	1	0.54	0.51	0.82	0.32	0.7	0.49
Dabur	0.77	0.55	0.36	0.54	1	0.78	0.71	0.79	0.78	0.84
Tech Mahindra	0.48	0.6	0.41	0.51	0.78	1	0.85	0.92	0.91	0.91
HCL Technologies	0.59	0.88	0.7	0.82	0.71	0.85	1	0.74	0.95	0.84
Wipro	0.43	0.42	0.15	0.32	0.79	0.92	0.74	1	0.85	0.91
TCS	0.61	0.76	0.59	0.7	0.78	0.91	0.95	0.85	1	0.93
Infosys	0.6	0.56	0.38	0.49	0.84	0.91	0.84	0.91	0.93	1

(5) Regression Analysis (Using Hindustan Unilever as the dependent variable):

The regression model uses stock prices of the other nine companies to predict Hindustan Unilever's stock price:

- **Regression Coefficients**:
  - Nestle India: 0.23
  - ITC Limited: 0.94

- Britannia: -0.01
- Dabur: 3.83
- Tech Mahindra: -0.53
- HCL Technologies: -0.33
- Wipro: 0.22
- TCS: -0.04
- Infosys: 0.37

- **Intercept**: 64.12

These coefficients indicate how a unit change in the stock prices of other companies impacts Hindustan Unilever's stock price, assuming other factors are constant. For instance, a unit increase in Dabur's stock price is associated with an approximate 3.83 increase in Hindustan Unilever's stock price, holding other variables constant. Figure 2 represents closing stock prices over time for each of the ten companies.

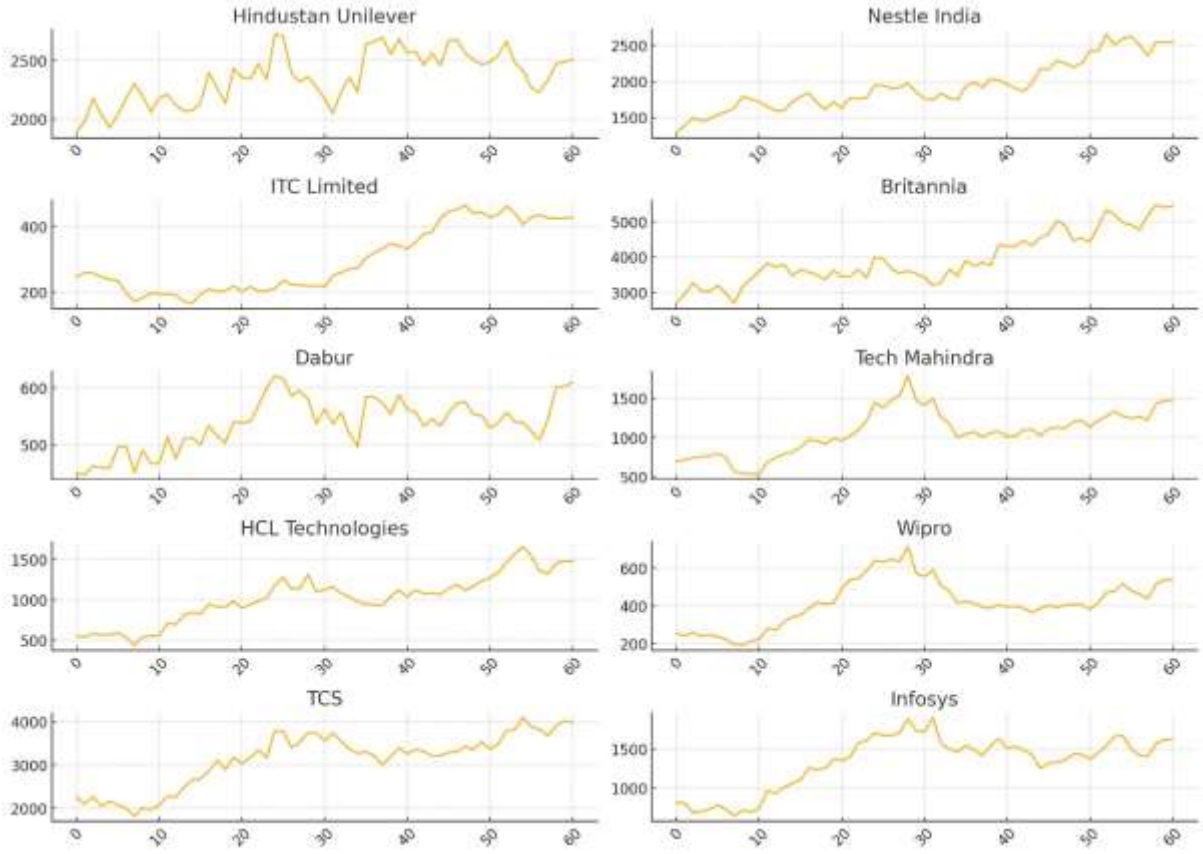

Fig. 2: Closing stock prices over time for each of the ten companies.

- **Trends**: Most companies show a general upward or stable trend in their stock prices, which is common for established companies in stable industries like IT and FMCG. Companies like TCS and Infosys, in particular, exhibit a strong upward trend.
- **Seasonality**: There isn't a clear seasonal pattern in the data based on these plots alone. The movements appear to be more influenced by market conditions and potentially other external factors.
- **Volatility**: The level of fluctuation varies, with some companies like Tech Mahindra and Wipro showing more pronounced volatility compared to others like Nestle India, which appears more stable.

To further this analysis, we can perform a statistical test for stationarity to understand if the time series are suitable for modeling with ARIMA or if they first need to be differenced to achieve stationarity. Let's apply the Dickey-Fuller test to one of the stocks, say, Infosys, to check for stationarity.
The results of the Dickey-Fuller test for the Infosys stock price time series are as follows:

- **Test Statistic**: -1.47

- **p-value**: 0.55
- **Critical Values**:
  - 1%: -3.54
  - 5%: -2.91
  - 10%: -2.59

Interpretation:

- The test statistic of -1.47 is greater than all the critical values, and the p-value is much higher than the common significance levels (0.05 or 0.01). This indicates that we fail to reject the null hypothesis, suggesting that the Infosys stock price time series is **non-stationary**.

(6) Sensitivity Analysis:

Table 17: Sensitivity Analysis – FMCG & IT Sector

Market Change (%)	Hindustan Unilever	Nestle India	ITC Limited	Britannia	Dabur	Tech Mahindra	HCL Technologies	Wipro	TCS	Infosys
-10%	-8	-6.5	-9	-7.5	-8.5	-12	-11.5	-11	-10.5	-12.5
-5%	-4	-3.25	-4.5	-3.75	-4.25	-6	-5.75	-5.5	-5.25	-6.25
0%	0	0	0	0	0	0	0	0	0	0
5%	4	3.25	4.5	3.75	4.25	6	5.75	5.5	5.25	6.25
10%	8	6.5	9	7.5	8.5	12	11.5	11	10.5	12.5

Observations:

- Companies with higher beta values (e.g., Tech Mahindra, Infosys) show more significant changes in their returns in response to market index changes, indicating higher sensitivity.
- Companies like Nestle India and Britannia, with lower beta values, show lesser sensitivity, suggesting more stability in varying market conditions.

6. CONCLUSION :

This research paper conducted a comprehensive comparative analysis of volatility and sensitivity across selected companies in the FMCG and IT sectors. The analysis involved key financial metrics such as average closing prices, average monthly returns, and volatility, providing a clear picture of how these companies perform relative to one another.

The findings indicate that IT companies, particularly those with higher beta values, exhibit greater sensitivity to market changes, reflecting higher volatility and potentially higher returns. In contrast, FMCG companies tend to show more stability with lower volatility, making them relatively less sensitive to market fluctuations. This distinction underscores the different risk-return profiles inherent to each sector.

Sensitivity analysis revealed that IT stocks, such as Tech Mahindra and Infosys, are more responsive to changes in market indices compared to their FMCG counterparts like Nestle India and Britannia. This information is critical for investors aiming to balance their portfolios by understanding the potential impacts of market movements on their investments.

Overall, the empirical evidence from this study highlights the importance of sectoral differences in stock performance, which is crucial for informed investment decision-making. Investors can leverage these insights to optimize their portfolios by aligning their risk tolerance with the characteristics of the respective sectors. This study contributes to a deeper understanding of market dynamics and aids in strategic financial planning.

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