A Study on Impact of Nifty 50 Volatility on Stock Price

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Abstract: ***The stock market is reflecting as the mirror of the economy in India. It captures financial movements, confidence of investors, their expectations etc. The index Nifty 50 acting as a point of reference of the market performance by observing and tracking the top 50 companies in all sectors. The volatility in the index occurred due to global economic shocks, changes in the policy, domestic development etc. But this volatility is break free from the index and spread over into the stock prices of individual companies. It creates risk and opportunities for the investors. This study helps to know the impact of Nifty 50 volatility on the stock prices of the selected financial and IT companies, which are HDFC, LIC, ICICI, Infosys, TCS and Wipro. Because of their strong performance in the stock market, these companies were chosen. In this study statistical tools like correlation analysis, regression analysis and ARIMA forecasting techniques were used to measure the sensitivity of the prices of stocks to Nifty 50 fluctuations and to identify patterns in their movement. This research paper explores the importance of managing the risk, portfolio diversification, awareness about each sector for the investors who are seeking for the opportunity to invest in the stock market and expecting the risk and returns. The link between the theoretical framework and real market data helps to gain the valuable insights to the analysts, students, investors and portfolio managers. This study helps to understand the behaviour of the stock price, fundamental factors of each sector etc.***

Keywords: ***Nifty 50, ARIMA model, volatility, regression analysis, correlation analysis, NSE.***

I. INTRODUCTION

The stock market plays a major role in forming the economy and in India, described as the heartbeat of the economy and Nifty 50 works as its pulse. The Nifty 50 index is the strong indicator of market performance. It reflects the movement of 50 of the largest and most actively traded companies and captures the movements of industries which helps to India's growth. But the Nifty 50 index is not always in stable mode, it varies according to the events happen in the market. Stock prices are constantly moving — they rise and fall depending on a range of factors. This constant fluctuation, often referred to as volatility, impacts both the overall market index and the prices of individual stocks.

In this project, we're taking a closer look at how shifts in the Nifty 50 index influence the stock prices of a few selected companies. Our main focus is on major players in the financial and IT sectors , specifically HDFC Bank, ICICI Bank, TCS, and Wipro. All four are part of the Nifty 50. Finance plays a critical role in driving the economy, and changes in this sector often trigger noticeable shifts in stock prices. On the other hand, the IT sector — which has become a symbol of India's global presence — supports digital growth across industries, and its performance also contributes to market movements. This industry is influenced by business cycles, investment technological disruptions etc. To study this, we have used real stock data and applied statistical tools like ARIMA, regression and correlation analysis. These tools help us track patterns and measure how sensitive stock prices are to changes in the overall market. By doing this, the project aims to give useful insights to investors, students and financial analysts.

In today's world, where market changes happen fast due to global events or local policies, understanding volatility is more important than ever. Through this project, we hope to make stock market behaviour easier to understand and help investors make better and decisions. At the end this study helps to make market behaviour more understandable and provide valuable guidance for students, analysts, portfolio managers and retail investors, empowering them to make informed and confident decisions even in volatile market conditions.

II. LITERATURE REVIEW

1.Inflation, Exchange rates and macroeconomic factors.

Broader factors such as inflation, exchange rates, and commodity prices have a noticeable impact on the volatility of the Nifty 50 index. According to various studies, a moderate level of inflation tends to support healthy stock market returns. In contrast, high

inflation can destabilize the economy and lower investor confidence (Salma Begum, P Singh, A Singh, Bhanudevi, and Ilango). Likewise, changes in exchange rates can influence market risk by affecting how investors approach hedging strategies. However, some research suggests that fluctuations in exchange rates have little to no direct effect on Nifty 50 volatility (Nitin Tanted, Kanak Agarwal). Overall, these studies help investors keep an eye on key economic indicators and currency movements, which is especially useful when planning diversification strategies during volatile market conditions.

2. Impact of Global Events and Crises.

Global and domestic crises have consistently been among the key triggers of sharp volatility in the Indian stock market. Research by Sri Lakshminarayana, S Vevek, Patel, and Shakya highlights how these events tend to disrupt normal market patterns and contribute to unpredictable shifts in volatility. In the same way, the geopolitical events like war between Russia and Ukraine led to the sudden spikes in the volatility of Nifty 50 index, reflecting the commodity prices rising, depreciation in the currency etc (Madhvi Kaushik & Neeraj kumar). Together, these studies show that geopolitical events and crises impact market volatility, making it essential for investors to consider global developments when making decisions in the Indian market.

3. Market structure, Investor Behaviour, and Sectoral Dynamics.

Lending and borrowing of securities do influence volatility but have a limited effect on overall market returns. Studies show that liquidity plays a role in price fluctuations—higher trading volumes often lead to increased volatility (Savitha Lakkol, Shalini, Raveendra). Research also indicates that sectoral indices don't always move in sync with the Nifty 50; some sector stocks are more sensitive and tend to follow their own trends. Additionally, futures expiration days can cause unusual volatility in Nifty 50 trading (Santhosh Kumar, Suryanarayana). Beyond macroeconomic factors, aspects like market structure, investor behavior, and sector sensitivity also contribute to volatility patterns, providing useful insights for both investors and regulators.

III. RESEARCH METHODOLOGY

The main purpose of this study is to explore and know the influence of volatility in Nifty 50 index on the price of stocks of selected companies. It helps to know the sectoral diversity, stability of the stocks, weightage of the stocks in the index. It analyses and explains the importance of the economy of India, helps investors in decision making, risk handling, portfolio management etc.

The research began with a sampling method, selecting companies based on market capitalization and stock volatility within the two largest industries: finance and IT. Secondary data was gathered from the NSE and other trusted historical sources. The study reflects the behavior of both stable markets and periods of volatility caused by global crises.

Several statistical tools were applied to analyze the data and derive results. Descriptive statistics helped calculate the mean, standard deviation, variance, and skewness, offering an overview of stock returns and volatility. Correlation analysis measured the strength and direction of the relationship between the Nifty 50 and individual stock returns. Regression analysis was used to determine beta values, which indicate how sensitive a stock is to Nifty 50 volatility, classifying stocks as defensive, balanced, or aggressive. The ARIMA model was employed to forecast stock prices and identify short-term trends, proving useful for predicting future values based on past patterns in financial time series.

IV. ANALYSIS OF THE STUDY

This study offers valuable insights into how volatility in the Nifty 50 affects the stock prices of six selected companies. Descriptive statistics show that the Nifty 50 experienced moderate fluctuations. Among the chosen stocks, financial companies like HDFC and ICICI displayed more stable returns, while IT firms such as Infosys and Wipro experienced greater market volatility. Correlation analysis indicates that LIC's stock price is mostly independent of overall market volatility. HDFC and TCS sometimes show weak positive correlations but also move in opposite directions at times. Regression analysis was used to classify stocks as defensive, balanced, or aggressive based on their beta values, which measure sensitivity to market changes. LIC, TCS, and HDFC are considered defensive stocks, meaning they carry manageable risk. On the other hand, Wipro and Infosys fall into the aggressive category with higher

risk. ARIMA modeling helped forecast future stock prices and trends: LIC shows a slight downward trend, HDFC a steady upward trend, Infosys and TCS minor declines, ICICI remains stable, and Wipro follows a unique pattern, suggesting it is less influenced by market volatility but more sensitive in its own way.

V. FINDINGS AND CONCLUSIONS

Findings

The analysis and results provide the valuable insights about how the volatility in the Nifty 50 index affects on the prices of stocks of the selected companies in the market. The Nifty 50 index experiences moderate volatility and short-term fluctuations, serving as a good indicator of overall market trends. LIC's stock prices show a very weak correlation with the Nifty 50, meaning they are mostly independent and influenced by insurance-related factors. ICICI and Infosys have a weak positive correlation with the index, suggesting their stock prices partly follow market movements but are also shaped by sector-specific conditions. HDFC shows a balanced correlation with the Nifty 50, acting as a defensive stock with moderate risk. TCS stocks also display defensive traits, reacting less sharply to market volatility, which offers investors some stability. In contrast, Wipro's stock prices are highly sensitive to market changes, showing more unpredictable and risky behavior. Regression analysis reveals that beta values vary significantly among these companies, categorizing them into defensive, balanced, and aggressive groups. ARIMA forecasts indicate that short-term market fluctuations will be limited, maintaining a relatively stable environment. Overall, the study shows that companies respond differently to Nifty 50 volatility, emphasizing the need for investment diversification.

Conclusion

This study helps to understand how the volatility of the Nifty 50 index effects on the stock prices of selected companies belongs to financial and IT industry. This shows that stock price changes don't fully depend on Nifty 50 volatility, though they are influenced by it. The extent of price movement varies based on each stock's nature and its relationship with the index.

The correlation analysis shows that the link between the companies and the Nifty 50 index is generally weak, suggesting that sector-specific factors influence these stocks more than the overall index. Regression analysis helps us understand the different types of stocks and their behavior in the market. Meanwhile, the ARIMA model highlights short-term market fluctuations, price stability, and the overall market volatility alongside the index's performance.

This study helps investors, students, and analysts understand how Nifty 50 volatility affects the market and causes stock prices to change. It increases investor's confidence to invest on different stocks and suggests the risk level -associated with the stocks, finds the strategy to invest in the Indian market.

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