

Market Momentum Over Twenty Years: Evidence from Reliance Industries



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Thushara T K

**MARKET MOMENTUM OVER
TWENTY YEARS: EVIDENCE FROM
RELIANCE INDUSTRIES**

A Research Monograph

By

Thushara T K

Assistant Professor,
PG Department of Commerce,
Christ College, Puliyanmala, Kattappana, Idukki

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Author:

Thushara T K

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FOREWORD

I am pleased to present this book, which serves as a significant outcome of the workshop conducted by the PG Department of Commerce on “*Secondary Data and AI-Assisted Research Tools.*” This publication reflects the department’s commitment to strengthening the research culture of the institution by embracing modern analytical techniques and technological advancements.

The initiative taken by the Commerce Department is highly commendable. By integrating artificial intelligence into academic research practices, the department has set an excellent example for others to follow. This book stands as a model that can inspire all departments to adopt similar innovative strategies to enhance the quality and visibility of their academic output.

This publication forms an important part of the department’s ongoing research initiatives, aimed at promoting a structured and progressive approach

to academic inquiry. It also opens the possibility for annual publications of PG and UG research works, thereby creating a continuous and sustainable platform for scholarly contributions from the department. In the future, the department hopes and aspires to bring out many more such publications, further strengthening its academic and research footprint.

I congratulate the PG Department of Commerce for its vision, dedication, and academic leadership. I am confident that this book will serve as a valuable reference for researchers, faculty members, and all those interested in quality-driven academic work.

Dr. M V Georgekutty

Principal, Christ College

PREFACE

This book presents an in-depth analytical study on the stock price behaviour of Reliance Industries. over a twenty-year period from May 2005 to May 2025. The work offers a comprehensive examination of market trends, volatility patterns, and trading dynamics using monthly secondary data. Employing descriptive statistics, time-series visualisation, correlation analysis, and non-parametric techniques, the study evaluates the central tendency, dispersion, long-term movement, and the relationship between price levels and trading turnover. The findings highlight significant variability in stock prices, consistent upward price trends, intraday volatility reflected through the consistent difference between high and close prices, and a strong inverse association between price levels and trading volume. Through these insights, the book contributes meaningfully to academic literature in finance and serves as a practical reference for analysts, researchers, and

academicians interested in understanding stock market behaviour within the Indian context.

The relevance of this study lies in its systematic and data-driven approach, supported by the integration of AI-assisted tools that enhance the precision and depth of analysis. By focusing on one of India's leading company, the book provides a model framework for conducting stock market research using secondary data and modern analytical methods. It is hoped that this work encourages a more evidence-based approach to financial studies and inspires similar research initiatives in the future.

I place on record my sincere gratitude to Dr Bobby Thomas of Pavanatma College, Murickassery, Idukki, for his unwavering support, scholarly guidance, and encouragement throughout the writing of this book. His mentorship has been instrumental in shaping the clarity, quality, and academic rigour of this work. I also acknowledge that this publication is an outcome of the workshop on "Secondary Data and AI-Assisted Research

Tools” conducted by the PG Department of Commerce, which provided the conceptual direction and motivation for undertaking this study.

ABSTRACT

This study analyses the long-term stock price behaviour of Reliance Industries Ltd. over a 20-year period (January 2005–June 2025) using monthly secondary data. It examines central tendency, dispersion, long-term price trends, volatility, directional differences between high and close prices, and the relationship between prices and trading turnover. Descriptive statistics, time-series visualisation, the Sign Test, and correlation analysis were conducted using Gretl software. The findings show strong long-term price growth with periods of notable volatility, particularly around 2008, 2021, and 2024 due to major economic events. High prices consistently exceeded close prices, confirmed by the Sign Test. Strong positive correlations exist among price variables, while turnover shows only a moderate positive link with closing prices. Overall, Reliance stock remains attractive for long-term investment but carries short-term trading risks, offering useful insights for investors and market analysts.

Chapter 1

Introduction and Framework

1.1 Introduction

The Indian financial market is a dynamic system that facilitates the flow of funds and the trading of financial instruments such as stocks, bonds, and commodities. It is broadly divided into the money market, which deals with short-term funds, and the capital market, which handles long-term investments. A major component of the capital market is the Bombay Stock Exchange (BSE), Asia's oldest stock exchange, established in 1875. The BSE's benchmark index, the SENSEX (Sensitive Index), comprises 30 of the largest and most actively traded companies across key sectors of the Indian economy. Introduced in 1986, the SENSEX is widely regarded as a barometer of the Indian stock market, reflecting investor sentiment, economic conditions, and market trends. Movements in the SENSEX are influenced by factors such as corporate earnings, inflation,

interest rates, government policies, and global events. As such, the SENSEX plays a crucial role in guiding investment decisions and assessing the overall health of the Indian economy.

1.2 Company Profile

Reliance Industries Ltd (RIL) is a diversified conglomerate with operations in energy, petrochemicals, textiles, retail, entertainment, materials and telecommunication sectors. The company carries out the exploration, development and production of oil and gas, refining of crude oil, marketing of petroleum products, and production of petrochemicals. Its refined products include propylene, gasoline, naphtha, kerosene, alkylate, sulphur and petroleum coke. The company commercializes petrochemical products, including aromatics, elastomers and polyesters. It operates a range of retail stores comprising food and grocery specialty, footwear, hypermarkets and other specialty stores. The company also provides telecommunication, broadband internet, security and other digital services. RIL is headquartered in

Mumbai, Maharashtra, India. India's largest private sector company, Reliance Industries has evolved from being a textiles and polyester company to an integrated player across energy petrochemicals, textiles, natural resources, retails and [telecommunications](#) and operates world-class manufacturing facilities across the country. Reliance's products and services portfolio touches almost all needs of people on a daily basis, across economic and social spectrums. Reliance Industries Limited is headquartered in Mumbai and is growing under the leadership of Mukesh Ambani, the son of late Dhirubhai Ambani and elder brother of Anil Ambani after the division of the family business among the two brothers. Reliance Group is a conglomerate holding company in India that has a wide portfolio of business and is the highest taxpayer in the Indian Private Sector. It accounts for over 5% of the Indian Government's revenues and almost 8% of the total merchandise exports from India. RIL was the first Indian company to breach \$100 billion market capitalization in 2007 and 2019 it

has become the first Indian firm to cross Rs 9 lakh crore market valuation marks.

1.3 Need of the Study

Understanding stock price behaviour is crucial for investors, analysts, and policymakers to make informed financial decisions. The analysis of central tendency and dispersion provides insight into the average performance and risk associated with stock investments. Examining monthly fluctuations over an extended period, such as twenty years, helps identify patterns, cycles, or anomalies that may influence investment strategies. Moreover, assessing the relationship between stock prices and trading volume offers valuable information on market activity and investor sentiment. Identifying long-term trends in stock performance is equally important, as it can guide long-term investment planning and policy formulation. Given the dynamic and volatile nature of financial markets, this study is essential to gain a comprehensive understanding of stock behaviour

over time and its implications for market participants.

1.3.1 Objectives of the Study

1. To describe the central tendency and dispersion characteristics of Reliance stock prices over the study period.
2. To analyse the monthly price movements of stock over a 20-year period from 2005 to 2025.
3. To examine the relationship between monthly stock price and turnover
4. To identify any long-term trends in the performance of Reliance stock during the study period.

1.3.2 Research Questions

1. What insights do the descriptive statistics provide regarding the average value, variation, and distribution pattern of monthly stock prices over the past ten years?

2. What patterns and changes can be identified in the monthly movements of stock prices throughout the study period?
3. Is there a directional difference between the monthly high prices and closing prices of the stock over the study period?
4. Is there a meaningful statistical correlation between monthly stock prices and trading volume?

1.3.3 Research Hypothesis

- H_{01} There is no directional difference between the monthly high prices and closing prices of the stock.
- H_{02} There is no linear correlation between stock price and turnover
- H_{03} There is no significant difference in the monthly average stock prices of Reliance Industries across different years during the period 2005 to 2025.

$H_{0.4}$ There is no significant trend in the long-term movement of stock prices during the study period.

1.4 Scope of the Study

This study focuses on the stock price behaviour of Reliance Industries Ltd over a 20-year period from January 2005 to June 2025, using monthly data. The analysis is limited to understanding the statistical characteristics, trends, and relationships within the stock prices and trading volumes of the company. The scope includes the application of descriptive statistics, time series plotting, Sign Test, and correlation analysis to examine central tendency, dispersion, directional movements, and price-volume relationships. The study exclusively employs Gretl software for all statistical computations. By concentrating solely on Reliance Industries Ltd and using secondary stock market data, the research does not extend to broader market indices, macroeconomic factors, or inter-company comparisons. The findings are expected to provide insights specifically relevant to

investors, analysts, and researchers interested in the long-term stock performance of Reliance Industries.

1.5 Research Methodology

1.5.1 Research Design

The present study adopts a quantitative and analytical research design. It focuses on historical stock price data to examine patterns, fluctuations, and statistical relationships over time. The study is exploratory in nature, aiming to derive meaningful insights through numerical data analysis.

1.5.2 Sources of Data

The study is based entirely on secondary data collected from authentic stock market sources such as the Bombay Stock Exchange (BSE), official company reports, and other financial databases. Monthly stock prices and trading volumes of Reliance Industries Ltd have been compiled for analysis.

1.5.3 Period of Study

The time frame for the study spans from January 2005 to June 2025, covering a comprehensive 20-year period of monthly observations. This long-term period enables the identification of consistent patterns and trends in stock performance.

1.5.4 Variables Considered

The key variables considered for the study include:

- ❖ Monthly Opening Price
- ❖ Monthly Closing Price
- ❖ Monthly High Price
- ❖ Monthly Low Price
- ❖ Trading Volume (Turnover)

These variables are used to evaluate the stock's central tendency, dispersion, directional movement, and correlation with volume.

1.5.5 Software Used

All data analysis and statistical tests are carried out using Gretl software.

1.5.6 Tools of Analysis

The following analytical tools and techniques are employed in the study:

- Descriptive Statistics
- Time Series Plots
- Sign Test
- Correlation Analysis

1.6 Limitations of the Study

The study is limited to a single company (Reliance Industries Ltd), which restricts the applicability of the findings to the broader stock market or other sectors. It relies exclusively on secondary data, so any errors, inconsistencies, or revisions in the stock prices or trading volumes could affect the reliability of the analysis.

1. The use of monthly data may fail to capture short-term or intraday fluctuations in stock prices.
2. Influential external factors such as macroeconomic conditions, policy shifts,

global market trends, and company-specific developments are not included, though they can significantly impact stock performance.

3. The analysis is conducted using Gretl software only, which, despite being suitable for econometric analysis, may lack the advanced modelling capabilities of more sophisticated or commercial tools.

1.7 Chapterization

Chapter 1: Introduction and Framework

This chapter outlines the background of the study, research problem, objectives, research questions, hypotheses, scope, limitations, and methodology adopted for the analysis.

Chapter 2: Review of Literature

This chapter presents a review of past studies related to stock price behaviour, turnover analysis, trend analysis, and statistical techniques used in stock market research. It also identifies research gaps and establishes the theoretical foundation for the study.

Chapter 3: Data Analysis and Interpretation

This chapter includes descriptive statistics, time series plots, Sign Test results, and correlation analysis to answer the research questions.

Chapter 4: Findings and Suggestions

This chapter discusses the major findings derived from the analysis, interprets the results in light of the research objectives, and provides suggestions for investors, researchers, and policy-makers.

Chapter-II

LITERATURE REVIEW

2.1 Introduction

Understanding stock market behavior has been an enduring area of research due to its critical role in investment decisions, economic development, and financial planning. Over the past two decades, Reliance Industries Limited (RIL)—as one of India’s largest and most actively traded conglomerates—has drawn substantial academic and industry attention due to its dynamic stock performance and influential position in the Indian equity market.

This literature review aims to explore and synthesize previous empirical studies related to stock price volatility, forecasting models, and market efficiency, with a focused lens on Reliance Industries. The review draws from a wide spectrum of national and international studies that have examined broader market behaviors as well as

firm-specific dynamics. These studies employ a variety of statistical tools and econometric models—such as GARCH, ARCH, time series decomposition, and machine learning techniques—to investigate patterns of volatility, investor sentiment, financial leverage, and price predictability.

By reviewing the evolution of stock price behavior and volatility in the context of both macroeconomic influences and firm-specific risk indicators, this chapter sets the empirical foundation for analyzing the long-term market behavior of Reliance Industries from 2005 to 2025. The insights derived from this review help contextualize the present study within existing research, highlight gaps in literature, and identify methodological frameworks relevant for analyzing two decades of stock market behavior.

2.2 Stock price Volatility and Market behaviour

This study analysed the key determinants such as market capitalization, earnings per share, price-earnings multiples, dividend yield, and trading

volume. A significant positive relationship has been found between market capitalization and stock prices. However, literature presents conflicting theories—such as Gordon's relevance theory and Modigliani's irrelevance theory—regarding the impact of dividend yield, indicating the need for further exploration. Additionally, price-earnings multiples are generally reported to have a negative influence on stock prices. Trading volume is consistently associated with stock price movements and is recognized as a source of market risk, with evidence of a cointegrating relationship between the two variables. (Ruhani, F, Islam, M& Ahamad, T.S.T 2018)

This study introduces a hybrid model that integrates deep learning techniques with sentiment analysis for stock price prediction. Specifically, a Convolutional Neural Network (CNN) is used to classify investor sentiments derived from a major stock forum. These sentiment results are then combined with technical indicators using a Long Short-Term Memory (LSTM) Neural Network to form the hybrid model. Real-life experiments were

conducted across six major industries and three-time intervals on the Shanghai Stock Exchange (SSE) to assess the model's effectiveness. The findings demonstrate that the hybrid model outperforms baseline classifiers in sentiment classification and shows superior stock price prediction accuracy compared to standalone models or models lacking sentiment analysis. (Jing, N et.al., 2021)

The paper examines the relationship between returns and volatility, volatility clustering, leverage effect and the persistence of volatility for the Indian stock markets viz. National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) for the financial year 2005-06 to 2013-14. The GARCHM model is used to examine the volatility clustering and persistence of volatility and the relationship between returns and volatility. The EGARCH model is used to capture the asymmetric effect. The study reveals that the volatility in both the markets exhibits the characteristics like volatility clustering, asymmetry effect and persistence of volatility in their daily returns. The study finds that

the recent news as well as past news both has an impact on volatility. The study also finds the existence of leverage effect indicating that the negative shocks or bad news have more impact on volatility than that of positive shocks or good news. The relationship between returns and volatility is not significant for both the markets. (Ali, I. 2016)

This study focuses on analyzing time series data from the Indian stock market and aims to build a statistical model capable of effectively forecasting future stock trends. Time series analysis and forecasting play a crucial role across various fields, including the stock market, which is known for its complexity and frequent price fluctuations over time. Forecasting stock trends involves identifying patterns in market movements to help investors maximize returns and minimize risks. Given the market's high sensitivity and volatility, the primary objective is to develop innovative methods for predicting profitable stocks. (Idrees, S et.al., 2019)

The main aim of this study is to help the investors gain knowledge about volatility present in different

months, thereby they can invest continuously. The primary objective of this study is to analysis the stock price of RIL. Monthly data has been taken from official website of BSE (Bombay stock exchanges) and NSE (National stock exchanges) and used one sample t-test to analysis the stock price of RIL during from 2005–2010. Stock prices are often very tempting in an economic downturn. The low prices offered are a good deal for many people, they just don't trust company to improve. The investor was careful when purchasing stock in the company, as the stock price was known to fluctuate greatly in this specific market (Pathania, A. and Swami, R. 2018)

This study investigates stock market volatility by analyzing volatility clustering and levels of volatility in the Indian stock markets—specifically the NSE and BSE—from 2015–16 to 2019–20. Using the GARCH model, the presence of volatility clustering is identified in both stock exchange indices and sectoral indices. The findings reveal that while both exchanges exhibit similar volatility patterns, BSE indices are comparatively

more volatile, implying higher risk for investors trading through BSE listings. The study consistently compares the volatility behavior between the BSE and NSE throughout the analysis. (Agarwal, A. 2021).

This study introduces an information retrieval method to examine the impact of economic news on stock market values, using stock prices as a reference point. While previous research has explored the correlation between economic news and stock prices through text mining and time series analysis, this paper specifically investigates which time series techniques are most suitable for analyzing stock market closing values. Economic news articles and their dates were collected into a database, with a basic text mining approach using term frequency–inverse document frequency (TF-IDF). Ten time series methods—including random walk, moving average, Bollinger bands, momentum, and others—were applied to the Turkish Stock Market data over a two-year period. The study offers a comparative analysis of these techniques, combining news sentiment with stock

performance for more insightful forecasting. (Seker, S. E et.al., 2014)

In this paper, EMD and ensemble empirical mode decomposition (EEMD), a modified method of EMD, are applied to financial time series. Through analyzing the intrinsic mode functions (IMFs) of EMD and EEMD, we find EEMD method performs better on the orthogonality of IMFs than EMD. With clustering the ordered frequencies of IMFs, the IMFs obtained from EEMD method are grouped into high-, medium-, and low-frequency components, representing the short-, medium-, and long-term volatilities of the index sequences, respectively. With the cross-correlation analysis of DCCA cross-correlation coefficient, our findings allow us to gain further and detailed insight into the cross-correlations of stock markets. (Xu, M., Shang, P. & Lin, A. 2016).

The short-run interdependence of prices and price volatility across three major international stock markets is studied. Daily opening and closing prices of major stock indexes for the Tokyo,

London, and New York stock markets are examined. The analysis utilizes the autoregressive conditionally heteroskedastic (ARCH family of statistical models to explore these pricing relationships. Evidence of price volatility spillovers from New York to Tokyo, London to Tokyo, and New, York to London is observed but no price volatility spillover effects in other directions are found for the pre-October 1987 period. (Hamao, Y et.al., 2006)

2.3 Stock Market Analysis

This study evaluates the weak form efficiency of the Indian Capital Market by analyzing the daily closing indices of the NSE and BSE from April 1, 2000, to March 31, 2010. Using the non-parametric Runs Test, the study assesses whether stock price movements follow a random walk pattern. The results lead to the rejection of the alternative hypothesis, indicating that the Indian stock market does not exhibit weak form efficiency and does not conform to the random walk model. The findings have significant implications for investors,

financial institutions, and policymakers in the context of a globalized economy. (Khan, A. Q et.al., 2011)

This paper presents a comprehensive and robust stock price prediction framework that integrates statistical, machine learning, and deep learning models. Using high-frequency intraday data from a well-known NSE-listed company, the data is aggregated into three daily time slots for model training. The study develops eight classification and eight regression models, along with a deep learning model based on Long Short-Term Memory (LSTM). The results demonstrate that this agglomerative modeling approach effectively captures and predicts the volatile patterns in stock price movements, and a critical evaluation of model performance is also provided. (Mehtab, S. and Sen, J. 2020).

This study examines the relationship between stock market performance and economic growth, focusing on both short-run and long-run dynamics. Using monthly Index of Industrial Production (IIP)

data and quarterly Gross Domestic Product (GDP) data from April 1996 to March 2009, the analysis employs Unit Root tests (ADF, PP, KPSS), Granger Causality tests, the Engle-Granger Cointegration test, and an Error Correction Model. The Granger causality results show a bidirectional relationship between IIP and stock prices (BSE and NSE), while a unidirectional relationship from GDP to NSE is found, with no significant link between GDP and BSE. The Engle-Granger test indicates a long-term relationship between stock market performance and economic growth. The error correction model further shows that economic growth adjusts to correct long-run disequilibrium. Overall, the findings support the ‘demand-following’ hypothesis in the short run and highlight the influence of economic growth on stock market development. (Paramati, S. R. and Gupta, R. 2011).

The paper examines the relationship between returns and volatility, volatility clustering, leverage effect and the persistence of volatility for the Indian stock markets viz. National Stock Exchange

(NSE) and Bombay Stock Exchange (BSE) for period from 1990 to 2016. The main focus of this research paper is to examine the nature of the volatility in the Indian stock markets. In this study ARCH and GARCH models have applied to study the behaviour of stock market volatility. This study shows that GARCH (1, 1) model is more satisfactorily explains volatility clustering and its high persistence for better decisionmaking purpose. (Tanty, G. and Patjoshi, P. K. 2016).

A study conducted by Thomas.B on daily stock price dynamics of IRCTC and RVNL show contrasting behaviours, with IRCTC trading at higher and more stable prices, while RVNL remains lower-priced and more volatile. Unit root tests confirm both stocks are $I(1)$, supporting further long-run linkage analysis. However, Engle–Granger results indicate no cointegration, suggesting an absence of long-term equilibrium between the firms despite their sectoral connection. VAR findings reveal significant short-run influence of IRCTC on RVNL, indicating short-term shock transmission. Overall, IRCTC

emerges as a leading indicator in India's railway-linked stock movements (Thomas, 2025).

As long as financial markets are concerned, people tried to forecast the future movement of it. The purpose of forecast to expect great fortunes. In reality it an important question that is it possible to forecast market with the historical data? If it possible than excess returns can be made by picking up lottery stock. This situation called Inefficient Market. On the other hand if market efficient, it west of time to predict stock market. The main intention of this paper to study the efficiency level in Indian Stock market and the random walk nature of the stock market by using RUN test for the period from 1st January 2001 to 31st December 2010. In this paper, 6 major indices (BSE 30, BSE 100,200,500, BSE SMALL CAP and BSE MIDCAP) are studied. (Joshi, D. 2012)

The present study aims to examine the existence of month-of-the-year effects in the Indian stock market. For analysis, we selected the BSE Ltd and NSE broad market cap indices, namely S&P BSE

500 and NIFTY 500, which are a comprehensive representation of the Indian stock market. The time selected for this study is from April 1, 2011, to March 31, 2021 (i.e., ten years). The study used secondary data collected from the 'monthly open, high, low and closing prices of broad market indices of the Indian stock market through the official websites (www.bseindia.com; and www.nseindia.com). The study's findings indicate that the ADF and PP test confirms the presence of unit root of the return series of S&P BSE 500 and NIFTY 500 Indices. The results from the KPSS test confirm the stationarity of the return series of both Indices. The regression coefficients for March were negative and significant for both indices. These results suggest that the month-the-of-the-year effect is the 'March effect.' (Elangovan et.al., 2022).

2.4 Reliance Industries

This study analyses firm-specific risk indicators in relation to business and financial risks, focusing on Reliance Industries Ltd (RIL). Key indicators—

such as Degree of Operating Leverage (DOL), Degree of Financial Leverage (DFL), Degree of Combined Leverage (DCL), Debt-Equity Ratio, and Fixed Asset to Total Asset Ratio (FATA)—are examined using statistical tools including descriptive statistics, correlation, and regression analysis. The study period is divided into two phases: 2008–2012 and 2013–2017, with comparisons drawn across both halves and the entire period. Linear regression is used to assess the impact of DOL and DFL on DCL, and various correlation methods (Pearson, Spearman, and Kendall) are employed to explore relationships between risk and return. Results indicate that RIL's overall risk increased, primarily due to operating risk, and no significant correlation was found between debt-equity and FATA. Interestingly, a negative association was observed between risk undertaken and return generated, contradicting traditional theories that suggest a positive risk-return relationship. (Yadav, D. A. P. and Kumar, D. M. R, 2018)

Stock prices are often very tempting in an economic downturn. The low prices offered are a good deal for many people, they just don't trust company to improve. The investor was careful when purchasing stock in the company, as the stock price was known to fluctuate greatly in this specific market. The main aim of this study is to help the investors gain knowledge about volatility present in different months, thereby they can invest continuously. The primary objective of this study is to analysis the stock price of RIL. Monthly data has been taken from official website of BSE (Bombay stock exchanges) and NSE (National stock exchanges) and used one sample t-test to analysis the stock price of RIL during from 2005–2010. (Pathania, A. and Swami, R. (2018).

This study emphasizes the importance of accurate stock price forecasting due to its significant impact on the stock market and overall economy. As a key economic indicator, stock market performance affects both individual investors and corporations. Reliable stock price predictions based on factors like economic conditions, company profitability,

and investor sentiment are essential for making informed trading and investment decisions. The paper focuses on predicting the stock price of Reliance Industries Limited using the Long Short-Term Memory (LSTM) algorithm. Weekly data from January 8, 2020, to December 8, 2022, was sourced from Yahoo Finance. The model's performance is evaluated using metrics such as Root Mean Squared Error (RMSE), Mean Absolute Error (MAE), and Mean Squared Error (MSE), along with visual analysis. The study highlights the value of accurate forecasts for investors, analysts, and policymakers in navigating market risks and making strategic financial decisions. (Kukreti, V et.al., 2023)

2.5 Research Gap

Although extensive research has been conducted on stock market volatility, forecasting techniques, and market efficiency, there remains a significant gap in long-term, company-specific analyses—particularly focusing on Reliance Industries Ltd. Most existing studies emphasize broad market

indices or employ high-frequency trading data with complex econometric and machine learning models. However, limited attention has been given to evaluating the monthly stock price behaviour of a single company over an extended period such as twenty years. There is also a noticeable lack of studies that use descriptive statistics, sign tests, and simple correlation analysis to explore fundamental characteristics like central tendency, dispersion, and the relationship between stock price and trading volume in the context of Reliance Industries. Furthermore, prior research has largely overlooked the importance of identifying consistent monthly patterns or trends that can guide long-term investment strategies. This study addresses these gaps by offering a detailed, data-driven analysis of twenty years of monthly stock price movements of Reliance Industries Ltd., aiming to provide both academic insight and practical relevance for investors and policymakers.

REFERENCES

- Ruhani, F., ISLAM, M. A., Ahmad, T. S. T. & Quddus, M. R. (2018). Effects of Financial Market Variables on Stock Prices: A Review of the Literature, 14. <https://doi.org/10.17265/1548-6583/2018.11.002>
- Jing, N., Wu, Z. & Wang, H. (2021). A hybrid model integrating deep learning with investor sentiment analysis for stock price prediction. *Expert systems with applications*, 178. <https://doi.org/10.1016/j.eswa.2021.115019>
- Gregoriou, G. (2009). Stock market volatility. . <https://doi.org/10.2469/faj.v46.n3.23>
- Ali, I. (2016). Stock Market Volatility and Returns: A Study of NSE & BSE in India.
- Agarwal, A. (2021). A study on stock market volatility pattern of bse and nse in india. *Open access journals*, 1(1). <https://www.openaccessjournal.com/abstract/831>
- Idrees, S., Alam, M. A. & Agarwal, P. (2019). A Prediction Approach for Stock Market Volatility Based on Time Series Data. *IEEE Access*, 7. <https://doi.org/10.1109/access.2019.2895252>

- Khan, A. Q., Ikram, S. & Mehtab, M. (2011). Testing weak form market efficiency of Indian capital market: A case of national stock exchange (NSE) and Bombay stock exchange (BSE). *African Journal of Marketing Management*, 3(6). <https://doi.org/10.5897/ajmm.9000069>
- Mehtab, S. and Sen, J. (2020). A Time Series Analysis-Based Stock Price Prediction Using Machine Learning and Deep Learning Models. *International Journal of Business Forecasting and Marketing Intelligence*. <https://doi.org/10.1504/ijbfmi.2020.115691>
- Paramati, S. R. and Gupta, R. (2011). An Empirical Analysis of Stock Market Performance and Economic Growth: Evidence from India. . <https://doi.org/10.2139/ssrn.2335996>
- Tanty, G. and Patjoshi, P. K. (2016). A Study on Stock Market Volatility Pattern of BSE and NSE in India. *Asian Journal of Management*, 7(3). <https://doi.org/10.5958/2321-5763.2016.00029.9>

- Thomas, B. (2025). Tracking the rails: Short-run interdependence and price dynamics in India's railway firms. Conference proceedings.
- Joshi, D. (2012). Testing Market Efficiency of Indian Stock Market. *Social Science Research Network*.
<https://doi.org/10.2139/ssrn.3307352>
- Elangovan, R., Irudayasamy, F. G. & Saini, A. (2022). Month-of-the-Year Effect: Empirical Evidence from Indian Stock Market. *Asia-pacific Financial Markets*.
<https://doi.org/10.1007/s10690-021-09356-2>
- Pathania, A. and Swami, R. (2018). Stock Price Analysis for Reliance Industry Limited (RIL). *Asian Journal of Management*.
<https://doi.org/10.5958/2321-5763.2018.00047.1>
- Yadav, D. A. P. and Kumar, D. M. R. (2018). BUSINESS AND FINANCIAL RISKS IN RELIANCE INDUSTRIES LIMITED: AN EMPIRICAL INVESTIGATION. *ELK ASIA PACIFIC JOURNAL OF FINANCE AND RISK MANAGEMENT*.
<https://doi.org/10.31511/eapjfrm.2018v09i02002>

- Pathania, A. and Swami, R. (2018). Stock Price Analysis for Reliance Industry Limited (RIL). *Asian Journal of Management*.
<https://doi.org/10.5958/2321-5763.2018.00047.1>
- Kukreti, V., Bhatt, C. & Dani, R. (2023). A Stock Market Trends Analysis of Reliance using Machine Learning Techniques. *2023 6th International Conference on Information Systems and Computer Networks (ISCON)*.
<https://doi.org/10.1109/iscon57294.2023.10112145>
- Xu, M., Shang, P. & Lin, A. (2016). Cross-correlation analysis of stock markets using EMD and EEMD. *Physica A-statistical Mechanics and Its Applications*, 442.
<https://doi.org/10.1016/j.physa.2015.08.063>
- Hamao, Y., Masulis, R. W. & Ng, V. (2006). Correlations in Price Changes and Volatility Across International Stock Markets. *Social Science Research Network*.
https://autopapers.ssrn.com/sol3/papers.cfm?abstract_id=886547

Chapter-III

DATA ANALYSIS AND INTREPRETATION

3.1 Introduction

This chapter presents a detailed statistical analysis of the stock price behaviour of Reliance Industries Ltd over the twenty-year period from January 2005 to June 2025. The data, collected from secondary sources, is analysed using both Microsoft Excel and Gretl software. The tools employed include descriptive statistics to study central tendency and dispersion, time series plots to visualize monthly stock movements, the Sign Test to examine directional differences, and correlation analysis to assess the relationship between stock prices and trading volume.

The analysis is structured around the key objectives of the study:

- 1 To describe the central tendency and dispersion characteristics of Reliance stock prices over the study period.
- 2 To analyse the monthly price movements of stock over a 20-year period from 2005 to 2025.
- 3 To test whether the monthly high prices of the stock are consistently greater than the closing prices.
- 4 To identify any long-term trends in the performance of Reliance stock during the study period.

The results presented in this chapter are intended to provide empirical answers to the research questions and test the stated hypotheses. The findings aim to offer meaningful insights into the performance and volatility of Reliance stock, supporting investors, researchers, and policymakers in their decision-making processes.

3.2 Data Description

The present study is based on secondary data comprising monthly stock price records of Reliance Industries Ltd over a continuous period of 20 years, from January 2005 to June 2025. The dataset includes a total of 246 monthly observations, corresponding to each month within the specified timeframe.

The variables considered for analysis are as follows:

- **Monthly High Price:** The highest trading price of the stock recorded during each month.
- **Monthly Closing Price:** The final trading price of the stock at the end of each month.
- **Monthly Turnover:** The total trading volume or value of shares traded during the month, used to assess market activity.

This data provides the basis for evaluating the central tendency, dispersion, price trends, directional movements, and the relationship

between stock prices and trading volume. The analysis facilitates a comprehensive understanding of long-term stock price behaviour, essential for informed decision-making by investors and market analysts.

3.3 Descriptive Statistics

Descriptive statistics offer a foundational understanding of the stock price behaviour of Reliance Industries Ltd over the 20-year period from January 2005 to June 2025. This section summarizes the central tendency, dispersion, and distributional properties of the four key price variables: Open Price, High Price, Low Price, and Close Price. The statistical measures computed include the mean, median, minimum, maximum, skewness, and excess kurtosis, as shown in the table below:

Table No.3.1

Measures of Central Tendency

Price Variable	Mean	Median	Minimum	Maximum
Open Price	1440.9	1170.9	520.05	3129.9
High Price	1542.4	1271.5	553.80	3252.1
Low Price	1337.2	1038.1	498.20	2927.1
Close Price	1441.2	1169.6	527.70	3131.8

Source: Secondary Data, Gretl Output

Interpretation

The table 3.3.1 provides descriptive statistics for four stock price variables Open Price, High Price, Low Price, and Close Price. The mean values of all price variables (Open: 1440.9, High: 1542.4, Low: 1337.2, Close: 1441.2) are notably higher than their corresponding median values (Open: 1170.9, High: 1271.5, Low: 1038.1, Close: 1169.6). This suggests a right-skewed distribution, where some relatively high price values have pulled the mean

upwards. The minimum and maximum prices also show a wide range for each variable, indicating substantial price fluctuations during the observed period. The Open and Close prices are very close in terms of average value, which is typical in stable markets. However, the relatively higher range in High and Low prices indicates significant intra-period volatility.

Table 3. 2

Measures of Dispersion and Shape

Price Variable	SD	CV	Skewness	Ex. kurtosis
Open Price	681.95	0.473	0.830	- 0.616
High Price	721.49	0.468	0.768	- 0.765
Low Price	634.44	0.474	0.886	- 0.512
Close Price	677.94	0.470	0.831	- 0.629

Source: Secondary Data, Gretl Output

Interpretation

The table presents statistical measures Standard Deviation (SD), Coefficient of Variation (CV), Skewness, and Excess Kurtosis for four stock price variables. The SD values are relatively high for all price variables, ranging from 634.44 to 721.49, indicating significant volatility in stock prices during the period. The Coefficient of Variation (CV), which measures relative variability, is approximately 0.47 for all variables, showing that Open, High, Low, and Close prices exhibit a similar level of dispersion relative to their means. Skewness values are positive for all variables, indicating right-skewed distributions, meaning there are more low-value observations with a few extremely high prices stretching the distribution to the right. The Excess Kurtosis values are negative, ranging from -0.51195 to -0.76503, suggesting that the distributions are platykurtic or flatter than a normal distribution, implying fewer extreme values and a more uniform spread. Overall, the data indicates moderate to high price volatility,

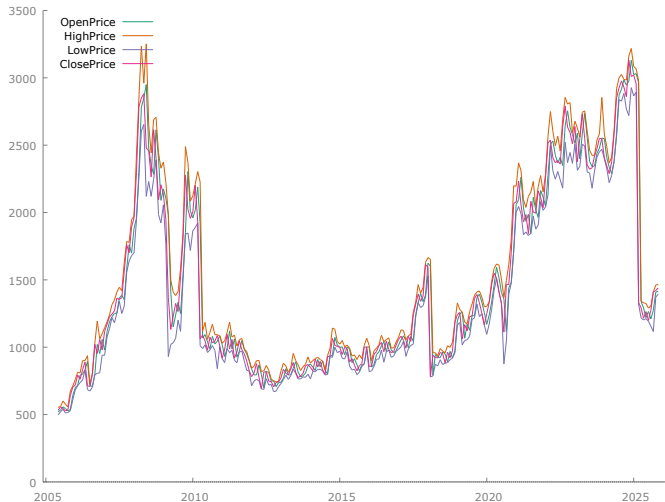
right-skewed distributions, and relatively flatter curves with fewer sharp spikes or outliers.

3.4 Price Movement Analysis

This section analyses the monthly price movement of Reliance Ltd. using a time series plot of Open, High, Low, and Close prices from 2005 to 2025, to identify long-term trends and short-term fluctuations in stock performance.

Figure 3.1 shows the trend.

Figure 3.1 Price Movement Analysis



Source: Secondary Data, Gretl Output

Interpretation

The time series chart from 2005 to 2025 shows a long-term upward trend in stock prices, with noticeable periods of volatility and correction. There are three major peaks visible—around 2008, 2021, and 2024—with sharp rises followed by steep declines, suggesting the impact of significant market events such as the global financial crisis, post-pandemic recovery, and a possible recent correction. The different colored lines, likely representing open, high, low, and close prices, move in similar patterns, with the high price consistently staying above others, indicating a reasonable intraday price spread. After a period of relative stability between 2014 and 2020, the market experiences increased volatility post-2020. A dramatic drop in prices around 2024, falling from around 3300 to below 1000, followed by a slight recovery, suggests a recent crash or correction and early signs of market rebound. Overall, the chart reflects long-term growth with intermittent market shocks, highlighting the

importance of cautious and long-term investment strategies.

3.5 Testing of Normality

Doornik-Hansen test for normality was applied to determine whether the data follows a normal distribution. The following hypothesis is formulated.

H₀ 1 The data for stock prices follows a normal distribution.

Table 3.3
Testing of Normality

Particulars	Test Statistic Value	p-Value
Open Price	122.755	2.20804
High Price	116.244,	5.7271e
Low Price	135.243	4.28795
Close Price	124.86	7.71006

Source: Secondary Data, Gretl Output

Since the p-values for all variables are significantly less than 0.05, the null hypothesis of normality is rejected, indicating that the data do not follow a normal distribution. Hence, we move forward to non-parametric test in testing of all hypotheses.

3.6 Directional Analysis

This section evaluates whether the monthly High Prices of the stock are consistently greater than the Close Prices over the study period. The analysis applies the Sign Test, a non-parametric statistical method used to determine the direction of differences in paired data. By examining the frequency of months in which the High Price exceeds the Close Price, this test helps identify any consistent directional pattern in price behaviour, which may reflect market dynamics, investor sentiment, or trading strategies. The following null hypothesis is formulated:

H_{01} There is no directional difference between the monthly high prices and closing prices of the stock.

The Sign Test assesses whether the number of positive and negative differences between paired observations is significantly different from what would be expected by chance.

Sign Test

Test for difference between High Price and Close Price

Number of differences: $n = 246$

Number of cases with High Price > Close Price:
 $w = 246$ (100.00%)

Under the null hypothesis of no difference, W follows $B(246, 0.5)$

$$\text{Prob}(W \leq 246) = 1$$

$$\text{Prob}(W \geq 246) = 8.84344\text{e-}075$$

The results of the sign test indicate that out of 246 observations, the High Price was greater than the Close Price in all cases (100%). Under the null hypothesis, which assumes no systematic difference between High Price and Close Price, such an extreme outcome is highly unlikely. The

probability of observing 246 positive differences out of 246 under a binomial distribution $B(246, 0.5)$ is extremely low ($p\text{-value} \approx 8.84 \times 10^{-75}$). This $p\text{-value}$ is far below any conventional significance level (such as 0.05), suggesting that the observed pattern is not due to random chance. Therefore, we reject the null hypothesis and conclude that High Prices are consistently and significantly higher than Close Prices in the dataset.

3.7 Pearson Correlation coefficient

To assess the relationship between stock price and trading turnover. Correlation coefficients, using the 246 observations 1 – 246, Two-tailed critical values for $n = 246$: 5% 0.1251, 1% 0.1640

Table 3.4

Corelation Matrix

Open Price	High Price	Low Price	Close Price	
1	0.991	0.9704	0.9639	Open Price
	1	0.9689	0.9754	High Price
		1	0.9903	Low Price
			1	Close Price

Interpretation

The Pearson correlation analysis was conducted to assess the linear relationship between various stock price variables: Open Price, High Price, Low Price, and Close Price, using 246 daily observations. The correlation coefficients between these variables are all very high and positive, indicating a strong linear association. Specifically, the Open Price shows a correlation of 0.9910 with the High Price, 0.9704 with the Low Price, and 0.9639 with the Close Price. Similarly, the High Price is strongly correlated with the Low Price (0.9689) and the Close Price (0.9754), while the Low and Close Prices are also highly correlated (0.9903).

All these coefficients are well above the critical values at the 5% (0.1251) and 1% (0.1640) significance levels, indicating that the relationships are statistically significant. These results suggest that stock price components (Open, High, Low, and Close) move closely together, and changes in one price type are strongly associated with changes in the others. This high degree of correlation is

typical in financial time series data, where daily price points are derived from the same trading activity.

3.8 Correlation with different prices

Table 3.5

High Price vs Other Prices

Compared With	Correlation Coefficient
Open Price	0.9910
Low Price	0.9689
Close Price	0.9754

Interpretation:

The High Price is strongly correlated with Open, Low, and Close Prices. A correlation of 0.9754 with Close Price means that when the high is significantly up during the day, the close is also likely to be high.

Table 3.6

Low Price vs Other Prices

Compared With	Correlation Coefficient
Open Price	0.9704
High Price	0.9689
Close Price	0.9903

Interpretation:

The Low Price has a very strong correlation with the Close Price (0.9903). This implies that stocks often close near the lowest point of the day, possibly indicating late-day selling pressure.

Table 3.7

Open Price vs Other Prices

Compared With	Correlation Coefficient
Low Price	0.9704
High Price	0.9909

Close Price	0.9638
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Interpretation

The correlation analysis reveals that the Open Price of Reliance stock maintains a very strong positive relationship with all other price variables. Its correlation with the Low Price (0.9704) indicates that months with higher opening values also tend to have higher lower bounds, showing the influence of the opening level on the monthly price floor. The correlation with the High Price (0.9909) is exceptionally strong, suggesting that optimistic openings are closely linked with higher peaks during the month. Similarly, the strong correlation with the Close Price (0.9638) demonstrates that the monthly closing level is largely shaped by the opening value, reflecting consistency across the trading cycle. Overall, these results confirm that the stock's monthly movements are strongly anchored to its opening position, with minimal divergence between opening, intramonth fluctuations, and closing levels.

Table 3.8 Close Price vs Other Prices

Compared With	Correlation Coefficient
Open Price	0.9639
High Price	0.9754
Low Price	0.9903

Interpretation:

The Close Price is most closely related to the Low Price. This shows that closing prices are strongly influenced by how low the stock went during the day. A strong correlation with High Price also indicates price consistency.

3.9 Corelation with close price and turnover

For the variables 'Close Price' and 'Total Turnover' Spearman's rank correlation coefficient (ρ) = 0.41243885

Under the null hypothesis of no correlation:

$T(244) = 7.07201$, with two-tailed p-value 0.0000

H02 There is no linear correlation between stock price and turnover

Interpretation

The Spearman's rank correlation analysis between Close Price and Total Turnover shows a coefficient of 0.4124, indicating a moderate positive relationship. This means that, in general, when the closing price increases, the trading turnover also tends to rise, although the relationship is not perfectly strong. The test statistic value of 7.072 with a p-value of 0.0000 confirms that this correlation is statistically significant, leading to the rejection of the null hypothesis of no correlation. Therefore, it can be concluded that there exists a meaningful and reliable association between the closing price and total turnover in the dataset.

Conclusion

This chapter provides a detailed analysis of the stock price behaviour of Reliance Industries Ltd over a 20-year period. The findings reveal that the stock prices exhibited significant volatility with right-skewed distributions, indicating the presence

of occasional extreme price values. Time series analysis showed a clear long-term upward trend interrupted by periods of sharp fluctuations, particularly during major economic events. The data did not follow a normal distribution, as confirmed by the Doornik-Hansen test, warranting the use of non-parametric methods like the Sign Test. The Sign Test results showed that in all observed months, the High Price was consistently higher than the Close Price, indicating a strong and significant directional pattern. Furthermore, Pearson correlation analysis demonstrated very strong positive relationships among Open, High, Low, and Close prices, while the correlation between prices and trading turnover was weak. Overall, the analysis highlights the dynamic nature of Reliance stock, its sensitivity to market conditions, and the strong interdependence among different price components.

Chapter-IV

FINDINGS AND SUGGESTIONS

4.1 Introduction

This chapter presents the consolidated results of the statistical analysis carried out on the stock price behaviour of Reliance Industries Ltd. over the 20-year period from January 2005 to June 2025. The findings are drawn from descriptive statistics, time series analysis, the Sign Test, and correlation techniques applied in the previous chapter. Together, they highlight the central tendency, dispersion, monthly price movements, directional differences between high and close prices, and long-term trends of the stock. Based on these empirical results, relevant suggestions are put forward for investors, policymakers, and researchers. The chapter concludes by summarising the overall implications of the study for understanding the long-term performance and volatility of Reliance stock.

Research Objectives

1. To describe the central tendency and dispersion characteristics of Reliance stock prices over the study period.
2. To analyse the monthly price movements of stock over a 20-year period from 2005 to 2025.
3. To examine the relationship between monthly stock price and turnover.
4. To identify any long-term trends in the performance of Reliance stock during the study period.

4.2 Summery of Findings

The analysis of Reliance Industries Ltd.'s stock prices from 2005–2025 shows that mean values were higher than medians, indicating right-skewed distributions influenced by extreme highs. Large standard deviations and similar coefficients of variation (~ 0.47) across all price variables confirm substantial and proportionate volatility. Time series analysis revealed a long-term upward trend with major peaks in 2008, 2021, and 2024, followed by

sharp declines linked to financial crises and market corrections. The Doornik–Hansen test rejected normality, leading to non-parametric testing. The Sign Test showed that High Prices were consistently greater than Close Prices, proving a significant directional difference. Correlation analysis indicated strong positive relationships among Open, High, Low, and Close prices, while Closing Price and Turnover showed only a moderate but significant positive correlation. Overall, Reliance stock displayed strong long-term growth with recurring volatility, making it favourable for long-term investment but risky for short-term speculation.

4.2.1 Summery of Data

The study is based on secondary data of Reliance Industries Ltd., covering a continuous period of 20 years from January 2005 to June 2025, comprising 246 monthly observations. The dataset includes four key stock price variables—Open Price, High Price, Low Price, and Close Price—along with Monthly Turnover to capture trading activity.

Among the prices, the High represents the maximum value recorded in a month, the Low indicates the minimum, the Open reflects the starting level, and the Close denotes the final trading value of the month. Turnover measures the total value or volume of shares traded and serves as an indicator of market activity and liquidity. This dataset provides a comprehensive basis for analysing stock price behaviour, examining volatility, identifying long-term trends, testing directional differences, and assessing the relationship between prices and turnover.

4.2.2 Central tendency and dispersion

1. The mean values of all stock price variables (Open, High, Low, and Close) are consistently higher than their respective medians, indicating a right-skewed distribution influenced by a few extreme high prices.
2. The minimum and maximum values show a wide price range, confirming that Reliance

stock experienced substantial fluctuations during the study period.

3. The average values of Open Price (₹1440.9) and Close Price (₹1441.2) are very close, which is typical of stable markets, while High and Low prices show wider ranges, pointing to significant intra-period volatility.
4. Standard Deviation values are high across all price variables (ranging from ₹634.44 to ₹721.49), reflecting considerable volatility in stock prices.
5. The Coefficient of Variation is approximately 0.47 for all price variables, showing that relative variability is almost the same across Open, High, Low, and Close prices.
6. Positive Skewness values for all variables confirm a right-skewed distribution, meaning most prices are clustered at the lower end, with a few extremely high prices stretching the distribution.

7. Negative Excess Kurtosis values (between -0.51 and -0.76) suggest the distributions are platykurtic, indicating flatter curves than a normal distribution with fewer extreme values and a more uniform spread.
8. Overall, Reliance stock prices during 2005–2025 displayed moderate to high volatility, right-skewness, and relatively flatter price distributions, highlighting both growth potential and investment risk.

Theoretical Linkage - Modern Portfolio Theory

The analysis of central tendency and dispersion of Reliance stock prices between 2005 and 2025 aligns closely with core concepts in statistics and financial theory, particularly the Modern Portfolio Theory (MPT) developed by Harry Markowitz. The higher means compared to medians indicate right-skewed distributions, consistent with the principle that means are more affected by extreme values than medians, reflecting occasional extreme highs that pulled the averages upward. The high standard deviation values signify greater

dispersion, confirming that stock prices are volatile—a concept directly linked to financial risk in investment theory and central to MPT, which emphasizes the evaluation of both expected returns and risk in decision-making. The similar coefficients of variation across all price variables show a comparable level of relative variability, supporting the statistical principle that CV allows meaningful risk comparisons across variables of different magnitudes. Furthermore, the positive skewness and negative excess kurtosis highlight deviations from normality, a well-documented feature in financial econometrics and acknowledged in extensions of MPT, which recognize that financial data often diverge from the normal distribution assumed in traditional models.

4.2.3 Monthly Price Movements

1. Reliance stock exhibited a long-term upward trend in prices between 2005 and 2025, indicating overall growth across the two decades.

2. Three major price peaks were observed—around 2008, 2021, and 2024—highlighting cycles of growth followed by corrections.
3. Each peak was followed by a sharp decline, reflecting the impact of significant market events such as the 2008 global financial crisis, post-pandemic corrections in 2021, and the recent downturn in 2024.
4. Between 2014 and 2020, stock prices remained relatively stable, suggesting a period of consolidation with limited volatility.
5. After 2020, volatility increased significantly, marked by rapid price movements and larger fluctuations.
6. A major crash occurred in 2024, when prices fell dramatically from around ₹3300 to below ₹1000, before showing early signs of recovery.
7. Throughout the period, High Prices consistently stayed above other variables

(Open, Low, Close), reflecting a systematic intraday spread in stock trading.

8. Overall, Reliance stock demonstrated long-term growth with intermittent market shocks, making it suitable for long-term investment but risky for short-term speculation.

Theoretical Linkage- Efficient Market Hypothesis (EMH)

The analysis of monthly price movements of Reliance stock from 2005 to 2025 fits into the framework of time series analysis and financial market theories, particularly the Efficient Market Hypothesis (EMH) proposed by Eugene Fama. The long-term upward trend observed over the two decades represents the trend component of time series, capturing growth driven by company fundamentals and market expansion. The sharp declines following peaks in 2008, 2021, and 2024 reflect the cyclical and irregular components, triggered by global financial crises, post-pandemic corrections, and recent downturns. The relatively

stable phase between 2014 and 2020 aligns with the concept of stationarity, where prices fluctuate within a narrow band before renewed volatility emerges, while the post-2020 period illustrates volatility clustering, with high fluctuations following phases of stability. According to EMH, stock prices incorporate all available information and respond rapidly to new events, which explains Reliance's sharp movements around major economic events. The consistent intraday spread, where High Prices remain above others, further supports the idea that markets continuously absorb trading activity and investor sentiment. At the same time, the cycles of volatility resonate with extensions of EMH, which acknowledge that market shocks, behavioral factors, and imperfect information can shape short-term fluctuations even within an efficient market framework.

4.2.4 Monthly Stock Price and Turnover

1. The Pearson correlation analysis shows very strong positive relationships among Open, High, Low, and Close prices, with

coefficients ranging between 0.9639 and 0.9910, indicating that these price variables move closely together.

2. The High Price is strongly correlated with the Close Price (0.9754), suggesting that when the stock reaches higher peaks, it generally ends the month with a higher closing level.
3. The Low Price shows its strongest correlation with the Close Price (0.9903), implying that closing prices are often influenced by how low the stock fell during the month, possibly due to late-session selling pressure.
4. The Close Price is most closely related to the Low Price (0.9903), further confirming that the stock frequently closes near its lower monthly levels, even while maintaining consistency with High Price movements.
5. The Spearman's rank correlation between Close Price and Total Turnover is 0.412,

indicating a moderate positive relationship—when prices rise, trading activity also tends to increase, though the association is not very strong.

6. The correlation between Close Price and Turnover is statistically significant ($p < 0.001$), leading to the rejection of the null hypothesis of no correlation, which confirms the existence of a meaningful link between stock price levels and trading activity.
7. Overall, the findings reveal that Reliance stock price variables are highly interdependent, and while turnover shows a positive association with closing prices, it plays only a moderate role in explaining price movements.

Theoretical Linkage- Market Microstructure Theory

The relationship between stock price and turnover reflects both statistical association and financial market dynamics. The strong correlations among

Open, High, Low, and Close prices confirm internal consistency in stock behavior, while the moderate positive correlation between Closing Price and Turnover ($\rho = 0.412$) suggests that higher prices generally attract greater trading activity, though turnover alone does not fully explain price movements. This aligns with the Market Microstructure Theory, which emphasizes that trading volume and liquidity influence price formation but are also shaped by broader macroeconomic and behavioral factors. It also resonates with the Liquidity–Price Relationship, which holds that greater liquidity tends to support stronger price movements, although the effect is rarely perfect. Thus, Reliance stock data shows that while turnover contributes to price dynamics, stock performance is ultimately driven by a combination of trading activity, investor sentiment, and external market conditions.

4.2.5 Long-term trends in the performance

- 1 Reliance stock displayed an overall upward trend in prices over the two decades (2005–

2025), reflecting long-term growth in company value and investor confidence.

- 2 The trend was interrupted by sharp volatility cycles, with major peaks around 2008, 2021, and 2024, followed by significant corrections.
- 3 The 2008 decline corresponded with the global financial crisis, while the 2021 correction followed the post-pandemic recovery phase, and the 2024 crash saw prices fall from about ₹3300 to below ₹1000 before partial recovery.
- 4 Between 2014 and 2020, the stock experienced a stable phase, showing limited volatility compared to other periods.
- 5 After 2020, volatility increased sharply, with wider price fluctuations and higher sensitivity to external shocks.
- 6 The consistent pattern of recovery after downturns suggests that Reliance stock follows a growth-with-shocks cycle, making

it attractive for long-term investors but relatively risky for short-term traders.

Theoretical Linkage- Business Cycle Theory

The long-term trend of Reliance stock from 2005 to 2025 reflects the interplay of trend, cyclical, and irregular components of time series analysis, supported by the Business Cycle Theory. The overall upward trajectory demonstrates the trend component, capturing persistent growth in stock value driven by company performance and market expansion. However, the sharp downturns in 2008, 2021, and 2024 highlight the cyclical and irregular components, as prices responded to external shocks such as the global financial crisis, post-pandemic corrections, and recent downturns. The relatively stable phase from 2014 to 2020 aligns with the concept of stationarity, where price movements remained within a narrow range before renewed volatility emerged. The subsequent recoveries after each downturn illustrate the principle of mean reversion, where prices tend to return to their long-term growth path. These

patterns align with Business Cycle Theory, which explains how expansions and contractions drive cyclical stock movements, while also resonating with the Random Walk Hypothesis, which recognizes that short-term fluctuations are unpredictable but long-term prices still reflect growth trends based on fundamentals and market efficiency.

4.3 Suggestions

1. Investors should adopt a long-term perspective and avoid panic during short-term fluctuations. Portfolio diversification can help reduce risk from extreme price movements.
2. Investors should remain invested through downturns, as Reliance has historically shown strong recovery after crises. Systematic investment strategies like SIPs (Systematic Investment Plans) could help average out risks.
3. Traders can use this consistent intraday spread for short-term trading opportunities.

However, stop-loss strategies must be applied since intraday peaks don't always reflect closing strength.

4. Price predictions should be based on interconnected price variables, as movements in one (e.g., opening price) reliably indicate trends in others. This supports the use of technical analysis tools.
5. Investors should track turnover alongside price trends, since rising prices accompanied by higher turnover often signal sustained bullish sentiment, while price increases with low turnover may indicate weaker momentum.

4.3.1 Scope for further studies

1. The present study focused on Reliance Industries Ltd.; future research can compare its stock performance with other leading companies in the energy, telecom, or FMCG sectors or with broader market indices like Nifty 50 or Sensex.

2. This study used monthly data; future studies may employ daily or weekly data to capture short-term price fluctuations and intraday volatility more accurately.
3. The inclusion of macroeconomic variables such as GDP growth, inflation, interest rates, crude oil prices, and exchange rates can provide a deeper understanding of the external factors influencing Reliance stock.

4.4 Conclusion

The study of Reliance Industries Ltd.'s stock prices over the twenty-year period from 2005 to 2025 reveals a pattern of long-term growth punctuated by periods of volatility and correction. Descriptive statistics highlighted right-skewed distributions, significant variability, and platykurtic patterns, confirming the presence of extreme price movements and deviations from normality. Time series analysis showed a clear upward trend with major peaks in 2008, 2021, and 2024, each followed by sharp declines linked to global financial crises and economic corrections, before

showing recovery. The Sign Test established that High Prices were consistently greater than Close Prices, reflecting a systematic and significant directional pattern in trading. Correlation analysis demonstrated very strong positive relationships among Open, High, Low, and Close prices, indicating high internal consistency, while the moderate correlation between price and turnover suggested that liquidity contributes to price dynamics but is not the sole driver.

Overall, the findings confirm that Reliance stock is attractive for long-term investors due to its steady growth trajectory, but its short-term volatility poses risks for speculators. The results also reinforce the relevance of combining statistical measures with financial theories to interpret stock market behaviour. For policymakers, researchers, and investors, the study underlines the importance of monitoring economic events, adopting risk management strategies, and applying advanced forecasting tools to better understand and navigate stock price movements.

REFERENCES

- NSE India (2025). *Historical Stock Price Data of Reliance Industries Ltd.* Retrieved from <https://www.nseindia.com>
- BSE India (2025). *Market Statistics and Company Information.* Retrieved from <https://www.bseindia.com>
- Gujarati, D. N., & Porter, D. C. (2020). *Basic Econometrics* (6th ed.). New York: McGraw-Hill Education.
- Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., & Cochran, J. J. (2019). *Statistics for Business and Economics* (13th ed.). Cengage Learning.
- Brooks, C. (2019). *Introductory Econometrics for Finance* (4th ed.). Cambridge University Press.
- Gretl (2025). *GNU Regression, Econometrics and Time-series Library.* Software package, available at <http://gretl.sourceforge.net>

Khan, M. Y., & Jain, P. K. (2021). *Financial Management: Text, Problems and Cases* (8th ed.). Tata McGraw-Hill.

Reserve Bank of India (2025). *Macroeconomic Indicators and Financial Market Reports*. Retrieved from <https://www.rbi.org.in>

World Bank (2024). *Global Economic Prospects*. Washington, DC: World Bank Publications.