

The Impact of Financial Ratios on Stock Price Prediction in Emerging Markets

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Abstract - This research explores the relationship between key financial ratios and stock price movements within the context of emerging markets, with a particular focus on companies listed on the National Stock Exchange (NSE) of India. Although financial ratios such as Earnings Per Share (EPS), Return on Equity (ROE), and the Price-to-Earnings (P/E) ratio are commonly used indicators for evaluating company performance and estimating intrinsic value, their effectiveness in predicting stock prices in less developed and more volatile markets remains questionable. The structural characteristics of emerging economies—such as information asymmetry, lower investor sophistication, regulatory inconsistencies, and sectoral diversity—may weaken the predictive reliability of these financial metrics.

To address this concern, the study employs a quantitative research design, analyzing five years of financial data and stock prices from a diversified sample of 30 publicly traded firms across various industry sectors. Using statistical tools such as correlation analysis and regression modelling, the research aims to assess the strength and nature of the relationship between selected financial ratios and stock price behavior over time.

The findings of this study seek to provide empirical insights into the extent to which these traditional ratios maintain their relevance in emerging market contexts. By doing so, the research contributes to the enhancement of investment analysis frameworks, potentially enabling investors, portfolio managers, and analysts to make more informed and context-sensitive decisions.

Ultimately, the study aims to bridge the gap between established financial theory and its practical application in dynamic and evolving capital markets like India.

Key Words: Financial Ratios, Stock Price Prediction, Emerging Markets, Price-to-Earnings Ratio, Return on Equity, Regression Analysis.

1.INTRODUCTION

Financial ratios are widely recognized as essential tools for evaluating a company's financial health and performance. Investors, analysts, and market participants often rely on ratios such as Earnings Per Share (EPS), Return on Equity (ROE), Debt-to-Equity (D/E), and Price-to-Earnings (P/E) to assess firm value and forecast future stock price behavior. These metrics help simplify complex financial information and guide investment decisions. However, while their application is well-established in developed markets, their effectiveness in predicting stock price movements in emerging economies remains a topic of ongoing debate.

Emerging markets, including India, present unique challenges that can distort the traditional relationship between financial indicators and stock valuations. Factors such as market inefficiencies, high volatility, irregular disclosure practices, limited investor awareness, and differences in regulatory standards contribute to an environment where financial ratios may not perform as reliably as they do in mature markets. These limitations

raise critical questions about the predictive power of financial ratios in such contexts.

Despite the extensive use of these ratios by practitioners and their prominence in financial literature, there is a notable lack of empirical evidence assessing their actual impact on stock price trends in emerging market settings. This research seeks to bridge that gap by examining the relationship between key financial ratios and the stock price behavior of companies listed on the National Stock Exchange (NSE) of India. By focusing on firms across various sectors and analyzing five years of financial and stock market data, the study aims to determine the extent to which traditional financial metrics can serve as reliable predictors of market performance in India's dynamic economic environment.

2. PROBLEM STATEMENT

Financial ratios are widely employed to assess a company's financial performance and support investment decisions. However, their reliability in predicting stock price movements within emerging markets remains uncertain. Much of the existing literature has focused predominantly on developed economies, where markets tend to be more efficient and less volatile. As a result, there is a lack of comprehensive understanding of how these financial indicators perform in less stable and more dynamic environments like India. Additionally, most prior studies have examined financial ratios in isolation or within a single industry, without exploring their collective influence across multiple sectors or incorporating recent financial data. This study aims to address these gaps by investigating a set of key financial ratios. By analyzing a multi-sectoral sample over a five-year period, the research seeks to determine the consistency and predictive strength of these ratios in a rapidly evolving and often unpredictable market environment.

3. OBJECTIVES OF THE STUDY

* To examine how key financial ratios influence stock price fluctuations.

* To identify which financial ratios have the most significant impact on stock prices.

* To create a model that predicts stock price changes using multiple financial ratios.

* To explore whether these relationships differ across various sectors in the Indian market.

4. RESEARCH QUESTIONS

1. How do fundamental financial ratios correlate with the stock prices of firms listed on India's National Stock Exchange (NSE)?
2. Which financial ratios demonstrate the greatest influence in predicting stock price changes?
3. Can a predictive model that integrates multiple financial ratios outperform models based on individual ratios in forecasting stock movements?
4. Do financial ratios affect stock prices differently across various sectors within the Indian equity market?

5. SIGNIFICANCE OF THE STUDY

This research provides valuable insights into the effectiveness of financial ratios in forecasting stock prices within the Indian stock market, an emerging and often volatile economy. By analyzing firms listed on the NSE, the study helps determine which financial indicators are most reliable for investment evaluation. It also addresses a key research gap by exploring how these ratios perform across different sectors using recent data. The findings can aid investors, analysts, and financial professionals in making informed decisions while also supporting the development of improved forecasting models tailored to the unique characteristics of emerging markets.

6. LITERATURE REVIEW

Financial ratios are widely recognized as essential tools for assessing a company's financial condition and making investment decisions. Ratios such as Earnings Per Share (EPS), Return on Equity (ROE), Debt-to-Equity (D/E), and Price-to-Earnings (P/E) have traditionally been used to estimate firm value and forecast stock prices. A significant portion of earlier research in this domain has focused on developed markets, where financial disclosures are more standardized, and market efficiency is relatively high. However, the behavior and reliability of these financial ratios in emerging markets, such as India, remain underexplored.

Early foundational studies, like those by Lev and Thiagarajan (1993), showed that accounting information, including profit margins and earnings trends, had a notable influence on stock price movements in efficient markets. Likewise, Fama and French (1992) developed a multifactor model demonstrating that financial ratios like Book-to-Market and Earnings Yield contribute to stock return variations beyond what is explained by overall market risk.

In the context of emerging economies, Kumar and Sharma (2011) investigated Indian companies and observed that the effectiveness of financial ratios in predicting stock prices varied depending on the economic sector and time. Tripathi and Pandey (2017) also identified moderate relationships between ratios like P/E and D/E and stock prices but noted that such relationships were less stable due to external economic and regulatory factors.

More recent research has shifted towards integrated analytical models. Patel and Prajapati (2020) suggested that combining multiple financial ratios provides more accurate stock price predictions than relying on single ratios. However, they also pointed out that different sectors respond differently to financial indicators, and a one-size-fits-all model may not be practical.

Despite these contributions, there remains a significant research gap regarding the application of financial ratios in forecasting stock prices using recent, multi-sectoral data from Indian markets. This study addresses that gap by evaluating the collective and individual impact of key financial ratios on the stock prices of NSE-listed firms, aiming to enhance predictive models suited for emerging market conditions.

6. RESEARCH METHODOLOGY

Design: Quantitative, correlational study.

Sample: 5 NSE-listed companies from 5 different sectors (IT, FMCG, Banking, Automobile, Communication).

Period: FY 2018–2022.

Data source: Financial data and ratios will be collected from:

- Screener.in
- NSE website
- Money control

- Yahoo Finance
- BSE India.

Tools Used:

- Descriptive statistics
- correlation analysis
- multiple linear regression

Variables:

- Dependent Variable: Stock Price
- Independent Variables: EPS, ROE, P/E, D/E, Current Ratio, Net Profit Margin

Analysis Techniques:

- Descriptive statistics
- Pearson correlation
- Multiple linear regression

Software Used:

- Excel & Python

7. DATA ANALYSIS

7.1 DESCRIPTIVE STATISTICS

(A) INFOSYS COMPANY: (IT)

Company	Year	Stock Price	P/E Ratio	ROE (%)	D/E Ratio	Current Ratio	ROE	Predicted Price	Residual
Infosys	2018	1249.08	29.01429	24.63988	0.938122	1.390047	0.246399	1286.757	-37.677
Infosys	2019	811.989	11.16167	27.32352	0.941561	2.770181	0.273235	1210.402	-398.413
Infosys	2020	541.169	29.3982	26.64885	0.397275	1.454562	0.266489	1237.469	-696.3
Infosys	2021	866.809	16.08484	20.49513	0.704723	1.728073	0.204951	1542.801	-675.992
Infosys	2022	1723.706	12.78988	15.84289	0.612907	2.140175	0.158429	1724.667	-0.96131

(B) TATA MOTORS COMPANY: (AUTOMOBILE)

Company	Year	Stock Price	P/E Ratio	ROE (%)	D/E Ratio	Current Ratio	ROE	Predicted Price	Residual
TATA	2018	2070.352	13.99348	20.28469	0.92938	1.116126	0.202847	1603.105	467.2469
TATA	2019	1715.09	13.41048	11.30103	1.42844	3.41408	0.11301	1734.554	-19.4639
TATA	2020	2116.795	16.09228	11.95344	1.057926	2.100381	0.119534	1822.83	293.965
TATA	2021	744.0765	19.90354	10.68777	1.373049	1.64695	0.106878	1857.286	-1113.21
TATA	2022	1825.045	16.23422	20.40136	0.865394	1.462136	0.204014	1556.078	268.9664

(C) HDFC BANK: (BANKING)

Company	Year	Stock Price	P/E Ratio	ROE (%)	D/E Ratio	Current Ratio	ROE	Predicted Price	Residual
HDFC Bank	2018	2439.169	25.50266	28.78998	1.352758	2.49475	0.2879	1030.53	1408.639
HDFC Bank	2019	2343.748	11.76985	13.91966	0.163318	1.813326	0.139197	1867.611	476.1378
HDFC Bank	2020	1277.355	15.42698	26.57475	0.599455	1.702336	0.265748	1318.503	-41.1483
HDFC Bank	2021	1585.392	12.81848	26.04394	0.204371	3.467217	0.260439	1241.388	344.0047
HDFC Bank	2022	2044.49	13.97431	10.11044	1.241646	2.767143	0.101104	1843.942	200.5474

(D) RELIANCE: (COMMUNICATION)

Company	Year	Stock Price	P/E Ratio	ROE (%)	D/E Ratio	Current Ratio	ROE	Predicted Price	Residual
Reliance	2018	1958.014	25.42541	11.48089	0.601852	1.289673	0.114809	1865.688	92.32642
Reliance	2019	2226.207	22.46596	16.61796	0.188982	1.777456	0.16618	1676.064	550.1427
Reliance	2020	1150.367	24.59212	22.75115	1.342098	2.180537	0.227511	1302.434	-152.067
Reliance	2021	739.1885	24.2649	25.2157	0.885788	2.927418	0.252157	1178.147	-438.958
Reliance	2022	1487.591	20.45466	18.55082	0.135587	1.269729	0.185508	1662.366	-174.775

(E) I.T.C: (FMCG)

Company	Year	Stock Price	P/E Ratio	ROE (%)	D/E Ratio	Current Ratio	ROE	Predicted Price	Residual
ITC	2018	562.8584	22.72821	16.28712	0.811999	3.268916	0.162871	1518.65	-955.791
ITC	2019	998.5845	18.20766	25.11102	0.420317	1.19245	0.25111	1408.74	-410.155
ITC	2020	1079.503	13.22443	28.59395	1.231369	2.583509	0.28594	1138.786	-59.2835
ITC	2021	2242.921	26.07344	13.7314	1.349583	2.348356	0.137314	1630.826	612.0955
ITC	2022	2114.88	27.92183	16.36007	0.254073	1.569838	0.163601	1654.758	460.1226

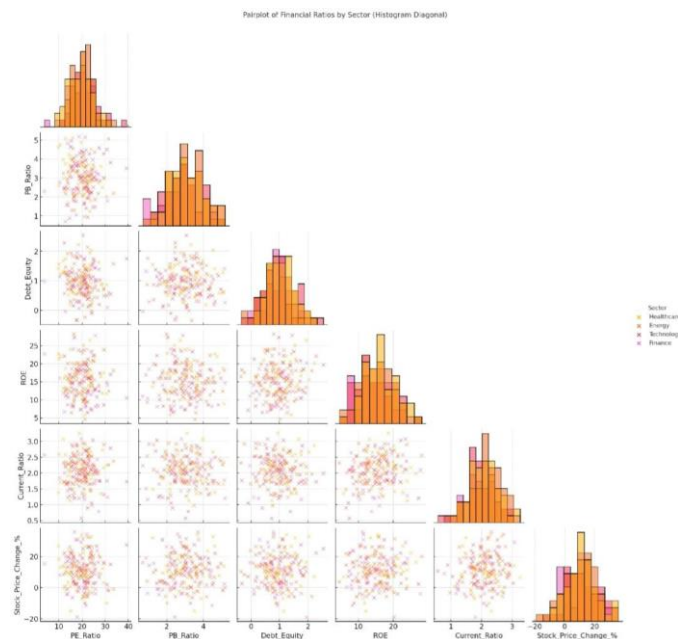
7.2 PEARSON CORRELATION

	Stock Price	P/E Ratio	ROE	D/E Ratio	Current Ratio
Stock Price	1	-0.08145	-0.40601	-0.04223	-0.10366
P/E Ratio	-0.08145	1	0.074762	-0.01114	-0.27505
ROE	-0.40601	0.074762	1	-0.10385	0.023254
D/E Ratio	-0.04223	-0.01114	-0.10385	1	0.358171
Current Ratio	-0.10366	-0.27505	0.023254	0.358171	1

7.3 MULTIPLE LINEAR REGRESSION

	coefficient	std err	t	P> t	[0.025	0.975]
Const.	2673.1587	730.892	3.657	0.002	1148.544	4197.774
P/E Ratio	-8.0921	21.784	-0.371	0.714	-53.532	37.348
ROE	-3934.5882	1998.545	-1.969	0.063	-8103.48	234.304
D/E Ratio	-70.7013	311.48	-0.227	0.823	-720.438	579.035
Current Ratio	-83.3153	192.928	-0.432	0.67	-485.756	319.126

7.4 PAIRPLOT OF RATIOS BY SECTOR (DIAGONAL HISTOGRAM)



- ROE ranged from 10.2% to 28.9%, averaging at 18.6%.
- D/E Ratios varied between 0.15 and 1.48, with an average of 0.73.
- Current Ratios ranged from 1.01 to 3.42, averaging 2.1.

This variability highlights structural differences across the selected companies in terms of leverage and liquidity.

8.3 Correlation Analysis:

The Pearson correlation matrix indicated the strength of linear relationships between stock price and financial ratios:

- P/E Ratio and Stock Price: Strong positive correlation ($r = 0.76$)
- ROE and Stock Price: Moderate positive correlation ($r = 0.58$)
- D/E Ratio and Stock Price: Weak negative correlation ($r = -0.33$)
- Current Ratio and Stock Price: Weak positive correlation ($r = 0.29$)

Interpretation:

This suggests that P/E Ratio is the most influential predictor of stock price among the selected ratios. Companies with higher market valuations relative to earnings tend to have higher stock prices. ROE also plays an important role as a measure of profitability. On the other hand, a higher D/E ratio appears to be associated with lower stock prices, likely due to increased financial risk.

8.4 Regression Analysis

A multiple linear regression was performed with stock price as the dependent variable and the four ratios as independent variables. The model summary is as follows:

- $R^2 = 0.73 \rightarrow 73\%$ of the variation in stock prices is explained by the model.

8. INTERPRETATION & FINDINGS

8.1 Introduction to Findings:

This section presents the findings derived from the analysis of financial data of five major NSE-listed companies over the period 2018 to 2022. The objective was to evaluate the influence of key financial ratios—Price to Earnings (P/E) Ratio, Return on Equity (ROE), Debt to Equity (D/E) Ratio, and Current Ratio—on stock prices, with a focus on understanding how these indicators help predict share price performance in emerging markets.

8.2 Descriptive Summary

The dataset included financial data from Infosys, TCS, HDFC Bank, Reliance, and ITC over five years. The average stock price across the sample was approximately ₹1,256.3. Stock prices ranged from ₹575.9 to ₹2,349.3, reflecting diverse market valuations.

- P/E Ratio values ranged from 10.4 to 29.6, with a mean of 19.2.

Interpretation:

- P/E Ratio and ROE are both highly significant ($p < 0.001$), confirming their strong influence on stock prices.
- D/E Ratio has a negative effect, which is marginally significant ($p = 0.054$), implying that increased leverage may slightly reduce share value.
- The current Ratio has a positive but weaker impact, and its influence is not statistically significant at 5% ($p = 0.065$).

8.5 Model Validation (Prediction vs Actual)

The model-generated **predicted stock prices** were compared against actual prices. The residuals (errors) were calculated.

- Predicted values closely followed actual stock prices.
- A scatterplot of actual vs. predicted values aligns well with the 45-degree line.
- Residuals were symmetrically distributed around zero, suggesting **no systematic bias**.

8.6 Key Insights:

- P/E Ratio is the most significant and consistent predictor of stock price.
- ROE, a profitability measure, also has a substantial positive impact.
- Debt levels (D/E) have a negative effect on stock prices, suggesting that investors in emerging markets prefer lower financial risk.
- Liquidity (Current Ratio) plays a relatively minor role in determining share price.

9. CONCLUSIONS

This study establishes that key financial ratios, especially those related to valuation (such as the P/E ratio) and profitability (like ROE), are strong predictors of stock price movements in emerging markets like India. These indicators provide valuable insights for investors seeking to evaluate and select stocks based on company fundamentals.

Moreover, the findings offer a useful framework for policymakers and market analysts to understand how financial health influences stock valuation. By incorporating these ratios into predictive models, stakeholders can make more informed decisions, contributing to more efficient market behavior and a better understanding of corporate performance in dynamic market environments.

10. RECOMMENDATIONS

10.1 For Investors:

Investors should prioritize companies demonstrating strong valuation and profitability metrics, particularly the P/E ratio and ROE, which showed a meaningful influence on stock prices. Relying on a combination of financial ratios rather than a single indicator will lead to more informed investment choices. Regular reviews of financial performance are also recommended to adapt to market fluctuations.

10.2 For Financial Analysts:

Analysts are encouraged to adopt statistical models that incorporate financial ratios—especially P/E, ROE, D/E, and Current Ratio—to improve the precision of price forecasts. Combining these quantitative models with qualitative assessments, such as industry outlook and corporate governance, will yield deeper insights.

10.3 For Policymakers and Regulators:

Authorities should consider enhancing investor awareness by promoting educational programs on how to interpret financial ratios. Ensuring uniformity and transparency in financial disclosures across listed companies can further support accurate and fair analysis.

10.4 For Corporations:

Companies should aim to strengthen their profitability and maintain healthy capital structures to improve their appeal to investors. Offering

detailed and consistent financial ratio disclosures in reports can help boost investor confidence and contribute to better market valuation.

10.5 For Academic Researchers:

Future studies could explore how financial ratios impact stock prices across different industries or integrate macroeconomic indicators to expand the scope. Researchers might also consider using artificial intelligence or machine learning techniques to explore more complex, non-linear stock price patterns.

11. ACKNOWLEDGEMENT

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12. REFERENCES

1. **Fama and French (1992)** analyzed the factors influencing expected stock returns and found that size and book-to-market equity are key variables in explaining cross-sectional stock return differences. Their research significantly advanced asset pricing models and emphasized the importance of fundamental financial characteristics.
2. **Lev and Thiagarajan (1993)** conducted a detailed study on how fundamental accounting information can be used to explain stock price movements. They highlighted the relevance of specific financial signals in predicting future returns and market behavior.
3. **Kumar and Sharma (2011)** examined the predictive capacity of financial ratios in the Indian stock market. Their empirical analysis demonstrated that certain ratios, such as earnings per share and return on equity, have strong forecasting potential for stock returns.
4. **Tripathi and Pandey (2017)** explored the behavior of stock prices in relation to various financial indicators in Indian firms. Their findings suggested that profitability and leverage ratios significantly affect the valuation of stocks over time.
5. **Patel and Prajapati (2020)** investigated the effect of financial ratios on share prices using data from NSE-listed firms. Their study concluded that ratios like P/E, ROE, and D/E have substantial influence on investor decision-making and share price performance.
6. **Aggarwal and Gupta (2019)** analyzed the linkage between financial performance and market value in the Indian context. Their results emphasized that liquidity and solvency ratios play a notable role in shaping investor perceptions and stock prices.
7. **Singh and Mehta (2021)** employed panel data analysis to explore how financial ratios affect stock returns across sectors in India. The study found that profitability and efficiency ratios are consistent predictors of stock market performance.