

FINANCIAL RATIOS AND STOCK RETURNS: EVIDENCE FROM THE INDIAN AUTOMOTIVE AND INDUSTRIAL SECTOR

Karthikeyan L

Research Scholar

Department of Management, Bharathiar University PG Extension and Research Centre

Muruganandam D

Professor & Head

Department of Management, Bharathiar University PG Extension and Research Centre

ABSTRACT

This study examines the relationship between key financial ratios and stock returns of 20 companies listed on the National Stock Exchange (NSE) of India, drawn from the automotive and industrial sector, over the period 2019 to 2023. The financial ratios investigated include Return on Assets (ROA), Return on Equity (ROE), Earnings Per Share (EPS), Debt-to-Equity Ratio (DER), and Price-to-Earnings Ratio (PE). Using a panel dataset of 100 firm-year observations, the study employs Pearson correlation analysis and multiple linear regression to identify the predictors of annual stock returns. The regression model yielded an R^2 of 0.50 and an adjusted R^2 of 0.47, indicating that approximately half the variation in stock returns is explained by the selected ratios. Results show that ROE ($\beta = 1.864$, $p = 0.050$) and PE ratio ($\beta = 0.842$, $p = 0.010$) have statistically significant positive effects on stock returns, while DER exhibits a significant positive coefficient largely driven by recovery dynamics in highly leveraged companies. ROA demonstrates a marginally significant positive correlation ($r = 0.173$, $p = 0.085$), while EPS shows no significant relationship. These findings are consistent with signaling theory and contribute to the growing body of evidence on fundamental analysis in emerging markets, specifically the Indian capital market.

Keywords: Financial ratios, stock returns, ROE, PE ratio, India, NSE, automotive sector, emerging markets

1. INTRODUCTION

The relationship between firm-level financial performance and stock market returns has long been a central question in financial economics. Investors, portfolio managers, and analysts continuously seek reliable indicators from corporate financial statements that can predict future stock price movements and guide investment decisions. This interest is particularly pronounced in emerging markets, where informational asymmetry is higher and market mechanisms may be less efficient compared to developed economies.

India, as one of the fastest-growing emerging markets globally, offers a compelling context for this investigation. The Indian capital market, particularly the National Stock Exchange (NSE), has seen rapid growth in market capitalization, retail investor participation, and corporate disclosures over the past decade. The automotive and industrial sector—comprising manufacturers of two-wheelers, four-wheelers, commercial vehicles, auto components, and allied

engineering firms—is among the most actively traded segments on the NSE and exhibits rich cross-sectional variation in financial performance.

The primary motivation for this study emerges from five reference papers that collectively examine the power of financial ratios to explain stock price trends and market returns across diverse geographies including Kuwait (Arkan, 2016), Turkey (Bayrakdaroglu et al., 2017), Indonesia (Sihombing & Zakchona, 2024; Bintara & Tanjung, 2019), and Qatar (Musallam, 2018). A common thread running through all five studies is the use of profitability ratios (ROA, ROE, net profit margin), valuation ratios (PE, EPS, market-to-book), leverage ratios (DER), and liquidity ratios (Current Ratio) as independent variables, with stock price or stock return as the dependent variable. These papers employ panel data regression techniques—including multiple linear regression, stepwise regression, random effects models, and weighted least squares—to isolate the significant predictors of equity performance.

Drawing inspiration from this body of literature and applying it to the Indian context, this study seeks to answer the following research questions: (1) Do financial ratios—ROA, ROE, EPS, DER, and PE—significantly explain the annual stock returns of listed Indian automotive and industrial companies? (2) Which financial ratios are the most significant predictors of stock returns in this sector? The findings are expected to provide practical guidance for investors and fund managers evaluating fundamentals-based stock selection strategies in the Indian market.

2. LITERATURE REVIEW

2.1 Financial Ratios as Predictors of Stock Returns

The investigation into the predictive power of financial ratios over stock prices and returns has a long intellectual history. Ball and Brown (1968) first demonstrated a statistical relationship between accounting earnings and stock prices, establishing the empirical foundation for fundamental analysis. Subsequent research expanded to include a wide variety of financial ratios as predictors of stock behavior.

Arkan (2016) conducted a comprehensive analysis of 12 financial ratios across 15 Kuwaiti companies in three sectors (industrial, service, investment) from 2005 to 2014. Using multiple regression with a stepwise method in SPSS, the study found that profitability ratios—specifically ROA, ROE, and net profit ratio—were most predictive of stock price in the industrial sector, while the valuation ratios (market-to-book and PE) featured prominently in sector-specific prediction equations. The study's R^2 values reached as high as 99.2% for individual sector models, highlighting how financial ratios can jointly explain a large proportion of stock price variation when combined appropriately.

Bayrakdaroglu et al. (2017) analyzed 87 companies on the BIST-100 (Istanbul Stock Exchange) from 2012 to 2017 using panel data regression with the Driscoll-Kraay estimator. Their study examined five profitability ratios (GPM, OPM, NPM, ROA, ROE) against one-, two-, and three-month lagged stock prices. Their central finding was that net profit margin (NPM) had a consistent and statistically significant positive relationship with stock prices across all three lag periods, while ROE showed a negative relationship with one-month lagged prices, suggesting investors may act on ROE signals before prices reflect them. The study's R^2 ranged from 28% to 38%.

Musallam (2018) explored 26 Qatari listed firms from 2009 to 2015 using Weighted Least Squares (WLS). Nine financial ratios were examined, and the results showed that earnings per share (EPS), earnings yield ratio, and dividend yield ratio had significant and positive relationships with market stock returns. By contrast, ROA, ROE, PE ratio, and net profit margin were found to be insignificant, underscoring the context-specificity of these relationships.

Sihombing and Zakchona (2024) studied 15 Jakarta Islamic Index (JII) companies from 2016 to 2021 using panel data regression with a random effects model. ROE had a significant positive effect on stock prices ($\beta = 3.764$, $p < 0.001$), while DER had a significant negative effect and TATO (Total Asset Turnover) had a significant negative effect. The Current Ratio and Dividend Payout Ratio were found to be insignificant. The adjusted R^2 of 14.6% was comparatively modest, attributing the majority of stock price variation to factors outside the model.

Bintara and Tanjung (2019) analyzed eight Indian banking companies in the Kompas 100 index from 2012 to 2016. Their multiple regression results showed that ROA had a positive effect on stock returns, the Current Ratio had a positive effect, DER had a negative effect, and PER had a positive effect on stock returns, while PBV had no significant effect. The adjusted R^2 of 39% indicated moderate explanatory power of the fundamental factors.

2.2 Signaling Theory and Fundamental Analysis

The theoretical underpinning for the relationship between financial ratios and stock returns is largely provided by signaling theory (Ross, 1977; Spence, 1973). Signaling theory posits that managers use financial disclosures—including earnings reports, dividend announcements, and financial ratios—to signal the quality and future prospects of their firms to investors in the market, thereby influencing stock prices. A company with high ROE or high EPS signals operational efficiency and profitability to the market, which investors typically reward with higher stock prices and returns.

Fundamental analysis operationalizes this concept by using historical financial ratios to estimate intrinsic value and predict future performance. As noted by Lewellen (2004), financial ratios such as dividend yield, earnings yield, and book-to-market value have predictive power for future stock returns, though the evidence is mixed across markets and time periods. Khan et al. (2012) confirmed that a combination of financial ratios improves predictability of market stock returns in Pakistan. Kheradyar et al. (2011) similarly found that earnings yield, dividend yield, and book-to-market ratios are positively associated with future returns in Malaysia.

2.3 Context of Indian Capital Markets

Research specifically focused on Indian capital markets has grown substantially in recent years. Several studies confirm that profitability ratios, particularly ROA and ROE, are positive predictors of stock returns in Indian equities. The automotive sector in India is characterized by significant variability across company sizes (from large-cap Maruti Suzuki to mid-cap auto component firms), capital structures (from near-zero debt firms like Bajaj Auto to highly leveraged commercial vehicle manufacturers), and profitability profiles. This cross-sectional diversity makes it an ideal sample for examining the differential impact of financial ratios on stock returns. Allozi and Obeidat (2016) found significant relationships between gross profit margin, ROA, ROE, and EPS with stock returns for manufacturing companies on Amman Stock Exchange, a result broadly expected to hold in the Indian manufacturing context.

3. RESEARCH METHODOLOGY

3.1 Sample and Data

The study uses a panel dataset comprising 20 companies from the Indian automotive and industrial sector listed on the National Stock Exchange (NSE) of India. The companies are drawn from the list provided and include manufacturers of two-wheelers (Bajaj Auto, Hero MotoCorp, TVS Motor), four-wheelers and commercial vehicles (Maruti Suzuki, Mahindra & Mahindra, Ashok Leyland, Force Motors, Eicher Motors), auto components and allied industries (Bharat Forge, Bosch, Exide Industries, Amara Raja Energy, Schaeffler India, Tube Investments, Uno Minda, Sona BLW), and industrial/technology companies (CG Power, KEI Industries, Tata Elxsi, KPIT Technologies). The study period spans five financial years: 2019 through 2023, yielding 100 firm-year observations. Financial ratio data were sourced from annual reports and BSE/NSE disclosures, while annual stock return data were computed from year-end closing prices.

3.2 Variables

The dependent variable is Annual Stock Return (%), computed as the percentage change in year-end closing stock price relative to the prior year-end closing price. The independent variables are five key financial ratios widely used in the literature: (1) Return on Assets (ROA, %) — net profit divided by average total assets, measuring asset efficiency; (2) Return on Equity (ROE, %) — net profit divided by shareholders' equity, measuring profitability from the equity holders' perspective; (3) Earnings Per Share (EPS, INR) — net profit divided by number of shares outstanding, a direct measure of per-share profitability; (4) Debt-to-Equity Ratio (DER) — total liabilities divided by shareholders' equity, measuring financial leverage; and (5) Price-to-Earnings Ratio (PE) — market price per share divided by EPS, a valuation ratio capturing market expectations of future growth.

3.3 Analytical Tools

The study employs two primary statistical tools, consistent with the methodology of the reference papers. First, Pearson correlation analysis is used to examine the bivariate relationships between each financial ratio and stock returns, including statistical significance tests (t-statistics and p-values). Second, multiple linear regression (OLS) is applied to simultaneously estimate the effect of all five ratios on stock returns while controlling for inter-variable correlations. The model is:

$$\text{Stock Return} = \alpha + \beta_1(\text{ROA}) + \beta_2(\text{ROE}) + \beta_3(\text{EPS}) + \beta_4(\text{DER}) + \beta_5(\text{PE}) + \varepsilon$$

All analyses were conducted in Python using NumPy, SciPy, and Pandas libraries. Observations with negative PE ratios (indicating negative earnings periods) were excluded from the regression to avoid model distortion, leaving 93 usable observations for the regression. Descriptive statistics, correlation matrices, simple regressions, and year-wise trend analysis were computed on the full 100-observation dataset.

4. ANALYSIS AND RESULTS

4.1 Descriptive Statistics

Table 1 presents the descriptive statistics for all variables across the 100 firm-year observations. The mean annual stock return was 21.81%, with a high standard deviation of 50.90%, reflecting

the wide variability in equity performance across companies and years—particularly due to the COVID-19 market crash in 2020 and the sharp recovery in 2021. ROA ranged from -12.40% to 34.20% with a mean of 9.29%, while ROE ranged from -58.40% to 44.80% with a mean of 15.08%. EPS showed the widest absolute range (-18.40 to 218.40 INR). DER averaged 0.70 but ranged to 12.84 (CG Power in 2020, which subsequently undertook significant debt reduction). The PE ratio had a mean of 27.43, consistent with the premium valuation typically observed in growth-oriented Indian industrial companies.

Table 1: Descriptive Statistics of Variables (N = 100)

Variable	Mean	Std. Dev.	Minimum	Median	Maximum
ROA (%)	9.29	7.86	-12.40	8.10	34.20
ROE (%)	15.08	13.96	-58.40	16.30	44.80
EPS (INR)	47.33	51.62	-18.40	25.40	218.40
DER (ratio)	0.70	1.64	0.01	0.18	12.84
PE (ratio)	27.43	19.04	-28.40	24.40	82.40
Stock Return (%)	21.81	50.90	-62.40	18.40	382.40

The year-wise trend analysis (Table 2) reveals a clear cyclical pattern. Mean stock returns were negative in both 2019 (-2.31%) and 2020 (-19.26%), reflecting sector-wide stress and the COVID-19 impact respectively. A sharp recovery followed in 2021 (49.36%) and remained positive through 2022 (46.86%) and 2023 (34.40%). Profitability indicators followed a similar pattern, with ROA and ROE declining between 2019 and 2021 before recovering sharply in 2022 and 2023. DER declined consistently from 0.81 (2019) to 0.28 (2023), reflecting deleveraging across the sector.

Table 2: Year-Wise Mean Financial Ratios and Stock Returns

Year	ROA (%)	ROE (%)	EPS (INR)	DER	PE	Stock Return (%)
2019	8.52	12.86	42.86	0.81	20.57	-2.31
2020	5.94	7.33	29.85	1.14	18.99	-19.26
2021	6.92	10.91	29.65	0.81	20.43	49.36
2022	11.30	19.57	54.90	0.46	36.28	46.86
2023	13.76	24.72	79.37	0.28	40.88	34.40

4.2 Correlation Analysis

Table 3 presents the Pearson correlation matrix for all six variables. ROE exhibits the strongest statistically significant positive correlation with stock returns ($r = 0.319$, $p = 0.001$), followed by the PE ratio ($r = 0.417$, $p < 0.001$). ROA shows a marginally significant positive correlation ($r =$

0.173, $p = 0.085$). Both EPS ($r = -0.006$, $p = 0.956$) and DER ($r = 0.022$, $p = 0.828$) show negligible and statistically insignificant correlations with stock returns in bivariate analysis.

Among the independent variables themselves, ROA and ROE are highly correlated ($r = 0.847$), as expected since both measure profitability. DER shows strong negative correlations with ROA ($r = -0.557$) and ROE ($r = -0.761$), confirming that higher-leverage firms tend to have lower profitability. PE shows moderate positive correlations with ROA ($r = 0.578$) and ROE ($r = 0.662$), indicating that the market rewards profitable firms with higher valuations.

Table 3: Pearson Correlation Matrix

	ROA	ROE	EPS	DER	PE	Stock Ret.
ROA	1.000	0.847***	0.603***	-0.557***	0.578***	0.173*
ROE	0.847***	1.000	0.436***	-0.761***	0.662***	0.319***
EPS	0.603***	0.436***	1.000	-0.326***	0.230**	-0.006
DER	-0.557***	-0.761***	-0.326***	1.000	-0.326***	0.022
PE	0.578***	0.662***	0.230**	-0.326***	1.000	0.417***
Stock Ret.	0.173*	0.319***	-0.006	0.022	0.417***	1.000

Note. *** $p < .01$, ** $p < .05$, * $p < .10$ (two-tailed).

4.3 Simple Regression Analysis

Prior to the multiple regression, simple (bivariate) regressions were performed for each ratio against stock returns (Table 4). The PE ratio demonstrated the highest explanatory power in simple regression ($R^2 = 0.177$, $\beta = 1.401$, $p < 0.001$), followed by ROE ($R^2 = 0.102$, $\beta = 1.163$, $p = 0.001$). ROA had a marginally significant positive relationship ($R^2 = 0.030$, $\beta = 1.119$, $p = 0.085$). EPS and DER showed negligible predictive power ($R^2 \approx 0.000$) with p-values far exceeding conventional significance thresholds.

Table 4: Simple Regression Results (Each Ratio vs. Stock Return)

Predictor	β	R^2	p-value	Significance
ROA	+1.119	0.030	0.085	*
ROE	+1.163	0.102	0.001	***
EPS	-0.006	0.000	0.956	ns
DER	+0.683	0.000	0.828	ns
PE	+1.401	0.177	<0.001	***

Note. *** $p < .01$, * $p < .10$, ns = not significant.

4.4 Multiple Linear Regression Analysis

The multiple regression model ($n = 93$, excluding negative PE observations) produced an R^2 of 0.5013 and an adjusted R^2 of 0.4726, indicating that nearly 50% of the variation in annual stock

returns is explained by the five financial ratios jointly. The model is highly significant overall ($F = 17.490$, $p < 0.001$). These results are presented in Table 5.

Table 5: Multiple Linear Regression Results (Dependent Variable: Annual Stock Return)

Variable	β	Std. Error	t-statistic	p-value	Sig.
Intercept	-55.865	10.937	-5.108	<0.001	***
ROA	-0.130	1.269	-0.103	0.919	ns
ROE	+1.864	0.937	+1.990	0.050	**
EPS	+0.046	0.094	+0.492	0.624	ns
DER	+47.548	6.810	+6.982	<0.001	***
PE	+0.842	0.321	+2.624	0.010	**

Note. $R^2 = 0.5013$, Adjusted $R^2 = 0.4726$, $F(5, 87) = 17.490$, $p < .001$. *** $p < .01$, ** $p < .05$, ns = not significant.

ROE is positively and significantly associated with stock returns ($\beta = 1.864$, $p = 0.050$), confirming that firms generating higher returns on equity deliver better stock performance, consistent with signaling theory and the findings of Arkan (2016) and Sihombing and Zakchona (2024). The PE ratio is also significantly positive ($\beta = 0.842$, $p = 0.010$), indicating that higher market valuations are associated with continued positive returns, possibly reflecting investor momentum and growth expectations—a finding consistent with Bintara and Tanjung (2019) and Musallam (2018).

The DER coefficient is positive and highly significant ($\beta = 47.548$, $p < 0.001$). This result requires careful interpretation. In the Indian automotive sector over this period, companies with initially high leverage (such as CG Power, Ashok Leyland, and Force Motors) experienced the most dramatic stock price recoveries during 2021–2023 as they successfully deleveraged. The positive DER coefficient therefore captures a recovery and mean-reversion dynamic rather than implying that higher leverage consistently generates higher returns. This is broadly consistent with trade-off theory, wherein firms managing leverage reduction are rewarded by the market.

ROA and EPS are statistically insignificant in the multiple regression. This is likely due to multicollinearity: ROA and ROE have a correlation of 0.847, meaning ROE subsumes much of the explanatory power that would otherwise accrue to ROA. EPS, while intuitively important, may be less informative about returns once PE (which incorporates EPS in its denominator) is already in the model.

5. CONCLUSION

This study investigated the relationship between key financial ratios and annual stock returns for 20 Indian automotive and industrial sector companies listed on the NSE over 2019–2023. Drawing on both theory and the methodology of five reference studies spanning Kuwait, Turkey, Qatar, and Indonesia, the analysis employed Pearson correlation and multiple OLS regression on a panel of 100 firm-year observations.

The main findings can be summarized as follows. First, Return on Equity (ROE) and the Price-to-Earnings (PE) ratio are the most consistent and statistically significant positive predictors of

annual stock returns, both in simple and multiple regression analyses. Second, Return on Assets (ROA) has a marginally significant positive bivariate relationship with stock returns but loses significance in the multivariate context due to its high correlation with ROE. Third, EPS shows no significant relationship with stock returns when other ratios are controlled for, suggesting that the market's valuation of earnings (as captured by PE) is more informative than the absolute level of EPS. Fourth, the DER coefficient is significantly positive in the multiple regression, reflecting the market's reward to firms successfully recovering from high leverage during the study period—a context-specific finding important for Indian market investors.

These findings have practical implications. Investors evaluating Indian automotive and industrial stocks should pay particular attention to ROE and PE ratios as leading indicators of future stock performance. Profitability efficiency (as measured by ROE) signals management quality and capital utilization effectiveness, while PE ratios capture the market's collective expectation of future earnings growth—both being strong drivers of equity returns in this sector.

The study has certain limitations. The dataset covers a single sector and a five-year period that includes unusual events (COVID-19 pandemic and recovery). Future research could extend the sample period, include additional sectors, incorporate macroeconomic variables (interest rates, inflation), and apply more advanced panel data techniques such as fixed or random effects models to control for unobserved firm heterogeneity. Additionally, the inclusion of valuation ratios such as market-to-book value and dividend yield could further enrich the model's explanatory power.

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