Fundamentals, Sectoral Effects, and Interaction Dynamics: An Empirical Analysis of the Determinants of Stock Returns in Bangladesh

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Project Report
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Declaration

I hereby declare that this project titled “Fundamentals, Sectoral Effects, and Interaction Dynamics: An Empirical Analysis of the Determinants of Stock Returns in Bangladesh” is the result of my own independent research and has not been submitted elsewhere for the award of any degree, diploma, or similar title.

All sources used in the preparation of this work have been duly acknowledged.

Date: June 5, 2025

Signature: 

Name: Shion Sarkar

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Abstract

This study investigates the determinants of stock returns across sectors in Bangladesh using four regression models for the time frame from 2021 to 2024. In exploring the impact of fundamental analysis on stock's performance for all industry, Model 1 finds that the price-to-earnings (P/E) ratio has a consistently positive and significant relationship with stock returns (Fama & French, 1992; Basu, 1977), while interest rates exert a negative impact, consistent with macroeconomic theory (Modigliani & Miller, 1958; Bernanke & Kuttner, 2005). Earnings surprises, captured by the difference in earnings per share (EPSDIFF), negatively influence returns, aligning with market efficiency literature (Ball & Brown, 1968). In figuring out which industry has got the higher or lower stock return compared to the textile industry, Model 2 provides marginal evidence of lower returns in the energy sector relative to textiles. In examining which industry's ROE has greater impact on stock return compared to textile industry, Model 3 shows that sector-specific return on equity (ROE) measures are not statistically significant compared to the textile industry's ROE, indicating profitability does not vary meaningfully across industries in influencing returns (Myers, 1984; Titman & Wessels, 1988). Lastly, to explore the industry that have more impact on their stock performance for valuation metrics, Model 4, which focuses on sectoral interactions with the P/E ratio, reveals that the P/E ratio significantly predicts stock returns within the textile industry at the 10% level. Although the interaction terms for other sectors are not statistically significant, some show marginal significance, suggesting weak or potential lower sectoral variations in how P/E ratios influence returns compared to textile industry. Overall, the study highlights the importance of valuation and macroeconomic indicators over industry-specific fundamentals in driving stock performance in an emerging market context.

Keywords: Financial ratios, Interaction terms, Dummy regression, Fundamental analysis.

1.0 Introduction

1.1 Introduction

Understanding the determinants of stock returns has long been a central issue in finance. In mature and well-developed markets, firm-specific financial indicators—such as Return on Assets (ROA), Return on Equity (ROE), Earnings Per Share (EPS), Debt-to-Equity Ratio (DER), Total Asset Turnover (TATO), Price-to-Earnings (P/E) Ratio, and Book-to-Market (BM) Ratio—have been extensively validated as significant predictors of stock performance (Fama & French, 1992; Lewellen, 2004). These fundamentals provide insight into a company's operational efficiency, financial stability, and valuation, thereby guiding investment decisions and return expectations.

However, in emerging markets like Bangladesh, the explanatory power of these traditional financial metrics may be limited or distorted. Market inefficiencies, low investor sophistication, inadequate regulatory enforcement, and macroeconomic volatility often undermine the predictive reliability of accounting-based ratios (Bekaert & Harvey, 2003; Claessens et al., 2000). Consequently, there is a need to empirically re-evaluate the relevance and performance of these variables within such markets.

This study addresses this gap by examining the relationship between stock returns and a broad set of firm fundamentals, along with macroeconomic and industry-specific factors, in the context of the Bangladeshi equity market. The methodology involves a stepwise Ordinary Least Squares (OLS) regression approach, beginning with a base model that incorporates only firm-level financial indicators and interest rates.

Initial findings reveal that, among all variables, only the Price-to-Earnings (P/E) ratio shows a consistently significant and positive effect on stock returns, aligning with prior research that emphasizes the role of valuation metrics in return predictability (Basu, 1977; Fama & French, 1998). This suggests that, in information-constrained environments like Bangladesh, investors may rely more on simplified valuation indicators rather than deeper profitability analysis.). Earnings surprises, captured by the difference in earnings per share (EPSDIFF), negatively influence returns, aligning with market efficiency literature (Ball & Brown, 1968).

In contrast, profitability ratios such as ROE and ROA, as well as leverage and turnover measures, do not demonstrate statistically significant associations with returns. Meanwhile, interest rates exert a negative and significant effect, consistent with the theoretical relationship between monetary tightening and lower asset prices (Chen, Roll, & Ross, 1986; Bernanke & Kuttner, 2005).

To account for industry effects, the analysis is extended by incorporating sector dummy variables. While most sectors do not differ significantly from the textile base sector, the energy sector demonstrates marginal return deviations, implying potential sectoral heterogeneity in investor expectations or risk profiles.

Additional models include interaction terms between key fundamentals (e.g., ROE and P/E ratio) and industry dummies to assess whether the predictive power of financial indicators varies by sector. While no strong interaction effect is found for profitability, but P/E-based interactions suggest that the valuation-return relationship may be lower in sectors such as energy, telecom, and consumer goods compared to textile industry. These findings align with

Bartram and Grinblatt (2018), who argue that industry characteristics can condition the effectiveness of valuation metrics.

In sum, this study contributes to the limited empirical literature on stock return drivers in Bangladesh by demonstrating that while valuation-based metrics like the P/E ratio retain relevance, profitability indicators and sectoral effects appear secondary. These results are consistent with the broader emerging market narrative where structural inefficiencies often alter or obscure the influence of traditional firm-level fundamentals (Harvey, 1995; Bekaert et al., 2007).

1.2 Problem Statement

While fundamental financial ratios have long been established as key determinants of stock returns in developed markets, their predictive power in emerging economies like Bangladesh remains inconclusive. Traditional indicators such as Return on Asset (ROA), Return on Equity (ROE), Earnings Per Share (EPS), and Debt-to-Equity Ratio (DER) often yield inconsistent results due to market inefficiencies, limited investor sophistication, and heightened macroeconomic volatility. Furthermore, the role of sectoral dynamics—whether different industries systematically influence how valuation metrics like the Price-to-Earnings (P/E) ratio affect stock returns—has received limited empirical attention in the context of Bangladesh. It is unclear whether firm-level fundamentals and macroeconomic factors alone are sufficient to explain return variations, or whether industry characteristics moderate these relationships. This gap creates uncertainty for investors and policymakers seeking reliable stock valuation strategies in the Bangladeshi equity market.

1.3 Objectives of the Study

The primary objective of this study is to empirically examine the determinants of stock returns in the Bangladesh equity market, with a particular focus on the role of firm-level financial fundamentals, macroeconomic variables, and sectoral characteristics. Specifically, the study aims to:

- Assess the impact of key financial ratios—including Return on Asset (ROA), Return on Equity (ROE), Earnings Per Share (EPS), Debt-to-Equity Ratio (DER), Total Asset Turnover (TATO), Price-to-Earnings Ratio (P/E), and Book-to-Market Ratio (BM)—on stock returns.
- Evaluate the influence of macroeconomic factors, particularly interest rates, on equity performance in Bangladesh.
- Examine the presence of sectoral effects in determining stock returns by introducing industry-specific dummy variables for major sectors such as Textile, Energy, Telecom, Consumer, Pharma, and Banking.
- Investigate whether the predictive power of financial fundamentals varies across industries by incorporating interaction terms between financial ratios (ROE and P/E) and sectoral dummies.
- Identify which variables consistently explain return variations, providing actionable insights for investors, analysts, and policymakers operating in an emerging market environment.

2.0 Literature Review

The relationship between firm-level financial fundamentals and stock returns has been a longstanding focus in asset pricing theory. Foundational studies by Fama and French (1992) and later extensions by Lewellen (2004) have emphasized the predictive significance of indicators such as Return on Equity (ROE), Earnings Per Share (EPS), Debt-to-Equity Ratio (DER), Total Asset Turnover (TATO), Price-to-Earnings Ratio (P/E), and Book-to-Market Ratio (BM). These variables are traditionally viewed as reflections of a firm's valuation and profitability and have been shown to explain return patterns in developed and efficient markets.

However, the relevance and robustness of these indicators may diminish in emerging market contexts due to structural inefficiencies, lack of transparency, and behavioral market dynamics (Bekaert & Harvey, 2003). In such markets, valuation ratios—especially the P/E ratio—are often found to be more consistent predictors of returns than profitability measures (Basiewicz & Auret, 2010). Macroeconomic variables, particularly interest rates, also play a prominent role in shaping return behavior, as higher interest rates are generally associated with reduced stock valuations (Bernanke & Kuttner, 2005).

To capture variations across industries, researchers have employed dummy variable regression models, incorporating sector identifiers to isolate industry-specific effects. Studies such as Gupta and Mahakud (2021) have explored these differences in the Indian market, reporting that while some sectors exhibit distinct return patterns, many industry dummies lack statistical significance—implying limited explanatory power for sectoral classification alone.

More recently, the use of interaction term models has allowed for deeper analysis of how financial ratios operate differently across sectors. By interacting ROE with industry dummies, researchers have examined whether profitability has industry-dependent effects. However, literature (e.g., Lewellen, 2004) has shown mixed outcomes, with many studies failings to detect significant variation in the effect of profitability measures across sectors.

An emerging focus in recent research is the interaction of valuation metrics like the P/E ratio with industry categories. This approach seeks to determine whether the influence of valuation differs by sector—a possibility supported in studies like Griffin et al. (2010), which document heterogeneous valuation effects across global industries. Such interactions are particularly relevant in frontier and emerging markets where investor behavior and sectoral fundamentals can vary widely.

In sum, the reviewed literature underscores that while valuation ratios (notably P/E) and macroeconomic factors consistently influence stock returns, the role of profitability metrics and sector-specific effects is less clear-cut in emerging markets. Interaction models provide a promising avenue for uncovering nuanced sectoral dynamics, though empirical evidence remains mixed and context dependent.

3.0 Methodology of the Study

This study employs a quantitative research design based on secondary data to empirically examine the determinants of stock returns in the Bangladesh equity market over the period 2020–2024. The methodological approach is structured around four progressive regression models to assess the effects of fundamental financial ratios, macroeconomic indicators, sectoral identities, and their interactions on firm-level stock returns.

3.1 Data Collection

Firm-level financial data were obtained from published annual reports and Dhaka Stock Exchange filings. Variables used include Return on Asset (ROA), Return on Equity (ROE), Earnings Per Share (EPS), Debt-to-Equity Ratio (DER), Total Asset Turnover (TATO), Price-to-Earnings Ratio (PE), and Book-to-Market Ratio (BM). Stock return data were computed using quarterly log returns based on adjusted closing prices. Interest rate data were obtained from Bangladesh Bank. The final dataset consists of 384 firm-quarter observations from 24 firms over 16 quarters.

3.2 Sample Selection and Industry Classification

This study analyzes a panel dataset comprising publicly listed companies on the Dhaka Stock Exchange (DSE) over the period from 2020 to 2024. The sample includes leading firms selected based on market capitalization to ensure broad sectoral representation reflective of the Bangladesh equity market structure. The companies are categorized into six industry groups:

- Pharmaceuticals: Square Pharmaceuticals, Renata, Beximco Pharma, Beacon Pharma
- Textiles: Square Textiles PLC, Envoy Textiles Limited, Malek Spinning Mills Ltd, Paramount Textile Ltd, Bangladesh Export Import Company Ltd. (BEXIMCO)
- Energy: Summit Power Ltd., Baraka Power Ltd., United Power Generation & Distribution Company Ltd.
- Telecommunications: Grameenphone Ltd. (GP), Bangladesh Submarine Cable Company Ltd. (BSCCL), Robi Axiata Ltd. (ROBI), ADN Telecom Ltd. (ADNTEL)
- Consumer Goods: British American Tobacco Bangladesh Company Ltd. (BATBC), Olympic Industries Ltd., Marico Bangladesh Ltd., Unilever Consumer Care Ltd.
- Banking: BRAC Bank PLC, Islami Bank Bangladesh PLC, Dutch-Bangla Bank PLC, Eastern Bank PLC

These industries were chosen to capture key market sectors and enable the examination of sectoral heterogeneity in stock return determinants.

3.3 Ratio Calculation

- ROA = Net Income / Total Assets
- ROE = Net Income / Shareholder's Equity
- EPS = Net Income / Number of Shares Outstanding
- DER = Total Liabilities / Shareholder's Equity
- TATO = Net Sales / Total Assets
- PE = Market Price per Share / Earnings per Share
- BM = Book Value per Share / Market Price per Share

3.4 Data Preparation and Variable Construction

Prior to modeling, all variables were tested for stationarity using unit root tests. The tests indicated that ROA, EPS and BM exhibited non-stationary behavior. To address this issue and ensure the validity of regression results, first differences of these variables were calculated and used in the analysis. Accordingly, ROADIFF, EPSDIFF and BMDIFF represent the differenced forms of ROA, EPS and BM, respectively, capturing changes rather than levels to satisfy stationarity requirements

3.5 Model Specification

- **Model 1 – Base OLS Model:**

$StockReturn\_it = \beta_0 + \beta_1 \cdot ROADIFF\_it + \beta_1 \cdot ROE\_it + \beta_2 \cdot EPSDIFF\_it + \beta_3 \cdot DER\_it + \beta_4 \cdot TATO\_it + \beta_5 \cdot PE\_it + \beta_6 \cdot BMDIFF\_it + \beta_7 \cdot IntRate\_t + \varepsilon\_it$

- **Model 2 – Dummy Variable Regression:**

$StockReturn\_it = \text{Model 1 terms} + \gamma_1 \cdot Energy + \gamma_2 \cdot Telecom + \gamma_3 \cdot Consumer + \gamma_4 \cdot Pharma + \gamma_5 \cdot Banking + \varepsilon\_it$

(*Textile is used as the base industry*)

- **Model 3 – ROE Interaction Model:**

$StockReturn\_it = \text{Model 1 terms} + \delta_1 \cdot (ROE\_it \times Energy) + \delta_2 \cdot (ROE\_it \times Telecom) + \delta_3 \cdot (ROE\_it \times Consumer) + \delta_4 \cdot (ROE\_it \times Pharma) + \delta_5 \cdot (ROE\_it \times Banking) + \varepsilon\_it$

(*Textile is used as the base industry*)

- **Model 4 – PE Interaction Model:**

$StockReturn\_it = \text{Model 1 terms} + \varphi_1 \cdot (PE\_it \times Energy) + \varphi_2 \cdot (PE\_it \times Telecom) + \varphi_3 \cdot (PE\_it \times Consumer) + \varphi_4 \cdot (PE\_it \times Pharma) + \varphi_5 \cdot (PE\_it \times Banking) + \varepsilon\_it$

(*Textile is used as the base industry*)

3.6 Econometric Approach

To determine the most appropriate modeling strategy for analyzing stock return determinants in the context of Bangladesh's emerging equity market, a series of comprehensive diagnostic tests and model comparisons were conducted. The goal was to ensure both statistical validity and practical relevance of the chosen econometric framework. Initially, the F-test for fixed effects was applied to assess whether individual firm-specific heterogeneity significantly influenced stock returns. The test result indicated no statistically significant fixed effects, suggesting that controlling for individual-specific variation does not substantially improve the model. Similarly, the Breusch-Pagan Lagrange Multiplier (LM) test for random effects failed to show any significant panel-level variance, reinforcing that the random effects model does not offer a better fit compared to a pooled regression. To further guide model selection, the Hausman test was employed to compare fixed and random effects. The result supported the preference for a simpler structure, aligning with the outcomes of the prior tests. In combination, these diagnostics suggested that individual heterogeneity across firms is not a major concern in this dataset, and thus, Pooled Ordinary Least Squares (OLS) was chosen as the baseline model for analysis. This approach strikes a balance between parsimony and explanatory power, assuming homogeneity across cross-sectional units while preserving analytical clarity. Following the selection of the pooled OLS model, residual diagnostics were conducted to evaluate classical linear regression assumptions. Specifically, tests for autocorrelation were carried out to detect potential serial correlation in the error terms. Evidence of negative autocorrelation was found, which could compromise the efficiency of standard OLS estimators. To address this issue and ensure robust inference, Driscoll-Kraay standard errors were applied to the OLS estimates. This correction accounts for cross-sectional dependence, heteroskedasticity, and autocorrelation in the residuals, thus enhancing the reliability of the coefficient estimates and their standard errors. The use of Driscoll-Kraay standard errors is particularly suitable for macro-panel data with a relatively small number of time periods and larger cross-sectional dimension, such as in this study.

In summary, based on statistical diagnostics and theoretical considerations, the pooled OLS model with Driscoll-Kraay standard errors was selected as the most suitable and robust framework for investigating the relationship between stock returns and firm-level fundamentals, macroeconomic indicators, and industry-specific effects in the Bangladeshi stock market.

3.7 Hypotheses

- **Hypotheses for Model 1: Base OLS Model**

Objective: To examine the direct impact of fundamental financial ratios and macroeconomic variables on stock returns.

Null Hypothesis (H0): Fundamental financial ratios (ROADIFF, ROE, EPSDIFF, DER, TATO, PE, BMDIFF) and macroeconomic variables (interest rate, policy uncertainty) have no significant effect on stock returns.

Alternative Hypothesis (H1): At least one of the fundamental financial ratios or macroeconomic variables significantly affects stock returns.

- **Hypotheses for Model 2: Dummy Variable Regression Model**

Objective: To assess whether sectoral (industry) differences have a significant effect on stock returns beyond the fundamental variables.

Null Hypothesis (H0): Industry dummy variables (with Textile sector as baseline) have no significant effect on stock returns.

Alternative Hypothesis (H1): At least one industry dummy variable significantly influences stock returns compared to the baseline sector.

- **Hypotheses for Model 3: ROE Interaction Model**

Objective: To investigate if the effect of return on equity (ROE) on stock returns varies across different sectors.

Null Hypothesis (H0): Interaction terms between ROE and industry dummies are not significant, implying ROE's impact on stock returns is uniform across industries.

Alternative Hypothesis (H1): At least one ROE–industry interaction term is significant, indicating sectoral differences in how ROE affects stock returns.

- **Hypotheses for Model 4: PE Interaction Model**

Objective: To explore whether the effect of price-to-earnings (PE) ratio on stock returns is moderated by industry sectors.

Null Hypothesis (H0): Interaction terms between PE ratio and industry dummies are not significant, indicating the effect of PE on stock returns is consistent across sectors.

Alternative Hypothesis (H1): At least one PE–industry interaction term is significant, suggesting that the influence of PE ratio on stock returns varies by sector.

4.0 Model 1 Analysis

4.1 Unit Root Test Results

Prior to conducting the regression analysis, the Augmented Dickey-Fuller (ADF) unit root test was applied to verify the stationarity properties of the panel data variables. Ensuring stationarity is critical to avoid spurious regression results. Variables identified as non-stationary—ROA, EPS, and BM—were differenced accordingly, and their transformed series confirmed to be stationary. This preprocessing step guarantees the reliability and robustness of subsequent econometric modeling and inference. The stationarity of the key variables was assessed using the Augmented Dickey-Fuller (ADF) test to ensure the suitability of the data for regression analysis. The test results indicated that several variables exhibited non-stationarity in their levels and required differencing.

Variable	ADF Statistic	p-value	Stationarity Status
Stock Return	-3.53	0.0073	Stationary
ROA	-1.95	0.3081	Non-stationary (unit root)
ROE	-4.26	0.0005	Stationary
EPS	-2.14	0.2275	Non-stationary (unit root)
DER	-3.81	0.0028	Stationary
TATO	-3.98	0.0015	Stationary
PE	-4.29	0.0005	Stationary
BM	-2.50	0.1146	Non-stationary (unit root)
BMDIFF	-5.85	3.55e-07	Stationary
ROADIFF	-7.42	6.95e-11	Stationary
Int	-7.37e+11	0.0	Stationary
EPSDIFF	-6.70	4.02e-09	Stationary

Table 1: ADF Statistic

Variables found to be non-stationary in their levels—specifically ROA, EPS, and BM—were transformed by taking their first differences, after which stationarity was confirmed. All other variables were stationary at their levels.

4.2 The Variance Inflation Factor

The Variance Inflation Factor (VIF) test was conducted to assess multicollinearity among the independent variables used in the regression models. The results, presented in Table 1, indicate that all explanatory variables have VIF values close to 1, suggesting minimal multicollinearity concerns. The highest VIF value was observed for the constant term at 5.38, which is acceptable and does not indicate severe multicollinearity. Overall, these results confirm that multicollinearity is unlikely to bias the regression estimates, supporting the reliability of the model coefficients.

Variable	VIF
ROE	1.13
EPSDIFF	1.01
DER	1.10
TATO	1.15
PE	1.08
Int	1.02
BMDIFF	1.02
ROADIFF	1.01
const	5.38

Table 2; VIF Test

4.3 The Hausman Test

The Hausman test was conducted to determine the appropriate panel data model between the Fixed Effects (FE) and Random Effects (RE) estimators for analyzing stock returns. The comparison of the FE and RE models is summarized in the table below:

Variable	FE Coefficient (t-stat)	RE Coefficient (t-stat)
Const	0.0357 (1.4642)	0.0237 (1.2807)
ROADIFF	0.0015 (0.0047)	-0.0408 (-0.1320)
ROE	-0.0313 (-0.6156)	0.0031 (0.1133)
EPSDIFF	-0.0160 (-2.9345)	-0.0155 (-2.9410)
DER	0.0114 (0.4953)	0.0162 (1.4304)
TATO	-0.0027 (-0.2874)	0.0037 (0.4347)
PE	5.764e-05 (3.1360)	4.836e-05 (2.8694)
BMDIFF	-0.0300 (-1.3190)	-0.0267 (-1.1968)
Int	-0.7503 (-3.7386)	-0.7518 (-3.8781)

Table 3: The Hausman Test

Both models demonstrate significant explanatory power with F-statistics and corresponding p-values indicating model relevance. The Hausman test evaluates whether the individual effects correlate with the regressors, which would favor the Fixed Effects model. Given the data and test statistics, the Hausman test did not find sufficient evidence to reject the null hypothesis of no correlation between regressors and individual effects.

Consequently, the Random Effects model is deemed consistent and efficient in this context, making it the preferred model over Fixed Effects for this analysis. This choice aligns with the empirical evidence that the individual heterogeneity does not bias the coefficient estimates in the Random Effects framework.

4.4 The Breusch-Pagan Test

The Breusch-Pagan test was conducted to examine the presence of heteroscedasticity in the panel regression model. The test yielded a Lagrange multiplier statistic of 7.64 with an associated p-value of 0.47. Since the p-value exceeds the conventional significance levels, there is insufficient evidence to reject the null hypothesis of homoscedasticity. This result indicates that the variance of the error terms is constant across observations, supporting the assumption of homoscedasticity in the model. Consequently, the model's standard errors and inference can be considered reliable without the need for heteroscedasticity-robust adjustments.

4.5 F-test for Fixed Effects (Pooled F-statistic)

To determine whether fixed effects are necessary in the regression model, an F-test for fixed effects was conducted. The null hypothesis for this test states that all fixed effects (e.g., firm or time-specific effects) are zero. The model produced a Pooled F-statistic of 0.6194 with a corresponding p-value of 0.9155, distributed as F(23, 352). Given the high p-value, the null hypothesis cannot be rejected. This indicates that the inclusion of fixed effects does not significantly improve the model, and thus, a pooled OLS regression is more appropriate than a fixed effects specification in this context.

4.6 Durbin-Watson test for autocorrelation

After conducting the Breusch-Pagan test, which indicated no significant heteroscedasticity in the model, the next step involved examining the presence of autocorrelation in the residuals. An OLS regression was performed on the residuals with their lagged values to detect autocorrelation. The results revealed a statistically significant negative coefficient for the lagged residuals (coefficient = -0.1509, p-value = 0.003), indicating the presence of negative autocorrelation in the error terms. This finding suggests that residuals are negatively correlated over time, violating the classical assumption of independence. Given this autocorrelation, it is necessary to adopt estimation techniques or robust standard error corrections that account for serial correlation to ensure valid inference in subsequent modeling.

4.7 Pooled OLS with Driscoll-Kraay standard errors

After conducting the Durbin-Watson test to assess autocorrelation in the panel data, the results indicated the presence of autocorrelation issues. To address this, the Pooled Ordinary Least Squares (OLS) regression model was estimated with Driscoll-Kraay standard errors, which provide robust correction for autocorrelation, heteroskedasticity, and cross-sectional dependence.

Metric	Value
Dependent Variable	Stock Return
Estimator	Pooled OLS
Covariance Estimator	Driscoll-Kraay
No. of Observations	384
No. of Entities	24
Time Periods	16
R-squared (Overall)	0.0794
R-squared (Between)	-0.0051
R-squared (Within)	0.0823
F-statistic (Standard)	4.0452
F-statistic (Robust)	14.088
P-value (F-statistic)	0.0000
Log-Likelihood	172.73

Variable	Coefficient	Std. Error	T-Statistic	P-value
const	0.0237	0.0265	0.8952	0.3713
ROADIFF	-0.0408	0.1283	-0.3179	0.7507
ROE	0.0031	0.0131	0.2355	0.8140
EPSDIFF	-0.0155	0.0048	-3.2251	**0.0014**
DER	0.0162	0.0124	1.3110	0.1907
TATO	0.0037	0.0037	0.9966	0.3196
PE	0.00004836	0.00001128	4.2858	**0.0000**
BMDIFF	-0.0267	0.0244	-1.0950	0.2742
Int	-0.7518	0.2471	-3.0424	**0.0025**

Table 4: Model 1 Regression Results

The results of the Pooled OLS regression indicate that the model explains approximately 7.94% of the variation in stock returns (R-squared = 0.0794), which is relatively low. This suggests that while some explanatory power is present, most of the variation in stock returns is influenced by other factors not included in the model. Despite the low R-squared, the overall regression is statistically significant, as shown by the robust F-statistic of 14.088 with a p-value of 0.0000. This means that the group of independent variables collectively has a statistically significant relationship with stock returns. Among the individual variables, EPSDIFF (difference in earnings per share) has a statistically significant negative impact on stock returns at the 1% level (coefficient = -0.0155, p = 0.0014). This suggests that when the difference in EPS increases, stock returns tend to decrease, possibly reflecting market disappointment relative to expected earnings. Similarly, the PE ratio (price-to-earnings ratio) shows a positive and highly significant relationship with stock return (coefficient = 0.00004836, p = 0.0000), implying that higher valuations are associated with higher returns—potentially reflecting growth expectations or market optimism. Another variable with significant explanatory power is Int (interpreted as interest or interest rate proxy), which has a strong negative effect on stock returns (coefficient = -0.7518, p = 0.0025). This indicates that increases in interest-related factors are associated with a substantial decline in stock returns, consistent with traditional finance theory where rising interest rates dampen equity performance. Other variables such as ROADIFF**,** ROE**,** DER**,** TATO, and BMDIFF are not statistically significant at conventional levels, suggesting their individual relationships with stock return are weak or not distinguishable from zero in this model. Their p-values are all above 0.1, indicating insufficient evidence to reject the null hypothesis of no effect.

5.0 Model 2 Analysis

The Ordinary Least Squares (OLS) regression model was estimated to examine the impact of various firm-level financial indicators and industry sector effects on stock returns by taking the textile industry as base. The test has been done to see whether there is any industry whose stock return are significantly higher or lower than the textile industry.

Metric	Value
R-squared	0.088
Adjusted R-squared	0.056
F-statistic	2.761
Prob (F-statistic)	0.000920
Log-Likelihood	174.61
AIC	-321.2
BIC	-265.9
Durbin-Watson	2.230
Observations	384
Df Residuals	370
Df Model	13

Variable	Coefficient	Std. Error	t-Statistic	P-Value
Intercept	0.0485	0.028	1.744	0.082
ROADIFF	-0.0444	0.310	-0.143	0.886
ROE	-0.0040	0.033	-0.122	0.903
EPSDIFF	-0.0159	0.005	-3.008	0.003
DER	0.0138	0.014	0.954	0.340
TATO	0.0026	0.009	0.291	0.771
PE	0.00004927	0.0000173	2.845	0.005
BMDIFF	-0.0277	0.022	-1.237	0.217
Int	-0.7497	0.195	-3.838	0.000
Pharma Dummy	-0.0191	0.030	-0.635	0.526
Energy Dummy	-0.0492	0.028	-1.744	**0.082**
Telecom Dummy	-0.0313	0.028	-1.123	0.262
Consumer Goods Dummy	-0.0137	0.037	-0.368	0.713
Bank Dummy	-0.0138	0.028	-0.488	0.626

Table 5: Model 2 Regression Results

The model explains about 8.8% of the variation in stock returns, as indicated by an R-squared value of 0.088, and the overall model is statistically significant with an F-statistic of 2.761 ($p = 0.00092$). Among the financial variables for the textile industry, EPSDIFF (Earnings Per Share difference) has a statistically significant negative coefficient (-0.0159, $p = 0.003$), indicating that an increase in EPS difference is associated with a decrease in stock returns, holding other factors constant. The Price-to-Earnings (PE) ratio shows a small but positive and statistically significant effect (coefficient = 0.000049, $p = 0.005$), suggesting that firms with higher PE ratios tend to have slightly higher stock returns. Additionally, the Interest expense ratio (Int) has a significant negative effect (-0.7497, $p < 0.001$), implying that higher interest expenses correspond to lower stock returns. Other financial variables such as ROADIFF, ROE, DER (Debt to Equity Ratio), TATO (Total Asset Turnover), and BMDIFF (Book-to-Market difference) are not statistically significant at conventional levels, indicating no strong evidence that these factors individually affect stock returns in this model.

Only the Energy industry dummy shows a marginally significant difference from the textile base at the 10% level, indicating somewhat lower stock returns in Energy firms compared to Textile firms holding the fundamental factors constant. All other sector dummies are not significant at this threshold. The Durbin-Watson statistic of 2.230 indicates no strong evidence of autocorrelation in the residuals. However, the relatively low R-squared suggests that other factors not included in the model may explain much of the variation in stock returns.

6.0 Model 3 Analysis

Model 3 extends the analysis by exploring whether the relationship between stock returns and return on equity (ROE) varies across different sectors. To test this, the model introduces interaction terms between ROE and sector dummy variables—using the textile sector as the reference category. This approach helps assess whether sector-specific profitability contributes differently to stock return behavior in the Bangladeshi equity market compared to the textile industry.

Metric	Value
R-squared	0.081
Adjusted R-squared	0.049
F-statistic	2.520
Prob (F-statistic)	0.0025
Observations	384
Durbin-Watson Statistic	2.213
Condition Number	19200

Variable	Coefficient	Std. Error	t-Statistic	P-Value
Intercept	0.0222	0.0200	1.113	0.267
ROADIFF	-0.0383	0.3110	-0.123	0.902
ROE	-0.0073	0.0410	-0.179	0.858
EPSDIFF	-0.0153	0.0053	-2.876	0.004
DER	0.0216	0.0146	1.474	0.141
TATO	0.0026	0.0090	0.290	0.772
PE	0.0000498	0.0000171	2.916	0.004
BMDIFF	-0.0269	0.0225	-1.196	0.233
Int	-0.7654	0.1983	-3.859	0.000
ROEP	-0.0002	0.0731	-0.002	0.998
ROEEng	-0.0026	0.0101	-0.252	0.801
ROETel	-0.0111	0.0181	-0.613	0.540
ROECon	0.0118	0.0266	0.444	0.657
ROEBank	-0.00000596	0.00300	-0.002	0.998

Table 6: Model 3 Regression Results

The results reveal that none of the sector-specific ROE variables exhibit statistical significance, indicating that ROE does not have a distinct impact on stock returns across different sectors. Among all the variables considered, only EPSDIFF (negatively), PE ratio (positively), and interest rate (negatively) showed statistically significant associations with stock returns, but they are for all the industries. However, the ROE coefficient in this model is not significant which says that the impact of ROE isn't prominent in the textile industry. Moreover, all the

interactions are not significant statistically which also indicate the weak relationship of other industries' ROE with the stock return. These findings suggest that stock return behavior is not driven by sector-specific fundamentals in isolation, and aggregated financial indicators may play a more dominant role in explaining return variations.

7.0 Model 4 Analysis

This regression model is designed to examine whether industry-specific price-to-earnings (P/E) ratios have a statistically significant differential impact on stock returns, using the textile industry as the base category. By including interaction terms for P/E ratios across various sectors (engineering, telecom, consumer goods, banking, etc.), the study investigates whether the influence of the P/E ratio on stock returns varies by sector.

Statistic	Value
R-squared	0.093
Adjusted R-squared	0.061
F-statistic	2.912
Prob (F-statistic)	0.000484
No. of Observations	384
AIC	-323.1
BIC	-267.8
Durbin-Watson Statistic	2.227
Condition Number	26,100 (Large)
Omnibus Test (Normality)	60.066 (p = 0.000)
Jarque-Bera Test (JB)	384.744 (p ≈ 0.000)
Skewness	0.432
Kurtosis	7.827

Variable	Coefficient	Std. Error	t-Statistic	P-value
Intercept	0.0164	0.020	0.836	0.404
ROADIFF	-0.0324	0.309	-0.105	0.917
ROE	0.0114	0.031	0.373	0.709
DER	0.0095	0.013	0.727	0.468
EPSDIFF	-0.0150	0.005	-2.846	0.005
TATO	0.0034	0.009	0.394	0.694
PE	0.0009	0.000	1.773	**0.077**
BMDIFF	-0.0250	0.022	-1.115	0.265
Int (Interest)	-0.7189	0.196	-3.667	0.000
PEP	-0.0008	0.000	-1.687	**0.093**
PEEng	-0.0009	0.001	-1.847	**0.066**
PETel	-0.0007	0.000	-1.507	0.133
PECon	-0.0008	0.001	-1.618	**0.106**
PEBank	-0.0002	0.001	-0.265	0.792

Table 7: Model 4 Regression Results

The core objective of this analysis is to assess if any specific industry's P/E ratio demonstrates a stronger relationship with stock returns compared to the textile industry. While the base coefficient for P/E (0.0009, $p = 0.077$) is marginally significant, several sector-specific interaction terms (PEEng, PETel, PECon, etc.) exhibit negative and near-significant coefficients, suggesting that the P/E ratio in some industries might be contributing differently—possibly more negatively or lower—to stock returns compared to the textile base.

However, none of the sectoral P/E interaction terms are statistically significant at the 5% level, meaning the evidence is not strong enough to confirm that any sector's P/E ratio has a distinct, statistically significant impact on stock return beyond what is captured by the base (textile) industry's P/E ratio.

8.0 Findings, Recommendations and Conclusions

8.1 Findings

Model 1:
The price-to-earnings (P/E) ratio consistently shows a positive and significant relationship with stock returns, supporting its role as a key valuation metric (Fama & French, 1992; Basu, 1977). Interest rates negatively affect returns, reflecting the cost of capital impact (Modigliani & Miller, 1958; Bernanke & Kuttner, 2005). Earnings per share difference (EPSDIFF) also negatively influences returns, consistent with market reaction to earnings surprises (Ball & Brown, 1968). Other fundamentals like ROE, ROADIFF, DER, TATO, and BMDIFF are not statistically significant individually, suggesting more complex or indirect effects.

Model 2:
This model moderately explains return variation, confirming the significant negative effect of EPSDIFF and positive effect of P/E ratio. Interest rates remain a strong negative influence in the textile sector. The intercept and energy sector dummy show marginal significance at the 10% level, indicating that, controlling for fundamentals, energy sector firms may achieve slightly lower returns than textile firms. This points to potential sectoral influences worth further study.

Model 3:
Sector-specific return on equity (ROE) terms for engineering, telecom, consumer goods, and banking sectors do not significantly affect stock returns compared to the textile sector, implying sector profitability differences are not primary drivers of stock performance (Myers, 1984; Titman & Wessels, 1988). EPSDIFF and P/E ratio maintain their significant roles, while interest rates continue to negatively impact returns for all the industries, reinforcing the dominance of aggregated financial indicators and macroeconomic factors.

Model 4:
The overall P/E ratio exhibits a marginally significant positive effect on returns at the 10% level for the textile sector. Sector-specific P/E interaction terms have negative, near-significant coefficients, suggesting some sectors may experience weaker effects relative to textiles, though these differences are not statistically robust at the 5% level. These findings align with literature showing valuation metrics' importance, while sectoral variations remain inconclusive (Damodaran, 2012; Fama & French, 1997).

8.2 Recommendations

1. Focus on Valuation Metrics

Given the consistent and statistically significant positive relationship between the price-to-earnings (P/E) ratio and stock returns across all models, investors should emphasize valuation indicators like the P/E ratio when making investment decisions. Higher P/E ratios may reflect market optimism and growth potential, aligning with long-term return expectations.

2. Monitor Macroeconomic Conditions

The strong and negative effect of interest rates on stock returns highlights the importance of macroeconomic monitoring. Investors and portfolio managers should closely track central bank policies and interest rate trends, as increases in rates can dampen returns by raising the cost of capital and reducing corporate profitability.

3. Treat Earnings Surprises with Caution

The negative association between earnings per share differences (EPSDIFF) and stock returns suggests that unexpected changes in earnings—particularly negative surprises—can lead to market penalties. Firms should manage earnings expectations transparently, and analysts should consider the timing and content of earnings announcements when forecasting market behavior.

4. Avoid Overreliance on Sectoral Fundamentals

The analysis revealed that sector-specific return on equity (ROE) and P/E ratio differentials do not significantly impact stock returns compared to the base (textile) industry. Therefore, investment strategies based solely on sectoral fundamentals may be limited in effectiveness. Investors are encouraged to combine sector analysis with broader financial and macroeconomic indicators for a more balanced approach.

5. Further Exploration of Energy Sector Performance

Although the energy sector dummy showed only marginal significance, it suggests that firms in this sector may experience slightly better returns than those in textiles. This finding warrants further investigation. Analysts and researchers should explore whether unique characteristics of the energy sector (e.g., resource-based revenues, pricing mechanisms) contribute to return variations.

6. Policy Considerations

For regulators and policymakers, the influence of interest rates on returns underscores the transmission of monetary policy to capital markets. Maintaining a stable interest rate environment may promote investor confidence and equity market stability.

8.3 Conclusion

This study set out to investigate the key determinants of stock returns across multiple sectors in the Bangladeshi equity market, with particular emphasis on valuation metrics, firm fundamentals, and macroeconomic factors. By utilizing four regression models, the analysis explored how both aggregate financial indicators and sector-specific variables contribute to variations in stock performance. The findings consistently highlight the price-to-earnings (P/E)

ratio as a positive and statistically significant predictor of stock returns, reinforcing its role as a core valuation tool for investors. Additionally, interest rates demonstrated a strong and negative relationship with returns, emphasizing the critical influence of macroeconomic conditions and monetary policy on market behavior. The earnings per share difference (EPSDIFF) also emerged as a significant factor, albeit with a negative impact, suggesting that markets may penalize earnings volatility or surprises.

Contrary to expectations, sector-specific return on equity (ROE) variables were largely insignificant, suggesting that ROE does not exert a differentiated influence on stock returns across industries. However, the P/E ratio was statistically significant in the base sector (textile), indicating its relevance in explaining returns. Moreover, the interaction terms for P/E ratios across sectors—particularly energy, consumer goods, and construction—showed marginal significance with negative coefficients, implying slightly lower returns in these sectors compared to the base. These patterns highlight that while ROE may not vary meaningfully across industries in its effect on returns, valuation measures like the P/E ratio can capture nuanced sectoral return differences, albeit modestly. This underscores the importance of combining firm-level valuation metrics with broader market indicators for more effective return analysis. In summary, the study confirms that stock return behavior is more closely tied to general financial metrics and economic conditions than to isolated sectoral characteristics. For investors, analysts, and policymakers, this underlines the importance of combining valuation analysis with macroeconomic awareness to make informed decisions in the stock market.

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