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The Effect of Investor Sentiment on Stock Returns: Evidence from a Frontier Market

The conventional theory of finance considers that investors are rational and make informed investment decisions and any change in pertinent risk is expected to be the result of changes in fundamental factors. However, the relationship between sentiment and stock-return challenges the hypothesis of an efficient market. This study is based on the theory of behavioural finance, which explores the impact of investor sentiment on the yearly stock returns of 141 companies listed on the Dhaka Stock Exchange (DSE) from July 2017 to June 2021. Two distinct sentiment dimensions are analysed, stock-specific investor sentiment, measured by the change in trade volume and market-wide sentiment, measured by the change in the DSEX index. The regression model includes firm characteristics variables: firm size (SIZE), price-to-NAV ratio (PNAV), sale growth (SG), and Earning Per Share (EPS) as well as macroeconomic control variables: inflation rate (INF) and short-term interest rate (INT). By employing a cluster random effects regression model, it is observed that stock-specific investor sentiment has a significant positive influence on stock returns, while market-wide sentiment does not. This effect persists even after controlling for macroeconomic factors across firm size, valuation, and growth. Hence, the empirical outcomes imply that the optimistic investor sentiment boosts stock returns whereas the pessimistic sentiment of the investors has a reverse impact.

1.0 Introduction

The sentiment-return association strongly contradicts the hypothesis of an efficient market (Fama, 1997). Nonetheless, the theory of behavioural finance implies that changes in stock prices can be driven by variations associated with the sentiment-prone activities of noise traders fuelled by pessimistic or optimistic expectations of the stock return, future cash flow, and investment risk, which are incompatible with the variations in fundamental factors.

Investor sentiment refers to the investors' inclination to speculate in the stock market and thus the attitude or sentiment is linked to the investors' psychological mindset.

Regular strategies of investment are followed by the investors in their positive state of mind whereas investment decisions are taken based on critical rigorous analyses and considerations in their negative state of mind. Good times can lead to the stocks' mispricing as investors become less attentive in good times (Dellavigna and Pollet, 2009). The sentiment is defined as the market participants' expectations of a norm (Brown and Cliff 2004). An average stock investor is considered as the investor with zero sentiments whereas an investor having optimistic (pessimistic) expectations desires greater (lesser) stock returns in comparison with an average investor.

A large number of sentiment-related research studies have been conducted in recent years. However, most of these studies were conducted by following an indirect method. The probable influence of investor sentiment on stock returns is inferred by conducting the exploration of particular events, i.e., natural calamities (Shan and Gong, 2012; Kaplanski and Levy, 2010), man-made calamities (Drakos, 2010), religious events (Białkowski, Etebari, and Wisniewski, 2012), and other variables (Kaustia and Knupfer, 2012), and sporting events. However, this sort of sentiment may not reflect the stock–specific investor sentiment or market-wide sentiment that can directly affect the stock returns. To fulfil this research gap, a direct study of sentiment's effect on returns of stock is conducted in this study. This research addresses the sentiment-return relationship within the context of Bangladesh's stock market, offering new insights into less-regulated, volatile frontier markets where investor sentiment may have a more pronounced effect.

2.0 Review of literature

The swings in investor sentiment can affect the stock returns as the pessimism or optimism of an investor can lead to stock mispricing. Investors' optimistic (pessimistic) sentiment can drive the price of the stock higher (lower) than the stock's price which should be prevalent based on its fundamental value. Optimistic (pessimistic) investors tend to overestimate (underestimate) the prices of the stock.

While earlier studies like Brown and Cliff (2004) observed a direct association between contemporaneous stock return as the sentiment in the U.S. market, they also found that, sentiment had little predictive power for near-term stock returns. This has been corroborated by more recent studies in global markets. For instance, Li et al. (2019) investigated sentiment's predictive power across both developed and emerging markets, finding that while sentiment affects short-term price movements, its long-term impact is more pronounced in markets with lower efficiency, consistent with the findings of Schmeling (2009). The study also found that high (low) sentiment caused lower (greater) stock market returns across countries. It also emphasized the role of investor overreaction and underreaction during economic cycles, which leads to mispricing that can persist for longer periods in less regulated markets.

Zouaoui, Nouyrigat and Beer (2011) used panel data from 15 stock markets in the USA and Europe which revealed that the plausibility of occurring stock market crises is increased by sentiment within the horizon of one year. The sentiment's influence is more distinct in those regions which have less institutional involvement, and cultures are driven by overreaction and herding behaviour. Likewise, Bathia and Bredin (2013) examined the sentiment's influence on the returns of a growth stock, value stock, and the aggregate market overall G7 stock market. In line with the findings of previous studies, the study found an inverse association between future stock returns and investor sentiment.

Chen (2011) explored the asymmetric relationship between returns of the stock and consumer confidence during market fluctuations. The findings suggest that stock returns are largely affected by market pessimism during bearish market as inverse relationship is found between the lacking in confidence of consumer and stock returns in the USA stock market.

Chung, Hung and Yeh (2012) expanded the discussion by examining the asymmetry in the sentiment's predictive power across economic cycles in the cross-section of the stock returns. The behavioural theories' implications are tested which infers that sentiment's predictability has to be more

obvious in economic expansion while the optimism of the investors rises. The findings suggest that sentiment's predictive power, formed by age, size, dividend yield, price-to-earnings ratio, volatility of the return, growth opportunities, and the ratio of book-to-market equity, is stronger during economic expansion state. While these studies offer valuable insights, they primarily focus on market-wide sentiment in developed economies, leaving frontier markets and stock-specific sentiment underexplored.

Berger and Turtle (2012) conducted a study on the sentiment of investors and cross-sectional performance based on the model of multiple risk factors. The accuracy of information is crucial in valuing risky assets. The participants of the market may want more compensation for holding stocks that have less transparent information. The study found an inverse association between the opaque stocks' marginal performance and the ex-ante acknowledged sentiment of the investors.

In the U.S. market, Baker, Wurgler, and Yuan (2019) re-examined their original hypothesis that sentiment influences hard-to-value stocks more significantly. Their findings show that the sentiment impact on stocks that are highly volatile, young, and distressed remains robust, particularly during periods of economic uncertainty. They observed a significant increase in the effect of sentiment on small-cap and growth stocks after 2008 financial crisis, demonstrating that sentiment-driven mispricing has become more intense in times of macroeconomic stress.

In line with the findings of Lemmon and Portniaguina (2006), who identified an inverse correlation between sentiment and small-stock returns in the U.S., Kim and Nofsinger (2008) explored the aspect of Asian behavioural finance and found that behavioural biases are more pertinent in Asian countries than in other countries.

Hence, the authors concluded that the importance of examining the sentiment of investors in the stock markets of Asia is crucial. Asians' psychological distinctiveness drives the peculiarities prevalent in Asian markets of stock and hence investing in Asian market of stock provides the researchers with plenty of insights regarding the sentiment's effect on stock returns. Aligning with these findings, Yildirim and Tekin (2022) examined the impact of investor sentiment in African frontier markets, such as Nigeria and Kenya, and found that high levels of sentiment correlate with increased market volatility. In the African context, the study showed that market sentiment tends to be more reactive to external shocks, such as global commodity price movements, further driving mispricing in local stocks.

In the context of Asian markets, Chen, Chen and Lee (2013) explored the sentiment's asymmetric influence on the stock return in the Asian markets. Once including the regime intercept, optimism has a less asymmetric effect in comparison with pessimism on the returns of the healthcare, gas and oil, and financial industries. Hence, the study findings reveal that the returns of the industry tend to be overvalued due to global optimism while they tend to be undervalued in times of pessimism. The study was conducted on 11 developed stock markets i.e., Singapore, Japan, etc and only focused on the returns of industry rather than the returns of individual stocks, thus leaving a gap in understanding how sentiment impacts stock-specific returns in emerging markets.

The study of Białkowski, Etebari and Wisniewski (2012) investigated that the stock markets of Muslim countries experience greater returns and less volatility without essential justification during the time of Ramadan. An optimistic perception exists during this Holy month which substantially affects the investors' investment decisions.

On the other hand, the study of Zhu and Niu (2016) concentrating on the stock price, accounting information, and investor sentiment of stock market in China found that both the required rate of return and expected growth of earnings can be changed by the sentiment of investor and hence the price of the stock is affected. Sentiment affects the firms having greater uncertainties of information to a greater extent.

In the context of stock market of Malaysia, Tuyon, Ahmad and Matahir (2016) found that the investor sentiment's effect is not homogenous across the distinct states of market, industry groups, and size which are consistent with the prevalent perspective of behavioural finance. Likewise, Canbas and Kandir (2009) examined the effect of investor sentiment on the stock return traded in Istanbul Stock Exchange. Proxies of investor sentiment and stock portfolio returns are considered as endogenous variables while economic and natural crises are considered as exogenous variables. The study findings suggest all sentiment proxies except the stock market turnover ratio do not have the predictive power to estimate the movements of future stock returns.

How the Taiwan stock market is affected by the sentiment's indirect and direct influence is critically investigated by Liu and Wu (2014). It reveals that market returns are variously influenced by indicators that are extremely dark and bright. Also, how the volatility structure and returns are impacted by the financial Tsunami are assessed here in this study. The authors found that sentiment indicators that are extreme by nature show a crucial role in explaining stock returns.

The study of Anusakumar, Ali and Hooy (2017) based on 13 Asian regions i.e., China, Indonesia, Malaysia, Japan, Philippines, Thailand, Bangladesh, India, Pakistan, Taiwan, South Korea, Singapore,

and Hong Kong found that momentum is non-existent in the pessimistic period and only ascends in the mild and optimistic periods and this outcome is robust to the sample period, size of the firm, the volume of the trading, and other alternative proxies.

The behavioral aspects of sentiment in Asian markets have gained significant attention in recent years. Kwak and Lee (2021) explored sentiment's effect on South Korean stock returns, emphasizing the heightened influence of sentiment during times of geopolitical uncertainty. Their findings suggest that periods of heightened tension, such as the U.S.-China trade war, led to greater sentiment-driven volatility in South Korean stocks, particularly in sectors like technology and industrials.

Similarly, Chen et al. (2020) examined sentiment's impact on the stock returns of Asian emerging markets and found that market sentiment is a key determinant of stock price volatility. Their study revealed that investor sentiment in China and India, in particular, tends to overreact to short-term news, causing greater price swings and deviations from intrinsic value. The researchers also highlighted the role of social media and online forums in amplifying sentiment-driven market behaviors, a trend that has become more pronounced in the digital age.

Raza et al. (2020) also extended this work to emerging markets. Their study showed that sentiment plays a larger role in driving the returns of small and medium-sized enterprises (SMEs) in markets such as India and Brazil. Investors in these markets often are more prone to sentiment-driven trading, leading to greater volatility in small-cap stocks compared to larger, more established firms. This is particularly relevant in frontier markets, where institutional involvement is low and herding behavior prevails.

Additionally, a broader study by Rakesh Parkash and colleagues (2022) examined investor sentiment across nine Asian countries. They found that investor sentiment, both rational and irrational, has a significant positive effect on stock returns and volatility in these markets. Their results supported the assumptions of behavioral finance, indicating that Asian investors exhibit both rational and irrational decision-making behaviors, which affect market stability.

A recent study conducted by Sana Tauseef and Hira Suman (2023) focused on the Pakistan stock market to examine the impact of investor sentiment on stock returns. The researchers created a sentiment index using seven proxies, such as the price-to-earnings ratio, dividend premium, and relative strength index. The findings revealed that lagged sentiment positively influences both future sentiment and aggregate market returns, suggesting the persistence of herd behavior in Pakistan's emerging market. However, while sentiment impacted aggregate returns, the cross-sectional analysis of stock returns using arbitrage portfolios showed inconsistent patterns, highlighting complexities in how sentiment translates across different stocks.

The study conducted on the stock market of Bangladesh divulges that several factors have been considered for explaining stock returns by the researchers. The study findings of Chowdhury and Sharmin (2013) reveal a weak association between stock returns and the factors of systematic risk.

While the recent literature provides deeper insights into how investor sentiment affects stock returns, several gaps remain, particularly in frontier markets. The majority of studies focus on market-wide sentiment, often neglecting the stock-specific sentiment, which can have a more nuanced and direct effect on individual stock returns. This gap is particularly critical in frontier markets, where individual stocks may be more susceptible to investor sentiment. Moreover, prior studies have predominantly examined short-term or contemporaneous relationships between sentiment and stock returns.

It is also observed that long-term impact of sentiment, especially in less efficient frontier markets like Bangladesh, remains underexplored. By using yearly stock returns, this study seeks to provide a more comprehensive analysis of how sentiment influences stock returns over a longer time horizon. While developed markets have been extensively studied (Chung, Hung & Yeh, 2012; Baker et al. (2019), fewer studies have investigated the unique dynamics of frontier markets, where investor behavior may differ due to lower levels of regulation, information asymmetry, and higher volatility.

Building on these gaps, the current study hypothesizes that both stock-specific and market-wide sentiment positively influence yearly stock returns in Bangladesh's frontier market. By investigating both stock-specific and market-wide sentiment, this study addresses these gaps and contributes to a more comprehensive understanding of how sentiment influences stock returns in Bangladesh's frontier market. Given the unique characteristics of frontier markets, such as lower regulation, information asymmetry, and higher volatility, this dual approach provides valuable insights that extend beyond the developed market context explored in previous studies.

3.0 Research objectives

3.1 Core objective

The fundamental purpose of the analysis is to explore and understand the effect of investor sentiment on the stock returns from an emerging market concept, i.e., Bangladesh, after controlling for firm-spe-

cific and macroeconomic factors. Sentiment's two distinct dimensions are explored here in this study which is stock-specific investor sentiment and market-wide sentiment.

3.2 Secondary objectives

The objectives mentioned below can facilitate attaining the fundamental or core purpose of the study:

i.   To understand the behavioural perspective of frontier market investors.

ii. To explore the reasons behind the sentiment-prone volatility of stock returns of the DSE-listed companies.

iii. To provide evidence of the direct impact of changes in stock-specific and market-wide sentiment on the yearly return of the stock.

iv. To reflect the study's analytical findings' implications from the stakeholders' aspects.

4.0 Rationale of the study

This research study stands out from previous works by uniquely addressing and employing a dual approach in analyzing both stock-specific investor sentiment and market-wide sentiment, dimensions often treated separately in existing literature. While prior studies, such as Sayim and Rahman (2015), have mostly focused on one dimension of sentiment at a time, this study fills a significant gap by examining both dimensions simultaneously. By doing so, it provides a broader and more nuanced perspective on the influence of investor sentiment on stock returns in Bangladesh, a frontier market with distinct characteristics compared to more developed markets.

Another key distinction is the long-term perspective adopted in this study. Unlike most previous research that focuses on short-term or contemporaneous effects of sentiment using quarterly or monthly stock returns, this study employs yearly stock returns to better capture the prolonged and persistent effects of sentiment on

stock performance. This approach is particularly suited to frontier markets like Bangladesh, where sentiment-prone stock return volatility can persist for longer periods.

Moreover, frontier markets, including Bangladesh, are underrepresented in sentiment-return studies. The vast majority of prior research has concentrated on developed or emerging markets, leaving a significant gap in understanding how sentiment operates in less regulated, volatile environments with high levels of information asymmetry and a prevalence of retail investors. This study addresses this gap by focusing on Bangladesh, where retail investors dominate the market, and sentiment-prone behaviors such as herding, overreaction, and reliance on rumors are more pronounced. In contrast to studies in more developed markets, where institutional investors and strong regulatory frameworks tend to stabilize markets, Bangladesh's frontier market exhibits low institutional involvement and inefficient regulation. By controlling for firm-specific and macroeconomic factors, this study seeks to uncover the direct relationship between sentiment and yearly stock returns in this specific context, a dimension largely unexplored in existing literature.

This study not only fills a geographical gap by focusing on an under-researched frontier market but also offers a methodological advancement by adopting a long-term, dual-dimension approach to the sentiment-return relationship, which has not been comprehensively explored in previous research.

5.0 Research methodology

5.1 Design and technique of the sampling

Two major sampling techniques, probability sampling and non-probability sampling are widely implemented in various researches as identified by Creswell and Poth (2017). In probability sampling, all elements of the population have an equal

possibility of being selected, ensuring randomness. On the contrary, non-probability sampling technique involves selecting elements based on predetermined criteria, meaning not all elements have an equal chance of being included. For this study, the nonprobability sampling technique is chosen to better align with the research objectives.

The sample size is an important factor in ensuring the validity and reliability of the research findings. To ensure the sample size is representative of the population, a 95% confidence level with a 5% margin of error was used as a benchmark for determining sample adequacy. This is a commonly accepted standard in financial research to ensure that the results are statistically significant and can be generalized to the broader population of companies (Chen, et al. 2013).

The target population of this study is the total number of companies listed on the Dhaka Stock Exchange (DSE) on 2016. For this study, the sample consists of 141 companies from 14 different sectors listed on the Dhaka Stock Exchange (DSE). After excluding companies from the financial sector and those that do not meet the criteria of being listed since 2016 with regular financial reporting, the target population was significantly reduced. The financial sector companies (e.g., banks, financial institutions, insurance companies, mutual funds, and treasury/corporate bonds) are excluded due to their unique regulatory frameworks and different market dynamics. Their inclusion could introduce noise and make it difficult to isolate the effect of sentiment on stock returns in other sectors.

The selected sample includes companies that have sufficient and accessible historical data since 2016, allowing for the analysis of long-term trends in stock-specific and market-wide sentiment. Any company with incomplete or inconsistent data during this period was excluded to ensure data integrity. Also, the companies chosen span various sectors, excluding financials, to provide a diverse sample that captures the impact of investor sentiment across different industries. This diversity ensures that the findings are not skewed by sector-specific factors but instead reflect broader market dynamics.

Overall, this study employs nonprobability sampling technique, which allows selecting companies that meet specific, relevant criteria such as being listed on the Dhaka Stock Exchange (DSE) since at least 2016, having regular annual general meetings, having data availability and accessibility, and ensuring transparent reporting. This approach ensures that the sample is representative of the broader market and suitable for drawing meaningful conclusions about the influence of sentiment on stock returns in Bangladesh's frontier market.

5.2 Sources of data

The study assesses the effect of sentiment on the stock return based on the data of 141 companies from 14 different sectors. The companies that are taken into this study's sample are shown in Appendix 01. The data of the companies are acquired from the respective companies' annual reports, while the data of macroeconomic variables are retrieved from the World Bank and Bangladesh Bank's websites. The data on yearly stock market price and the trading volume is collected from the website of DSE and Investing.com. Sample of 141 companies listed in DSE and established and administered in Bangladesh. Key information that is collected from various sources is the yearly market price, trade volume, net sales growth, earnings per share, number of shares outstanding, NAV per share, inflation rate, and 91-day treasury bill rate. The balanced panel dataset incorporates 141 listed companies covering the time horizon of 5 years, from 2017 to 2021 resulting in 705 observations.

Table 1: Variables, their proxies, measurement, and expected signs

Sector	No. of Companies
Cement	7
Ceramics	5
Engineering	24
Food and Allied	10
Fuel and Power	16
IT Sector	6
Miscellaneous	7
Paper and Printing	2
Pharmaceuticals and Chemicals	21
Service and Real Estate	2
Tannery Industries	3
Telecommunication	2
Textile	34
Travel and Leisure	2
Total	**141**

Source: Authors' compilation

5.3 Definition of variables and hypotheses

The dependent, independent, and control variables' interpretations are given below:

5.3.1 Dependent variable

Yearly stock return (RETURN): The yearly returns of individual stocks are taken as a dependent variable in the study. The study of Anusakumar, Ali and Hooy (2013) also used yearly returns of stocks instead of weekly, monthly, or quarterly stock returns, unlike previous studies to consider the long-term perspective. For calculating the yearly stock returns, the formula written down below is used where $Return_{i,t}$ denotes the closing stock price of i at the end of year t.

$$Return_{i,t} = \frac{Return_{i,t} - Return_{i,t-1}}{Return_{i,t-1}} \times 100$$

5.3.2 Independent variables

5.3.2.1 Stock-specific investor sentiment (SentimentS)

The Stock-specific sentiment means the sentiment of individual stocks. According to Baker and Stein (2004), numerous factors such as market liquidity (turnover and trading volume), market information, depth, and spread can be used as indicators of sentiment. In this study, trading volume is used as a proxy of stock-specific investor sentiment, which has been used in previous studies (Anusakumar, Ali and Hooy 2013, Baker, Wurgler, and Yuan (2019), Chen, Chen and Lee 2013, and Liao, Huang and Wu 2011) to reflect investor sentiment.

The chosen proxy is calculated using the log difference in trading volume between two consecutive years:

$SentimentS_{i,t}$ = Log $(Volume_{i,t})$ – Log $(Volume_{i,t-1})$

$SentimentS_{i,t}$ refers to the stock i's investor sentiment at year t. $Volume_{i,t}$ refers to the stock i's trading volume at year t and $Volume_{i,t-1}$ refers to the stock i's trading volume at year $_{t-1}$.

Hypothesis 1: Stock-specific sentiment of investors positively influences the yearly returns of stock.

5.3.2.2 Market-wide investor sentiment (SentimentM)

Overall market sentiment is measured by the variable of SentimentM which indicates the market-wide investor sentiment. Zouaoui, Nouyrigat and Beer (2011) and Chen et al. (2020) observed that investors tend to forecast the index returns' trend based on past performance, leading to trends in market sentiment. Persistent bullish or bearish trends can significantly influence investor behavior and stock returns.

Market-wide investor sentiment is calculated as the difference in the log of the DSEX index closing price between two consecutive years:

$SentimentM_t=Log (DSEX_t) –Log (DSEX_{t-1})$

$SentimentM_{i,t}$ is the market-wide sentiment at the end of year t and $DSEX_t$ is the closing price at the end of year t for the DSEX index.

Hypothesis 2: Market-wide sentiment positively influences the yearly returns of stock.

The choice of using these sentiment proxies was made for their simplicity and suitability to the Bangladeshi market. More complex sentiment proxies, which rely on advanced market indicators or behavioral measures, are difficult to apply here due to the limited market infrastructure and data availability. By focusing on trading volume and index changes, the study uses readily accessible data that effectively captures investor behavior in a straightforward way. This approach keeps the analysis both practical and relevant given the current state of the market and data constraints.

5.3.3 Firm-specific control variables

Characteristics of the firms are observed to be a crucial determinant in identifying the extent to which returns are influenced by the sentiment. The authors of previous literature determine several variables that are sentiment sensitive, i.e., volatility, size, assets' tangibility, default risk, opportunities for growth, unprofitability, age, size, and pay-outs of dividends. Baker, Wurgler and Yuan (2012) considered book-to-market, size, growth of sales, and volatility as the firm-specific control variables whereas Corredor, Ferrer, and Santamaria (2013) considered book-to-market, size, growth of sales, and volatility, and dividend per share as the firm-specific control variables. Following these aforementioned studies, the variables mentioned below are included in this study as firm-specific control variables.

5.3.3.1 Firm size (SIZE)

In the study of Baker et al. (2019) and Raza et al. (2020), the authors observed sentiment mostly influences small-sized firms. The study of Lemmon and Portniaguina (2006) concentrated on the market-wide sentiment and size and finds that high (low) sentiment causes the small stocks' returns to be lesser (greater) than the larger stocks' return. Conversely, Brown and Cliff (2004) did not observe any sentiment-prone biasness that influences the small stocks' returns.

5.3.3.2 Stock valuation (PNAV)

Investors' sentiment-prone trading drives the prices of an asset away from the stocks' fundamentals and so price risks driven by sentiment cause substantial anomalies in the asset prices in the market. Chung, Hung and Yeh (2012) found market sentiment to have a positive effect on PNAV and overvalued shares are more investor sensitive. Lee, Sing and Tran (2013) found that lagged trading volume has positive effects on PNAV which implies that uninformed investors' herd activities drive up the prices of stock.

5.3.3.3 Firm's sales growth (SG)

The growth of sales is measured by dividing the change in the firm's nest sales by the previous year's net sales of the firm. Anusakumar, Ali and Hooy (2013) observed that high (low) sales growth firms are linked with distress (greater growth opportunities) and the stock returns of the distressed companies tend to be more sentiment-sensitive.

5.3.3.4 Firm's profitability (EPS)

Earnings Per Share (EPS) is taken as a proxy for measuring the profitability of the firms which is observed negatively associated with the sensitivities of sentiment. Mian and Sankaraguruswamy (2012) observed that stock price sensitivity to favourable news of earnings is greater during high sentiment phases than in low sentiment phases. Conversely, sensitivities of stock prices to unfavourable news of earnings are larger during high-level sentiment phases than in low sentiment phases.

5.3.4 Macroeconomic variables

For controlling the contradictory macroeconomic situations, this study also includes macroeconomic variables. The inclusion of macroeconomic variables allows for the isolation of sentiment's influence from that of macroeconomic situations. Also, Lemmon and Portniaguina (2006) and Schmeling (2009) counted this aspect and employed various macroeconomic control variables in their regression model. Following these aforementioned studies, the variables mentioned below are included in this study as macroeconomic control variables.

5.3.4.1 Inflation, Consumer Price Index (INF)

Rising inflation is historically correlated with lower equity returns. During high inflationary phases, value stocks incline to perform better contrasted with growth stocks whereas, in low inflationary periods, growth stocks incline to react better.

5.3.4.2 Short-term interest rate (INT)

Historically, it is observed that higher rates of interest tend to inversely influence the prices and earnings of stocks. For shielding from interest rate risk, investors usually consider going for bonds or alternative assets which have a shorter maturity. Moreover, investors consider investing in shares of the firms highly risky during rising rates of interest in comparison with other investment options.

The variables used in the study and their proxies, measurement, and expected signs are presented in the following table:

Table 2: Variables, their proxies, measurement, and expected signs

Variables	Notation	Proxy	Measurement	Antici-pated Impact
Dependent Variable				
Yearly Stock Return	RETURN		$Return_{i,t} = \dfrac{Return_{i,t} - Return_{i,t-1}}{Return_{i,t-1}} \times 100$	
Independent Variables (Sentiment Proxies)				
DSEX Index Return	SentimentM	Market-wide sentiment	$SentimentM_t = Log\ (DSEX_{i,t}) - Log\ (DSEX_{t-1})$	(+)
Trading Volume	SentimentS	Stock-specific investor sentiment	$SentimentS_{i,t} = Log\ (Volume_{i,t}) - Log\ (Volume_{i,t-1})$	(+)
Firm-Specific Control Variables				
Market Capitalization	SIZE	Firm Size	$SIZE$ =Market Price × No. of Outstanding Shares	(+)
Price-to-NAV ratio	PNAV	Stock Valuation	$\dfrac{Market\ Price}{NAV\ per\ Share}$	(+)
Sales Growth	SG	Firm Growth	$\dfrac{Net\ Sales_{i,t} - Net\ Sales_{i,t-1}}{Net\ Sales_{i,t-1}} \times 100$	(+)
Earnings Per Share	EPS	Firm Profitability	$\dfrac{Net\ Income}{Outstanding\ Shares}$	(+)

Macroeconomic Control Variables

Inflation, CPI (% Annual)	INF	Inflation Rate	Source: World Bank, 2021	(-)
91-Day Treasury Bill Rate	INT	Short-Term Interest Rate	Source: Bangladesh Bank, 2021	(-)

Source: Authors' compilation from previous literature

5.4 Econometric model specification

To conduct the empirical analysis of this study, the following equation is developed:

$RETURN_{it} = \beta_0 + \beta_1\ SentimentS_{it} + \beta_2\ SentimentM_{it} + \beta_3\ SIZE_{it} + \beta_4\ PNAV_{it} + \beta_4\ SG_{it} + \beta_5\ EPS_{it} + \beta_6\ INF_{it} + \beta_7\ INT_{it} + \varepsilon_{it}$.

Where, the intercept is denoted by β_0, the coefficients are indicated by β_1 to β_8,

i (number of the companies) = 1, 2….,141;

time interval is denoted by t = 1, 2...,5; and error term is denoted by ε_{it}.

5.5 Data analysis techniques

The panel regression model is employed to find out the relationship between dependent, independent, and control variables for exploring stock return-sentiment relationship. In panel regression model, both cross-sectional and time series elements are combined, thus individual time and firms will likely correspond to residuals, and so biased outcomes will result in the OLS model. The model of panel multivariant regression is appropriate as it is an exploratory study. The sample of the study contains a strongly balanced panel dataset and its hypotheses will be assessed using the software of Stata 15.0. Whether the explanatory and control variables are correlated or not was assessed by the correlation matrix. Afterwards, Breusch-Pagan / Cook-Weisberg test for heteroskedasticity was carried out to check whether the dataset is heteroscedastic or not. To test the serial correlation or first-order autocorrelation, the Wooldridge test was carried out. After that, the Hausman test was employed for choosing the appropriate model for this study and RE model is found to be the preferred model for this study. Since this study's dataset is autocorrelated and heteroskedastic, a cluster random-effect model was carried out for eradicating the problem of both autocorrelation and heteroskedasticity.

6.0 Findings of the empirical analysis

6.1 Descriptive statistics

The descriptive statistics of variables for 141 DSE-listed companies during 2017-2021 are shown in the following Table 3. At 1st and 99th percentiles, this study's dependent, independent, and control variables are winsorised here for minimizing the outliers' potential effects.

Table 3: Descriptive statistics of independent and explanatory, and control variables

Variable	Obs	Mean	50% Percentile	Std. Dev.	Min	Max
RETURN	705	.1265	.0058	.51807	-.5645	2.6890
SentimentS	705	-.0181	-.0916	.88228	-1.933	2.3095
SentimentM	705	.0588	.1932	.18691	-.1902	.22375
SIZE	705	12899	3079.0	1.05e+07	234.65	9.09e+07
PNAV	705	3.7551	1.4332	6.9288	-3.022	43.304
SG	705	.0549	.0588	.32857	-.9499	1.6315
EPS	705	6.1212	1.62	14.759	-8.45	84.01
INF	705	.056	.056	.00089	.055	.057
INT	705	.0375	.0309	.02271	.0069	.07136

Source: Authors' compilation using Stata 15.0

6.2 Test of multicollinearity

The association between the explanatory and control variables is found by conducting the test of multicollinearity. The correlation matrix found that both measures of sentiment are positively associated with the yearly stock returns. In comparison with the market-wide sentiment (SentimentM), stock-specific sentiment (SentimentS) is found to be highly correlated with stock returns which implies its larger impact on stock returns compared to the market sentiment. The outcomes suggest that the variables are not substantially associated with each other since the values of the correlation coefficient are not greater than 0.80.

Table 4: Correlation matrix

	RETURN	Sent-S	Sent-M	SIZE	PNAV	SG	EPS	INF	INT
RETURN	1								
SentimentS	.61	1							
SentimentM	.16	.20	1						
SIZE	-.03	.02	-.01	1					
PNAV	.08	.03	-.03	.031	1				
SG	.23	.19	-.14	.031	.02	1			
EPS	-.01	.07	-.02	.157	.32	.11	1		
INF	-.19	-.18	.39	-.01	-.03	-.22	-.02	1	
INT	-.42	-.43	-.14	.001	-.02	-.19	-.04	.60	1

Source: Authors' compilation using Stata 15.0

6.3 Stationary test

A test of panel data stationary is conducted to identify if there is any unit root in the data by employing Levin-Lin-Chu unit root test on the variables of RETURN, SentimentS, SIZE, PNAV, SG, and EPS. It is found that all of the p-values of Levin-Lin-Chu test are significant at the 5% significance level and so, we reject the null hypothesis. Thus, all of these variables are stationary in this study.

6.4 Test of heteroscedasticity

Breusch-Pagan / Cook-Weisberg test is carried out to check if the study's strongly balanced panel dataset is heteroscedastic.

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

H_0: Constant variance; Variables: fitted values of RETURN

chi^2(1) = 341.20; Prob > chi^2 = 0.0000

The value of Chi^2 is less than the 5% significance level and thus, null hypothesis cannot be rejected. So, according to test outcome, the problem of heteroscedasticity is existent in the regression model.

6.5 Test of autocorrelation

As the time element is existent in this dataset, it may hold autocorrelation problem and hence Wooldridge test is carried out to identify if the dataset is autocorrelated.

Wooldridge test for autocorrelation in panel data

H_0: no first-order autocorrelation

F (1,140) = 6.931; Prob > F = 0.0094

The null hypothesis of the test is serial correlation is non-existent in this dataset. Here, the probability is 0.94% which is substantially below the significance level of 5% and hence, the first-order autocorrelation problem is existent in this dataset.

6.6 Hausman test

Hausman test is employed in this study to find out the study's most appropriate and

suitable empirical model. Firstly, both FE and RE models were employed and then the Hausman test is carried out to deter-mine this study's preferred model and the outcome of the test is shown as follows:

Table 5: Hausman test

RETURN	Fixed Effect	Random Effect	Difference	S.E.
SentimentS	.2912892	.2975025	-.0062134	.007522
SentimentM	.0855387	.0540343	.0315044	.0292905
SIZE	-5.53e-09	-1.05e-09	-4.49e-09	2.22e-08
PNAV	.0139264	.0065097	.0074167	.0043892
SG	.1855506	.1831512	.0023994	.0274189
EPS	.0029621	.0029357	0.000264	.0029227
INF	39.14263	42.57199	-3.429361	8.446461
INT	-4.895334	-5.106108	.2107741	.3522064
$chi^2 = 6.41$;	Prob > $chi^2 = 0.4928$			

Source: Authors' compilation using Stata 15.0

6.7 Outcomes of the model specification and discussions

The diagnostic tests reveal that the unit root and multicollinearity problems are non-existent in the random effect model which is the study's appropriate model. However, the dataset contains the problem of heteroskedasticity and first-order autocorrelation and so, the cluster estimators for the model of random effect are employed that automatically correct these problems.

Table 6: Cluster random effect regression outcome

RETURN	Coefficient	Clustered Std. Err.	t	P>t
SentimentS	**.2975025**	.0282178	10.54	**0.000**
SentimentM	.0540343	.1285635	0.42	0.674
SIZE	-1.05e-09	5.86e-10	-1.79	0.074
PNAV	**.0065097**	.003251	2.00	**0.045**
SG	**.1831512**	.060677	3.02	**0.003**
EPS	**.0029357**	.000777	3.78	**0.000**
INF	42.57199	33.13141	1.28	0.199
INT	**-5.106108**	1.10298	-4.63	**0.000**
Constant	.2975025	1.817883	-1.14	0.253
R-sq = 0.4266;	Wald chi2 (8) = 299.43;	Prob > $chi^2 = 0.0000$		

Source: Authors' compilation using Stata 15.0

Based on the cluster random effect regression results, the following model is evolved for this study:

$RETURN_{it}$= .2975025 + .2975025 SentimentS$_{it}$ + .0540343 SentimentM$_{it}$ - 1.05e-09 SIZE$_{it}$ + .0065097 PNAV$_{it}$ + .1831512 SG$_{it}$ + .0029357 EPS$_{it}$ + 42.57199 INF$_{it}$ - 5.106108 INT$_{it}$ + ε_{it}.

The findings indicate that the coefficient of stock-specific sentiment (SentimentS) is positive and statistically significant at the 1% level, confirming a strong relationship

between stock-specific sentiment and stock returns. This supports the notion that high stock-specific sentiment is associated with high stock returns, likely driven by an increase in relative demand and perceived value for the specific stocks as sentiment rises, leading to higher returns. Conversely, a decline in stock-specific sentiment results in lower returns, reflecting a shift in investor perceptions. These findings align with the study of Ryu, Kim, and Yang (2016), which also reported a positive association between stock-specific sentiment and stock market returns.

However, the coefficient of market-wide sentiment is positive but not statistically significant, even at the 10% level. This implies that market-wide sentiment does not have a meaningful impact on the returns of DSE-listed companies.

This discrepancy between the effects of stock-specific and market-wide sentiment can be attributed due to information asymmetry, driven by limited access to market information. Market structure and investor composition may also lead to this discrepancy, as frontier markets are dominated by retail investors who rely more on stock-specific news and rumors rather than broader market trends, leading to a stronger influence of stock-specific sentiment. Stock-specific sentiment may be more closely tied to firm-specific events and investor behavior, while market-wide sentiment, driven by macroeconomic factors, might be less relevant in a market with high idiosyncratic risk like Bangladesh. Moreover, the use of yearly returns may dilute the influence of market-wide sentiment, which may have a more pronounced effect in the short term.

In the empirical analysis, four firm-specific variables—firm size, valuation, growth, and profitability—are included to control firm-specific characteristics. Among these, all coefficients of firm characteristics except SIZE are significant in this model, indicating that firm size does not have a meaningful impact on explaining yearly stock returns. The positive and significant result for PNAV at the 5% significance level implies that overvalued shares are more sentiment-prone. This finding corroborates with the previous study outcomes.

Sales growth (SG) exhibits an anticipated effect on the yearly stock returns, with a 1% significance level. It connotes that with a lowered anticipation of the company's future cash flows and growth, the investors of the company will not obtain as much growth from the appreciation of stock price which makes the ownership of the stock less desirable. EPS is also statistically significant at the 1% level, exhibiting the expected relationship. This statistical finding is consistent with the findings of Anusakumar, Ali and Hooy (2013), which highlight that in Asian markets, profitability tends to be inversely correlated with the stock returns.

It is also relevant to investigate if the study outcomes are driven by the macroeconomic aspects. As such, two macroeconomic control variables—inflation rate (INF) and short-term interest rate (INT)— were included in the model. The statistical findings found no significant effect of the inflation rate on yearly stock returns. However, the short-term interest rate (INT) is statistically significant at the 1% level, demonstrating an inverse relationship with the stock returns. This finding is coherent with previous study findings which connotes that higher interest rates lead to lower stock prices, as projected future cash flows decline due to reduced revenue or higher debt costs.

The findings contribute to the existing literature by highlighting the distinct roles that stock-specific and market-wide sentiment play in frontier markets. While studies in developed markets (e.g., Baker et al. (2019); Zouaoui, Nouyrigat and Beer 2011) often find that both stock-specific and market-wide sentiment influence stock returns, this research suggests that in less

developed markets like Bangladesh, stock-specific sentiment plays a far more significant role. This is consistent with the behavioral finance perspective, which posits that less informed, retail-dominated markets are more prone to sentiment-driven trading, particularly at the individual stock level (Chung, Hung & Yeh, 2012).

6.8 Sensitivity analysis

The study further explores whether the effect of sentiment on stock returns remains consistent across different firm characteristics, such as firm size (SIZE), price-to-net-asset value (PNAV), and sales growth (SG). The dataset of 705 observations is divided into three categories—low, medium, and high—for each variable to assess whether the impact of sentiment is robust regardless of a company's size, valuation, or growth potential. The results, with clustered standard errors shown in parentheses, are shown in the appendices 2, 3, and 4.

The empirical findings reveal that the stock-specific investor sentiment has a robust effect across all firm sizes, though the intensity of this effect varies. This contradicts with the recent study of Tuyon, Ahmad and Matahir (2016) who suggest that sentiment's impact on stock prices may differ by firm sizes. However, it is found that low-sized firms are more sentiment-prone than large-sized firms as the coefficient of small-sized companies is larger than the coefficient of larger companies. This finding is consistent with the study of Baker et al. (2019) and Berger and Turtle (2012) which observe that stocks of small companies are more difficult to value and less transparent which makes them more sentiment-sensitive than the stocks of large companies. The size of the firm is closely related to the ease of information accessibility, its capacity for trading, and to liquidity, which is closely related to the adversity of arbitrage and valuation.

Similarly, the influence of stock-specific

sentiment on yearly stock returns remains robust for firms with varying PNAV levels. The findings indicate that firms with low PNAV, often referred to as value stocks, are more sentiment-prone, implying that value stocks are harder to arbitrage and costly and hence, they are more sentiment-sensitive. The undervaluation of these stocks can attract irrational and less sophisticated traders, leading to valuations that are heavily sentiment-driven.

The study also investigates whether investor-specific stock sentiment's effect on stock returns is robust irrespective of the firms' sales growth. In line with size and PNAV, the findings suggest that the stock returns of the companies with low, medium, and high sales growth are significantly influenced by the stock-specific investor sentiment. Firms with lower sales growth are found to be more sentiment-sensitive which aligns with the findings of Anusakumar, Ali and Hooy (2013). The authors observe that companies with low sales growth are often associated with financial distress, while firms with higher sales growth present greater growth opportunities. As a result, distressed firms tend to experience higher levels of sentiment-driven mispricing.

In general, the statistical findings imply that sentiment's influence is more pronounced for firms with low size, low PNAV, and low sales growth—firms that are typically harder to value and more difficult to arbitrage. Overall, the findings indicate that the stock-specific sentiment plays a more significant role in driving stock returns than fundamental factors. The impact of investor optimism and pessimism on stock returns is evident, with fluctuations in sentiment eventually leading to reversals in stock prices. This supports the notion that Asian investors, particularly in emerging markets, are more sensitive to behavioural biases while making investment decisions than the investors of other cultures, as supported by Kim & Nofsinger

(2008). Nevertheless, thorough comparative research between Asian countries and other countries needs to be conducted for providing conclusive evidence.

7.0 Research implications

The research implications are substantial for a wide range of stakeholders i.e., general public, institutional investors, policymakers, regulators of the frontier markets. For investors, understanding the effect of sentiment is crucial for formulating their investment strategies before making any investment decisions. By observing changes in trading volume and market trends, investors can better anticipate market movements and make more informed decisions. This provides valuable insight in a frontier market where inefficiencies and sentiment-driven fluctuations are common.

For policymakers, the study emphasizes the necessity for regulatory interventions to improve market transparency and lessen the influence of sentiment-driven speculation. Measures such as information disclosure and stricter regulations on market manipulation could stabilize the market. Additionally, enhancing investor education programs could help reduce irrational decision-making, making the market more efficient. Beyond Bangladesh, the findings have far-reaching relevance for other emerging markets, where market inefficiencies and sentiment-driven behaviors are similarly prevalent.

8.0 Conclusion

This study explores the impact of both stock-specific and market-wide investor sentiment on yearly stock returns within the context of Bangladesh's frontier market. By incorporating sentiment as a key variable, the research provides new insights into how investor behavior and market dynamics influence stock performance over the long term. It is found that the stock-specific investor sentiment has a significant positive influence on stock returns whereas market sentiment is not found to have any significant influence, offering a more nuanced understanding of market behavior. The insignificance of market-wide sentiment, indicates unique dynamics of such less developed markets, where individual stock sentiment may matter more due to the composition of investors and the structural inefficiencies.

Findings imply that stock returns of this frontier market are significantly influenced by the stock-specific investor sentiment irrespective of the firm size, stock valuation, and sales growth and reaffirm the investor sentiment's importance. The research contributes to the existing literature by bridging the gap between sentiment and stock returns, particularly in the context of a frontier market, and provides practical implications for investors and policymakers enhancing investment strategies, regulatory frameworks, and investor education. As a whole, it can be concluded that stock-specific sentiment is a non-trivial concern for the investors of the Bangladeshi stock market.

9.0 Limitations of the research

Although substantial evidence of the sentiment's effect on stock returns is provided by this study, several aspects could be explored. The empirical study could be benefitted from additional analyses by using alternative proxies of sentiments, additional samples, and periods. First, the proxies used for investor sentiment—log differences in trading volume and index value—are relatively simple measures. While appropriate for the available data in Bangladesh, they may not fully capture the complexities of investor sentiment. Second, the study focuses solely on Bangladesh's capital market, which may limit the generalizability of the findings to other frontier or emerging markets with different market structures and regulatory environments. An extensive comparative study on different markets' sentiment

effects could be conducted to investigate the cross-country variations. Lastly, the link between sentiment and stock returns is assessed based on the long-term perspective. Further research could be carried out on this aspect based on the short-term perspective. Overall, future research could address these limitations by exploring more advanced sentiment measures, expanding the geographic scope, and using monthly stock returns to provide a broader understanding of sentiment-driven market behavior.

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11.0 Appendices

Table A1: List of listed companies in DSE

Sector	SL No.	Company Name	Symbol
Cement	1	Aramit Cement Limited	ARAMITCEM
	2	Confidence Cement	CONFIDCEM
	3	Crown Cement PLC	CROWNCEMNT
	4	Heidelberg Cement Bangladesh Limited	HEILDELBCEM
	5	LaFargeHolcim Bangladesh Limited	LHBL
	6	Meghna Cement	MEGHNACEM
	7	Premier Cement Mills Limited	PREMIERCEM
Ceramic	8	Fu-Wang Ceramic Industries Limited	FUWANGCER
	9	Monno Ceramic Industries Limited	MONNOCERA
	10	RAK Ceramics Bangladesh Limited	RAKCERAMIC
	11	Shinepukur Ceramics Limited	SPCERAMICS
	12	Standard Ceramic Industries Limited	STANCERAM
Engineering	13	Aftab Automobiles Limited	AFTABAUTO
	14	Anwar Galvanizing Ltd.	ANWARGALV
	15	Atlas Bangladesh Limited	ATLASBANG
	16	Aziz Pipes Limited	AZIZPIPES
	17	Bangladesh Autocars Limited	BDAUTOCA
	18	BD Thai Aluminium Limited	BDTHAI
	19	Bengal Windsor Thermoplastic Ltd.	BENGALWTL
	20	Bangladesh Steel Re-Rolling Mills Limited	BSRMLTD
	21	BSRM Steels Limited	BSRMSTEEL
	22	Deshbandhu Polymer Limited	DESHBANDHU
	23	Eastern Cables Limited	ECABLES
	24	Golden Son Limited	GOLDENSON
	25	GPH Ispat Limited	GPHISPAT
	26	KDS Accessories Limited	KDSALTD
	27	Monno Agro & General Machinery Limited	MONNOAGML
	28	Navana CNG Limited	NAVANACNG
	29	National Polymer Industries Limited	NPOLYMAR
	30	National Tubes Limited	NTLTUBES
	31	Olympic Accessories Limited	OAL
	32	Quasem Industries Limited	QUASEMIND
	33	Rangpur Foundry Limited	RANFOUNDRY
	34	Ratanpur Steel Re-Rolling Mills Limited	RSRMSTEEL
	35	S. Alam Cold Rolled Steels Limited	SALAMCRST
	36	Singer Bangladesh Limited	SINGERBD
Food & Allied	37	Agricultural Marketing Company Limited (Pran)	AMCL (PRAN)
	38	Apex Foods Limited	APEXFOODS
	39	British American Tobacco Bangladesh Company Limited	BATBC
	40	Beach Hatchery Limited	BEACHHATCH
	41	Gemini Sea Food Limited	GEMINISEA
	42	Golden Harvest Agro Industries Limited	GHAIL
	43	National Tea Company Ltd.	NTC
	44	Olympic Industries Limited	OLYMPIC
	45	Rangpur Dairy and Food Products Limited	RDFOOD
	46	Unilever Consumer Care Limited	UNILEVERCL

Fuel and Power	47	Baraka Power Limited	BARKAPOWER
	48	CVO Petrochemical Refinery Limited	CVOPRL
	49	Dhaka Electric Supply Company Ltd.	DESCO
	50	Eastern Lubricants Ltd.	EASTRNLUB
	51	GBB Power Ltd.	GBBPOWER
	52	Jamuna Oil Company Limited	JAMUNAOIL
	53	Khulna Power Company Limited	KPCL
	54	Linde Bangladesh Limited	LINDEBD
	55	MJL Bangladesh Limited	MJLBD
	56	Meghna Petroleum Limited	MPETROLEUM
	57	Padma Oil Co. Ltd.	PADMAOIL
	58	Power Grid Company of Bangladesh Ltd.	POWERGRID
	59	Shahjibazar Power Co. Ltd.	SPCL
	60	Summit Power Limited	SUMITPOWER
	61	Titas Gas Transmission & Dist. Co. Ltd.	TITASGAS
	62	United Power Generation & Distribution Company Ltd.	UPGDCL
IT	63	Aamra Technologies Limited	AAMRATECH
	64	Agni Systems Ltd.	AGNISYSL
	65	BDCOM Online Ltd.	BDCOM
	66	Daffodil Computers Ltd.	DAFODILCOM
	67	Information Services Network Ltd.	ISNLTD
	68	IT Consultants Limited	ITC
Miscellaneous	69	Aramit Limited	ARAMIT
	70	Berger Paints Bangladesh Limited	BERGERPBL
	71	Bangladesh Export Import Company Limited	BEXIMCO
	72	Bangladesh Shipping Corporation	BSC
	73	GQ Ball Pen Industries Ltd.	GQBALLPEN
	74	National Feed Mill Limited	NFML
	75	Usmania Glass Sheet Factory Limited	USMANIAGL
Pharmaceuticals and Chemicals	76	ACI Limited	ACI
	77	ACI Formulations Limited	ACIFORMULA
	78	The ACME Laboratories Limited	ACMELAB
	79	Active Fine Chemicals Limited	ACTIVEFINE
	80	AFC Agro Biotech Ltd.	AFCAGRO
	81	Ambee Pharmaceuticals Limited	AMBEEPHA
	82	Beacon Pharmaceuticals Limited	BEACONPHAR
	83	Beximco Pharmaceuticals Limited	BXPHARMA
	84	Beximco Synthetics Limited	BXSYNTH
	85	Far Chemical Industries Limited	FARCHEM
	86	Global Heavy Chemicals Limited	GHCL
	87	The IBN SINA Pharmaceutical Industry Limited	IBNSINA
	88	JMI Syringes & Medical Devices Limited	JMISMDL
	89	Marico Bangladesh Limited	MARICO
	90	Orion Infusion Limited	ORIONINFU
	91	Orion Pharma Limited	ORIONPHARM
	92	Reckitt Benckiser (Bangladesh) Limited	RECKITTBEN
	93	Renata Limited	RENATA
	94	Square Pharmaceuticals Limited	SQUAREPHARMA
	95	Wata Chemicals Limited	WATACHEM

Tannery	96	Apex Footwear Limited	APEXFOOT
	97	Apex Tannery Limited	APEXTANRY
	98	Bata Shoe Company Bangladesh Limited	BATASHOE
Service and Real Estate	99	SAIF Powertec Limited	SAIFPOWER
	100	Samorita Hospital Limited	SAMORITA
Paper and Printing	101	Hakkani Pulp & Paper Mills Limited	HAKKANIPUL
	102	Khulna Printing & Packaging Limited	KPPL
Telecommunication	103	Grameenphone Ltd.	GP
	104	Bangladesh Submarine Cable Company Limited	BSCCL
Textile	105	Alhaj Textile Mills Limited	AL-HAJTEX
	106	Anlimayarn Dyeing Limited	ANLIMAYARN
	107	Apex Spinning & Knitting Mills Limited	APEXSPINN
	108	Argon Denims Limited	ARGONDENIM
	109	The Dacca Dyeing & Manufacturing Co. Limited	DACCADYE
	110	Desh Garments Limited	DSHGARME
	111	Dragon Sweater and Spinning Limited	DSSL
	112	Dulamia Cotton Spinning Mills Limited	DULAMIACOT
	113	Envoy Textiles Limited	ENVOYTEX
	114	Far East Knitting & Dyeing Industries Limited	FEKDIL
	115	Generation Next Fashions Limited	GENNEXT
	116	Hamid Fabrics Limited	HFL
	117	H.R. Textile Limited	HRTEX
	118	Hwa Well Textiles (BD) Limited	HWAWELLTEX
	119	Maksons Spinning Mills Limited	MAKSONSPIN
	120	Malek Spinning Mills Limited	MALEKSPIN
	121	Matin Spinning Mills Ltd.	MATINSPINN
	122	Metro Spinning Limited	METROSPIN
	123	Paramount Textile Limited	PTL
	124	Prime Textile Spinning Mills Limited	PRIMETEX
	125	Rahim Textile Mills Ltd.	RAHIMTEXT
	126	Regent Textile Mills Limited	REGENTTEX
	127	Safko Spinnings Mills Limited	SAFKOSPIN
	128	Saiham Cotton Mills Limited	SAIHAMCOT
	129	Saiham Textile Mills Limited	SAIHAMTEX
	130	Shasha Denims Limited	SHASHADNIM
	131	Simtex Industries Limited	SIMTEX
	132	Sonargaon Textiles Limited	SONARGAON
	133	Square Textile Limited	SQUARETEXT
	134	Stylecraft Limited	STYLECRAFT
	136	Tosrifa Industries Limited	TOSRIFA
	137	Tung Hai Knitting & Dyeing Limited	TUNGHAI
	138	Zaheen Spinning Limited	ZAHEENSPIN
	139	Zahintex Industries Limited	ZAHINTEX
Travel & Leisure	140	The Peninsula Chittagong Limited	PENINSULA
	141	Unique Hotel & Resorts Limited	UNIQUEHRL

Source: Authors' compilation

Table A2: Cluster random effect regression outcome based on size

RETURN	(1) Size_Low	(2) Size_Medium	(3) Size_High
SentimentS	.374196	.2899236	.220155
	(0.000)	(0.000)	(0.000)
SentimentM	-.0388963	.1086005	.1799508
	(0.885)	(0.614)	(0.332)
PNAV	.0093058	.0030462	.0043679
	(0.132)	(0.532)	(0.001)
SG	.1144941	.1703048	.4802076
	(0.130)	(0.146)	(0.008)
EPS	.001179	.0026753	.0006465
	(0.775)	(0.661)	(0.314)
INF	100.822	53.95544	-29.2632
	(0.171)	(0.318)	(0.439)
INT	-6.435521	-6.547706	-.7050417
	(0.005)	(0.000)	(0.696)
Constant	-5.241468	-2.666797	1.658799
	(0.196)	(0.369)	(0.418)
Observations	235	235	235
R-sq	0.4358	0.5152	0.3957

Source: Authors' compilation using Stata 15.0

Table A3: Cluster random effect regression outcome based on PNAV

RETURN	(1) PNAV_Low	(2) PNAV_Medium	(3) PNAV_High
SentimentS	.3343011	.2597618	.2607096
	(0.000)	(0.000)	(0.000)
SentimentM	.1524159	.1165241	-.1370502
	(0.494)	(0.578)	(0.605)
SIZE	-7.16e-06	4.53e-06	-1.50e-09
	(0.040)	(0.252)	(0.041)
SG	.1664727	.1336312	.2144183
	(0.019)	(0.379)	(0.034)
EPS	.0001522	.0070867	.001885
	(0.979)	(0.020)	(0.014)
INF	51.46198	75.04363	-1.054786
	(0.396)	(0.169)	(0.888)
INT	-5.726072	-6.29794	-3.707076
	(0.004)	(0.000)	(0.074)
Constant	-2.510684	-3.878592	.365218
	(0.451)	(0.195)	(0.949)
Observations	235	235	235
R-sq	0.5488	0.4927	0.2524

Source: Authors' compilation using Stata 15.0

Table A4: Cluster random effect regression outcome based on sales growth

RETURN	(1) SG_Low	(2) SG_Medium	(3) SG_High
SentimentS	**.3795223**	**.2414482**	**.3188989**
	(0.000)	**(0.000)**	**(0.000)**
SentimentM	-.2554377	.1945157	.0888016
	(0.188)	(0.332)	(0.732)
SIZE	**-8.05e-08**	**-1.44e-07**	-8.96e-10
	(0.000)	**(0.117)**	(0.419)
PNAV	.0075693	**.0085507**	.0039942
	(0.159)	**(0.003)**	(0.301)
EPS	**.00357**	**.0026289**	.0035894
	(0.000)	**(0.000)**	(0.253)
INF	124.8323	25.47338	-30.52812
	(0.055)	(0.634)	(0.598)
INT	**-7.986463**	**-5.396366**	-3.171915
	(0.000)	**(0.001)**	(0.105)
Constant	-6.566666	-1.115303	1.981429
	(0.066)	(0.704)	(0.533)
Observations	235	235	235
R-sq	0.4479	0.4521	0.3914

Source: Authors' compilation using Stata 15.0