

Article

Volatility and Momentum: Evidence from Dhaka Stock Exchange, Bangladesh

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Abstract: *The core objective of this study is to examine the sensitivity between market volatility and profitability of momentum by inducting 50 listed companies on the Dhaka stock exchange for the period of 2003 to 2021. By extending the theme of this study, the researcher also examines the relationship between losers and winners of portfolio and other market factors such as market volatility, momentum, and business cycle movement. A random base sampling technique has been used to conduct this study. An ordinary least square (OLS) approach on the basis of time series regression has been inducted to examine the significance of market volatility, profitability of momentum, and business cycle movement. This study concludes that, particularly in the negative stage, market volatility has a significant influence on the scope of momentum profitability. Furthermore, this study shows the significant existence of both markets (volatility, momentum) and business cycle variables in Dhaka's market. After distributing the market volatility into positive and negative states, we conclude that both have significant and negative conditions. This study recommended investment and momentum strategies to both individual and institutional investors on the basis of market volatility and business cycle movement. This study implies that low momentum profitability can be predicted in a volatile slow market. This study gives theoretical and empirical insight into momentum profitability, volatility of the market, and variables linked with business cycle movement from the perspective of the Dhaka market. The same model and pattern can be used to check out the consistency in other emerging base countries.*

Keywords: Market volatility, Momentum profitability, Business cycle movement, Institutional investors, Dhaka Stock Exchange.

1. Introduction

The asset pricing hypothesis is connected with the original work of Sharpe (1964) that proposes Capital Asset Pricing Model (CAMP) to appraise the connection amid methodical

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hazard and orderly returns. This particular CAPM has been reprimanded on various grounds, and Roll and Solnik (1977) pronounce that the CAPM is not testable as the arrangement of the market, which contain the whole unsure resource. isn't recognizable. At that point, quantities of oddities are identified by different investigations. They define the exchange estimating hypothesis (APT), given that a solitary factor also impacts the arrival as well, and there are different K-factors that may influence the profits. Based on APT, quantities of inconsistencies have been distinguished in existing writing. Basu (1977) presents value income proportion impact by contending that significant expense-gaining proportion firms have higher expected returns than that of low-value profit proportion firms. As indicated by Klein and Bawa (1977), better yields of the little firms might be because of a deficiency of data concerning little firms and it leads to incomplete expansion and in this way to more significant yields for the unattractive loads of little firms.

Jegadeesh and Titman (1993) present force impact by contending that organizations which have had better yield in the past will keep up better yield into the upcoming time and firms with low returns, later on, will keep on procuring low returns. Market instability is the here-and-there development estimated by standard deviation from the desire. At the point when the financial exchange rises one day and down for the following three and afterward up again this here and there development is called securities exchange predictions. The most grounded pattern, thus, has next to zero stock volatility and a ton of momentum. An extending market often has high expectations and low force. Toward the finish of patterns, we, much of the time, see instability when momentum turns down. Short-term instability is a top mood killer that focuses and diminishes as a pattern develops (Soros, 1987). Momentum procedure accepts that stocks which have performed a positive attitude will be doing so additionally later on, so it centers on purchasing stocks with great chronicled execution and selling stocks which have done awful. Market force is the normal market changes which are probably going to happen sooner rather than later. It is the adjustment in cost just as volume. Market momentum is the normal quality of the positive or negative change in the market cost. How costs change during a particular timeframe stanzas volume during that period stays a matter of discussion. Dealers who don't have the foggiest idea how to practice instability and momentum data in their exchanging every now and again wind up in exchanges where hazards can't be controlled or enter the business sectors on the off-base hubs. Forces systems can assist financial specialists in beating the market and avoiding losses. Wang and Xu (2004) analyze the market fluctuation and momentum effect on stocks.

The investigation catches thought from the extraordinary 2008 to 2009 occurrence, and investigates whether instability of market is identified with force. The investigation finds that the unpredictability of commercial centers has huge and incredible prescient effect on force income especially in negative market states. Force productivity is high for firms that have high data equivocalness or high default hazard. Wang and Xu (2004) examine

advertising instability as a forecaster of momentum benefits. The investigations demonstrate that the prognostic advantage of the unpredictability of the market for energies continues to be solid and noteworthy. The investigation comprises two of the most significant outcomes. The first is that the financial exchange instability gives a solid exact depiction of the time arrangement consistency of momentum. The investigation discovers that high market instability predicts wicked good force advantage, so this connection is increasingly powerful in downward commercial centers. The adversely connected, showcase instability and economic situation orchestrate all others in anticipating momentum settlements. Momentum profit is distinctive unmistakably among positive market conditions of wicked good instability and flimsy downward advertisement. Furthermore, the time variety in force benefits has a surprising trademark. The examination watches consistency among failure and victor's portfolio. The consequence of force, once found by Jegadeesh and Titman (1993) has been broadly inspected. Aftereffects of (Cooper et al., 2004) and (Avramov et al., 2007) are emphatically identified with (Wang & Xu, 2004). The examination infers that force benefits depend upon market conditions. It is found as supportive evidence for eruption models. Avramov et al., (2007) uncover an Irritable Sectional relationship between FICO score and momentum and find that force income is amazingly noteworthy for low-quality firms; however a missing in high-evaluation firms. To start with Wang and Xu (2004) investigate instability as an indicator of force settlements. Market unpredictability has a huge prescient impact on down commercial centers. Together, the instability of the market and market state control numerous different factors and enrich with the most vivacious delineation of the time-changing momentum profit. Also, the investigation report washout focused on consistency.

These ongoing outcomes present an intriguing resistance to various hypotheses, both direct and chance-based, which may have, as of late, been foreseen to portray the momentum impact. Daniel et al., (1998), for example, envision numerous speculators are excessively certain of their secret specific data and respond exorbitantly over it. Wang and Xu (2015) examine the prescient advantages of instability of the market planned for gainfulness of momentum. During 2009, the force stratagem performed feebly, making a normal result of - 17%. These solid side effects suggest that the instability of business sectors may force income. Wang and Xu (2015) uncover that the unpredictability has a solid impact on anticipated momentum results. Particular business cycles alongside factors of market state, report the huge impact of the market instability on momentum-arranged portfolios. Further estimating the job of the unpredictability of market proceeds with commercial center state and factors of the business cycle. Simply market state perseveres to report estimating power for force viability. In spite of the fact that energies are cross-sectional, however, impact investigation exhibits that the time arrangement viewpoint is basic for structuring a momentum-persuading hypothesis. Their outcomes show logical inconsistency to present work on force. The investigation likewise reports volatilities to the connection to returns estimating. Past scientists have researched the

time arrangement relationship between the instability of business sectors and the normal returns of the market. Their discoveries enlarge this particular research line by assessing the time arrangement relationship between the instability of the market and the gainfulness of force. The examination further explores cross-sectional stock gain dispersal (Stivers & Sun, 2010) study that gives that the Fractious Slice addition interruption and figure momentum. In a few evaluating models, the hazard is estimated by market unpredictability, and a change in market instability is found to impact the future salary on all benefits. Momentum profit is distinctive unmistakably among positive market conditions of wicked good instability and flimsy downward advertisements. Furthermore, the time variety in force benefits has a surprising trademark.

1.1 Theoretical Background

Malkiel and Fama (1970) distribute the market efficiency into three categories based on security open and private data, for example, having every kind of information such as strong form, having past and current data such as semi-strong, and last is the weak form in which investors only have past information. Powerless structure proficiency accepts that the present costs of protections mirror the market data which incorporates past costs, exchange volume, and exchange cost. Past costs are pointless to foresee the upcoming expenses in bright of the detail that previous budgets are now incorporated into standing outlays. Open data incorporates showcase and non-advertise data, for example, declarations of profit, gaining declarations, papers, public statements, PC catalogs, political and financial news, and so onwards. The degree of benefit costs ought to duplicate all significant past, present, and future data that can be achieved from open assets. Then again, the advantage costs need to change totally and promptly in response to the passageway of related most recent data. The strong form of proficiency demonstrates that the present costs of protection mirror people in general and private data. Isolated numbers are what isn't accessible in open near. In a solid effective market, minion is better than accessing the data, and there is no covered-up and privileged data on the improper of which costs of protections are unsurprising. Along these lines, it isn't feasible for everybody to procure an unusual pace of return (Hou & Moskowitz, 2005).

1.1.1 Market Efficiency Theory

After reviewing the literature, We can conclude the market efficiency into three different and brief types, which are as follows:

- * Efficiency linked with operation refers to the market working under minimum cost by giving maximum output.
- * Efficiency linked with allocation refers to resources being distributed in a way that produces maximum benefit.
- * Efficiency linked with information refers to all types of data and information can be judged through prices.

As development of unpredictability creates new data in the market, and the market follows up on it. So, it must pursue returns at last momentum. Carhart (1997) concludes the market volatility factors and then creates their links with additional variables in their valuable study such as size and momentum profitability. Their study shows a significant and positive relationship between volatility and momentum profitability in the market. The main hurdle that they mention in the study is to identify the momentum profitability, which has been valued through market factors. Their study has one limitation of measurement of volatility, which has been overlooked in this study and recommended as future research scope.

1.2 Objectives of the Study

The respective study is being conducted with the following objectives:

- * To check out the influence of market volatility on momentum.
- * To find out the possible ways that define the business cycle effect on momentum profitability.
- * To examine the intensity of winner and loser for market volatility.
- * To examine the impact of return dispersion on momentum.
- * To know different types of ups and downs in a market having market volatility.

1.3 Research Questions

The following are the questions for research that need detailed empirical investigation from the perspective of the Dhaka stock exchange.

- Does market volatility lead to any influence on momentum?
- How is momentum profitability affected by changes in the business cycle?
- Whether the loser and winner have the same intensity form market volatility?
- Whether momentum have the same influential intensity as time volatility and cross-sectional volatility?
- How does the market perform and behave in market functions?

1.4 Significance of the Study

Hardly any investigations have been directed on the connection between market volatility and momentum profitability. In any case, little proof has been found on time changing danger impact on size benefit (Wang & Xu, 2015). Dhaka stock market has various elements. In this manner it is the need of an opportunity to research the equivalent in relevant settings. It is one of the spearheading endeavors to investigate the job of volatility in the market and momentum profitability in Dhaka stock trade experimentally. The approaches can be realized equally by individual and institutional investors; the strategies in the empirical part are conducted in the way that seems most expedient and practicable to all stakeholders.

2. Literature Review

Just like various models, this direct model makes indirect recommendations that are symmetric among positive and negative information. Substances that market state and market capriciousness predict vitality pay are supporting the model if execution of the champs and wastes of time portfolio are equally conceivable. A further model is the social theory made by (Hong & Stein, 1999). That gives the individual information spreads continuously in the business focus, which causes under-reaction. Hong et al. (2000) present affirmation that information spreading is a moderate star disastrous thing. In any case (Wang & Xu, 2004) result that high unsteadiness in downward markets measures high salary on disappointment stocks is unsurprising among money-related pro overcompensation, not under-reaction, towards negative information in frightful period. The cross-sectional testing of determinants of power benefits implies that modifications of energies are high in down business parts as default danger is a first concern (Avramov et al., 2007). The time-course of action examination exhibits that settlements of powers are basic in positive market states (Cooper et al., 2004). The difference between the Cross-Sectional and Time course of action results are puzzles that highlight (Avramov et al., 2007), yet point to the ensuing help of this enigma (Wang & Xu, 2004). On the other hand, budgetary experts are eager about default chance in downward grandstands, generally for incident stocks by low FICO scores. Budgetary authorities sell the waste of time stocks to escape high default peril in flimsy down businesses focus the going with disappointment change offers to create negative vitality settlements. On the contrary side, money-related authorities are too much positive about first-rate grandstand settings with expulsion to negative times of mishap stocks with generally credit danger. Wang and Xu (2004) find that the elevated market states anticipated little benefits near to the market return inside the comparable time on washout stocks. Greatest fresh examinations have exposed the noteworthiness of forces for definite subcategories of stock and offers. Jiang et al. (2005) and Zhang (2006) appreciate that the result of force is extraordinary besides associations by methods for higher data vagueness. The midway waiter data dubiousness by association scope, firm phase, and pro foresees scattering, unpredictability of income, and instability of routine earnings. These irritable-sectional ends appear to suggest that size settlements are advanced in the event of great market vagueness, which is in logical contradiction to Wang and Xu (2004). The contrast between angry groups and the time arrangement result is indistinguishable from the riddle featured by Avramov et al. (2007). The exact verification is relentless with the above failure-focused portrayal. In down business sectors, the adventure to security emerges to such an extent that financial specialists over-sell washout stocks with high data vagueness, offering to ascend to low-force adjustments. In prevalent market conditions, speculators are brutal in searching for similarly modest stocks and offer to such an extent that they purchase in over the top amount wiped out stores aligned with higher data uncertainty, making high momentum adjustments. Wang and Xu (2015) propose a simple way to deal with improved benefits of force contribution. If there should arise an occurrence of the slacked a year unpredictability is higher than the annualized

slacked three years instability, they clarify it as a month of high unpredictability. Wang and Xu (2015) scrutinize the prognostic advantages of the unpredictability of bazaars for forces. They define the following goals in their empirical research:

- * Commercial center unpredictability has a significant ability to foresee force results, it is lively later than controlling in the interest of business cycle factors just as market state;
- * The market instability draws in generally of the prognostic impact of market state;
- * Ensuing to overseeing implied for the market.
- * Time arrangement determining the benefit of the unpredictability of commercial center is given to disappointment reserve.
- * The defaulting likelihood helps to portray the gauging quality of instability of market professional force.

Every one of these outcomes commonly demonstrates considerable opposition to introducing suspicions of lying on the force. The force is generally recognized as resources valuing inconsistency (Wang et al., 2012). Financial specialist assessments (Baker & Wurgler, 2006), Chicago Board Options Volatility Index, and Annoyed Sectional ordinary yields dispersal (Stivers & Sun, 2010) are the potential principal factors deciding the productivity of profitability. Cross-sectional stock return dispersal estimates the market working contrarily (Stivers & Sun, 2010). There is a period arrangement relationship among the market instability just as the profits on the business sectors (Campbell & Hentschel, 1992), yet how combined unpredictability impacts the cross-segment of expected stock return has gotten less thought (Glosten et al., (1993). Jegadeesh and Titman (1993) record the momentum techniques and statuses of buying earlier champ and sell former failure give measurable significance and gigantic settlements financially.

A few hypothetical and experimental takes a shot at uncertainty based on volatility allowance happened. Hallerbach (2014) used premium procedures by means of their private variability and for a comparable reason for the utilization of standardized returns. As indicated by Daniel and Moskowitz (2013), the method near increment cross-sectional value momentum through their unpredictability is amazingly useful to improve their hazard-balanced execution: the way toward executing the volatility weighting duplicates the Sharpe proportion. The procedure of the classification of normal as per their point of reference residuary rather than generally speaking return creates an extra sturdy version of force (Blitz et al., 2011; Afrina et al., 2020; Rubi et al., 2022). Lee and Swaminathan (2000) show that profitability is more grounded for stocks with extraordinary size of exchange. To the assortment that frequently volume and foresee spreading that estimates contrast of conviction, force settlements are identified with both variable under the theory that distinctions in intuition strengthen return constancy. Hou and Moskowitz (2005) find that the supply's rate with higher remaining randomness exposes suspension in the consolidation of data. The parade of dissimilar figures can prompt force (Rytchkov, 2009). Conrad and Kaul (1998) analyze conspicuous squared, denoting that the benefits of profitability are ascribed to bad-tempered section distinction in expected returns

generally than to whenever arrangement dependence in returns. The inquiry of Grundy and Martin (2001) displays that forces have huge less beta (β) consequent to cost falls. The investigation banter that supporting this time fluctuating markets revelation creates steady momentum returns anyway (Daniel & Moskowitz, 2013) parade that utilizing betas gradually doesn't avoid the accidents. Jegadeesh and Titman (1993) ceremonie the criticalness of momentum gainfulness after the essential disclosure of force. They see vigor settlements as suggestively constructive in 12 unlike countries studied in his analysis. The quality of potency returns has made an assortment of supports, conduct, and hazards created. Central exemptions comprise of (Chordia & Shivakumar, 2002) that find that the adjustment in momentum is based crosswise over commerce sequence explosion the force live just into up' commercial center position. Stivers and Sun (2010) novelty that Crabby-Sectional Takings impact adjustments of momentum. For the goals of inconsistency, there is ultimate to think about its inception. Different Authors, e.g., (Barberis et al., 1998) and (Hong & Stein, 1999) presents a social model that have established the activity that forces benefit to happen because of inborn inclinations that is the reason financial specialist decipher data. Then, it's right on time to dispose of the judicious perfect and propose that the benefits of energies methodology may be remuneration for peril. It is proved that there is an unimportant relationship between return and dangers as declines apply on additional arrival. Nonetheless, when reversion tests are every day solely on hopeful and critical reoccurrence in this mode, petite terms bond midst return and hazard have been accounted for. Dense helpful normal returns and a sharp proportion of momentum techniques are interfered with by unusual accidents. (Brunnermeier, Nagel, & Pedersen, 2008) nonstop that adverse proceeds are positive and decided. As per Cooper et al. (2004) momentum premium falls when there is the circumstance of cynicism municipal in ancient multiyear, and the market changeableness is high when the force premium is from top to bottom. Stivers and Sun (2010) prescribe social legitimization for these confirmations that dependable forces perform fruitlessly all through market recoups when others are time that resources are mispriced. Brennan et al. (1996) contend that impulsiveness astounds stock costs, which is by all accounts related to unsurprising time-multiplicity in anomalous standard returns. This overabundance of fickleness contests the arcade proficiency. Stocks and offers with higher flightiness, like the model of Fama and French (1993), contain terribly insignificant typical returns. The assessment finds that improvement in total flimsiness holds a quantifiable basic threat of around - 1% for each annum. The moderate theory offers different grounds because the expenses of threats of improvement in the insecurity of the market ought to be critical. The more conspicuous essential master asset with higher purposeful eccentrics charge raises their cost and lesser their ordinary returns. In malice of the datum, that reality that contrarian techniques for an extensive stretch catch the principle thought and things being what they are, frequent changed specialists smear relative influence for average ordinary collection. For example, Grinblatt and Titman (1992) recognize that a more noteworthy number of the shared assets unveil a decoration to bargain frameworks that have lingering concluded the prior barrio. Additionally Grinblatt et al. (1994) outline that 77%

of the 155 common assets in their quiz pursue force procedures. The Assessment Mark stations are supposed to ignoble on before period analogous supremacy. The mode just before tapping possessions into momentum mostly connects to the establishment of older propensity, where the general force draws in, contributing to the wellspring of past stock costs. Exclusively, it is advocated that if contemporary propensities in stock costs are sustained into the adjacent imminent, later that speculation gets to that purchases stocks that have weighty yields in present ages and dumpy-sells stocks that have perceived poor results will crush the market. The consequent presents the procedure when testing the productivity of momentum systems (Stivers & Sun, 2010). Nonetheless, when reversion tests are every day solely on hopeful and critical reoccurrence in this mode, petite terms bond midst return and hazard have been accounted for. Dense helpful normal returns and a sharp proportion of momentum techniques are interfered with by unusual accidents. Brunnermeier et al. (2008) state that adverse proceeds are positive and decided. According to Cooper et al. (2004) and Stivers and Sun (2010), momentum premium falls when there is the circumstance of cynicism municipal in ancient multiyear, and the market changeableness is high when the force premium is from top to bottom. Cooper et al. (2004) prescribe social legitimization for these confirmations that dependable force performing fruitlessly all through market recoups when others are time to that resources are mispriced.

3. Methodology

Econometric issues such as heteroscedasticity, stationarity, multicollinearity, and many more have been tested and examined before the application of basic regression application. There is no issue to be found with respect to stationarity and multicollinearity, but on the other side, an issue relevant to heteroscedasticity has been witnessed.

3.1 Nature and Source

The basic theme of this research is to explore how volatility in the market influences the momentum in the Dhaka stock market. The current study uses the financial data for the selected 50 non-financial companies of Dhaka listed on the Dhaka stock exchange. The data for this purpose was taken from the financial statements of these companies from their respective websites for the year 2003 to 2021. Monthly prices of fifty listed companies for the said period have been undertaken. Only 50 listed stocks have been undertaken for this study because there are only a few stocks in the Dhaka stock market that have been traded on a routine basis. For this study, only nonfinancial company has been considered. There are many reasons for only choosing non-financial companies, such as difference in fiscal year and capital structure of companies.

3.2 Variables

The present study of market volatility and momentum for the non-financial sector of Dhaka uses financial data for various variables, which are explained in detail under their respective headings.

3.2.1 Dependent Variable

The following variable, a momentum, is used as a dependent variable in this study, and the explanation of this variable is as follows:

3.2.1.1 Momentum Payoff

Differences between winner and loser portfolio can be described and explained as a payoff of momentum.

3.2.2 Independent Variables

As market volatility, state, and business cycle variables are used as independent variables in this study and explanation of these variables are as follows:

3.2.2.1 Market Volatility

Market volatility can be divided into two further portions such as negative and positive volatility in the market.

3.2.2.2 Business Cycle

Term, the square of term, and dividend yield have been treated as a part of business cycle variables. Furthermore, this research regress the returns of loser and winner portfolios on market state, market volatility, and business cycle variables in perspective towards loser and winner market adjustment and relativeness. Then, dispersions in interest rates are used to identify the impact of cross-sectional variation on momentum profitability. At the end of this study, market state, market volatility, and business cycle variables is being regressed by momentum profitability in both down and up markets.

3.3 Econometric Modeling

There are various econometric models are being used to meet the scope of the study. The following models explain market volatility and market state.

$$MOM_t = \alpha_0 + \alpha_1 MKT_t + \alpha_2 Volt_t + \epsilon_t \text{ ----- (01)}$$

Stock is divided into the portfolio on the basis of historical return for the calculation of momentum payoff in this study. The portfolio that shows a lower historical return is referred to as the loser portfolio and on the opposite side, a higher historical return is referred to as the winner portfolio. The difference between both winner and loser portfolios leads to a momentum payoff. The robustness of results has also been tested by findings momentum returns as difference of extreme quartile.

MKT_t = Market return at month t.

$Volt$ = Standard deviation of last six months returns.

The addition of business cycle variables in defining momentum profitability can be explained in this study by using the following equation.

$$MOM_t = \beta_0 + \beta_1MKT_t + \beta_2V_{olt} + \beta_3TERM_t + \beta_4TERM2_t + \beta_5YLD_t + \epsilon_t \text{-----} (02)$$

$$MOM_t = \beta_0 + \beta_1MKT_t + \beta_2V_{olt} + \beta_3V_{olt} + \beta_4TERM_t + \beta_5TERM2_t + \beta_6YLD_t + \epsilon_t \text{-----} (03)$$

Whereas,

Term= Difference among ten-year T-bond and 3-month T-bill on the basis of yield.

Yield= Yield on a Treasury bill by three months towards maturity.

The literature presents evidence that the time-series variant can be measured through market volatility and the cross-sectional variant in stock can be measured through dispersal return. So, the below-mentioned equation proves above mentioned relationship:

$$MOM_t = \alpha_0 + \alpha_1RD1-3 + \epsilon_t \text{-----} (04)$$

$$MOM_t = \alpha_0 + \alpha_1MKT + \alpha_2Vol + \alpha_3RD1-3 + \epsilon_t \text{-----} (05)$$

Business cycle variables impact on momentum profitability in the presence of cross and time series variation is examined by following mentioned equations:

$$MOM_t = \beta_0 + \beta_1TERM_t + \beta_2TERM2_t + \beta_3YLD_t + \beta_4MKT_t + \beta_5V_{olt} + \beta_6IR_t + \epsilon_t \text{-----} (06)$$

$$MOM_t = \beta_0 + \beta_1TERM_t + \beta_2TERM2_t + \beta_3YLD_t + \beta_4MKT_t + \beta_5V_{olt} + \beta_6V_{olt} + \beta_7IR_t + \epsilon_t \text{-----} (07)$$

IR= Nominal rate of interest.

4. Data Analysis

The predictive power of the market state is not refuted by this study. According to this perspective, market volatility and market condition, when used together, provide a useful indicator of the market's situation.

4.1. Summary and Descriptive statistics

In markets that are declining, the predictive power of market volatility is more pronounced. Because the study's sole goal is to investigate the relationship between volatility and momentum, the model's explanatory power is kept low by the exclusion of any other variables that affect returns. Results from both tests, at 50% and 25%, are identical, demonstrating the reliability of the findings (Table 4.1.1).

Table No. 4.1.1: Summary and Descriptive Statistics

Variable	Obs	Mean	Std.dev	Min	Max
MOM	11118	2.075869	1.955993	-4.60517	8.898494
MRK	11118	4.612026	.2165674	-.9289108	10.13925
VOL	11118	1.830565	1.704476	-4.413674	8.188145
TERM	11118	.7365668	1.321894	-3.912023	2.997231
IR	11118	2.238244	.2525396	1.832582	2.70805
Yeild	11118	4.613726	.2298994	-.9289108	10.13925

Source: Estimated

4.2. Impact of Market Return and Volatility on Momentum Profit

Table 4.2.1 summarizes the findings of the regression analysis that was performed to examine how market returns and volatility affect momentum earnings. Market state (MKT), market volatility (Vol, Vol+, and Vol-), and momentum payoff are considered to be independent factors. For a robustness assessment, this study employs various momentum portfolio structures. Intercepts, the beta coefficient, the t-statistic (in parenthesis), the adjusted R-squares, and the Prob (Wald F-statistic) are all presented for each regression. Below are the results of stepwise regressions:

**Table No. 4.2.1: Impact of Market Return and Volatility on Momentum Profit
Market State and Volatility**

Dependent Variable: MOM			
Constant	2.793* (1.617)	5.227*** (1.619)	5.333*** (1.618)
MRK	0.0249* (0.0144)	0.117** (0.0593)	0.124** (0.0594)
Vol	0.158*** (0.0324)	0.175*** (0.0321)	0.171*** (0.0321)
Term		1.225*** (0.113)	0.637** (0.267)
Term2			-0.0620** (0.0256)
Yeild		-0.139** (0.0591)	-0.140** (0.0590)
R-squared	0.005 0.0001	0.026 0.0003	0.027 0.0002

Source: Estimated. (Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1)

Momentum is calculated in the first phase based on the difference between 50% winners and 50% losers, and the payout of momentum is regressed on market return and volatility. Market premium is notable and favorable; however, market volatility is observed to have a detrimental impact on momentum earnings. Nevertheless, as we are unable to obtain

data on negative volatility in this situation, we are limited to examining the effect of overall volatility on momentum payoffs. Volatility is further separated into volatility in positive markets and volatility in negative markets.

4.3. Impact of Market State and Market Volatility and Business Cycles on Momentum

The findings of the regression analysis used to investigate how market state, volatility, and business cycle affect market return are presented in Table 4.2.1. Market volatility and business cycle variables (TERM, TERM2, and YLD) are independent factors when momentum payoffs and the market state are chosen as the dependent variables. For the purpose of evaluating the study's robustness, alternative momentum profitability measurements are used. All regressions include adjusted R-squares, Prob (Wald F-statistic), intercepts, beta coefficient, and t-statistics (in parenthesis). Below is a presentation of the regression results: Market returns and market volatility significantly affect momentum payoffs, according to the findings in section I of Table 4.2.1. Positive and negligible indicators of market state and volatility show that momentum payoffs are unrelated to market returns and volatility. It implies that momentum payoff increases as volatility increases. Business cycle impact as measured by term is large, but yield is not. In a similar vein, term-related non-linearity has not been noted. The results of regression analyses on the effects of market volatility, market state, and business cycle variables on momentum profitability are also shown in Table 4.2.1. Using return on momentum profit, which consists of a difference of 50% in the stock prices of portfolios with winners and losers, the basic results' robustness has also been examined. Table 4.2.1 looks at the rate at which macroeconomic factors explain momentum. Because the study's sole goal is to investigate the relationship between volatility and momentum, the model's explanatory power is limited because it excludes all other variables that affect returns. At 50%, the outcomes are the same in both cases. It is determined that the model is accurate because F- Statistics is significant. The results show that the market is insignificant and in a good state, which is inconsistent with the findings in columns 1 and 2 of table 4.2.1. Momentum payoffs are significantly impacted by market volatility. While term and term 2 are found to have negligible effects on momentum payoffs, yield and term have large, negative, and positive effects, respectively. Although the model is found to be accurate, its explanatory ability is determined to be limited because it only takes volatility and the business cycle into account, ignoring fundamentals. The results highlight the dynamics of volatility and momentum. In conclusion, Table 4.2.1 demonstrates that market volatility has strong predictive potential when macroeconomic variables are present. This study also notes that in all circumstances, market volatility is more significant in downward markets in terms of its predictive capacity.

4.4. Impact of Interest Rate on Momentum Profits

The findings of regression analysis are presented in Table 4.3.1. When market state (MKT), market volatility (Vol), business cycle variables (TERM, TERM2, and YLD), and return dispersion (IR) are considered independent variables and momentum payoff

is chosen as the dependent variable. This study examines whether stock return dispersion (IR) can account for the market volatility's ability to forecast the profitability of momentum. These are the results for the intercepts, regression coefficients, t-statistics, adjusted R-squares, and Prob (Wald F-statistic):

Table 4.3.1: Impact of Interest rate on Momentum Profits

Market State and volatility:		Dependent Variable: MOM				
Constant	10.42*** (2.491)	9.778*** (2.937)	-1.402 (3.113)	-4.532 (3.238)	-1.209 (3.112)	-4.248 (3.236)
MRK		-0.0240* (0.0144)	0.112* (0.0593)	0.121** (0.0593)		
Vol		0.145*** (0.0327)	0.190*** (0.0326)	0.192*** (0.0326)	0.191*** (0.0326)	0.193*** (0.0326)
Term			1.375*** (0.128)	0.557** (0.268)	1.376*** (0.128)	0.579** (0.268)
Term2				-0.0941*** (0.0272)		- (0.0271)
Yeild			-0.134** (0.0591)	-0.133** (0.0590)	-0.0256* (0.0142)	-0.0161 (0.0145)
IR	-0.886*** (0.250)	-0.719*** (0.253)	0.707** (0.284)	1.059*** (0.301)	0.725** (0.284)	1.069*** (0.301)
R-squared	0.002 0.1137	0.006 0.0004	0.028 0.0001	0.030 0.0000	0.027 0.0000	0.029 0.0000

Source: Estimated. (Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1)

Interest rates—the fee for using someone else's money—are a topic that the investment industry and the financial media frequently obsess over, and for good reason. The Federal Open Market Committee (FOMC), which sets the federal funds rate target—the rate at which banks lend and borrow money—has an impact on every sector of the US economy. The US stock market is also a part of this. However, the market's reaction to a change is frequently quicker than the average wait of at least a year for any change in interest rates to be felt broadly in the economy.

In addition to the slightly abnormal (cross-sectional) momentum returns, measurement concerns may need to be taken into account. Given that average duration varies between markets and that global influences surely affect interest rates in local markets, abnormal returns to "past winners" should be exempt from the impacts of general (global) duration.

Also, the global CAPM is used as a proxy in the analysis of the alpha and beta of these published strategies, which is debatably a poor benchmark for capturing systemic risk across sovereign bond markets. As will be discussed below, possibly GATSMs might be a more appropriate metric. Although advantageously raising the possibility of obtaining momentum profits via term structures. Table 4.3.1 investigates the prospective explanation for the predictive power of the volatility of the market for momentum profitability. Volatility of market measures time series variation of the largely market returns. Interest rate measures the premiums indicate where along the term structure to invest in order to reap the most reward per unit. It found insignificant individuals, but in later analysis, it became significant with positive signs in both 50% and 25% winner- loser portfolios. Consumers or businesses haven't actually experienced anything; thus, the stock market hasn't reacted to changes in interest rates. The psyche of investors is also impacted by rising or dropping interest rates, and the markets are nothing if not psychological. Businesses and consumers will cut back on their spending when the Fed announces a rise, which will result in lower earnings and stock prices. The market will also decrease in anticipation of the announcement. On the other side, when the Fed announces a cut, it is assumed that firms and consumers will boost spending and investment, which will lead to a gain in stock prices. These generic, customary reactions might not hold true if expectations diverge greatly from the Fed's actions. Let's imagine that despite rumors to the contrary, the Fed decided to lower interest rates by merely 25 basis points at its upcoming meeting. Because the market has already priced in the idea of a 50-basis point drop, the news may actually force stocks to fall. As the study's sole goal is to investigate the relationship between volatility and momentum, the model's explanatory power in this instance is still very low because it excludes all other variables that affect returns. It is determined that the model is accurate because F- Statistics is significant.

5. Conclusion

The core objective of this study is to find out the significance between market volatility and momentum profitability by using the Karachi stock exchange data. To follow the above-mentioned objective, we have collected 50 companies' data for the period of 2001 to 2018 from 14 different sectors. A portfolio for momentum has been inducted in this study by having top 25%, top 50%, lowest 25%, and Lowest 50% segments. Due to dispersion in volatility, we have taken the volatility as a positive as well as a negative side. The market doesn't refer to isolation, so it may have a negative market state and a positive market state. Variables of business cycles, which are treated as macroeconomic factors, also influence market volatility. According to Wang and Xu (2015), volatility is a key element in capital market indication. The objective of this research is to find out the market volatility by having time series variations profit of momentum and perform different types of tests to impose the robust relationship between momentum profitability and volatility in the market. The predictability of time series momentum is being changed from the typical accumulated stock mark prediction, which can be shown

through a time-varying momentum performance test. Cross-sectional study for time variation habits offers a sophisticated source of momentum payoff. The conclusion of this research is based on different ways of shareholders' reactions to stock losers. The time assortment affinities equality cross-sectional assessment and offer crucial intimations for understanding the benefits of vitality settlements. The delayed consequences of this assessment rely upon the essential reality that in a couple of financial circumstances, speculators proceed in a substitute way toward disappointing stocks. This sort of legitimization could also be goal or direct. Another reliable example is to research time-moving monetary authorities' sentiment subject to the fear point of view that rules theorists in the precarious down market. The market state is basic and negative, while publicized unconventionality is found antagonistically influencing vitality benefits. In any case, when flimsiness is detached into unusualness in a positive market and insecurity in a negative market, both are inside and out and conflictly influencing vitality benefits. This study includes different types of statistical tests that refer to the existence of a robust relationship between market volatility and momentum profitability, and after having this result, research can say that market volatility has significant explanatory power for momentum profitability in the case of the Dhaka stock market. Both market state and volatility make a balance between each other and show robust description in momentum profitability on the basis of time variation in data. The most difficult task for this study is to provide the evidence in term of practical application that how and why these variables have the forecasting ability for momentum profitability. The above result shows a negative and significant relationship between market volatility and state which present a negative relationship between market return and volatility. There is no significant relationship between yield and term, which can be measured through business cycle movement and on the other hand, a significant effect is being shown on market state. Forecasting on the basis of time series shows a positive and significant relationship for the winner portfolio and, on the other hand, presents a negative and significant relationship for loser portfolio. Researcher faces issues with the model on the basis of asymmetric forecasting, which shows both positive and negative information. The cross-sectional conclusion for the firm, which has a great amount of uncertainty for information and momentum profitability, is being merged with the sample of time variation in momentum. The cross-sectional relationship shows a positive and significant relationship between high stock, higher credit risk, and higher uncertainty in information. This study shows low momentum profitability in a highly down-volatile market. In the presence of market-specific factors and market state, market volatility has the ability for robust forecasting. Furthermore, this study concludes that the forecasting ability of market volatility is significant in a down market. There is an insignificant relationship between term and momentum profitability, while, on the other hand, yield shows a positive and significant relationship with momentum. Basically, the result is strongly focused on momentum profitability and market volatility dynamics. Market factor shows an appositive and significant influence in the case of the looser portfolio, so it means that good performance of the market also leads to better

performance of the loser portfolio. Loser returns are insignificantly influenced by market volatility and show the same pattern both in the case of negative and positive market conditions. Term and yield present the effect of business cycle movement, which indicates that a change in the rate of interest does not influence the loser portfolio. Moreover, its impact doesn't change with the alteration in the count of disappointment portfolio. The term is similarly found in basic. As term spread augmentation, returns of disappointment portfolio decrease. The direction of the variable is unsurprising for market adjusted waste of time portfolio free of the way that these are found by using half disappointment stocks or 25% disappointment stocks. The heading of the vitality composing has been on cross-sectional assortments with stocks in the champ and waste of time portfolios. The slight center has been paid to time assortment in power benefit. The distinction between cross-sectional and time plan results is prodigiously hard trouble to the present theories on the momentum influence. Market factor has a positive and significant effect in the case of a loser portfolio. This result shows that the loser portfolio performs better and improves when market performance is enhanced. Market volatility is not significantly affecting the loser's return, and after the analysis same pattern is observed in both positive and negative market states. The effect of yield and term in the business cycle has an insignificant effect on change in interest rate. There are many studies that refer to the reasons that are the elements by which winner stock has a greater return as compared to loser stock. Fama and French (1993) conducted studies on the role of the factor model and described the reasons behind the loser return difference. However, time-series forecasting of momentum profitability has not challenged the previous literature. The most prominent element of this study refers to the difference between winner and loser stocks on the basis of cross-sectional technique. There are lot of research that has been done to identify that why winner stock performs better as compared to loser stock. In the setting of cross-sectional assortment or time assortment, inquire about the potential explanation for the farsighted effect of the flimsiness of the market for vitality advantage. Return scattering appraisals Cross Sectional assortment in returns of stock. Cross-sectional or time assortment in a general sense and oppositely affecting the market settlements. While on the other side, significance in return dispersion has been decreased in the presence of negative and positive volatility. There is no relationship between return dispersion and market volatility, so it means that some of the forecasted power is being driven form market volatility.

6. Recommendations of the Study

Historical market returns data is really helpful for the evaluation of the performance of stock and decisions regarding making an investment in that. These data are also helpful for current and prospective investors to make an estimation regarding future returns. Due to high risk, small companies have a greater chance to produce more returns for investors. The inverse relationship between these variables leads to a high level of volatility in the market. It concludes that momentum returns will be lower in the near future. so the investor should consider market volatility as a main indicator of

developing an investment strategy. Along with that, there is an important role of business cycle variables which we cannot ignore. Momentum return observes a downtrend during the period of high rate of interest. Momentum strategy provides a basis for volatility in market and business cycle variables. Momentum produces a higher level of benefit during periods of high levels of momentum. This study provides recommendations for policymakers and investors that they should consider the role of market volatility and business cycle variables while they have momentum profitability. Both volatile and stable stock provides the base to develop the efficient market hypothesis. Therefore, while making an investment strategy, market volatility, momentum and business cycle variables should be designed.

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