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Investor Sentiments and Stock Returns: A Study on Noise Traders

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Abstract
The concept of investor sentiments aims to access the interest of market players or their anticipation towards their investments. Investor sentiments hold a crucial role in trading, however, the task of measuring it is complex as it involves the quantification of emotions. Additionally, varying sentiments may exist among individual investors. Nevertheless, it is widely acknowledged that investor sentiments are integral element of stock market dynamics along with genuine explanatory power. Sentiments serve as ambiguous elements in economic activities, shaping investors' subjective outlook on future returns. Consequently, this influences their investment behavior, ultimately making a substantial impact on the market. This study aims to analyze the impact of investor sentiments on stock returns. This research is the first one to study investor sentiment proxies instead of a joint index with some novel proxies i.e. share mispricing, bond yield spread, and gold bullion in the context of Pakistan. This study uses panel data of 49 non-financial firms taken on quarterly basis from 2012-2019 covering 1467 observations of the unbalanced panel. The Generalized Least Squares model is used in the study for hypotheses testing. The results for all five hypotheses of investor sentiments' proxies are accepted i.e. about gold bullion, survey data indicator, turnover and the two technical analysis indicators. Additionally, the findings are consistent with the literature studies conducted on the developed and developing economies. However, this study has some limitations, which can become part of future studies for having an in-depth analysis of investors' sentiments in the Pakistan stock market. The policy implication of this study is for the policymakers to direct the policies in consideration of investors' noise trading behavior by understanding the stock market biases.

Keywords: investor sentiment, stock returns, noise traders, rational investors, gold, turnover, technical indicator

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1. Introduction

Financial theory gives several models related to asset pricing, which associate expected returns with one or more than one variable signifying numerous risk sources. The characteristics of such variables are based on the underlying assumptions of the models. Among these models, the most renowned is the Capital Asset Pricing Model (CAPM), which has one risk source. The second commonly used model is the Arbitrage Pricing Theory (APT), which has numerous risk sources. These models are utilized to examine the performance of funds and to assess the cost of capital (Parab & Reddy, 2020).

The models of conventional financial theory are deemed to derive risk factors related to stock price determination. They are based on the assumption that investors have rational expectations; thereby design their strategies related to investment and such strategies are typically founded on the rule of risk and return (Baker et al., 1977). These models are unable to explain the performance of the actual market after internet bubbles and stock market crashes. Behavioral finance is an alternative field to explain this phenomenon by arguing against the assumption of rational prospect. It argues that investors are normal humans influenced by psychological biases and sentiments based on their decisions on inefficient markets. They also have varied expected returns than risk differences (Singh, Babshetti, & Shivaprasad, 2021). The factors of behavioral finance can better elucidate the stock market movements for decision-making of a lot of investors pursuing good or bad news or other aspects like loss aversion, herd, etc. These investors make inefficiency in the information of stock markets, which leads the APT to play a limited role (De Long, Shleifer & Summers, 1990). Along with that, sentiments also play an important role in movement of the stock returns. The true value of stock prices is reflected only in case of efficient markets and complete information with investors. However reality is different and such irrational investors play a significant role in determining the stock prices (Fisher and Statman, 2000, Fisher and Statman, 2004). Therefore, the pieces of evidence in line with the inefficiency of financial markets are more inducing than in contrast to it (French, 2017).

Investor sentiments can have a significant impact on the financial markets. Existing research tries to reveal the shadowy workings behind this sentiment effect. In 2011, Chen tried at solving this puzzle by developing a framework that shows that investor sentiments essentially play a role in the importance of accounting information. When investor sentiments raise, people tend to be more optimistic about future earnings growth, and stock analysts are more likely to give favorable ratings to those tricky-to-value stocks (Jordão, Almeida, & Novas, 2022). Now, things get even more fascinating when you consider how sentiments influence the expected rate of return – and it is not a straightforward relationship. According to the pricing theory, the expected rate of return is simply the risk level multiplied by the risk premium. Optimistic investors, though, might not fully grasp their risk exposure and end up expecting higher rewards for their risk-taking during high-sentiment periods.

In the quest to reveal the relationship between investor sentiments and stock prices, this study dives into the hidden workings of their impact. This research separates this complex relationship using the intriguing theoretical frameworks crafted by Ohlson (1995) and Chen (2011), shedding light on the investor's sentiments and their effect on stock returns. Therefore, the research objective of this study is to analyze the impact of investor sentiments on the stock returns. This study uses panel data of 49 non-financial firms taken on a quarterly basis from 2012-2019 covering 1467 observations of the unbalanced panel.

The investor sentiment studies are significant for two key concerns. Firstly, such studies reveal the stock market biases regarding investors' predicting power. Secondly, such studies present prospects to make more returns by using these biases.

On the basis of above discussion, this study is novel to study the investor sentiments on the stock returns by measuring sentiments with proxies rather than a joint index (Reis & Pinho, 2020). This study is also the first to use gold for measuring sentiment in Pakistan as it is commonly traded and its price can be easily valued in comparison to other mercantile products. In a couple of decades, studies focus on the financial markets and financial instruments. This trend elevates the risks coupled with the financial system. It also develops a need for investors' safe haven. Even though gold is coupled with the persistence of a safe haven, yet any research testing it as actually a safe haven is beyond the knowledge of prevailing research. The safe heaven argument argues that investors hold gold usually and at the time of stress, receive loss compensation instigated by negative stock returns through positive gold returns. In theoretical terms, there is the possibility of a negative correlation between gold and stocks; thereby posing gold as a hedge. However, this trend may become positive in the circumstances of the extreme markets; thereby becoming not a safe haven. There is another probability that gold may sustain its value in the circumstances of extreme market and shows co-movement with average stocks; thereby posing a protection, but not a hedge. Investors tend to move towards gold on negative return days and sell it off after regaining confidence and less volatility.

2. Literature Review

2.1. Theoretical Review

Predicting stock returns has long been a hot topic in the world of empirical finance, leading to an array of models designed to make sense of it. While some models may overlook the psychological factors at play by arguing that in the long-run the return anomalies go off with a change in the method of measurement. Groundbreaking studies by Kahneman & Tversky (1979) uncovered a significant connection between investor psychology and returns. Two main theories explore this intriguing relationship: herd behavior theory, and investor sentiment theory.

Herd behavior arises as investors opt to mimic their peers rather than rely on their unique information for decision-making (Kyriazis, 2020). Amidst this sea of emotions, irrational investors are persuaded by noise more than hard data. This collective emotional decision-making introduces an added layer of risk that should be taken into account – a risk tied directly to investor sentiment (Brown, 1999). In the realm of wealth management, herd mentality primarily implies that due to a lack of adequate information, investors face challenges in accurately predicting market trends. Consequently, they rely on observing the actions of the masses and continuously strengthen this information, ultimately resulting in herd-like behavior. Although individual conduct may appear rational in this scenario, it can lead to collectively irrational behavior (Liu,

Liu, & Hen, 2019).

Investors' demand for stocks can sometimes be driven by irrational factors; while logical shifts in stock demand are typically based on publicly available information. It is important to consider that some adjustments in demand could stem from the emotions and predictions of investors rather than rational thoughts. These instances occur when investors react to misleading cues, dubbed as "noise." Those who base their decisions on such noise are referred to as noise traders. This is a concept first introduced by Black in 1986 and later expanded into a widely recognized theory (De Long, Shleifer, Summers, & Waldman, 1990).

Within the De Long et al. (1990) model, investors can be categorized into two types: rational investors and noise traders. Rational investors possess rational expectations and can flawlessly identify the returns produced by all investment opportunities. On the other hand, noise traders develop misguided variations about future stock values. Neither rational investors nor noise traders can predict the behavior of noise traders in future, including the nature of demand and resulting equilibrium price of stock. Since every investor must liquidate their stocks later on, the unpredictability of demands and misconceptions of noise traders represent a significant risk factor (Chen, Hu, & Yao, 2022).

Investor sentiment research traces its roots back to human psychology, with Watson's pioneering work in 1912. Over time, behavioral finance emerged as a discipline that later gave rise to modern investor sentiment theories. Focusing on the psychological aspects of investor behavior, Kahneman and Tversky's Prospect Theory (1979) posits that retail investors are more vulnerable to emotional influences and cognitive biases, giving rise to illogical trading decisions. Investor sentiments lack a uniform definition; however, Stein (1996) characterized sentiment as investors' consistent divergence of expectations for the future. The concept of investor sentiment aims to gauge the enthusiasm of market players or their anticipation towards their investments. In a similar vein, Baker & Wurgler (2006) describe it as "a belief about future cash flows and investment risks not supported by available evidence." Despite the undeniable significance of investor sentiment in trading, the method of measuring it is complex as it involves quantifying emotions. Additionally, varying sentiments may exist among individual investors. Nevertheless, it is widely acknowledged that investor sentiments are integral element of stock market dynamics, provided with genuine explanatory power. Sentiments serve as ambiguous element in economic activities, shaping investors' subjective outlook on future returns. Consequently, this influences their investment behaviors, ultimately making a substantial impact on the market.

2.2. Empirical Review

Numerous research studies have investigated the relationship between sentiments of investors and stock returns empirically. In this context, researchers from the developed as well as developing economies have instigated that how the sentiments can have impact on the stock returns of different kinds of markets. This study examines investor sentiments on the stock returns by measuring sentiments with proxies i.e. gold, consumer confidence index (CCI), turnover, advance-decline ratio (ADR), relative strength index (RSI) and some controlling variables.

Gold is considered in this study as investor sentiments proxy because it is among the preliminary types of money and is traditionally utilized as a hedge for inflation (Reis & Pinho, 2020). In addition, it is not correlated with other types of assets. This feature is quite crucial in the globalization epoch since correlations are intensely augmented among other types of assets and these constituents may have a significant contribution to the role of gold (Baur & Lucey, 2010). Dyhrberg (2016) researches bitcoin as a virtual gold for hedging stocks and associates its trade with a future recession; thereby offering low sentiment. Nevertheless, the Harvard dictionary defines gold as an economic parameter for the positive sentiment (Da, Engelberg, & Gao, 2015). Therefore, this study considers gold as a haven in the crisis era by the investors influencing sentiments by exploring the directional hypothesis of gold bullion (Padungsaksawasdi, 2020). On the basis of the above discussion, the following hypothesis is made:

H1: Gold bullion (as investor sentiments' proxy) is a significant predictor of stock returns.

A number of studies focus on the proxies for measuring survey-based investor's sentiments covering CCI (Kumari, Oad Rajput, Hussain, Marwat, & Hussain, 2022; Schmeling, 2009; Akhtar et al., 2011; Zouaoui et al., 2011). Even though consumer confidence and investor sentiments are dissimilar things, yet there exists a significant as well as positive relationship. Consumer confidence becomes a direct proxy for investors' sentiments in compliance with the American Association of specific investors for the time covering 1987 to 2000. After that, this metric is acknowledged for measuring investor sentiments. The relationship between the stock returns and CCI reveal no impact on the stock indices in the study of Bremmer (2008). He studies commonly used indices like NASQAD, S&P 500 and Dow Jones. Conversely, the study of Baker and Wurgler (2007) argues that local as well as global sentiments foresee relative and market returns for highly

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unstable, growth and small portfolios. In addition to it, CCI as the investor sentiment proxy remains under consideration in the study of Schmeling (2009). He studies the relationship between stock returns and investor sentiments for industrialized economies and finds negative relationship. In addition to it, the inverse relationship holds for small, valuable and growth stocks. In addition to it, the influence of CCI on stock returns is proportionally stronger for less developed institutional markets and for those economies, which have the propensity of investor overreaction. Therefore, this study checks the directional hypothesis of CCI on the stock returns. On the basis of the above discussion, the following hypothesis is made:

H2: CCI (as investor sentiments' proxy) is a significantly negative predictor of stock returns.

Baker and Stein (2004) asserts that liquidity, specifically the turnover represents sentiment index (Chen, Zhao, Li, & Lu, 2020). Baker and Wurgler (2007) claimed that turnover reveals the disagreement among investors at dissimilar point of time. Low turnover shows that the behavior of investors is negative and vice versa. Either the behavior of investor is optimistic or pessimistic, it impacts stock's liquidity. The research studies reveal that high level of trading volume or market liquidity has been deemed as a sign of stock's overvaluation (Baker & Stein, 2004). If there are constraints with short-selling in any market, then only optimistic retail investors will take part in it, which augments the volume of trade. Therefore, in case of optimistic traders, liquidity should raise coupled with high demand for stocks having overvalue (Finter, Niessen-Ruenzi, & Ruenzi, 2012). This study checks the directional hypothesis of turnover on the stock returns. On the basis of the above discussion, the following hypothesis is made:

H3: Turnover (as investor sentiments' proxy) is a significant predictor of stock returns.

Moreover, ADR is an indicator, which seems to be technical though simple in the context of implementation. This ratio reveals the breadth of the market to assess the proportion of stocks which advances in a period to the proportion of stocks which decline in that period (PH & Rishad, 2020). The increasing trend of this indicator indicates that the market is going upward and vice versa (Brown & Cliff, 2004). Normally the relationship between ADR and stock prices is positive since sentiments of the investors keep the dynamics of the market. Therefore, this ratio assists in realizing updated trend and can become a market performance indicator as well. However, some research studies find no significant relationship between stock indices and ADR (Joshi & Bhavsar, 2011; Patel, 2015). These studies also use lagged models, but the results argue that past ADR is not able to forecast future trends in the market. In contrast, the researches indicate this ratio as the bearish and bullish market trend. Therefore, this study checks the directional hypothesis of ADR on the stock returns. On the basis of the above discussion, the following hypothesis is made:

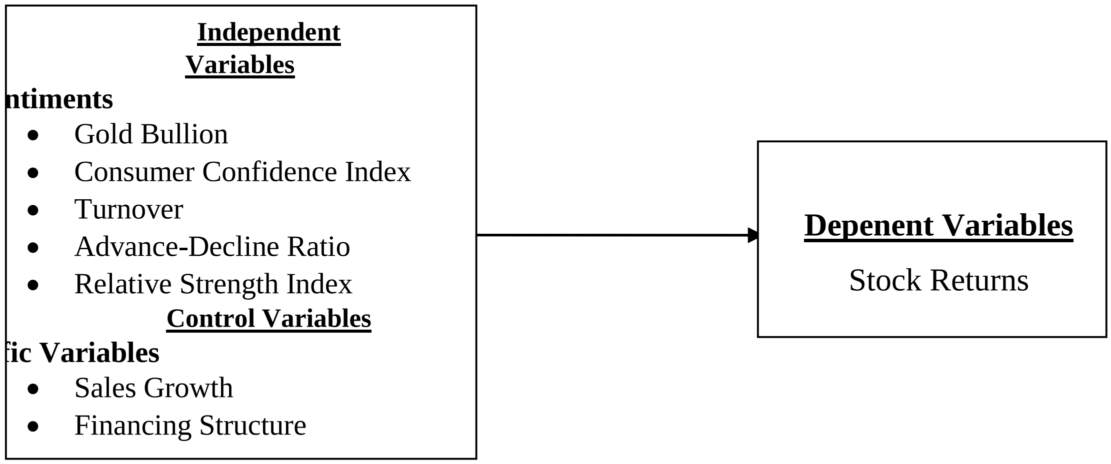
H4: ADR (as investor sentiments' proxy) is a significantly positive predictor of stock returns.

A lot of studies emphasize on the significance of one among the most adopted measures of technical analysis i.e. RSI. These researches find that the custom of normally acknowledged methods in the usual markets may not provide any benefit to the market's investors. The price of shares in the stock market is that price, which can be estimated at any point of time by the participants in the market at the rule of demand and supply (Jogiyanto, 2004). The investors' quest to find stock prices requires analyzing the movements of stock. The technical indicator used to estimate this movement in price is the closing price. RSI measures the movement in stock price for any certain time (Nabila, Maulana, Abdillah, & Djuanda, 2023; Wira, 2010). If a stock price is high, then the resultant RSI would also be high; thereby providing improved profits to the investors (Hendarto, 2005). Therefore, this study checks the directional hypothesis of RSI on the stock returns. On the basis of the above discussion, the following hypothesis is made:

H5: RSI (as investor sentiments' proxy) is a significant predictor of stock returns.

Figure 1 illustrates the schematic diagram of the theoretical framework. Where stock returns is the dependent variable; whereas, investor sentiment is the independent latent variable measured using proxies i.e. gold bullion, consumer confidence index, turnover, advance-decline ratio and relative strength index. Moreover, sales growth, financing and size are the firm-specific control variables.

Figure 1: Schematic Diagram of Theoretical Framework



3. Research Design

The population of this study is Pakistan Stock Exchange. Following the study of Reis & Pinho (2020), KSE-100 companies of the fiscal year 2012 are selected. These companies are screened for sectors by eliminating financial sector companies. In addition to it, defaulters and non-complaint segments are eliminated from the sample. Attempts are made to search the missing data from websites of the companies or from other official resources to gather as much data as possible. The companies are selected after excluding those having negative equity and profits. In this way, 49 companies having active trading, representative sampling and data representation are used covering quarterly data on 8 panel variables over the period of 8 years from 2012 to 2019 after excluding the covid-2020 time period. The data related to companies' financial information are gathered from the annual reports of the companies retrieved from their official websites, PSX, SBP, and data stream. The data related to stock prices are collected from Business Recorder and PSX. The data related to CCI are gathered from the website of SBP. The data related to gold bullion prices are taken from the website of WTI. Once data is collected, it is organized in the Excel sheet to make additional calculations as per the variables' definition.

Stock return is the percentage change in stock prices adjusted with dividends (Van Horne, 2020):

$$R_{i,t} = \frac{(P_t - P_{t-1}) + D}{P_{t-1}} \qquad (1)$$

where Ri,t is the quarterly stock return, Pt is the quarterly ending stock price, Pt-1 is the quarterly beginning stock price, D is the dividend paid quarterly, i is the cross-section and t is the time period.

Pertaining to the proxies of sentiments, gold bullion is measured as the quarterly closing price of USD gold multiply by the exchange rate to convert it into Pakistani rupee and then take its percentage change. CCI is a survey sentiment measure and a significant OECD (Organization for Economic Corporation and Development) indicator, which forecasts future trends in household consumption and savings by conducting comprehensive surveys on consumers' financial expectations, overall economic sentiments, unemployment concerns, and their ability to save. When the CCI surpasses 100, it signifies a robust consumer confidence in the future, leading to a higher inclination towards major purchases in the subsequent year. On the other hand, a value below 100 indicates pessimism in the air. CCI survey is conducted on quarterly basis by the State Bank of Pakistan (SBP).

Share turnover is the share volume to the number of shares issued. Share turnover is the sum of quarterly traded shares in the stock exchange.

$$TURN_{i,t} = \frac{Share\ turnover_i}{Outstanding\ shares_i} \qquad (2)$$

where turn stands for share turnover, i stands for companies and t stands for time period

ADR is the fraction of the number of quarterly advancing and declining stocks to assess the breadth of the market. This ratio considers the advancing stocks as those stocks having a closing value higher than the previous closing and vice versa for declining stocks. In order to calculate this ratio, the sum of advancing stocks in the quarter is divided by the sum of declining stocks in that quarter. The value above 1 shows bullish sentiment as the trend of the market is in the movement of increasing direction. A value of less than 1 indicates bearish sentiment as the trend of the market is in the movement of decreasing direction.

$$\text{ADR} = \frac{Number\ of\ advancing\ stocks}{Number\ of\ declining\ stocks} \tag{3}$$

where ADR stands for advance-decline ratio

RSI is an offshoot of the momentum indicator, customarily based on a span of 14 days. RSI meticulously measures price fluctuations to evaluate overbought or oversold securities within a range of 0 to 100. When RSI touches or goes beyond 70, it shows a potentially overbought or overestimated security; however, an RSI having the value of 30 leads in the reversal of that trend.

$$\text{RSI} = 100 - \left(\frac{100}{1 + \frac{Average\ gain}{Average\ loss}}\right) \tag{4}$$

where RSI stands for relative strength index

The very first calculation for average gain and average loss are simple averages of each stock price. First the average gain is sum of gains over the period divided by the number of days in that period (n). Similarly, first average loss is the sum of losses over the past period divided by the number of days in that period (n). The second, and subsequent, calculations are based on the prior averages and the current gain loss as:

$$\text{Average Gain} = \frac{[(Previous\ average\ gain) * (n-1)] + current\ gain}{n} \tag{5}$$

$$\text{Average Loss} = \frac{[(Previous\ average\ loss) * (n-1)] + current\ loss}{n} \tag{6}$$

where n is the current time period and n-1 is the previous time period

If there was an average gain in the previous period and loss in the current period and vice versa then the value of the current period would be zero. The calculation made after 14 days window period is then converted into a quarter by taking an average of the daily RSI value.

However, among firm-specific controlling variables, sales growth is measured as past growth of sales per one-quarter period. Financial structure is net debt measured in terms of property, plant and equipment; whereas, net debt is measured as the difference of total debts with cash and cash equivalents. Size is measured in terms of the natural log of assets.

3.1. Empirical Model

This study uses quantitative approach to analyze the secondary data. Despite limited examples of panel data approaches in studying the impact of investor sentiments on stock returns, this research relies on the comprehensive methodology employed by Chen, Chen, & Lee (2013); Ni, Wang, & Xue (2015); Schmeling (2009) and Zouaoui, Nouyrigat, & Beer (2011). Utilizing two robust estimation methods adds to the credibility of our study. Firstly, this study implements GLS estimation on a dataset comprised of 49 listed firms. By employing the Generalized Least Squares (GLS) model for regression testing, we effectively address time-series and cross-sectional autocorrelation issues while handling violations in homoscedasticity assumptions as shown in equation 7. The result is significantly more stable and estimates efficiency.

$$y^* = X^*\beta + \varepsilon^* \tag{7}$$

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where $y^* = \sum^{-1} y$, $x^* = \sum^{-1} x$, β = regression co-efficient and $\varepsilon^* = \sum^{-1} \varepsilon$

Secondly, this study employs the Fully Modified Ordinary Least Square (FMOLS) approach, analogous to Engel-Granger's technique. This enables Ordinary Least Square (OLS) estimation when a cointegration relationship exists between the dependent variable and its fundamentals as shown in equation 8.

$$X_{it} = \alpha_i + Y_{it}\beta + \varpi_{it} \tag{8}$$

where i = 1, 2, 3,…, N, t = 1, 2, 3,…, T, β = slope, ϖ_{it} = stationary distribution

Consistent findings from both methods not only demonstrate the stability of our research model but also enhance its persuasiveness and appeal to readers.

This model tests relationship of investor sentiments with the stock returns using E-views 12 software tool. The model is expressed as:

$$R_{i,t} = \beta_1 + \beta_2\ GOLD_t + \beta_3\ CCI_t + \beta_4\ TURN_{i,t} + \beta_5\ ADR_{i,t} + \beta_6\ RSI_{i,t} + \beta_7\ SALES_{i,t} + \beta_8\ FIN_{i,t} + \beta_9\ SIZ_{i,t} + \mu_t \tag{9}$$

where i represents company, t represents time, β is regressor coefficient, GOLD is gold bullion, CCI is consumer confidence index, TURN is share turnover, ADR is advance-decline ratio, RSI is relative strength index, SALES is sales growth, FIN is financial structure, SIZ is size, and μ is error term.

4. Empirical Results and Discussion

Table 1: Descriptive Statistics (n=1467)

	Mean	Median	Max	Min	Std. Dev.	Skewness	Kurtosis	Jarque-Bera
R	0.03	0.02	1.23	-1.98	0.19	-0.25	12.75	5832.13***
GOLD	0.02	-0.00	0.26	-0.22	0.09	0.24	4.06	82.66***
CCI	0.01	0.01	0.25	-0.18	0.08	0.39	3.83	79.77***
TURN	0.11	0.04	1.99	0.00	0.19	3.27	16.70	14076.46***
ADR	1.01	0.96	5.00	0.00	0.38	3.49	29.99	47518.77***
RSI	50.01	49.35	99.78	1.00	13.72	0.11	3.24	6.43**
SALES	0.05	0.02	3.28	-0.65	0.21	9.59	123.72	913335.30***
FIN	0.72	0.29	90.95	-118.25	8.13	-6.25	133.16	1045157.00***
SIZ	10.26	10.22	13.62	7.47	1.22	0.25	2.75	18.69***

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

The analysis of data is conducted by testing the classical assumptions of regression to come across the fundamentals of the test (Hair et al., 2019) covering normality, unit root, autocorrelation, cointegration, cross dependence, and heteroscedasticity. It can be observed from the results reported in table 2 that the p-value of Jarque-Bera is consistent with the coefficients of Skewness and Kurtosis; thereby rejecting the normality hypothesis. The unit root test reports that all variables are not stationary at one level. The Durbin-Watson test reports value of 1.902, suggesting absence of autocorrelation since it is closer to the threshold value of 2. The LR test is performed to test heteroscedasticity with a p-value of less than 0.05, revealing that residuals are heteroscedastic. In order to deal with the concerns of diagnostic tests, FMOLS and GLS models are applied.

Table 2: Estimation Results

Variables	GLS Coefficients	FMOLS Coefficients
GOLD	-0.22***	-0.31***
CCI	-0.07*	-0.11**
TURN	0.18***	0.09***
ADR	0.26***	0.23***
RSI	0.00***	0.00***
SALES	0.04***	0.04**
FIN	0.00*	0.00
SIZ	-0.04***	-0.05***
C	-0.06	-5.23
R-squared	0.62	0.55

***p < 0.01, **p < 0.05, *p < 0.1.

The estimation results (table 3) detail the outcomes from F-statistic with p-value of less than 0.05, thereby rejecting the possible parameters of the model to be zero at 1% significance level. Pertaining to investor sentiments, all variables are significant however, only CCI's significance level is at 10% level of confidence; else all variables are significant at 1% level of confidence; thereby showing the impact of investor sentiments on stock returns. Regarding firm-specific variables, the financial structure has a positive effect on the stock returns at 10% level of confidence; else all variables are significant at 1% level of confidence. However, financing structure does not influence on stock returns in the FMOLS model consistent with the study of Reis & Pinho (2020). All other variables show similar results respect to the direction of relationship between exogenous variables and endogenous variables along with significant p-value; thereby showing robustness of results.

Gold serves as both an insurance policy and safe haven for major stock markets, potentially providing stability to the financial system by detecting losses ahead of severe negative market shocks (Baur & McDermott, 2010). In this study, gold demonstrates a remarkable significance level of 1% across all estimations. However, the negative relationship shows that gold is used as a hedge in the PSX since investors use it at the time of negative shocks in stock returns to have compensation of loss (Baur & Lucey, 2010).

The consumer confidence index serves as impactful sentiment survey indicator (Simoes, 2011). Comprising five diverse yet vital sectoral confidence indicators – industrial, services, consumer, construction, and retail trade – economic sentiment surveys reveal much more than as seems to be. Interestingly, the connection between the consumer confidence index, economic sentiment indicator, and capital market is not always clear-cut in the literature. Rather, cultural elements play a significant role in molding the way optimism and pessimism circulate among economic players. A striking majority of research, consistent with this study, has revealed an inverse relationship between investor sentiments and stock returns – high investor sentiment often paves the way for low future returns. Therefore, consumer confidence measurements have been extensively utilized as reliable substitutes for investor sentiment (Jansen & Nahuis, 2003; Fisher & Statman, 2003; Lemmon & Portniaguina, 2006; Chui, Titman, & Wei, 2010).

The usage of the turnover rate is a sentiment that many financial experts rely on, including Baker & Wurgler (2006), Baker & Wurgler (2007), Chen, Chong, & Duan (2010), Baker, Wurgler, & Yuan (2012), Huang, Jiang, Tu, & Zhou (2015), Yang & Zhou (2015, 2016), Kumari & Mahakud (2015), Asem, Chung, Cui, & Tian (2016), Jitmaneeroj (2017), Gao & Yang (2017), Ma, Xiao, & Ma (2018), Seok, Cho, & Ryu (2019), & Zhou (2018), to indicate the level and effect of optimism in the business world. This information can help firms determine their level of liquidity and competitiveness. In the model of this study, turnover impacts significantly on the stock return with predicting power of $\alpha = 1\%$.

In the world of finance, two important indicators for technical analysis are RSI and ADR. Not only do these indicators help assess sentiments, but they are also powerful tools for predicting stock returns both in the short and long term. Extensive research has shown that positive coefficients go with robust estimations, highlighting the importance of these indicators. The relative strength index, for example, captures investor

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sentiments by evaluating whether a stock is oversold or overbought, thus positively correlating with stock returns in consistent to the results of undertaken study i.e. $\alpha = 1\%$. Numerous studies, including works by Chen, Chong, & Duan (2010), Yang & Zhou (2015, 2016), Seok et al., (2019), Zhou & Yang (2020), and Ryu, Kim, & Yang (2017), have demonstrated its efficacy in accurately predicting short-term and long-term stock returns. The RSI specifically captures investor sentiment, providing insight into whether the stock is overbought or oversold, and as one would expect, correlates positively with stock returns. Furthermore, the ADR, which measures the fraction of advancing to declining stocks, confirms upward sentiments trends and also demonstrates a positive relationship with stock returns (Kumari & Mahakud, 2015; Dash, 2016; Brown & Cliff, 2004; Jitmaneeroj, 2017). In the model of this study, ADR impacts significantly on the stock returns with predicting power of $\alpha = 1\%$. The evidence is clear: high investor sentiment consistently results in higher stock market returns.

As expected, the control variables are important in assessing the stock returns. Stock returns have direct relationship with sales and financial structure and inverse relationship with size (Banz, 1981; Basu, 1977 and Lau, Lee, & McInish, 2002).

Bintara (2020) states that the growth rate of a company is proportional to its need for funds to finance the expansion. As a result, a company with greater growth prospects will retain its income for future financing needs, rather than paying it out as dividends to shareholders with cost constraints in mind. Therefore, faster company growth means more funds are needed to create a greater opportunity for profit and increased income withholding, which translates into a lower dividend payout ratio; thereby enticing fewer investors. These companies show inverse investor sentiments; thereby showing lower stock returns.

The financial structure of a company plays the role of a tradeoff between risk and reward. In the case of highly leveraged firms, there is a demand for high returns from the investors due to bankruptcy risk on their stocks (Ahmad, Fida, & Zakaria, 2013; Bhandari, 1988; Yang et al., 2010). Therefore, leverage reveals a direct relationship with stock returns. In the model of this study, financial structure significantly impacts the stock return with predicting power of $\alpha = 0.1\%$.

When it comes to stock returns, size does matter, but not in the way you might expect. While larger firms may seem like the safer bet, research from Fama & French (1992) reveals that smaller firms outperform their larger counterparts in terms of returns. However, small stocks come with increased risk, so they require compensation to entice investors. Meanwhile, big firms attract more investors who are hoping for higher future returns, resulting in higher prices and lower returns. This is where the size factor comes into play, and why they negatively impact stock returns is consistent with the study of Finter & Ruenzi (2012) and Statman (2014). To put it simply, even the experts agree: the size factor is key in explaining why we see such variation in expected returns in the stock market today.

5. Conclusion and Policy Implications

Based on the findings of this study, this article delves into a comprehensive examination of investor sentiment proxies rather than index based on the market data and the technical analysis shedding light on their ability to account for market returns (Reis & Pinho, 2020). By meticulously integrating 8 investor sentiment proxies with technical analysis indicators and control variables through 49 companies, the often-debated topic of sentiment proxies is studied. This study covers gold bullion as an investor sentiments' indicator, which is not studied in Pakistan before. Unsurprisingly, gold bullion employs a significant effect on the stock returns. Additionally, survey data sentiment indicator i.e. CCI exhibits potent impact on stock performance. While not initially classified as a sentiment proxy, technical analysis indicators demonstrate its worth by proving its ability to predict future stock returns effectively. Through this approach, we capture the essence of investor confidence and its momentum. Consequently, the exogenous variables of this study are deemed highly effective sentiment indicators capable of explaining stock returns. However, there are some limitations to this study. This study excludes crisis time period, which can become part of future studies with more years. Furthermore, the stock returns are not adjusted for bonus and right shares since the sample constitutes only a few observations having right and bonus shares. The ADR is calculated for the number of advancing and declining stocks, not for the magnitude of advancing and declining stocks. These limitations can be overcome in future studies.

The results of this research study can be generalized to investors and policy-makers. The policy implication involves gaining insights into the understanding of investors' particular decisions on the prospective earnings. It impacts the behavior of their investment and its influence on the market. In similar to it, this study can assist investors in understanding the irrational decisions for their investments on the basis of stock market biases rather than market laws. It also assists the policy regulators to direct their policy-making by productively using these biases.

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Disclosure of Interest Statement

There is no conflict of interest among the authors.

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