

Determinants of Stock Returns: The Role of Bond Yield Spread and Gold Bullion as Investor Sentiments

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Abstract

The role of financial information is the reference point in the capital market to assess the strength and profitability of a firm. Financial markets, including the Pakistan Stock Exchange (PSX), are influenced by investor sentiments, which interplay with perceptions, emotions, and behavioral biases to drive stock prices. The behavioral finance approach of bounded rationality of investors is considered to determine the impact of bond yield spread on asset price for a longer period. Moreover, investors have traditionally used gold as a hedge against inflation; however, from the perspective of portfolio management, it can be seen to offer the benefits of diversification and protection against exchange rates. This research aims to investigate the relationship between investor sentiments and stock returns in the Pakistani stock market. Investor sentiments are quantified using novel proxies such as bond yield spread and gold bullion. The sample size covers data from 49 non-financial firms from 2012 to 2019 quarterly, covering 1467 observations. The Fully Modified Ordinary Least Square method is used in the study for the hypotheses testing. The results for two hypotheses of investor sentiments' proxies are accepted. The findings confirm that bond yield spread and gold bullion significantly impact stock returns. The policy implication of this study is to understand that biases and economic conditions influence investor sentiments. Investors, policymakers, and government officials make informed decisions, which can reduce market volatility and improve financial stability. Additionally, increasing financial

literacy and making market data accessible can mitigate the impact of irrational investment decisions, fostering a more efficient market. This study's limitations include the exclusion of non-listed and financial firms, reliance on the KSE-100 index, and the use of advancing and declining stock counts rather than their magnitudes. Future research should address crisis periods, examining the sector-specific impact of investor sentiments, and considering business cycle stages to understand stock market volatility.

Key words: Bond Yield Spread, FMOLS, Gold Bullion, Investor Sentiment, Stock Returns.

Introduction

After the 1930s great depression, the financial industry all over the world went through a lot of economic uncertainties. It is essential to have information regarding the financial performance of a firm since it considers the stock price of investment with their expected future returns (Brown, 2020; Sutejo and Utami, 2020). The stock price plays the role of an indicator of the factors impacting the business of a stock market. Given that, the prices of stock indicate the firm's value, in addition to non-economic and economic factors, which may influence a specific sector or business (Momani and Alsharari, 2011). The earnings of the firm typically show its profitability trend, thereby providing investors with important information on buying or selling a specific stock. From this viewpoint, the role of financial information is the reference point in the capital market to assess the strength and profitability of a firm.

Ideally, the stock returns are driven by rational expectations of fundamental factors such as economic conditions, firm performance, industry, and global market indicators. In an efficient capital market, security prices should reflect their intrinsic value, and there should be no underpricing or overpricing. However, the reality is quite different from this ideal situation. Financial markets, including the Pakistan Stock Exchange (PSX), are influenced by investor sentiments, which interplay with perceptions, emotions, and behavioral biases to drive stock prices. Consequently,

momentum, sentiments, inefficiencies, and volatility typically influence real-world stock returns. These drivers are shaped not only by fundamental aspects but also by the common psychology of market participants. The research problem of this study is to investigate the relationship between investor sentiments and stock returns in the Pakistani stock market.

The bond yield spread is a financial indicator for assessing economic fundamentals. However, it is essential to recognize the impact of non-fundamental factors such as risk aversion and market imperfections among investors (Favero and Missale, 2012; Geyer et al., 2004). The behavioral finance approach of bounded rationality of investors is considered to assess its impact on asset price for a longer period. The researchers (Baker et al., 1977; Baker and Wurgler, 2006, 2007; Schmeling, 2009) document equity market inefficiencies and rationale behind extreme movements in the bond spread. The study of Eichengreen and Mody (1998) explores that the variation in fundamental variables is just a fraction of the spread. Therefore, researchers have started to rethink the forces underlying the changes in the spread of sovereign bonds. The supporters of behavioral finance try to find the relationship between the bond yield spread and market sentiment (Schmeling, 2009). The study of Menkhoff and Rebitzky (2008) provides an approach of indirect measurement of investors' sentiments to determine the bond yield spread, which is closely related to investor sentiments rather than fundamentals (Kumar et al., 2018; Kumar and Lee, 2006). The under-considered study uses bond yield as a sentiment proxy in the developing economy of Pakistan for the very first time to the best interest of our knowledge.

For millennia, gold has served the role of value storage and a medium of exchange. Investors have traditionally used it as a hedge against inflation; however, from the perspective of portfolio management, it can be seen to offer the benefits of diversification (McCown and Zimmerman, 2006; Sherman, 1982) and protection for investors against exchange rates (Capie et al., 2005). The financial media and empirical research show the significance of gold

as a safe haven during a crash or financial crunch (Baur and Lucey, 2010; Baur and McDermott, 2010). In the modern era, the development of novel investment tools such as exchange-traded funds (ETFs) has caused a large number of retail and institutional investors to participate in the gold market. Conover et al. (2009) recommend that investors significantly improve the performance of portfolios after adding considerable exposure to the equities of precious metals firms. However, Riley (2010) reveals the advantages of precious metals, such as strong negative association and good expected return with other assets classes. Hammoudeh et al. (2011) focused on the significance of different precious metals other than gold in the management of risk. Given the increasing relevance of precious metals, Hood and Malik (2013) use gold as a potential safe haven or hedge. Gold is adopted as a safe asset in this study in case of low sentiments. Gold is used as a hedge and a safe haven for major stock markets and acts as a restoring force for the financial system by registering losses before extreme adverse market shocks (Baur and McDermott, 2010). This study also uses gold as a hedge and a safe haven for the Pakistani stock market as an investor sentiment proxy. To the best interest of our knowledge, the under-considered study uses gold as a sentiment proxy in the developing economy of Pakistan for the very first time.

Literature Review

The bond yield spread shows the investor's willingness to give money to a country in its capacity to borrow money and fund the deficits. This spread is meant to devise a feasible solution and make decisions for precise policies to solve the crisis. In this way, it is crucial to thoroughly understand the factors influencing investors' expectations and find sovereign yield spreads, particularly in the financial turmoil. The bond yield spread shows the premium the investors need to hold securities over safer assets. The noteworthy increase in yield spreads shows the non-consideration of financial markets in policy measures and bailout packages enough for the stability of an economy. In addition, the high level of spreads shows

that the borrowing rate is economically unviable with demoralized economic development (Gómez-Puig et al., 2014).

The research of Spyrou (2013) undertook his study on the benchmarked government 10-year bond yields in Ireland, Spain, Portugal, Italy, and Greece by using it as a sentiment proxy in the University of Michigan Consumer Sentiment Index (MCSI) based on a survey conducted by the University of Michigan, the Economic Sentiment Indicator and Thomas Reuters. The results are statistically significant for investor sentiments regarding the bond yield spread of the country, particularly in the era of crisis, i.e., 2007-2011. Moreover, the studies of Aizenman et al. (2013) and Georgoutsos and Migiakis (2013) use monthly stock returns to reflect the allocation of portfolio effects between bonds and stocks in Ireland, Spain, Portugal, Italy, and Greece. The period of negative stock returns and financial turmoil go side by side with an increase in sovereign bond yield due to a rising tendency to hold a safer stock (Spyrou, 2013). Kim and Lee (2022) research established the statistical importance of the different factors linked to the market sentiment and then applied them to forecast the risk premium in the sovereign bonds of China. A composite sentiment index was created in the context of the study based on the indicators of investor risk appetite and market participation. The research findings have indicated that the sentiment factor and macroeconomic variables have outperformed the yield curve in predicting bond returns even during the financial crisis of 2008. It suggests its relevance in market turmoil due to a sentiment-driven "flight-to-quality" effect.

Empirical evidence exists in the literature on the relationship between bond yield spread and stock returns (Baker and Wurgler, 2007; Smales, 2017). Behavioral finance theories also argue that investors are irrational and driven by sentiments (Barberis and Thaler, 2003). Emerging economies like Pakistan usually show more volatility and sensitivity to sentiments than emerged economies (Bekaert and Harvey, 1997). These studies suggest that the impact of bond yield spread on the stock returns is pronounced in emerging economies like Pakistan because of lower liquidity and market

inefficiencies. More research is needed on the impact of bond yield spread on stock returns in Pakistan. Based on the above discussion, the following hypothesis is made:

H1: *There is a significant impact of bond yield spread (a proxy for market-based investor sentiment) on the stock returns in the Pakistani stock market*

Gold is considered in this study as an investor sentiment proxy because it is among the preliminary types of money and is traditionally utilized as a hedge for inflation (Reis and Pinho, 2021). A hedge is an asset uncorrelated with another asset on average. Notably, a hedge does not curtail losses in turmoil or market stress as the asset may show a positive correlation in that period and a negative correlation in the standard period (Baur and Lucey, 2010). There are theoretical models explaining why gold is usually considered a haven. A haven is an asset uncorrelated with the stock market in financial turmoil (Hood and Malik, 2013). This feature is crucial in the globalization epoch since correlations are intensely augmented among other types of assets, and these constituents may significantly contribute to the role of gold (Baur and Lucey, 2010; Shabbir et al., 2020).

Raza et al. (2019) assess the asymmetric influence of oil prices, gold prices, and their related stock market volatilities in emerging economies. Using the non-linear autoregressive distributed lag model to determine the short-run and long-run asymmetries, the results show that gold prices impact the stock prices of large emerging economies and have an inverse impact on small emerging economies. The volatility of gold prices has an inverse impact on all the stock market's emerging economies in the short and long run. In this way, the emerging economies' stock returns are more susceptible to events and bad news in uncertain economic situations.

The co-movement of oil prices and gold prices is becoming an increasingly researched topic in assessing the link between oil and gold, as the movements in their prices have significant implications for the financial markets of an economy. The rationale is that in inflationary economies, the investors hold the gold in an

increasing trend owing to hedge against inflation (Naifar and Al Dohaiman, 2013; Reboredo, 2013). The study of Ciner et al. (2013) assessed the relationship among oil, stocks, gold, exchange rates, and bonds to provide evidence that these classes of assets are deemed as haven for each other. The results confirm that these commodities are haven against each other. Dyhrberg (2016) researches bitcoin as a virtual gold for hedging stocks and associates its trade with a future recession, offering low sentiment.

Research reveals that gold price changes can predict the movement of the stock market, as Conover et al. (2009) argue that adding gold to a portfolio may significantly improve the performance of that portfolio since gold prices and stock returns are inversely related to the market turmoil. Emerging economies such as Pakistan are more sensitive and volatile towards investor sentiment changes compared to developed economies, and gold prices have a pronounced impact on stock returns. This unique dynamic of Pakistan's stock market is yet to be explored. Based on the above discussion, the following hypothesis is made:

H2: There is a significant impact of gold bullion (a proxy for market-based investor sentiment) on the stock returns in the Pakistani stock market

Methodology

The study excludes financials and utilities on the basis of the fact that these companies have different nature of business, obligations, requirements, and reporting methods, so a set of companies (non-financial) are selected in this research in order to gather similar types of firms with same features to maintain the accuracy and reliability of results. Forty-nine firms are chosen from the KSE-100 index to ensure the representation of sample from different market conditions and industries. It helps to make sure that outcomes are not confined to a particular sector. Consumer Confidence Index is a proxy of investor sentiments used in the study, which has been started surveying by the State Bank of Pakistan at the last quarter of 2011. Therefore, data is collected over a period of 2012-2019 on quarterly basis after excluding crisis period and also after excluding time period for which data was not available for all variables.

The data related to stock prices (stock returns, turnover, advance-decline ratio, and relative strength index) are collected from Business Recorder and PSX. The data related to bond yield are collected from the website of SBP. The data related to gold bullion prices are taken from the website of the World Gold Council. The data related to the consumer confidence index are gathered from the website of the SBP-reports section. The data related to sales and size are gathered from the quarterly reports of the companies retrieved from their official websites, PSX, SBP (State Bank of Pakistan), and data stream. Once data is collected, it is organized in the Excel sheet so that additional calculations can be made as per the variables' definitions.

Stock Return. At a certain time, the profit earned from the stock investment is called stock return. Stock return is the logarithm of the percentage of today's stock price to the previous day's stock price (Reis and Pinho, 2021; Siddikee, 2018):

$$R_{i,t} = \ln \left(\frac{P_t}{P_{t-1}} \right) \quad (1)$$

where $R_{i,t}$ is the stock return of i security at time t ,

\ln is logarithm

P_t is the quarter ending stock price, and P_{t-1} is the quarter beginning stock price.

Bond Yield Spread. The bond yield spread is the difference between the quarterly 10-year and quarterly 3-month bond yield calculated as (Hussain and Mahmood, 2017):

$$BON_t = 10yBON_t - 3mBON_t \quad (2)$$

Where BON_t is the bond yield spread at time t

$10yBON_t$ is the 10-year quarterly bond yield at time t

$3mBON_t$ is the 3-month quarterly bond yield at time t

Gold Bullion. Gold bullion is measured as the quarterly closing price of USD gold multiplied by the exchange rate to convert it into Pakistani rupee (Reis and Pinho, 2021) and then taking its percentage change as:

$$\Delta Gold_t = \frac{(Gold_t - Gold_{t-1})}{Gold_{t-1}} \quad (3)$$

Where, $\Delta Gold_t$ is the change in price of gold at time t

$Gold_t$ is the price of gold at time t

$Gold_{t-1}$ is the previous price of gold

Consumer Confidence Index. CCI is a survey sentiment measure and a significant Organization for Economic Corporation and Development (OECD) 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 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. It is used as a measure to test the impact of each individual measure on the stock returns instead of a joint index in empirical research (Qiu and Welch, 2004). The index of CCI is further estimated as:

$$\Delta CCI_t = \frac{(CCI_t - CCI_{t-1})}{CCI_{t-1}} \quad (4)$$

Where, ΔCCI_t is the change in price of CCI at time t

CCI_t is the price of gold at time t

CCI_{t-1} is the previous price of CCI

Turnover. 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 (Chen et al., 2013; Kim and Byun, 2010; Liao et al., 2011; Yang and Zhou, 2015, 2016).

$$TURN_{i,t} = \frac{Share\ turnover_{i,t}}{Outstanding\ shares_{i,t}} \quad (5)$$

where turn stands for share turnover,

i stands for companies and

t stands for the time period

Advance-Decline Ratio. ADR is the fraction of the number of quarterly advancing and quarterly declining stocks to assess the

breadth of the market. The advancing stocks are 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 (Baker and Wurgler, 2006; He et al., 2017).

$$ADR_{i,t} = \frac{\text{Number of advancing stocks}_{i,t}}{\text{Number of declining stocks}_{i,t}} \quad (6)$$

where ADR stands for advance-decline ratio,
i stands for firms and
t stands for the time period

The value above 1 shows bullish sentiments as the trend of the market is increasing since the number of advancing stocks is more than the number of declining stocks. It is a sign of investment sentiments having an optimistic perspective and vice versa for a pessimistic perspective. Therefore, this ratio gives insights into investor sentiments, market trends and market health (Brown and Cliff, 2004; Dash, 2016; Jitmaneroj, 2017; Kumari and Mahakud, 2015b).

Relative Strength Index. RSI is an offshoot of the momentum indicator which measures the speed and variation in price movements. It is 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. It is considered an investor sentiment proxy (Baker and Wurgler, 2006; Yang and Zhou, 2015, 2016; Zhou and Yang, 2020).

$$RSI_{i,t} = 100 - \left(\frac{100}{1 + \frac{\text{Average gain}_{i,t}}{\text{Average loss}_{i,t}}} \right) \quad (7)$$

where RSI stands for relative strength index,
i stands for firms and
t stands for the time period

The very first calculation for average gain and average loss are simple averages of each stock price. First, the average gain is the sum of gains over the period divided by the number of days in that period

(n). Similarly, the 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 (Baker and Wurgler, 2006; Yang and Zhou, 2015, 2016; Zhou and Yang, 2020):

$$\text{Average Gain}_{i,t} = \frac{[(\text{Previous average gain}_i) * (t-1)] + \text{current gain}_i}{t} \quad (8)$$

$$\text{Average Loss}_{i,t} = \frac{[(\text{Previous average loss}_i) * (t-1)] + \text{current loss}_i}{t} \quad (9)$$

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

If there were 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 the 14-day window period is then converted into a quarter by taking an average of the daily RSI value. The window of 14 days is chosen as the lesser the time, the more precise the results. When RSI touches or goes beyond 70, it shows a potentially overbought or overestimated security. It proposes that investors are excessively optimistic, and there is a prospective for correction or reversal. However, an RSI with a value of 30 is the reverse of that trend, i.e., oversold security. It proposes that investors are excessively pessimistic, and there is a prospect for upward correction or rebound (Chen et al., 2010; Zhou, 2018).

Sales Growth. Among firm-specific controlling variables, sales is measured as quarterly sales in terms of quarterly total income and then taking its percentage change (Ajizah and Biduri, 2021):

$$\text{Sales}_{i,t} = \frac{\text{Sales Proceed}_{i,t}}{\text{Net Income}_{i,t}} \quad (10)$$

Where, i = companies

t = time period

Size. Size is measured in terms of the natural logarithm of quarterly assets (Reis and Pinho, 2021):

$$SIZ_{i,t} = \ln (Total\ assets_{i,t}) \quad (11)$$

Where, SIZ = size

Ln = natural logarithm

i = companies

t = time period

This study uses the Fully Modified Ordinary Least Square (FMOLS) approach, analogous to Engel-Granger's technique (Agyemang and Bardai, 2022; Hardi et al., 2023; Hardia and Rezeki, 2024; Pasha and Ramzan, 2019; Tetteh et al., 2019; Trichilli et al., 2020). The FMOLS model tests the relationship of investor sentiments with the stock returns in the E-views 12 software with an unbalanced panel. The model is expressed as:

$$R_{i,t} = \beta_0 + \beta_1 BOND_t + \beta_2 GOLD_t + \beta_3 CCI_t + \beta_4 TURN_{i,t} + \beta_5 ADR_{i,t} + \beta_6 RSI_{i,t} + \beta_7 SALES_{i,t} + \beta_8 SIZ_{i,t} + \mu_t \quad (12)$$

where i represents company, t represents time, β is regressor coefficient, R is stock returns, BON is bond yield spread, 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, SIZ is size, and μ is error term.

Results and Discussion

Table No 1

Descriptive Statistics

n =	R	BO N	GO LD	CC I	TU RN	AD R	RSI	SAL ES	SIZ
1467	0.02	0.01	0.01	0.01		1.00	50.0	0.05	10.2
Mean	8	2	9	5	0.112	8	14	0	57
Media	0.01	0.01	0.00	0.01	0.04	0.96	49.3	0.02	10.2
n	9	2	2	3	1	2	48	5	23
Max	1.23	0.0	0.25	0.2		5.00	99.7	3.28	13.6
	5	27	9	49	1.997	0	80	0	12
Min	1.98	0.01	0.22	0.18	0.00	0.00	1.00	0.64	7.46
	0	0	4	4	0	0	4	6	8

Std. Dev.	0.193	0.007	0.092	0.083	0.194	0.383	13.722	0.214	1.217
Skewness	0.252	0.431	0.239	0.394	3.267	3.488	0.107	9.594	0.246
Kurtosis	12.754	4.308	4.060	3.827	16.696	29.995	3.243	123.722	2.747
Jarque-Bera (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.040	0.000	0.000

Table 1 shows the descriptive statistics of the study. It shows that $n = 1467$, which means that the sample size covers 1467 quarterly observations as a unit of analysis. Furthermore, it shows the mean value of stock returns as 0.0277, which means 2.77% is the average quarterly stock return in the non-financial listed firms of Pakistan. The mean value of the bond yield spread is 0.0122, which means 2.1% is the average quarterly bond yield spread showing an upward yield curve, a sign of high return on long-run risk and confidence in the economy's growth, thereby turning investor sentiments toward short-run stock investments. The mean value of gold bullion is 0.0191, which means that 1.91% is the average increase in quarterly change in gold bullion for the financial listed firms of Pakistan. The mean value of the consumer confidence index is 0.0149, which means 1.49%, which is an encouraging improvement in the confidence of investors over the quarters. The mean turnover value is 0.1125, which means 11.25% is the quarterly turnover for the financial listed firms of Pakistan. This low mean of turnover value shows investors must actively buy and sell shares. The mean value of the advance-decline ratio is 1.0079, which means, on average, the number of advancing stocks is equal to the number of declining stocks in a quarter for the financial listed firms of Pakistan. The mean value of more than 1 shows a bullish market trend as the

market moves toward advancing stocks. The mean value of the relative strength index is 50.0139, which shows that neither securities are oversold or overbought. The mean value of sales growth is 0.0500, which means, on average, 5% of the quarterly increase in sales of the financial listed firms in Pakistan. The mean value of size is 10.2571.

Table No 2

Unit Root Test

Levin-Lin-Chu unit-root test	At level		At 1st Difference		At 2nd Difference	
	t-statistic	p-value	t-statistic	p-value	t-statistic	p-value
R	-9.424	0.000				
BON	10.816	1.000	-8.380	0.000		
GOLD	-12.549	0.000				
CCI	-10.540	0.000				
TURN	-11.816	0.000				
ADR	-11.525	0.000				
RSI	-12.385	0.000				
SALES	0.247	0.598	-1.870	0.031		
SIZ	-0.402	0.344	1.333	0.909	-11.251	0.000

Table 2 shows the unit root test results of stock returns, gold bullion, consumer confidence index, turnover, advance-decline ratio, and relative strength index are significant at a level for PP-Fisher

and ADF-Fisher chi-square; thereby reporting stationarity at the level. The bond yield spread and sales results are significant at the first difference, thereby reporting difference stationarity. However, size significant at the second difference, reporting the second difference stationarity.

Table No 3
Panel Regression Results for Stock Returns

Variable	FMOLS		OLS	
	Coefficient	Prob.	Coefficient	Prob.
BON	-1.084	0.036	-1.071	0.034
GOLD	-0.326	0.000	-0.354	0.000
CCI	-0.109	0.028	-0.082	0.091
TURN	0.090	0.004	0.071	0.000
ADR	0.233	0.000	0.231	0.000
RSI	0.004	0.000	0.004	0.000
SALES	0.051	0.013	0.037	0.027
SIZ	-0.065	0.000	-0.007	0.012
C			-0.341	0.000
R-squared		0.550		0.516

Table 3 reports the results of panel regression using FMOLS. The results of testing the relationship between bond yield spread and stock returns show that the beta coefficient is negative (-1.0838) with a p-value of 0.0395. It shows a negative significant relationship between bond yield spread and stock returns in the Pakistani stock market at a 5% confidence level, thereby allowing the first hypothesis to be accepted. It shows that when investors have low sentiments, they become risk-averse and find some alternate and safe assets, such as government bonds or corporate bonds, to encounter low default risk. This result is confirmed in the literature studies (Engstrom and Sharpe, 2019; Georgoutsos and Migiakis, 2013; Gómez-Puig et al., 2014). In this way, the negative sign for the bond yield curve is expected for sentiment changes. The same may hold for a higher level of sentiments, which suggests that investors'

optimism puts less demand for debt securities, thereby increasing stock prices and decreasing bond yield, consistent with the study of Spyrou (2013). In a developing economy like Pakistan, investors' shift towards bonds during periods of low sentiment highlights their risk aversion in the face of economic uncertainty. This shift away from equities to bonds increases the demand for debt securities, leading to a decrease in stock prices and a corresponding increase in bond yields. Conversely, during periods of high sentiment, investor optimism reduces the demand for bonds, driving up stock prices and lowering bond yields.

Further, the results of testing the relation between gold bullion and stock returns reveal that the beta coefficient is negative (-0.3256) with a p-value of 0.0000. It shows a negative significant relationship between gold bullion and stock returns in the Pakistani stock market at a 1% level of confidence; thereby allowing the second hypothesis to be accepted. In this study, gold demonstrates a remarkable significance level of 1% across all estimations. However, the negative relation shows that gold is used as a hedge in the PSX since investors use it during adverse shocks in stock returns to compensate for loss, consistent with the study of Baur and Lucey (2010). Being a safe haven, gold has the property of a negative correlation with stock returns in case of stock market turmoil. In a developing economy like Pakistan, where economic and financial systems are often more volatile and susceptible to external shocks, the role of gold becomes even more critical. Investors in developing markets such as Pakistan may need more access to sophisticated financial instruments and market information, making them more reliant on traditional safe haven assets like gold. This behavior aligns with empirical studies (Baur and Lucey, 2010; Hood and Malik, 2013), which confirm gold's role as a hedge and a haven for stock market investors. It shows that the price of gold increases after a decrease in stock price and compensation for investors for their losses incurred with stock investments.

The results further show a negative significant relationship between the consumer confidence index and stock returns ($\beta = -$

1.092 and $p = 0.0282$) in the Pakistani stock market. 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 and Nahuis, 2003; Fisher and Statman, 2003; Lemmon and Portniaguina, 2006; Chui, Titman, and Wei, 2010).

The relationship between turnover and stock returns is positively significant ($\beta = 0.0904$ and $p = 0.0045$). The direct relation of the turnover rate (as a sentiment) on the stock returns is confirmed in several studies including Baker and Wurgler (2006), Baker and Wurgler (2007), Chen, Chong, and Duan (2010), Baker, Wurgler, and Yuan (2012), Huang, Jiang, Tu, and Zhou (2015), Yang and Zhou (2015, 2016), Kumari and Mahakud (2015), Asem, Chung, Cui, and Tian (2016), Jitmaneroj (2017), Gao and Yang (2017), Ma, Xiao, and Ma (2018), Seok, Cho, and Ryu (2019), and Zhou (2018). If there are constraints with short-selling in any market, then only optimistic retail investors will participate in it, increasing the volume of trade. Therefore, in optimistic traders, liquidity rises together with high demand for overvalued stocks, as confirmed in the study of Finter et al. (2012). When discussing the context of Pakistan, a developing economy, it is crucial to consider the unique market characteristics and investor behaviors that can influence the relationship between turnover and stock returns. In developing economies like Pakistan, the stock market may be less efficient and more susceptible to volatility, which can magnify the impact of investor sentiment on market dynamics.

Moreover, the relationship between the advance-decline ratio and stock returns is positively significant ($\beta = 0.2327$ and $p = 0.0000$). The result for the fraction of advancing to declining stocks is consistent with the studies of Brown and Cliff (2004), Dash (2016), Jitmaneroj (2017), and Kumari and Mahakud (2015), which confirms upward sentiment trends and also demonstrates a positive relationship with stock returns.

Furthermore, the relationship between relative strength index and stock returns is positively significant ($\beta = 0.0045$ and $p = 0.0000$). The relative strength index captures investor sentiments by evaluating whether a stock is oversold or overbought, thus positively correlating with stock returns consistent with the results of the undertaken study. Numerous studies, including works by Chen, Chong, and Duan (2010), Yang and Zhou (2015, 2016), Seok et al., (2019), Zhou and Yang (2020), and Ryu, Kim, and Yang (2017), have demonstrated its efficacy in accurately predicting short-term and long-term stock returns.

The relationship between sales and stock returns is also positively significant ($\beta = 0.0506$ and $p = 0.0130$). As expected, the control variables are important in assessing the stock returns. Stock returns have direct relationship with sales (Banz, 1981; Basu, 1977 and Lau, Lee, and McInish, 2002). Bintara (2020) states that the growth rate of a company is proportional to its need for funds to finance the expansion. Investors consider the sales growth as a vital sign of a firm's competitiveness, market demand for products/services and management effectiveness. The positive growth in sales leads to increased investor confidence. The positive sentiments and expectations regarding future earnings contribute to high returns, as revealed by the results of this study.

However, the relationship between size and stock returns is also negatively significant ($\beta = -0.0653$ and $p = 0.0000$). While larger firms may seem like the safer bet, research from Fama and French (1992) reveals that smaller firms outperform their larger counterparts in terms of returns, as confirmed in empirical studies (Banz, 1981; Basu, 1977 and Lau, Lee, and McInish, 2002). These results are also same when Ordinary Least Square Method is applied to check the robustness of the study.

Conclusion

Overall, this research sheds light on how various proxies of investor sentiment influence stock returns in the Pakistani Stock market, emphasizing their crucial role in comprehending market dynamics and predicting stock movements. The policy implications involve

gaining insights into understanding investors' particular decisions on the potential earnings. It impacts the behavior of their investment and its influence on the market. This study can assist investors in understanding the irrational choices for their investments based on stock market biases rather than market laws. In this way, the investors, specifically developing market investors, consider the behavioral aspects that play a vital role in the securities return and keep the efficient market hypothesis in view. This study can also help portfolio or fund managers in forecasting market movements.

However, this study has some limitations. All the non-listed and financial firms are excluded from this study because of their unavailability of data and the nature of business, respectively. The main limitation of this study is using the KSE-100 index instead of all listed companies, which can present different findings based on different fundamental features. Furthermore, the ADR is calculated for the number of advancing and declining stocks, not for the magnitude of advancing and declining stocks. The above-stated limitations can be overcome in future studies. This study excludes the crisis periods, which can be included in future studies by comparing crisis and non-crisis periods. Future research studies can study the impact of investor sentiments on stock returns across different sectors. Another perspective for future research can be to study the impact of business cycle stages on investor sentiments to examine the effect of stock market volatility on various sectors.

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