SPORTS SENTIMENTS AND FINANCIAL MARKETS: SHADENFREUDE IN RIVALRY OF INDIA AND PAKISTAN

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Abstract. *This paper examines the reaction of sports (International Cricket) outcomes*

on stock markets of Pakistan and India. Valuation of stock markets is taken in terms of abnormal stock returns around the dates of one day international (ODI) matches. Event study has been employed in this paper for 605 ODI matches played by Pakistan and 660 ODI matches played by India in period of 1990-2019. Findings suggest that on next trading day following the match stock returns are positive after win and negative after losing the game in both countries. In this paper one novel finding is existence of negative abnormal returns one day before matches due to anxiety of fan investors before game starts. Another important aspect of rivalry is examined as two rival countries are taken as sample. Results suggest that fan investors experience schadenfreude as they feel positive when their national team wins or rival team loses and feel bad when their team loses or rival wins. This optimism or pessimism results in abnormal stock returns mentioned in results of this paper.

Introduction

History reveals that stock market is driven into booms or crashes by big events like crash of 1929, black Monday of 1987, 9/11 effect and financial crises of 2008. Standard finance models have great difficulty to explain extraordinary stock price movements due to these events. These big events have large emotional effects on investors as compare to prosperous years. Sentiments play vital role in stock markets (Fan & Wang, 2018). Behavioural finance explains sports events viewed by an outsized no. of people. Sports can fascinate crowds

these phenomena on basis of two assumptions that are investor sentiments and limits to arbitrage. Firstly, investor's decisions are affected by sentiments and secondly it is very risky and costly to go against sentiments of investors which suggest presence of limits to arbitrage in the market (Ritter, 2003).

Sentiments were first given importance by Keynes (1936) in his General theory of employment, interest and money "Prospective yield of an asset". He argued that humans are important part of investments activity and their emotions play key role in investment decision making. To understand better performance of economies, attention must be paid on thoughts patterns that animate people ideas, beliefs, feelings and animal spirit. Economic events are not easy to understand unless we accept the fact that their roots are basically mental in nature (Akerlof & Shiller, 2009). Thus in real life investor does not take decision solely on the basis of available information and facts in the market but also most often makes decision on the basis of his judgments, comments, peer information and many more such biases (Brealey & Myers, 2008; De Long, Shleifer, Summers & Waldmann, 1990).

Sentiments are usually and easily influenced by so many non-economic factors which can be single or continuous events. Single events like aviation disaster, earthquake, terrorism activity and continuous events like temperature, sunshine, weather, weekend effect, Lunar phases and sleep patterns provide a novel perspective for explaining the probable reasons of stock market volatility and deviation of asset prices from fundamental (Edmans, Garcia & Norli, 2007). In view of efficient market hypothesis security market reflects nothing but economic information. The investor sentiments stemmed from environment, weather, sports events and lunar phases can affect the behaviours of investors and stock markets returns (Fan & Wang, 2018).

There is growing body of literature both theory and evidence on explanation for the pricing of financial assets being based on investor psychology. Several recent studies have suggested findings related to effect of sporting events on stock prices. Sports events are non-economic phenomenon so one might find no relationship between sports outcomes and stock markets but behavioural finance suggests that the large sporting events can influence sentiments of spectators and investors ensuing in upward and downward moods swings which are reflected in stock prices (Mishra & Smyth, 2010).

Sports have pronounced economic and cultural effect in our everyday life. Sports industry is an important revenue generator in the economy. The mushrooming literature on psychology has revealed strong emotional impact of sports on moods of investors and ultimately on stock market. It can be claimed that if weather or sunlight could affect financial markets through investor's moods then these markets are also not resistant to sports sentiments for major

and major sports even can bring entire nations to a standstill (Verstoep, Singh, Nguyen & Bhattacharya, 2015). This study is extending the findings of previous studies by taking a mood variable "sports outcomes" to see if investor sentiments relating to sports have some effects on stock market.

Since results of previous studies are inconclusive so underlining economic mechanism of this relationship is needed to be fully explored and explanation of investor sentiments on financial markets remains open defy.

Another important perspective taken in this study is effect of rivalry in win or lose situation. Fan and Wang (2018) claimed that many rivalry games have strong impact on players and fans, such that if they win the rivalry game, it gives condolence prize to the fans even if the team were to perform subpar in the whole season. Outcomes of rivalry games can amplify the investor sentiments effects on stock market. Study aims to analyse the rarely studied phenomenon Schadenfreude, which is Germen word means feeling of pleasure at the suffering of another group. Hence this study introduces the performance of arch-rivals and effect of their games outcomes on stock markets. Do sports sentiments affect stock markets and investors experience schadenfreude in perspective of win and lose?

Literature Review
The belief that financial market contestants may be influenced by psychological factors is not novel and it is evident that many non-economic factors can impact stock markets not directly but through moods and sentiments of investors. Market is considered as bullish when sentiments of investors are higher and conversely bearish when sentiments are lower. Sentiments are not synonymous with the value of organization or performance of organization rather sentiments are emotions or feelings which drive the stock market (Zhou, 2018). Sentiment is a preference of the investors to trade on noise instead of information and some others have referred it as investor pessimism and optimism (Barberis, Shleifer & Vishny, 1998; Brown & Cliff, 2004; Daniel, Hirshleifer & Subrahmanayam, 1998). Saunders (1993) has used weather as driver of sentiments through moods to see its effect on stock market and to cast doubt on efficient market hypothesis. Kamstra, Kramer and Levi (2000) have proposed a psychological mechanism by which day light saving time changes influence on stock markets on two specific weekends every year due to sleep desyncronosis. Weekend effect already has several elucidations for stock market behaviours in many studies. Desyncronosis links with market returns through anxiety which itself is result of difficulty in problem solving and reaching rational decisions.

Traditional finance is of view that there is no momentous relationship between sunlight and stock markets. If sunlight affects the weather it can affect agriculture and perhaps can have effect on agriculture related firms only. Hirshleifer and Shumway (2003) opposes this view by stating that sunlight affects moods and people assess future prospects more positively in good mood as compare to bad mood. People in good mood generate more unusual associations, show greater mental flexibility and better solve the problems. Like many other factors sunshine has been linked to tilting and lack of sunshine to despair and suicide. Holidays have cultural significance in affecting the stock returns. Possible reasons include speculators want to cover short positions before closed markets and positive sentiments before any festive occasion. Frieder and Subrahmanayam (2004) studied the effect of two festive occasions St. Patrick's Day and Rosh Hashanah on stock markets before closing days for these festive events. People buy riskier assets and markets show run-up in prices due to increased confidence of people and decreased risk aversion accompanying these festive occasion.

Al-Hajieh, Redhead and Rodgers (2011) find calendar anomalies as predictor of mood to influence Islamic Middle Eastern stock markets. It is evident from the findings that Ramzan holy month for Muslims has strong positive effect on stock markets of these countries. This can be attributed to positive moods and firm belief of investors in their holy month.

Edmans, et al. (2007) stated that market declines after losing in world cup game elimination stage leads to next day abnormal stock returns of 49 basis points. These results are more pronounced in small stocks and more important games in the country. However, win effect is not significant in this study. This study rejects the view that loss stem from reaction of rational investors to cash flow relevant information instead explains the effect as a result of sports mood. The magnitude of effects due to sports mood suggests that investors may obtain large returns by trading on these moods events. Worthington (2007) analysed the impact of the Melbourne Cup on returns on the Australian stock exchange and found that mean Melbourne Cup day returns were significantly higher than returns on other Tuesdays in November and that of Tuesdays in other months. Sporting results affect both abnormal returns and the trading volume around the dates of matches. Defeat and draw at home result in drop of market prices subsequent to event day while win does not show any movement after event and this can be interpreted due to allegiance bias. Study confirms that investors revise their portfolios by taking into consideration sporting results (Benkraiem, Louhichi & Marques, 2009).

Palomino, Renneboog and Zhang (2009) provides new way of examining stock market reaction towards different types of news. For each firm two types

of news are released on weekly basis including expert's opinion based upon expectations about games results and secondly games outcomes itself. Study finds strong evidence of effect of games outcomes on stock returns. Berument, Ceylan and Ogut-Eker (2009) assess the effect of sports outcomes on stock returns for three soccer teams having more or less same number of fans in Turkey. Study examines the association of win with higher stock returns with the team having fans with more fanaticism. Wins can be taken as function of fanaticism in each team and results show that high returns are linked with winning outcomes and phenomenon is more pronounced in team having fans with high rate of fanaticism against foreign rivals than teams having supporters with low degree of fanaticism.

Mishra and Smith (2010) reported the significant impact of one day match on Indian stock market. Study shows asymmetry effect in which win does not have large positive impact as compare to large negative impact of defeat. Kaplanski and Levy (2010) proposed novel approach to exploit the effect of games on stock markets. Study shows aggregate effect which is not dependent on one local market effect rather is aggregated effect on USA market as this market is most liquid equity market for all other foreign investors. As about one third of transactions in US market are done by non-U.S investors so study expects that foreign investors' sentiments also affect stock market of USA. Study suggests that aggregated effect is involved with trading in single index longer as compare to see the effect of sentiments on local market. Gerlach (2011) finds that unusual returns also exist in those countries even though their national teams did not play. The evidence shows that national team matches do not affect neutral markets like the matching countries, which implies that sports do not cause usual returns in either domestic or foreign markets. The results indicate that changes in investor sentiment following international sports matches do not have a significant effect on asset prices

Bernile and Lyandres (2011) has examined the investor ex ante beliefs regarding probability distribution of future event and ex post irrational reactions of actual outcomes. It is found that market's reaction towards results of soccer games is asymmetric. Losses have negative impact on returns while wins are followed by zero returns. Study examines investors' biased beliefs and predictions which can account for this inefficiency. Chang, Chen, Chou and Lin (2012) examined the relationship between national football league (NFL) and stock returns of NASDAQ firms located in same geographic area where games are played. Study found that stock returns following the losing games are significantly lower i.e. 0.0575 than stock returns associated with winning games. Logic behind this fact is that investors feel bad when their team loses

game. Bearish sentiments are due to losing critical games, which are perceived more important, result in subsequent lower stock returns.

Verstoep et al. (2015) investigate the impact that investor sentiment can have on stock market following the performances by the national cricket teams. Study primarily focused on performance of "star" within sporting team. Secondly highlighted that different market types can be impacted differently by sports sentiments. Study has taken trading volume to see the impact of results of matches instead of daily stock returns. Findings suggest that although cricket is very prominent game in these countries yet there was no relationship found between good or bad performance of individual "star" and financial markets. This can be due to the fact that individual performance whether it is good or bad is overshadowed by how the team fared as a whole i.e. match won or lost. However, trading volume gets significantly affected due to the evidence of "mood effect" of poor performance by key players of national cricket team. Raheman, Kiyani, Sohail and Zulfiqar (2015) find the impact of T20 and ODI matches results on stock exchange of Pakistan. Results do not show any significant effects on stock returns but stock return volatility is influenced significantly by these match results on the next day following the matches. Analysis suggests the asymmetry in results as there was significant impact of losses on return volatility than win effect. The asymmetric behaviour shows that people give more importance to loss as compared to win. Study also gives justification of high sentiments in sports days as people in Asia are crazier and give more importance to matches, so reduced volatility may be due to less business in stock market on the match day.

Curatola, Donadelli, Kizys and Riedel (2016) documented the economic link between sports sentiments and US sectoral stock returns, during the period of FIFA world cup. Study states that sports sentiments has more pronounced impact on financial sector as compare to other sectors of economy. It is argued that this result might be explained by the high liquidity that makes the financial sector more attractive to foreign investors who in turn are more prone to sport sentiments than local investors in the US. Graziano and Vicentini (2016) aims at analysing the effect of Italian national soccer team results on national stock indexes. Provide new insight by considering sporting mega event and its impact on financial markets. Three important facts are highlighted in this study which can benefit the cultural sporting event to affect sports sentiments. These are sporting event, market sentiments and value of sporting event in the market. Results confirm that football results have a strong impact on investor moods.

Lee and Chiu (2016) propose three hypotheses to prove the relationship of non-economic event and economic decision making. These are asymmetric effect hypothesis, persistent effect hypothesis and sponsor effect hypothesis.

Results support efficient market hypothesis showing no relationship between sentiments and stock markets. Study provides evidence in favour of sponsor effect hypothesis while other two hypotheses are not supported from results. Findings suggest that excess stock returns of sponsors have positive or negative shifts in response to win or loss respectively and this effect holds for first and second trading day after losing or winning the game. It concludes that investors are rationale although they feel depressed when their favourite team loses but they do not take irrational decision regarding their investments. Akhigbe, Newman and Whyte (2017) examined relationship between predicted outcomes of national basketball association playoff games and trading volume of firms headquartered in geographic area where teams played. Results suggest that there is significant increase in trading stock of firms before games and these results are more pronounced when games outcomes are more predictable. Results are more evident for losses as compare to wins and are more pronounced for critical games. Results of losses are also more consistent with those firms which are facing high stock volatility, low assets performance growth, low assets tangibility and low market-book value.

Demir and Regoni (2017) consider the effect of rivalry in soccer and introduce the performance of rival party and its impact on stock market. Investment decisions of fan investors cannot only be affected by good or bad performance of their own teams but also can be affected by performance of arch-rival teams. It is concluded that investors are driven by passion conveyed by rivalry which is market relevant source of emotion. Fan and Wang (2018) examines the effect of game da, rivalry games and media on stock exchange. The results show significant effect of loss in games elimination and win effect in rivalry games. The study has ruled out traditional approach that loss and win is due to EMH rather results support role of sports sentiments mechanism. Dimic, Neudl, Orlov and Aijo (2018) report the results of abnormal returns of stock around the dated of sporting event. Although there is significant post event impact on stock prices with both types of news but bad news generates large shift in prices than good news. Reason behind this asymmetric phenomenon is that response to positive news increases in surprise to resolution of uncertainty while bad information connotes negative and vast reaction irrespective of surprise element embedded in it which drives post event irrational behaviour of investors. Secondly positive and negative news are processed differently by the stock markets. Bad news are absorbed gradually as compare to good news which are usually processed immediately. Thirdly large impact on stock markets can be due to large emotional component such as location of games or the goal differences. Sakkas and Urquhart (2018) report the firm level sentiments through premier league match

outcomes and stock returns of FTSE 350. Contrary to results of majority of literature which shows the loss effect more evident in driving negative sentiments this study shows the win effect on local stock market in London. Win effect is found to be stronger on Saturdays which means that investors pay more attention on Saturday matches as compare to matches played on other week days.

Nachimuthu and Selvam (2018) explored the effect of games out comes on stock returns on same day of game and on the following day of game. Although win and lose both have significant effects on stock returns yet loss impact was stronger as compare to win effect. Anghel (2018) studied investor behaviour in decision making in frontier stock market of Romania. Three hypotheses were stated i.e. sentiments of investors are not affected by outcomes of games. Secondly investors' sentiments due to sports affect stock markets but this is quickly reversed by other elements of market so results are not persistent for long time. Thirdly investors' sentiments significantly shift stock prices. Only second hypothesis was supported from data which was collected for three games soccer, handball and tennis. Significant results for losses were reported in soccer due to importance and value of soccer game in Romania while no effect was seen for other games taken in study.

Skrinjaric and Barisic (2019) investigated impact of football match results on Zagreb stock exchange for period of 2014-2018. It concludes that neither win nor loss have any significant effect on stock returns in analysed period. So, study does not recommend any profitable activity regarding investment in days of games. Gkillas, Gupta, Lau and Suleman (2020) reported the national sentiments generated by feeling of optimism or pessimism followed by win or loss of matches respectively. Study didn't find any evidence of sports sentiments with standard linear causality test rather non parametric causality-in-quantiles test showed the evidence of sports sentiments. Win and losses have significant impact on stock price movements with losses have stronger predictability than wins in volatility and volatility jumps. Results of this study have important implication for investors and decision makers of financial markets as losses outcomes of ODI matches can impact risk profile of Indian equity market so investors can predict systematic risk and can allow accurate pricing of sentiments by providing ahead of time information on risk premium.

Research Methodology
The extant literature has been found to examine the impact of sports (international Cricket) sentiments on stock markets of countries, full members of International Cricket Council (ICC) and are rivals of each other in international cricket game. Proposed study is explanatory in nature as results of

all matches of ODI (One Day) were evaluated in form of Win and Lose and their subsequent effect on next day stock returns.

Main purpose of this study as stated above is to see the impact of cricket outcomes on stock markets of Pakistan and India. These two countries are taken in study as cricket is considered one of critical games in these countries and rivalry of these countries in cricket is famous. Since win and loss effect is more pronounced in rival teams so these countries on being rivals of each other were taken as sample countries. Event study was conducted to see the effect around the match dates which makes possible market reactions to certain event of critical importance. Study has examined the abnormal returns of stock markets of Pakistan and India around the one day match dates. According to Benkraiem, Louhichi and Marques (2009) event study has three main following steps;

Estimating variable during period of no event i.e. control period or estimation window, (-120, -20) days for this study as in Benkraiem et al. (2009)

Finding out values of variable means abnormal returns by estimating difference between estimated values and observed values around the dates of match. Mean adjusted return approach following Chen and Siems (2004) was used in this study

Testing statistical significance of results obtained. One sample t-test was used to test statistical significance of abnormal returns.

Estimation of Variable and computation of Abnormal Returns
Study has followed the Benkraiem et.al (2009) to choose the constant means returns model used for event study which tests existence of abnormal returns around the dates of matches.

Main variable of study is sports sentiments which were estimated in form of market reactions around the event dates, namely abnormal stock returns. For estimation of expected returns window of control period taken was [-120d; -20d]. Stock returns were calculated by the following formula:

$R_{i,t} = (P_{(i,t)} - P_{(i,t-1)})/P_{(i,t-1)} \times 100$

Where

$R_{i,t}$ = Stock returns of country i at time t

$P_{i,t}$ = Value of index in country i at time t

$P_{i, t-1}$ = Value of index in country i at time t-1

Abnormal Returns were calculated by taking difference of actual returns observed during the event window and expected returns observed during the control period. Formula for calculation of abnormal stock return is!

$$AR\ i,t = R_{(i,t)} - \overline{(R_{(i,t)})}$$

Where:

AR= Abnormal Returns in country i at time t

Ri,t= Stock returns of country i at time t

$\overline{(R_{(i,t)})}$ = Expected returns of country i at time t

Expected return were calculated through the following formula:

$$\overline{(R_{(i,t)})} = 1/n \sum_{(i=1)}^{n} R_{(i,t)}$$

where

n = Days in estimation window [-120, -20]

Data:

Data is taken from two rival countries Pakistan and India for One-day matches. Two components of data taken for this study are cricket related data i.e. outcomes of ODI matches and second component is stock returns of two financial markets for period of 1990-2019. Stock markets data was extracted from Thomas Reuter's data stream data base and cricket data was calculated from Cricinfo including dates of games. Teams, scores of games, ground and opposition. From Cricinfo we took data of matches took place between1990-2019.Sample was again redistributed according to win and lose into two subgroups. So finally study had 4 sub-groups of both countries. Table I provides sample description for the matches used in this study. A total of 605 matches were considered for Pakistan, out of which Pakistan won 361 matches and lost 244 matches. For India, total 660 matches were considered out of which India won 354 and lost 306 matches.

Table 1 *Sample Description*

	Wins	Lose	Total
Pakistan	361	244	605
India	354	306	660

Results

Existence of abnormal returns show reaction of investors toward cricket outcomes and hence also provides possibility for investors to make trading profits around match dates. Following tables show the results of Win, Lose, Rival Win and Rival Lose on stock returns of both Pakistan and India. Results

show that Investors react positively to win and negatively to lose of games. R0 depicts average abnormal return on the date of match while R1 shows the average abnormal returns on trading day following the match.

Table 2 shows the results of winning Cricket matches in Pakistan where abnormal returns are observed around the match dates. Table shows results for period of 1980-2019 which is broken down in decades to analyse the cricket outcomes with respect to stock markets in different period. In 1990-1999 next day following the match date mean value of abnormal return = (0.23) and t= (2.43). In 2000-2009 mean value of abnormal return = (0.29) and t= (3.20). In 2010-2019 mean value of abnormal return = (0.19) and t= (1.97). In overall period of 1980-2019 same significant and positive results are observed i.e. mean value of abnormal return = (0.24) and t= (4.46). In this period one important result to report is that one day preceding the match negative results are found showing value of abnormal return=(-0.16) and t= (-2.46) which shows that due to anxiety before match investors feel pessimistic to invest in stocks, subsequently stock price drops down but after win significant positive results were evidence of happiness of investors.

Table 2 *Abnormal Stock Returns around Pakistan's Wins*

			R-2	R-1	R0	R+1	R+2
1990-1999	n=125	Mean Return	-0.10	-0.19	-0.03	**0.23****	0.08
		t-statistics	-0.68	-1.88	-0.26	2.43	0.57
2000-2009	n=127	Mean Return	-0.02	-0.20	0.10	**0.29*****	-0.15
		t-statistics	-0.14	-1.42	0.70	3.20	-1.13
2010-2019	n=98	Mean Return	0.07	-0.06	-0.17	0.19	-0.08
		t-statistics	0.61	-0.67	-1.77	1.97	-0.85
1980-2019	n=361	Mean Return	-0.03	**-0.16****	-0.02	**0.24*****	-0.05
		t-statistics	-0.46	-2.46	-0.31	4.46	-0.68

Significance level= *p<10%, **p<5%, ***p<1%

Table 3 shows the results of losing Cricket matches in Pakistan where abnormal returns are observed around the match dates. Table shows results for period of 1990-2019 which is broken down in decades to analyse the cricket outcomes with respect to stock markets in different periods. In 1990-1999 next day following the match date mean value of abnormal return = (-0.68) and t= (-6.80). In 2000-2009 mean value of abnormal return = (-0.88) and t= (-5.50). In 2010-2019 mean value of abnormal return = (-0.32) and t= (-5.28). In overall period of 1990-2019 same significant and negative results are observed i.e. mean value of abnormal return = (-0.63) and t= (-9.56).

Table 3 *Abnormal Stock Returns around Pakistan's Lose*

			R-2	**R-1**	**R0**	**R+1**	**R+2**
1990-1999	n=82	Mean Return	-0.38	-0.21	-0.09	**-0.68**[**]	-0.19
		t-statistics	-2.05	-1.21	-0.64	-6.80	-0.98
2000-2009	n=77	Mean Return	-0.17	0.16	0.13	**-0.88**[**]	0.14
		t-statistics	-0.80	0.86	0.65	-5.50	0.72
2010-2019	n=83	Mean Return	0.09	0.02	0.08	**-0.32**[**]	-0.03
		t-statistics	0.82	0.22	0.72	-5.28	-0.29
1980-2019	n=244	Mean Return	-0.15	-0.02	0.04	**-0.63**[**]	-0.03
		t-statistics	-1.53	-0.22	0.40	-9.56	-0.32

Significance level= *p<10%, **p<5%, ***p<1%

Table 4 shows the results of winning Cricket matches of Pakistan against its biggest rival India, where abnormal returns are observed around the match dates. Table shows results for period of 1990-2019 which is broken down in decades to analyse the cricket outcomes with respect to stock markets in different periods. In 1990-19999 one day before match mean value of abnormal return = (-0.51) and t= (-3.39) which shows anxiety of fans investors before match to be played against rival team of cricket subsequently results were turned positive after winning from rival. In 2000-2009 on same day of match, mean value of abnormal return = (-1.04) and t= (-2.23) which shows the negative sentiments of fan investors on same day of match when their team was playing against rival team. In 2010-2019 no matches were found where Pakistan has won against India. In overall period of 1990-2019 one day preceding the match negative results are found showing value of abnormal return=(-0.41) and t= (-2.27) and on same day of event mean value of abnormal return = (-0.36) and t =(-1.76) which shows that due to anxiety before and during match due to anxiety investors feel pessimistic to invest in stocks, subsequently stock price drops down but after win positive but results are observed with mean value =(0.29) and t=(1.91).

Table 4 *Abnormal Stock Returns around Pakistan's Rival Wins*

			R-2	**R-1**	**R0**	**R+1**	**R+2**
1990-1999	n=26	Mean Return	0.53	**-0.51**[***]	0.01	0.32	-0.13
		t-statistics	1.59	-3.39	0.08	1.45	-0.42
2000-2009	n=16	Mean Return	0.00	-0.28	-1.04[**]	0.26	0.15
		t-statistics	-0.01	-0.65	-2.23	1.12	0.40
2010-2019		Insufficient Observations					
1980-2019	n=45	Mean Return	0.27	-0.41	-0.36	0.29	-0.06
		t-statistics	1.19	**-2.27**[**]	**-1.76**[*]	**1.91**[*]	-0.28

Significance level= *p<10%, **p<5%, ***p<1%

Table 5 shows the results of losing Cricket matches of Pakistan against India, where abnormal returns are observed around the match dates. Table shows results for period of 1990-2019 which is broken down in decades to analyse the cricket outcomes with respect to stock markets in different periods. In 1990-19999 next day following the match date mean value of abnormal return = (-0.93) and t= (-3.25). In 2000-2009 mean value of abnormal return on next day following the match = (-1.48) and t= (-3.36). In 2010-2019 no significant results are reported. In overall period of 1990-2019 same significant and negative results are observed one day after match with mean value of abnormal return = (-1.00) and t= (-4.66).

Table 5 *Abnormal Stock Returns around Pakistan's Rival Lose*

			R-2	R-1	R0	R+1	R+2
1990-1999	n=15	Mean Return	-0.69	-0.03	0.18	**-0.93****	0.37
		t-statistics	-0.99	-0.07	0.39	-3.25	0.82
2000-2009	n=13	Mean Return	-0.19	0.52	0.69	**-1.48****	-0.16
		t-statistics	-0.23	0.87	1.05	-3.36	-0.27
2010-2019	n=8	Mean Return	-0.01	0.22	0.02	-0.33	0.13
		t-statistics	-0.01	0.65	0.04	-1.35	0.92
1980-2019	n=36	Mean Return	-0.36	0.22	0.33	**-1.00****	0.12
		t-statistics	-0.82	0.71	1.02	-4.66	0.44

Significance level= *p<10%, **p<5%, ***p<1%

Table 6 shows the results winning Cricket matches in India where abnormal returns are observed around the match dates. Table shows results for period of 1990-2019 which is broken down in decades to analyse the cricket outcomes with respect to stock markets in different periods. In 1990-19999 next day following the match date mean value of abnormal return = (0.58) and t= (4.53). In 2000-2009 mean value of abnormal return = (0.64) and t= (6.89). In 2010-2019 mean value of abnormal return = (0.22) and t= (3.93). In overall period of 1990-2019 same significant and positive results are observed i.e. mean value of abnormal return = (0.44) and t= (8.68). In this period significant positive results were evidence of happiness of investors when their team wins the match.

Table 6 *Abnormal Stock Returns around India's Wins*

			R-2	**R-1**	**R0**	**R+1**	**R+2**
1990-1999	n=82	Mean Return	0.12	-0.10	0.13	**0.58****	-0.11
		t-statistics	0.44	-0.54	0.83	4.53	-0.69
2000-2009	n=122	Mean Return	-0.33	-0.04	-0.19	**0.64****	0.15
		t-statistics	-2.44	-0.23	-1.30	6.89	1.19
2010-2019	n=133	Mean Return	-0.09	-0.10	0.04	0.22**	0.08
		t-statistics	-1.15	-1.17	0.46	3.93	1.15
1980-2019	n=354	Mean Return	-0.12	-0.10	-0.02	**0.44*****	0.06
		t-statistics	-1.39	-1.32	-0.25	8.68	0.90

Significance level= *p<10%, **p<5%, ***p<1%

Table 7 shows the results of losing Cricket matches of India, where abnormal returns are observed around the match dates. Table shows results for period of 1990-2019 which is broken down in decades to analyse the cricket outcomes with respect to stock markets in different periods. In 1990-19999 one day before match mean value of abnormal return = (-0.68) and t= (-5.23) which shows anxiety of fans investors before match to be played. In 2000-2009 one day before match mean value of abnormal return = (-0.80) and t= (-5.67) which subsequently turned positive after two days of match due to short span of sentiments induced by game outcomes. In 2010-2019 one day before match mean value of abnormal return = (-0.47) and t= (-3.71). In overall period of 1990-2019 one day preceding the match negative results are found showing value of abnormal return=(-0.51) and t= (-8.45) which shows that due to anxiety before match investors feel pessimistic to invest in stocks, subsequently stock price drops down. Results were found significant after two days of match.

Table 7 *Abnormal Stock Returns around India's Lose*

			R-2	**R-1**	**R0**	**R+1**	**R+2**
1980-1989	n=71	Mean Return	-0.06	-0.16	-0.01	**-0.10***	0.17
		t-statistics	-1.10	-1.67	-0.08	-1.68	1.65
1990-1999	n=86	Mean Return	-0.20	**-0.68*****	0.15	-0.18	0.10
		t-statistics	-1.34	-5.23	0.55	-1.16	0.68
2000-2009	n=93	Mean Return	-0.23	**-0.80*****	0.10	-0.08	**0.28***
		t-statistics	-1.34	-5.67	0.64	-0.48	1.81
2010-2019	n=59	Mean Return	0.04	**-0.47*****	0.09	0.03	0.10
		t-statistics	0.35	-3.71	0.64	0.26	0.72
1980-2019	n=306	Mean Return	-0.12	**-0.51*****	0.10	-0.11	**0.13***
		t-statistics	-1.71	-8.45	0.99	-1.50	1.86

Significance level= *p<10%, **p<5%, ***p<1%

Table 8 shows the results of winning Cricket matches of India against its biggest rival in cricket, Pakistan, where abnormal returns are observed around the match dates. On same day of match negative returns show anxiety in fans during match hours with mean value =(-0.74) and t=(-2.24) which was subsequently increased one day after winning the match showing positive and significant values of returns in period of 2000-2009 with mean value of abnormal return= (0.47) and t = (2.54). No other period shows significant results.in overall period of 1990-2019 results are positive after winning from rival with mean value of abnormal return= (0.20) and t = (1.98).

Table 8 *Abnormal Stock Returns around India's Rival Wins*

			R-2	R-1	R0	R+1	R+2
1990-1999	n=12	Mean Return	0.84	-0.23	0.02	0.16	-0.43
		t-statistics	0.53	-0.43	0.04	0.82	-0.90
2000-2009	n=12	Mean Return	-0.31	0.26	**-0.74***	**0.47***	0.63
		t-statistics	-0.64	0.50	-2.24	2.54	1.57
2010-2019	n=10	Mean Return	-0.20	-0.07	-0.19	0.02	0.10
		t-statistics	-0.70	-0.20	-0.51	0.10	0.46
1980-2019	n=36	Mean Return	0.11	-0.09	-0.36	**0.20***	0.09
		t-statistics	0.20	-0.33	-1.52	1.98	0.38

Significance level= *p<10%, **p<5%, ***p<1%

Table 9 shows the results of losing Cricket matches of India against Pakistan, where abnormal returns are observed around the match dates. In 1990-19999 one day before match mean value of abnormal return = (-0.77) and t= (-2.62) which shows anxiety of fans investors before match to be played. In 2000-2009 one day before match mean value of abnormal return = (-1.42) and t= (-3.76) and in 2010-2019 no match was lost against Pakistan. In overall period of 1990-2019 one day preceding the match negative results are found showing value of abnormal return=(-0.62) and t= (-3.87) which shows that due to anxiety before match investors feel pessimistic to invest in stocks, subsequently stock price drops down. Results were not found significant after the match dates.

Table 9 *Abnormal Stock Returns around India Rival Lose*

			R-2	R-1	R0	R+1	R+2
1990-1999	n=22	Mean Return	-0.20	**-0.77****	-0.10	0.04	0.55
		t-statistics	-0.97	-2.62	-0.24	0.12	1.70
2000-2009	n=19	Mean Return	-0.25	**-1.42*****	0.29	-0.56	0.21
		t-statistics	-1.14	-3.76	0.70	-1.36	0.46

2010-2019			Insufficient Observations				
1980-2019	n=59	Mean Return	-0.17	**-0.62**[***]	0.06	-0.25	0.21
		t-statistics	-1.57	-3.87	0.29	-1.35	1.18

Significance level= *p<10%, **p<5%, ***p<1%

Discussion

Shifts in stock returns during, before and after cricket matches show the presence of sentiments induced by games. Our main objective is to examine the notion founded from psychology literature that win leads to positive mood and losses are associated with bad moods. Results are examined by taking returns of stock markets of Pakistan and India, as they are rivals in cricket game. Abnormal returns are calculated on days before, on and after event to find the presence of cricket sentiments in fan investors. As per our main objective stock returns for both win and lose results are significant which means positive results after winning the one day international (ODI) and negative results because of bad moods of investors due to losing match by their national teams.

Results of both countries in Win situation from tables I and V show positive and significant returns one day after the match. Results of study are consistent with (Renneboog & Vanbrabant, 2000; Sakkas & Urquhart, 2018). In Pakistan abnormal returns are also significant but negative which show anxiety before match and was turned to positive returns with news of winning the game. Lose effect is also significant for stock returns as can be seen from tables II and VI. In Pakistan one day after losing shows significant negative results which shows bad mood of investors due to pessimism. Results are evidenced by Edman et.al. (2007). Results of India one day before match is negative and significant which shows anxiety before match however after two days it dropped down to positive returns due to short span of impact of sentiments on financial decision making (Anghel, 2018). However, lose effects are more pronounced and showing greater values of abnormal returns as compare to win which is supported by Edman et al. (2007).

Tables III and VII shows matches played and won by two famous rivals in international cricket. Overall results show negative returns before match due to anxiety of playing against rivals. Mood swings of fans in rivalry games could be larger as compare to non-rivalry games. We find positive win effect on stock returns on subsequent day of match and these results are consistent with findings of (Fan & Wang, 2018). Tables IV and VIII show that the stock return declines one day after losing games from rival teams. This is due to the fact that fan investors react positively to good performance of their team and also for bad performance of rival team. Similarly fan investors react negatively on losing their favourite team and on winning of rival team. Decisions of investors are not only affected by performance of their national team but also by their

rival's performance due to presence of emotions known as schadenfreude (Demir & Regoni, 2017).

Conclusion

Motivated by many studies conducted to prove the psychological evidence of sports sentiments this paper targets to check the presence of cricket sentiments in stock market returns. Cricket is considered very important and critical game in Pakistan and India and both countries are famous for their rivalry in cricket. Hence data is taken for Win, Lose, Rival Win and Rival Lose for both countries. Results document the significant effect of win and lose of one day international (ODI) matches in both countries and also report significant results of abnormal stock returns for winning and losing in rival games of these countries. Results of this study reject the view that win and lose effect stem from reaction of rational investors instead it documents the presence of abnormal returns around the match dates due to sentiments of fan investors. This paper significantly expands the existing evidences of relationship between moods and stock markets returns. Stock traders and investors can use results of this study to capture the cricket results and their impact on stock markets and subsequently can take investing decisions of short trading on basis of results of cricket matches.

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