International Journal of Advanced Information Science and Technology (IJAIST) ISSN: 2319:268
Vol.2, No.12, December 2013 DOI:10.15693/ijaist/2013.v2i12.44-57

One Day Cricket Internationals V/S Indian Stock Market (Nifty)

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ABSTRACT

This paper investigates Indian stock market reactions to one day international matches played by India in home .The idea for this work came from the fact that decision making is affected by mood of the person who is supposed to take decision. We have assumed that investor's mood is only affected by one day cricket internationals played by India in its home venue. The main conclusion of the study is that there exists an asymmetric relationship between the performance of the Indian cricket team and stock returns on the Indian stock market. In some cases we found the relationship but in some cases we haven't. We have done team wise analysis of the matches played by India in 1998- 2013 in home venue. While a win by the Indian cricket team has no statistically significant upward impact on stock market returns, a loss generates a significant downward movement in the stock market. Hence, we cannot conclude that sentiment has an impact on market performance in the India stock market NSE-nifty.

KEYWORDS: Cricket, one-day international matches, stock market, NIFTY, stock return,Investors Phycology, Mood Swing, Sentiments, Sporting performance, ODI-Ranking.

I. INTRODUCTION

This paper employs novel mood variable, international cricket results, to investigate the effect of investor sentiment on asset prices and daily stock return of stock market. Our study focuses on the impact of sporting events on stock market. Stock prices are affected by number of factors and events. The effect of some can be seen very quickly but of some not quickly but can be seen as event progresses.it is all about sentiments we are focusing somewhere whenever India lose sentiments of the people are hurt to some extent. The Efficient Markets Hypothesis (EMH) considers asset prices as rational if prices properly reflect all available information relevant to their future economic prospects (Fama, 1998). It is becoming increasingly recognized, however, that non-economic events such as sport can have a significant impact, not only on an economy, but on asset prices as well (Ashton, Gerrard & Hudson, 2003; Edmans, Garcia &Norli, 2007). Based on the EMH, sport should have no influence on stock market returns, as the former is considered a non-economic event. In contrast, behavioral finance theory draws on psychological literature that examines the impact of investors' mood fluctuations on their decision-making processes (Mishra & Smyth, 2010). Investors routinely and systematically allow their mood to influence their decision-making process, causing prices to deviate from the rationale of an efficient market (Statman, 1999). One main implication of behavioral finance, moreover, is that events that are able to alter investors' moods, temper and confidence will have a significant effect on asset prices (Boyle & Walter, 2003). Behavioral finance theory therefore assumes that in certain instances financial markets can be information-ally inefficient (Ritter, 2002; Shiller, 2003). However, behavioral finance suggests that large sporting events affect the sentiments of viewers cum investors resulting in upwards or downwards "mood swings" in the market, which are reflected in stock prices. we have analyzed the daily stock market return of NSE nifty and how it get affected by match result. There

are many studies in the psychology literature which have found that people in a good mood make optimistic judgments and choices and that people in a bad mood make pessimistic judgments and choices. We also know that people feel optimistic after good news and pessimistic after bad news decision making can be affected by these factors. If an individual investor is in a poor mood due to a negative sporting outcome, they may perceive the future earning potential of stocks to be low, and sell them. If this occurs In mass or bulk, the collective result would be a statistically significantly negative stock market return following a sporting loss.

Main contribution is to study variable, international cricket results that have particularly attractive properties as a measure of mood. Extensive psychological evidence, reviewed below, shows that sports in general have a significant effect on mood. TV viewing figures, media coverage and merchandise sales suggest that cricket in particular is of "national interest" in many of the countries we study. It is hard to imagine other regular events that produce such substantial and correlated mood swings in a large proportion of a country's population. These characteristics give us a strong a priori motivation for using game outcomes to capture mood changes among investors. Studying the impact of sporting events on the performance of the stock market is a relatively new development in the finance literature, but it forms a strand of a larger literature in behavioral finance, which studies the impacts of events that can change the mood of investors, with a subsequent effect on stock prices. The basic idea behind these studies is that after major victories in a sporting event people feel more optimistic about their chances of making a good investment or purchase, and this optimism is reflected in the relevant market. There are only a few studies which have empirically analyzed the effect of sporting events on the stock market.

II. DATA COLLECTION

The stock market data used in this study originate from the NSE Nifty. The data comprise daily NIFTY opening-closing prices, obtained from www.nseindia.comfor the period of 1st January 1998 to 14 November 2013. These dates were selected due to the lack of the availability of information available because before 1998 much of paper work is done so data is now available. At that time digitalization was at its very initial stage. For the same dates we have collected daily nifty closing and opening prices. The NIFTY is used to examine the effects of sporting performance on the market as a whole, as opposed to singling out main sponsors registered on the NSE. The choice of daily data is informed by the fact that international sporting contests have sporadic intervals. This is supported by previous research (Ashton et al., 2003; Edmans et al., 2007; Mishra & Smyth, 2010), which suggests that daily data is more accurate within the context of analyzing the effects of sporting results on stock
market returns. It has also been stated that India is a sport-crazy nation, where sport in general seems to be a religion in its own right.

Data of One day international matches played by India are collected from www.espncricinfo.com. The matches which were played on Friday and Saturday were not considered because on Sunday and Saturday nifty index is closed. Matches which end up as tie or no result and matches which were abandoned because of rain or bad pitch will not affect anything so these matches were neglected from the data. Since cricket is played at least for one day so it is obvious that its effect on stock market will be seen on next day since sentiments hurt by cricket cannot last for more than one day until unless it is world cup final or very close match with high ranking team. The focus of this study will be on one-day international cricket matches only. Due to the length of 5-day test matches, results can be ambiguous and Twenty-Twenty cricket matches have been popular only in the last few years (2007–2011); therefore there is not sufficient data to warrant their inclusion in this study. The focus on one-day internationals only also allows results to be easily compared to previous findings (Edmans et al., 2007; Mishra & Smyth, 2010; Gerlach, 2011).

III. METHODOLOGY

This study applies event study methodology and regression analysis to NIFTY movements on the NSE following international matches played by the Indian national cricket teams in Indian ground.

1. Data from 1998-2013 is taken because before 1998 digital system was not implemented to the extent to which it is now and use of digital system was very less throughout India.

2. Firstly data is to be sorted according to matches played by India and daily stock return.
3. Teams were categorized according to their rankings in ICC ODI RANKINGS then we included major teams which were and are giving tough competition to team India like Pakistan , Australia , south Africa , Sri-lanka , England, West-indies.
4. Bangladesh, Kenya , Zimbabwe and Canada were not considered because these are the teams ranked almost at last in ICC ODI rankings if India wins against them then it will be an expected event so it won't affect the decision making.
5. It should be noted that cricket games are often played over several days. However, if such games were included in this study, they may interrupt results, as it would be difficult to monitor at which point in the game the response to sporting results affected stock returns. Therefore only One Day International (ODI) cricket matches are included in the study.
6. Then two ratios were calculated for daily return accordingly
7. **(Opening – closing)/opening**
8. **Ln(today's closing/yesterday's closing)**
9. Team wise analysis had been done instead of overall analysis because we wanted to check that because of which team Indian stock market gets affected the most.
10. It is better than overall analysis in a way that we can do in depth analysis by using this technique.
11. We calculated both these ratios for all the matches played by team India against these teams and tried to analyses our results.
12. Then we calculated mean, standard deviation of the daily return and at last we performed t-test to see how much this data differs from the daily average return.
13. T-test used to check how much this data is deviating from normal day data.

IV. ANALYSIS

1) Pakistan

- Win result of first ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	0.005119839	-0.000209199
Variance	0.000203694	0.000258437
Observations	15	3938
Hypothesized Mean Difference	0	
Df	14	
t Stat	1.442640644	
P(T<=t) one-tail	0.085560207	
t Critical one-tail	1.761310136	
P(T<=t) two-tail	0.171120414	
t Critical two-tail	2.144786688	

- Win result for second ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	-0.004701294	0.000494394
Variance	0.000216727	0.000269572

Observations	15	3937
Hypothesized Mean Difference	0	
Df	14	
t Stat	-1.363658675	
P(T<=t) one-tail	0.097100523	
t Critical one-tail	1.761310136	
P(T<=t) two-tail	0.194201047	
t Critical two-tail	2.144786688	

- Loss result for first ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	0.007678912	-0.000209199
Variance	0.00016386	0.000258437
Observations	16	3938
Hypothesized Mean Difference	0	
Df	15	
t Stat	2.457022676	
P(T<=t) one-tail	0.013335376	
t Critical one-tail	1.753050356	
P(T<=t) two-tail	0.026670752	
t Critical two-tail	2.131449546	

- Loss result for second ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	-0.009556765	0.000494394
Variance	0.000270911	0.000269572
Observations	16	3937
Hypothesized Mean Difference	0	
Df	15	
t Stat	-2.437735954	
P(T<=t) one-tail	0.013850181	
t Critical one-tail	1.753050356	
P(T<=t) two-tail	0.027700362	
t Critical two-tail	2.131449546	

2) Australia

- Win result for first ratio:-

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	-5.23591E-05	-0.000142482
Variance	0.000471243	0.000256532
Observations	14	3935
Hypothesized Mean Difference	0	
Df	13	
t Stat	0.01551878	
P(T<=t) one-tail	0.493926973	
t Critical one-tail	1.770933396	
P(T<=t) two-tail	0.987853945	
t Critical two-tail	2.160368656	

- Win result for second ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	0.000718046	0.000420334
Variance	0.000487747	0.00026827
Observations	14	3934
Hypothesized Mean Difference	0	
Df	13	
t Stat	0.050389438	
P(T<=t) one-tail	0.480289027	
t Critical one-tail	1.770933396	
P(T<=t) two-tail	0.960578054	
t Critical two-tail	2.160368656	

- Loss result for first ratio:-

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	-0.003138335	-0.000142482
Variance	0.000457099	0.000256532
Observations	20	3935
Hypothesized Mean Difference	0	
Df	19	
t Stat	-0.625765755	
P(T<=t) one-tail	0.269456781	
t Critical one-tail	1.729132812	
P(T<=t) two-tail	0.538913562	
t Critical two-tail	2.093024054	

- Loss result for second ratio:-

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	0.002967877	0.000420334
Variance	0.000450729	0.00026827
Observations	20	3934
Hypothesized Mean Difference	0	
Df	19	
t Stat	0.535824786	
P(T<=t) one-tail	0.299148478	
t Critical one-tail	1.729132812	
P(T<=t) two-tail	0.598296956	
t Critical two-tail	2.093024054	

3) Sri-Lanka

- Win result for first ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	-0.008373088	-0.000140605
Variance	6.73942E-05	0.000258547
Observations	14	3951
Hypothesized Mean Difference	0	
Df	13	
t Stat	-3.726934984	
P(T<=t) one-tail	0.001268227	
t Critical one-tail	1.770933396	
P(T<=t) two-tail	0.002536454	
t Critical two-tail	2.160368656	

- Win result for second ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	0.000413363	-0.000140605
Variance	0.000270117	0.000258547
Observations	3950	3951
Hypothesized Mean Difference	0	
Df	7895	
t Stat	1.514327899	
P(T<=t) one-tail	0.064991363	
t Critical one-tail	1.645046654	
P(T<=t) two-tail	0.129982727	
t Critical two-tail	1.960264508	

- Loss result for first ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	0.012146273	-0.000140605
Variance	0.000166086	0.000258547
Observations	4	3951
Hypothesized Mean Difference	0	
Df	3	
t Stat	1.905298905	
P(T<=t) one-tail	0.076415806	
t Critical one-tail	2.353363435	
P(T<=t) two-tail	0.152831611	
t Critical two-tail	3.182446305	

- Loss result for second ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	-0.012535465	0.000413363
Variance	0.000170308	0.000270117
Observations	4	3950
Hypothesized Mean Difference	0	
Df	3	
t Stat	-1.982871701	
P(T<=t) one-tail	0.070830706	
t Critical one-tail	2.353363435	
P(T<=t) two-tail	0.141661413	
t Critical two-tail	3.182446305	

4) England

- Win result for first ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	-0.001893547	-0.000154101
Variance	0.000379885	0.000257768
Observations	22	3942
Hypothesized Mean Difference	0	
Df	21	
t Stat	-0.417806923	
P(T<=t) one-tail	0.340164694	
t Critical one-tail	1.720742903	
P(T<=t) two-tail	0.680329388	

t Critical two-tail	2.079613845

- Win result for second ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	0.000427839	-0.000154101
Variance	0.000269618	0.000257768
Observations	3941	3942
Hypothesized Mean Difference	0	
Df	7877	
t Stat	1.590905794	
P(T<=t) one-tail	0.055835454	
t Critical one-tail	1.645047095	
P(T<=t) two-tail	0.111670907	
t Critical two-tail	1.960265194	

- Loss result for first ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	0.004991534	-0.000154101
Variance	3.66354E-05	0.000257768
Observations	5	3942
Hypothesized Mean Difference	0	
Df	4	
t Stat	1.892535049	
P(T<=t) one-tail	0.065682768	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.131365535	
t Critical two-tail	2.776445105	

- Loss result for second ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	-0.002987731	0.000427839
Variance	3.30122E-05	0.000269618
Observations	5	3941
Hypothesized Mean Difference	0	
Df	4	
t Stat	-1.322428651	
P(T<=t) one-tail	0.128285158	
t Critical one-tail	2.131846786	
P(T<=t) two-tail	0.256570317	
t Critical two-tail	2.776445105	

5) South-Africa

- Win result of first ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	-0.002400018	-0.000132767
Variance	0.000157906	0.000258377
Observations	7	3956
Hypothesized Mean Difference	0	
Df	6	
t Stat	-0.476674695	
P(T<=t) one-tail	0.325228808	
t Critical one-tail	1.943180281	
P(T<=t) two-tail	0.650457615	
t Critical two-tail	2.446911851	

- Win result of second ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	0.004361071	0.000408805
Variance	9.26469E-05	0.000270198
Observations	7	3955
Hypothesized Mean Difference	0	
Df	6	
t Stat	1.083581953	
P(T<=t) one-tail	0.1600806	
t Critical one-tail	1.943180281	
P(T<=t) two-tail	0.320161199	
t Critical two-tail	2.446911851	

- Loss result of first ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	-0.013690068	-0.000132767
Variance	4.42183E-05	0.000258377
Observations	6	3956
Hypothesized Mean Difference	0	
Df	5	
t Stat	-4.972009917	
P(T<=t) one-tail	0.002102245	
t Critical one-tail	2.015048373	
P(T<=t) two-tail	0.004204489	
t Critical two-tail	2.570581836	

- Loss result of second ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	0.012608382	0.000408805
Variance	4.42891E-05	0.000270198
Observations	6	3955
Hypothesized Mean Difference	0	
Df	5	
t Stat	4.469629521	
P(T<=t) one-tail	0.003290758	
t Critical one-tail	2.015048373	
P(T<=t) two-tail	0.006581516	
t Critical two-tail	2.570581836	

6) New-Zealand

- Win result for first ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	-0.001954354	-0.000158366
Variance	7.42864E-05	0.000258823
Observations	11	3954
Hypothesized Mean Difference	0	
Df	10	
t Stat	-0.687781417	
P(T<=t) one-tail	0.253614621	
t Critical one-tail	1.812461123	
P(T<=t) two-tail	0.507229242	
t Critical two-tail	2.228138852	

- Win result of second ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	0.004172852	0.000430378
Variance	8.70918E-05	0.000270447
Observations	11	3953
Hypothesized Mean Difference	0	
Df	10	
t Stat	1.324335833	
P(T<=t) one-tail	0.107430513	
t Critical one-tail	1.812461123	
P(T<=t) two-tail	0.214861026	
t Critical two-tail	2.228138852	

- Loss result of first ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	0.005877778	-0.000158366
Variance	4.56353E-05	0.000258823
Observations	4	3954
Hypothesized Mean Difference	0	
Df	3	
t Stat	1.781955274	
P(T<=t) one-tail	0.08638904	
t Critical one-tail	2.353363435	
P(T<=t) two-tail	0.172778081	
t Critical two-tail	3.182446305	

- Lossresult of second ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	-0.006046067	0.000430378
Variance	4.76102E-05	0.000270447
Observations	4	3953
Hypothesized Mean Difference	0	
Df	3	
t Stat	-1.87185383	
P(T<=t) one-tail	0.078981618	
t Critical one-tail	2.353363435	
P(T<=t) two-tail	0.157963237	
t Critical two-tail	3.182446305	

7) OVERALL ANALYSIS OF ALL MATCHES PLAYED (WIN ONLY)

- Win result of first ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	-0.001459214	-0.000157261
Variance	0.000254648	0.000258112
Observations	83	3969
Hypothesized Mean Difference	0	
Df	86	
t Stat	-0.735546031	
P(T<=t) one-tail	0.232004174	
t Critical one-tail	1.662765449	
P(T<=t) two-tail	0.464008348	
t Critical two-tail	1.987934206	

- Win result of second ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	0.002507832	0.000434224
Variance	0.000256366	0.000269761
Observations	83	3968
Hypothesized Mean Difference	0	
Df	86	
t Stat	1.167100082	
P(T<=t) one-tail	0.123197931	
t Critical one-tail	1.662765449	
P(T<=t) two-tail	0.246395862	
t Critical two-tail	1.987934206	

8) Overall analysis of all matches played (losses only)

- Loss result of first ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	0.001363807	-0.000157261
Variance	0.000280762	0.000258112
Observations	55	3969
Hypothesized Mean Difference	0	
Df	55	
t Stat	0.668978296	
P(T<=t) one-tail	0.253153869	
t Critical one-tail	1.673033965	
P(T<=t) two-tail	0.506307737	
t Critical two-tail	2.004044783	

- Loss result of second ratio

t-Test: Two-Sample Assuming Unequal Variances

	Variable 1	*Variable 2*
Mean	-0.001948458	0.000434224
Variance	0.00031179	0.000269761
Observations	55	3968
Hypothesized Mean Difference	0	
Df	55	
t Stat	-0.994781939	
P(T<=t) one-tail	0.16209945	
t Critical one-tail	1.673033965	
P(T<=t) two-tail	0.324198899	
t Critical two-tail	2.004044783	

1) Win result for first ratio: Table win result for first ratio for every team represents the T-test table in which the ratio used is (Today's opening price – today's closing price/today's closing price)
2) Win result for second ratio: Table win result for second ratio every team represents the T-test table in which the ratio used is Ln (today's closing price/yesterday's closing price).

3) Lose result for first ratio: Table loss result for first ratio for every team represents the T-test table in which the ratio used is (Today's opening price – today's closing price/today's closing price)
4) Loss result for second ration: Table lose result for second ration for every team represents the t-test table in which the ratio used is Ln (today's closing price/yesterday's closing price).

5) Overall analysis of all matches played (win only)
   - Overall win result for first ratio: In this we have taken all the matches played and won by India with all teams and did the t-test to check how much the combined data for win differ from normal day return data using ratio (Today's opening price – today's closing price/today's closing price)
   - Overall win result for second ratio: In this we have taken all the matches played and won by India with all teams and did the t-test to check how much the combined data for win differ from normal day return data using ratio Ln (today's closing price/yesterday's closing price).

6) Overall analysis of all matched played (losses only):
   - Overall loss result for first ratio: In this we have taken all the matches played but loosed by India with all teams and did the t-test to check how much the combined data for win differ from normal day return data using ratio (Today's opening price – today's closing price/today's closing price).
   - Overall loss result for second ratio : : In this we have taken all the matches played but loosed by India with all teams and did the t-test to check how much the combined data for win differ from normal day return data using ratio Ln (today's closing price/yesterday's closing price).

7) CONCEPT USED FOR T-TEST: The t-value is an indication of the probability that both populations from which we selected our samples have the same mean and that differences in our sample means are due to random fluctuation. As the t-value gets smaller (approaches zero) the probability that the population means are the same gets larger. As the t-value gets larger (in either the positive or negative direction) the probability that the population means are the same gets smaller.

V. CONCLUSION

T-test performed to know how much data of match differs from daily return data. Whenever India plays with Indian sub-continent country in Indian home ground we can clearly see that whenever India loses the match there is decrease in daily return by some amount. Whenever India lost the match with Pakistan and Sri-lanka we can see one day after the match lost daily return is -0.9% to -1.2%. We can't clearly conclude the same for other teams like Australia and South-Africa but still t-test shows that there are some significant changes in the return after match as compared to normal days. We have seen that there is decrease in return after big match (like world cup 2011 knock-out matches) which may be because of investors are hung over day after the match and they may not want to participate in the stock market. So we can conclude that to some extent (very small but significant to some level) cricketing events can affects stock market in India. When we did overall analysis we found that daily return decreases and is lower then return after win.

Future research could use alternative models for measuring normal performance instead of using the constant mean return. The 'Market Model' relates the returns of any given security to the return of the market portfolio, and represents a potential improvement on the constant mean return model. Finally, another aspect for future research is refining and controlling for noise in the data. This would allow small cumulative changes in markets returns due to sporting performance to be more pronounced, thereby allowing regression-based analyses to determine stronger associations, if any, between market returns and sporting performance in India

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