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Investor sentiment, soccer games and stock returns☆

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A B S T R A C T

This study investigates the nature of stock price reactions of publicly-traded soccer clubs following league matches. Consolidating data on soccer games and betting odds, results suggest that the magnitude and the character of investor reactions vary considerably after the release of negative and positive information. Price response to positive information increases in surprise to resolution of uncertainty, while bad information connotes negative and vast reactions regardless of the surprise component. Moreover, negative news is more slowly absorbed by the stock market than positive news. Finally, investor reactions are larger following the games with considerable emotional component.

1. Introduction

The extant literature on behavioral finance suggests that asset prices may deviate from the fundamental values due to biased ex-ante evaluations of future value-related events[1] and irrational reactions to the event outcomes, caused by various psychological biases.[2] Abnormal price reaction can also be triggered by investors' limited processing ability, investor inattention, or limited information salience.[3] In this study we examine the effects of rational expectation, irrational reaction, and information salience on the absorption of news by the stock market using data on soccer games and betting odds.

Several behavioral finance studies, like Daniel et al. (1998, 2001) and Kumar (2009) report that behavioral biases are likely to be present in environments marked by high uncertainty and sentiment. In this regard, a soccer club's stock price reactions to game results comprise a unique setting in which to test the determinants of stock price fluctuations. Soccer games are frequent, quantifiable and convey very diverse information content, including value-related news about future cash flows as an indirect consequence of a win or loss and behavioral components such as emotional impact on investors. Along with game results, information on betting odds surrounds every game and equips an investor with expert information to assist with resolving uncertainty.

Recent studies examining the market reaction to outcomes of sporting events suggest various explanations for the cause of abnormal returns. Brown and Hartzell (2001) study Boston Celtic's share price fluctuations following game results and found that while wins do not have a price impact, losses, even expected ones, cause significant negative abnormal returns, thus suggesting investor irrationality. Edmands et al. (2007) study the effect of international soccer results and show that investor sentiment (changes

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[1] Among others Baker and Wurgler (2006, 2007) and Kaustia et al. (2008) suggest the biased pre-vent assessment as source of investor sentiment.

[2] Several studies investigate returns associated with ex post investor irrationality consequent to potentially mood-affecting events (sleep patterns, sunshine, non-secular holidays, etc.), see, e.g. Saunders (1993), Kamstra et al. (2000), Hirshleifer and Shumway (2003), Frieder and Subrahmanyam (2004) and Yuan et al. (2006).

[3] Recent studies presented evidence consistent with information salience theory, see e.g., Klibanoff et al. (1998), Huberman and Regev (2001) and Palomino et al. (2009).

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in investor mood) induced by game outcomes has an impact on international stock market indices. Using data on British publicly-traded clubs, Palomino et al. (2009) report significant abnormal price reaction after wins to the ex-post emotional response and overreaction. Conversely, Fung et al. (2015) find little evidence of investor's overreaction to soccer matches using data on Turkish soccer clubs. Finally, Vlastakis et al. (2008), Palomino et al. (2009) and Buraimo et al. (2013) suggest that betting odds are very good proxies for event outcomes if obtained from a large number of bookmakers, and can therefore be used as a measure of unbiased expectation of the game outcome.[4]

The purpose of this study is to explore two competing explanations of abnormal returns; 1) rational expectations, where the surprise component of the news causes price impact, and 2) sentiment, where the abnormal price reaction is triggered by investor irrationality. This is conducted by investigating the abnormal returns of publicly-traded soccer clubs around national league matches. Along with comprehensive internationally diversified data on soccer games, we collect satellite data on betting odds from the 12 largest bookmakers and created a proxy for the general expectations about the resolution of uncertainty. Within our setting we examine the investorś reaction to various types of news by controlling for the expectations, as measured by the aggregated betting odds. Further, the study advances understanding of the patterns in investor reactions, the efficiency of stock prices and the information absorption process around the events by investigating abnormal returns contingent upon the final result, the embedded surprise, and other characteristics of the events, such as the location and the final score.

We investigate three hypotheses that result from combining the traditional scheduled news announcement analysis with a sentiment-oriented approach, while accounting for the preannouncement probability of a resolution of uncertainty. The first hypothesis is that the magnitudes of the reactions to the game results increase in the size of the surprise consistent with rational expectations. If there are abnormal returns following game results, there should be differences in the magnitude of stock price reactions due to the comparatively diverse surprise component embedded in the news. The findings yield a mix of results. Hypothesis 1 is confirmed in cases of wins and draws, where the response to positive information increases in relation to a surprise component. However, the same patterns are not evident when the teams monitored lost. Conversely, irrespective of a surprise component, losses yielded a negative price reaction of similar magnitude, implying the presence of sentiment-induced mispricing. This finding is robust and persists after sorts on various characteristics of the games.

The second hypothesis is that negative information (a draw/loss) is processed more slowly by investors than positive information (a win). Motivated by a number of behavioral psychology studies (Grove et al., 1991; Wann and Branscombe, 1993, 1995),[5] bad news should have a lasting effect on ex-post investor irrationality due to potential emotional ties with the club. Moreover, regardless of any emotional component, the market should process good news faster than bad news, a result that may be caused by a lack of information salience. This hypothesis is uniformly confirmed. We find that about 60 percent of three-day cumulative abnormal returns occur on the second and the third day after the negative (defeats) resolution of uncertainty, whereas in the case of positive news (wins) the vast bulk of the average abnormal returns is generated on the first day after the game. The observed discrepancy might be due to the lack of information salience around the negative results and/or due to psychological biases, such as affected mood, loyalty to the club, and other forms of personalization of the club's performance.

Finally, we hypothesize that events associated with higher emotional loading (e.g. home and large goal difference games) result in stronger abnormal share price response. Behavioral biases are likely to be observed in high sentiment environments (Daniel, 1998, 2001). Alongside, psychological study of Williams (1991) suggests that during sport events at the home grounds individuals are exposed to irrational decision making due to extensive emotional response. Finally, Elias and Dunning (1986) by examining fox-hunting, cricket and British football suggest that individuals experience various forms of point-like excitement of game depending on the margin of the game outcome. In order to test the third hypothesis we concurrently investigated sentiment effects by scrutinizing the home/away and the goal difference effects, while controlling for prior expectations. We find that price reactions subsequent to games played at the home ground are larger than those relating to away games. We also found that abnormal returns increase in relation to the goal difference, and are indifferent to prior expectations, suggesting the presence of irrationality induced by behavioral biases. Thus, the third hypothesis is confirmed.

This study adds to the literature in several important ways: First, we add to the strand of the literature investigating the effect of sporting events on asset prices (Edmands et al., 2007; Brown and Hartzell, 2001; Palomino et al., 2009). We study a dataset of 4347 soccer games with corresponding betting odds from the 12 largest bookmakers and provide the new evidence on significant abnormal returns consequent to both wins and losses, while indicating the discrepancies in responses associated with the relative surprise component for both outcomes. Second, our findings provide additional evidence on constraints in information processing (Hong et al., 2000 and Chan, 2003) by documenting the slow absorption of negative information by the stock market. Finally, we add considerably to the literature on investor sentiment (Daniel et al., 1998; Baker and Wurgler 2006, 2007; Bernile and Lyandres, 2011) by showing that in events associated with high emotional loading asset prices are affected by investor sentiment.

The remainder of the paper is organized as follows. In Section 2, we describe the dataset, the data collection process, and provide descriptive statistics. In Section 3, we describe the methods of abnormal returns and outcome probabilities estimations. In Section 4, we turn to the relation at the center of the current study and examine the effect of game results on stock returns. Section 5 concludes the paper.

[4] Also, using contracts traded on betting exchanges, Bernile and Lyandres (2011) report that the actual bettors in the betting market have biased and overly optimistic expectations of game outcomes. Our study differs from this approach and uses the publicly available and unbiased betting odds, following Palomino et al. (2009).

[5] For comprehensive overview of abundant evidence on psychological biases that may affect asset prices, see Hirshleifer (2001).

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