

# Basking in Reflected Glory and Stock Returns

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## Abstract

This paper studies the investor sentiment induced from Premier League soccer matches on locally headquartered FTSE350 firms. Contrary to the majority of the sports sentiment literature which finds a significant loss effect, we find a significant win effect. This win effect is mostly concentrated in London, is stronger for Saturday matches and is prevalent in competitive and uncompetitive matches. We show that this win effect is consistent with basking in the reflected glory (BIRGing) from the psychology literature. Therefore our results show that the sentiment induced from soccer matches is quite different across countries.

*Keywords:* Basking in Reflected Glory, Investor Sentiment, Sports Sentiment, Stock Returns

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## 1. Introduction

Traditional finance theory suggests that stock market prices are the expected value of all future dividends, calculated in a rational manner. However investors are not necessarily rational, make mistakes and may possess psychological biases in the form of sentiment. Investor sentiment is typically defined as a belief about future cash flows and investment risks that is not justified by the facts at hand (Baker and Wurgler, 2007) and thus affecting stock market prices. There is a growing literature showing that the mood of investors tend to affect their evaluation of future prospects and therefore their behavior in financial markets. Many different psychological factors have been found to influence the mood of investors and consequently stock returns such as the weather (Saunders, 1993, Hirshleifer and Shumway, 2003, Chang et al., 2008), daylight (Kamstra et al., 2000, 2004), temperature (Cao and Wei, 2005), aviation disasters (Kaplanski and Levy, 2010b), air pollution (Levy and Yagil, 2011), influenza (McTier et al., 2013) and even the happiness of investors (Kaplanski et al., 2015).

In the psychology literature there is evidence that sporting outcomes bear a significant influence on individuals mood (Cialdini et al., 1976, Schwarz et al., 1987, Hirt et al., 1992, Wann, 2006). Bringing together the idea of investor sentiment and sports outcomes affecting the mood of investors, there have been a number of papers that examine the impact of sporting events on stock markets. The seminal paper by Edmans et al. (2007) finds that the outcomes of national sports have an economically and statistically significant negative effect on the losing country's stock market. This effect is more pronounced to international soccer games compared to international cricket, rugby and basketball games, whilst there is no evidence of a corresponding win effect. This country-level study has been examined in much detail with Kaplanski and Levy (2010a) examining whether they can exploit this effect on the US stock market during FIFA World Cup matches and find that the effect does not depend on the games results, and therefore is predictable. After controlling for stock market performance, the timing of World Cup events, distinct unexpected events as well as monthly and daily effects, the link between international stock market results and stock market returns is found to be robust. Recently, Ehrmann and Jansen (2017) show substantial investor inattention when a national team is competing at the World Cup, with trading volumes declining by up to 48% which indicates the lack of liquidity in the market when a national team is competing at the World Cup.

Another strand of the literature, closer in spirit to our paper, examines sports sentiment at the local, rather than the national level. National sporting results are important, but results for club teams may have a similar, or even stronger effect on stock returns for firms located near the clubs due to the tribalism of supporting a local team. Chang et al. (2012) examine the impact of National Football League (NFL) results on the return patterns of NASDAQ firms headquartered geographically near the NFL teams. They find evidence in support of Edmans et al. (2007) loss effect with lower next-day returns after a team's loss for locally headquartered stocks. This effect

is larger for surprising losses as well as for critical game losses. [Pantzalis and Park \(2014\)](#) study the relationship between the performance of NFL, MLB, NBA and NHL teams and the performance of firms that are located near the teams. They show mispricing is caused by sports sentiment and develop investment strategies based on recent past observations of sports sentiment and find that they generate sizeable abnormal returns. [Ehrmann and Jansen \(2016\)](#) examine soccer matches that led to the elimination of France and Italy from the 2010 FIFA World Cup using cross-listed firm intraday data and find that the firm's stock is underpriced by up to 7 basis points in the country that eventually loses. They also show that the probability of underpricing increases as elimination becomes more likely. Recently, [Akhigbe et al. \(2017\)](#) examine whether predictable outcomes of the National Basketball Association playoff games can generate increased trading of firms headquartered in the geographic area of the participating teams. They find statistically significant increased trading before games and this effect is more pronounced and persistent for games with more predictable outcomes, for predictable losses more than wins, and for more critical games. They also support the loss effect where returns are lower for local stocks the day after a loss.

We contribute to the literature by being the first to study the impact of sport's sentiment on stock returns at the firm level induced by matches of the British Premier League. We examine the relationship between Premier League soccer game outcomes and the returns of FTSE350 firms headquartered in the same geographical area. We choose soccer since it is the most popular and most watched sport in the world and in particular, the British Premier League since it is the most lucrative soccer league in the world, and the most lucrative league of any sort outside of the United States.<sup>1</sup> It is the most popular and most watched soccer league in the world, broadcasting to 225 territories and into 730 millions homes.<sup>2</sup>

We postulate that the results from matches in the Premier League will have an effect on investors' moods and therefore their investment decisions. During the 2014/2015 season, 46% (22,244,841) of the British population supported a British soccer club, while 35% (16,925,423) of the population supported a Premier League club.<sup>3</sup> This is further supported by the fact that 54.6 million people watched either live Premier League soccer or highlights of the Premier League in 2014/2015 season.<sup>4</sup> Our hypothesis is that Premier League matches are associated with sentiment in the stock market with significant changes in the prices of locally headquartered firms. Localized

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<sup>1</sup>See <https://howmuch.net/articles/sports-leagues-by-revenue>.

<sup>2</sup>The number of European viewers is 1157 million, while there are 857 million viewers in Asia and Oceania, 311 million viewers in the Middle East and North Africa, 287 million viewers in North America and the Caribbean, 276 million viewers in Sub-Saharan Africa and 149 million viewers in South and Central America. Therefore the Premier League is a global product being broadcast around the globe. See <http://fanresearch.premierleague.com/global-media-platform.aspxformoredetails>.

<sup>3</sup>See <http://fanresearch.premierleague.com/football-nation/domestic-fanbase.aspx> for more details.

<sup>4</sup>See <http://fanresearch.premierleague.com/football-nation/beyond-the-stadium.aspx> for more details.

trading is well-known fact of investors, with [Coval and Moskowitz \(1999\)](#) finding that within an international context there is a strong bias towards domestic investing, a phenomenon that extends to a preference for local investing within a domestic portfolio. Also [Ivković and Weisbenner \(2005\)](#) find that households exhibit a strong preference for local investments, which is supported by [Massa and Simonov \(2006\)](#). [Grinblatt and Keloharju \(2001\)](#), employing a sample of Finnish firms, also confirm that investors prefer stocks of firms in close proximity and of similar language and culture, while [Loughran and Schultz \(2004\)](#) support this finding using NASDAQ stocks. Given the literature suggests that investors have a preference to hold local stocks, sports fans holding these stocks may assert a sports sentiment on their prices. Therefore, given the evident of localized trading and the importance and popularity of the Premier League, we expect to reveal sentiment induced from soccer matches.

Our empirical evidence suggest that there exists a significant win effect, where returns for locally based stocks are significantly higher after a win, while we find no evidence of the loss effect. This effect is larger for Saturday matches and is evident in both competitive and uncompetitive matches. However, we find that this effect is only significant for London based firms/clubs and there is no significant win effect for non-London based ones. In addition, our empirical findings suggest that UK investors react differently to the performance of teams, compared to US investors ([Chang et al., 2012](#), [Akhigbe et al., 2017](#)). We explain this phenomenon based on the psychology literature which defines BIRGing (basking in reflected glory) ([Cialdini et al., 1976](#)), where individuals bask in the reflected glory of a winning team in which they are associated with. Therefore our results are consistent with the findings of [Palomino et al. \(2009\)](#) who examine soccer clubs listed on the London Stock Exchange to determine whether betting odds and the game results affect the stock returns, and they find abnormal returns for winning teams that is due to the overreaction induced by investor sentiment, although this is not the case for losing teams. Finally, we examine whether the sentiment induced by soccer in England is different to other countries by following [Edmans et al. \(2007\)](#) and study the England national teams results. We find no significant evidence of a win or loss effect, indicating that the magnitude of sentiment induced from soccer is different across countries.

The remainder of the paper is organized as follows. Section [2](#) introduces the firm-level and the Premier League data. Section [3](#) describes the methodology. Section [4](#) investigates the impact of Premier League game outcomes on stock returns, explores the role of firm characteristics and provides a discussion of the results. Section [5](#), examines the the sentiment effect at the national level while Section [6](#) concludes.

## 2. Data

We collect all firms, dead and alive, within the FTSE350 from Thomson Reuters Datastream that span the period 19th August 2000 to 17th May 2016.<sup>56</sup> Firms must have at least one complete year of stock prices in order to be included in our analysis and delisted firms are included to avoid survivorship bias issues. We use the FAME database and collect the headquarters of the firms from their company reports on the London Stock Exchange website.<sup>7</sup>

We study the Premier League soccer seasons from 2000/2001 to the 2015/2016 season, therefore including 16 seasons of Premier League action. The Premier League is played from the middle of August to early May each year and consists of 20 teams in which each team plays a total of 38 matches, home and away games against each of the other 19 teams in the competition. Unlike a number of other sports that have been examined the sporting literature (such as the NBA and NFL), the Premier League has relegation and promotion, in which the bottom 3 teams of the division are relegated to the Championship (the league below) and 3 teams from the Championship are promoted in their place. Therefore winning and losing is arguably more important in the Premier League than the NBA or NFL, as relegation means a huge drop in television revenues and sackings of managers, players and especially administration staff at the soccer clubs. Deloitte estimated that the cost of relegation for the bottom 3 clubs in the 2016/2017 season is £55 - 66 million.<sup>8</sup> Hence, we study 6080 games in total with the game data distributions reported in Table 1. Most games (58.60%) take place on Saturday, which is the traditional day for Premier League matches. Home wins represent 46.37% of the matches, while only 27.29% are away wins and 25.84% draws. The most frequent number of game goals is 2 at 24.39% while 5.58% of games had over 5 goals. Supporting the competitiveness of the Premier League, the most frequent winning margin is one goal (37.85%) and the higher the winning margin, the less frequent the result. Table 2 presents the clubs that were in the Premier League during the sample period as well as their relative performance during the 16 seasons we study. Only 7 of the 41 teams in our sample are present in the Premier League for the whole period, consistent with the fact that they generally have the highest percentage of wins.<sup>9</sup> The most successful team by percentage of wins is Manchester United (63.98%) while the teams with lowest proportion of wins is Bradford City

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<sup>5</sup>We choose the FTSE350 since it comprises of large and small firms that have appropriate liquidity while at the same time have enough stocks to be located throughout the UK to enable us to study the localized sporting sentiment. Focusing only on FTSE100 firms would not have provided enough geographically dispersed firms, as the vast majority of them are located in London while the FTSE All-Share would include many penny stocks with limited liquidity.

<sup>6</sup>Our data period starts in 2000 since we require bookmakers data to determine the competitiveness of matches in which the data only begins in 2000.

<sup>7</sup>See <http://www.londonstockexchange.com/home/homepage.htm> for more details.

<sup>8</sup>See <http://www.skysports.com/football/news/11095/10879090/what-is-the-cost-of-premier-league-relegation-for-sunderland-middlesbrough-and-hull-city>.

<sup>9</sup>Specially, Arsenal, Aston Villa, Chelsea, Everton, Liverpool, Manchester United and Tottenham Hotspur are constants in the Premier League from 2005 to 2016.

and Derby County (both with 13.16%). Arsenal have the lowest proportion of losses (16.78%) while Derby County have the highest proportion of losses (64.47%). Aston Villa have the highest number of draws at 31.25% while Manchester United have the least at 18.75%. As expected, teams with low win rates get relegated from the Premier League and teams with high win rates are in the Premier League for a longer period.

To examine the relationship between Premier League results and returns of locally headquartered stocks, we find the clubs location from the official Premier League website which provides information on each club including their postcode.<sup>10</sup> Given the postcode of the clubs and firms, we match firms to clubs that are geographically in the same postcode. We use the first part of the postcode to determine whether the headquarters of the firm is located in the same geographic area as the soccer team. The first part of UK postcodes either provides one letter and one or two digits (for example "M2" or "L13"), or two letters followed by one or two digits (for example "NE2" or "SO17"). Generally if the postcode has just one letter at the start, that letter refers to a large city, for example "B" refers to Birmingham and "L" refers to Liverpool. When a postcode has two letters at the beginning, this is to distinguish the area from large cities with the same first letter such as "LE" refers to Leicester and "LS" refers to Leeds. The exception to the rule is London, which has 8 postcodes and also contains 8 of our teams. We separate our London teams into 4 different postcodes based on their location, namely north, east, south and west and we match up firm postcodes to club postcodes. Table 3 presents the geographical area, postcode, teams within that postcode and the number of firms within that postcode.<sup>11</sup> There is a good spread of clubs in different postcodes, as well firms. The most popular postcode for clubs is South London (SE and SW) with four teams within this one postcode. The most popular postcode by firm is the West London (W and WC) and East London (E and EC) postcodes, which is not surprising given Londons importance in European trading. In fact, 69.66% of firms are the London region, however there is a good geographical spread of firms throughout the U.K. as well as a good spread of clubs with differing performances in the Premier League.

### 3. Methodology

In this section we describe the methodology we use in order to examine whether firms located near a Premier League team that won (lost) reflect stock return variations. The null hypothesis is that stock returns will not be affected by economic-neutral events such as soccer results. The alternative hypothesis is that game results matter and the stock return variation reflects overreaction of individual investors. We adopt a two-stage methodology employed in previous studies (Chang et al., 2012, Akhigbe et al., 2017). In the first stage, we use the Fama-French (1992, 1993)

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<sup>10</sup>For more information see <https://www.premierleague.com>.

<sup>11</sup>A number of firms are located in Scotland, Jersey, the Isle of Man and other locations throughout the UK where there are no Premier League clubs in their area and therefore are excluded from the analysis.

three-factor model and augment it with the momentum factor (model 1 thereafter), as follows:

$$R_{it} = \gamma_1 + \gamma_1(R_{mt} - R_{ft}) + \gamma_2SMB_t + \gamma_3HML_t + \gamma_4MOM_t + \epsilon_{it} \quad (1)$$

where  $R_{it}$  is the continuously compounded daily return of an individual stock  $i$  on day  $t$ ,  $R_{mt}$  is the continuously compounded daily FTSE350 return,  $R_{ft}$  is the risk-free rate,  $SMB_t$  is the small firm portfolio return minus the big firm portfolio return,  $HML_t$  is the high book-to-market portfolio return minus the low book-to-market portfolio return and  $MOM_t$  stands for the momentum portfolio return.<sup>12</sup> We estimate equation (1) for each firm  $i$  and we extract the estimated residuals  $\hat{\epsilon}_{it}$  which represent the abnormal returns that stem from soccer sentiment.

In the second stage we regress the residuals from equation (1) on win and loss dummies to define the effects of the outcome of soccer matches on the abnormal individual stock returns. To this end, we employ the following panel regression model:

$$\hat{\epsilon}_{it} = \beta_0 + \beta_{WIN}D_{WIN,t} + \beta_{LOSS}D_{LOSS,t} + v_{i,t} \quad (2)$$

where  $\hat{\epsilon}_{it}$  are the residuals from equation (1) for each firm  $i$  and  $D_{WIN,t}$  ( $D_{LOSS,t}$ ) equals one if the firm  $i$  is headquartered in the same postcode as the soccer club and the team won (lost) the game, and zero otherwise. One potential issue arises when two teams in the same geographical postcode have contrasting results. For instance in the Manchester postcode, if Manchester United win and Manchester City lose, the induced sentiment may be mixed dependent on which investor supported which club. Therefore we remove such cases from our sample. The panel model for equation 2 is estimated by clustering the standard errors by firm, allowing for observations from the same firm in different years to be correlated.<sup>13</sup> We also adjust the standard errors by using the White test procedure in order to produce heteroskedasticity-consistent standard errors (White, 1980).

We conduct an additional analysis where we augment equation (1) by controlling for the lagged firm returns, the day-of-the-week, holiday and the January effects (model 2 thereafter). Therefore our first stage regression (see equation (1)) becomes:

$$R_{it} = \gamma_{0i} + \gamma_{1i}(R_{mt} - R_{ft}) + \gamma_{2i}SMB_t + \gamma_{3i}HML_t + \gamma_{4i}MOM_t + \gamma_{5i}R_{it-1} + \sum_{j=1}^4 \gamma_{6ij}D_{jt} + \sum_{j=1}^5 \gamma_{7ij}H_{jt} + \gamma_{8i}Jan_t + \epsilon_{it} \quad (3)$$

where  $R_{it-1}$  is the previous day rate of return of firm  $i$ ,  $D_{jt}$ ,  $j=1...4$ , are dummy variables for the day of the week: Monday, Tuesday, Wednesday, and Thursday, respectively,  $H_{jt}$ ,  $j=1...5$ , are

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<sup>12</sup>We retrieve Fama French factors from Gregory et al. (2013) which can be accessed at <http://business-school.exeter.ac.uk/research/centres/xfi/famafrench/>.

<sup>13</sup>For more information on the methodology, refer to the work of Petersen (2009).

dummy variables for 1, 2, 3, 4 and 5 days before a non-weekend holiday and  $Jan_t$  is the dummy variable for the January effect;  $J_t = 1$  when  $t$  is in January and  $J_t = 0$  otherwise. Therefore we estimate both models to ensure the robustness of our results.

## 4. Empirical Results

### 4.1. Full Results

This section reports the results on the sentiment induced by local soccer clubs on local firms. Panel A of Table 4 reports the initial results where all firms and all clubs are included in our analysis. For both model specifications, we find a positive and statistically significant win effect in the magnitude of 4.42 and 3.93 basis points for model 1 and model 2, respectively. This suggests that firms experience a positive sentiment induced by a local team win. This is in contrast to the empirical evidence of a significant loss effect and non significant win effect found in a national level (Edmans et al., 2007) and in a firm-level (Chang et al., 2012, Akhigbe et al., 2017) setting. This suggests that in the U.K. investors react more strongly to a winning team than what is found in studies based on international soccer matches, the NFL and NBA. The loss coefficient is positive in both model specifications but is insignificant indicating no substantial loss effect. Therefore our baseline results show a positive win effect but no subsequent loss effect.

### 4.2. London vs Non-London

Table 3 shows that the majority of the firms in our sample are located in London, as well as eight soccer clubs. Therefore we split our sample into London and non-London and re-estimate our specifications. Panel B of Table 4 reports the London results and shows that the significant win effect is even stronger for London only firms/clubs, with a magnitude of 5.72 and 5.02 basis points for models 1 and 2, respectively. Panel C reports the non-London results in which we analyze only those firms/clubs that are located outside of London. We find no significant evidence of a win effect, although there is an insignificant win effect of magnitudes of 0.43 and 0.61. Therefore non-London firms/matches do generate a win effect although it is no longer significant indicating that London matches induce more investor sentiment on London firms than non-London matches on non-London firms.<sup>14</sup> A possible concern with the results for London firms/matches is the fact that in West London, we have 112 firms in our analysis but only one soccer club (QPR) who are only in the Premier League for 4 seasons. To address this concern, we re-estimate the London only data by removing from our analysis the firms located in West London as well as the QPR results and Panel D of shows that the win effect remains significant with a magnitude of 5.55 and 4.83 basis points for models 1 and 2, respectively. Therefore the significant win effect is only present for London firms/clubs and an insignificant win effect is found for non-London firms/clubs.

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<sup>14</sup>A possible reason for this finding is the lack of liquidity of non-London firms which we will investigate when we study firm characteristics in Section 4.5.

### 4.3. Competitive and Uncompetitive

Any sentiment effect from soccer matches is due to irrationality, but the level of irrationality may depend on the competitive nature of the matches in hand. For instance, if Manchester United beat a team of the similar level to theirs, such as Arsenal or Chelsea, investors are likely to produce a stronger level of sentiment than if Manchester United beat a team most analysts expect them to beat such as Derby County or Sheffield United. Therefore, we follow [Palomino et al. \(2009\)](#) and split matches in competitive and uncompetitive matches using betting data in order to determine whether investors do place more sentiment on competitive matches compared to uncompetitive ones.

We collect betting data from William Hill and Ladbrokes to determine which matches are competitive and which matches are deemed uncompetitive.<sup>15</sup> We collect betting data from two providers since one betting provider can not provide the odds for every match of the sample period. Therefore we employ both in order to get complete coverage of our sample period.<sup>16</sup> To examine the impact of unexpected results on our initial results, we follow [Palomino et al. \(2009\)](#) in that  $\delta_i, i = w, d, l$  is the bookmakers' perceived probability of the outcomes (win, draw and loss), defined as the inverse of the odds. To convert perceived probabilities to implied probabilities of a win, we normalize the former by dividing each odd by the sum:

$$ProbWin_t = \frac{\delta_w}{\delta_w + \delta_d + \delta_l} \quad (4)$$

$$ProbLoss_t = \frac{\delta_l}{\delta_w + \delta_d + \delta_l} \quad (5)$$

Therefore  $ProbWin_t$  and  $ProbLoss_t$  are the probabilities of wins and losses. From these probabilities, we follow [Palomino et al. \(2009\)](#) to calculate the  $\Delta Prob_i$  as:

$$\Delta Prob_i = ProbWin_i - ProbLoss_i \quad (6)$$

The larger the  $\Delta Prob_i$ , the more a win is expected relative to a loss and the smaller it becomes, the outcome becomes more uncertain. When  $\Delta Prob$  is negative, a loss is more likely than to occur than a win. To determine competitive and non-competitive matches, we define the bookmakers forecasts on the games by employing  $ProbWin$  [specification a] and  $\Delta Prob$  [specification b] as follows:

#### 1. Competitive Matches

- (a) *Competitive(a)* is equal to 1 if  $0.45 > ProbWin > 0.25$  and, zero otherwise.

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<sup>15</sup>We collect betting data from [www.football-data.co.uk](http://www.football-data.co.uk).

<sup>16</sup>Only in 4% of the matches does one of the two bookmakers fail to provide odds. When odds from both bookmakers is available, we take the average between the two which should have very little effect on our results since the correlation between the odds of the two bookmakers is 0.98.

(b) *Competitive(b)* is equal to 1 if  $0.3 > \Delta Prob > -0.3$ , and zero otherwise.

## 2. Uncompetitive Matches

(a) *Uncompetitive(a)* is equal to 1 if  $ProbWin > 0.45$  or  $ProbWin < 0.25$ , and zero otherwise.

(b) *Uncompetitive(b)* is equal to 1 if  $\Delta Prob > |0.3|$ , and zero otherwise.

That is, competitive matches are ones where the *ProbWin* is between 0.25 and 0.45, or when the *Prob* is between -0.3 and 0.3. Alternatively, an uncompetitive match is one where the *ProbWin* is greater than 0.45 or less than 0.25, or when the *Prob* is greater than absolute 0.3. We are left with 39.64% competitive matches and 59.84% uncompetitive matches from specification a), and 56.99% competitive matches and 43.01% uncompetitive matches from specification b).

Table 5 reports the competitive and uncompetitive results for each specification and each definition of competitive and uncompetitive matches. For both competitive and uncompetitive matches (for specification a and b), we find significant evidence of the win effect and no evidence of a loss effect. This is consistent with our baseline results and therefore indicates that the win effect is irrelevant whether the matches are competitive or uncompetitive.

### 4.4. Timing of Matches

As noted in Table 1, Premier League matches occur on many different days of the week, with Saturday games the most frequent. Traditionally, all soccer matches in the UK started at 3pm on a Saturday but in the last 30 years due to media coverage and their subsequent requests, more and more games are being spread throughout the week to maximize the amount of soccer on television. Matches on a Saturday may attract more attention from fans since it is the weekend and most fans will not be at work that day. Therefore fans have the Saturday morning to analyze the match and form forecasts on what the result may be. This is also reflected in the fact that stadium attendances are greater at the weekend than they are during the week. Also if an investors' team wins (loses) on the Saturday, they have Sunday to be happy (sad) which may grow throughout the rest of the weekend onto the start of the following week. To determine whether Saturday matches induce a different level of sentiment than for other days, we re-estimate our specifications but limit our sample to only games that take place on Saturday.

An alternative hypothesis is that the sentiment induced from the Premier League matches may weaken over time. To be specific, the impact of a Friday match will be diluted somewhat since the next trading day will be the following Monday. This is also the case for Saturday matches and any match that takes place around public holidays when the London Stock Exchange is closed.<sup>17</sup> To deal with this issue, we re-estimate our models but only include matches where the day after a

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<sup>17</sup>There has been evidence of a holiday effect in stock markets where returns are significantly higher on days before a public holiday, see [Kim and Park \(1994\)](#) and [Meneu and Pardo \(2004\)](#).

match is a trading day. Therefore this excludes all Friday and Saturday matches and any matches where the market is closed the following day for any reason.

Panel A of Table 6 reports sentiment induced from Saturday only matches as well as matches in which the next day is a trading day. We find a significant win effect for both our models, with a stock return increase of 3.97 and 2.93 basis points after a Saturday win. Again there is no evidence of a loss effect. Panel B of Table 6 presents the results for only the matches which have a trading day straight after the match and we find an insignificant win effect of magnitude 1.27 and 0.93 basis points, respectively. This suggests that the win effect is not diluted over time and that Friday and Saturday matches induce more sentiment in stock returns than Sunday to Thursday matches.

#### 4.5. Firm Characteristics

Baker and Wurgler (2006) argue that stocks with certain characteristics are more susceptible to shifts in investor sentiment than others. Accordingly, we sort our sample firms into thirds (in a way similar to Akhigbe et al. (2017)) based on a number of firm characteristics. We follow Baker and Wurgler (2006) and measure firm characteristics at the end of June prior to the soccer match. Firm size (*SIZE*) is the market capitalization in millions, *MV/BV* denotes is the ratio of the market value of equity to the book value of equity, asset tangibility (*TANGIBILITY*) is the gross property, plant and equipment scaled by total assets. Firm profitability (*PROFITABILITY*) is measured as the return on assets (*ROA*) defined as the ratio of earnings before interest and taxes to total assets, while dividend per share (*DPS*) is the total cash dividend divided by the number of shares outstanding. Finally, return volatility (*VOLATILITY*) is the standard deviation of monthly returns over the 12 month period ending in June before the soccer game.

Table 7 reports the summary statistics of the firm characteristics of our sample while Table 8 presents the win and loss effects of Premier League soccer game outcomes on daily stock returns for firms that are dependent on their characteristics. We find that small firms and low *MV/BV* firms induce a stronger win effect than large firms and firms with high tangibility. Regarding profitability, firms with low profitability have a stronger win effect than firms with high profitability while firms with low dividends per share have a much large win effect than firms with high dividends per share. Finally, we find that firms that are highly volatile induce a much larger win effect than firms that are not as volatile. Therefore our results indicate that certain firm characteristics are more susceptible to shifts in investors sentiment than other firm characteristics, consistent with previous studies (Chang et al., 2012, Akhigbe et al., 2017).

#### 4.6. Discussion

Our analysis has shown that there exists a significant win effect in a firm-level setting induced from Premier League soccer matches. This is in contrast to evidence that sports sentiment at the firm level generates a negative loss effect for American Football (Chang et al., 2012) and for American Basketball (Akhigbe et al., 2017).

The psychology literature hints at the possibility of win effects being larger than loss effects.<sup>18</sup> This is the behavioral pattern of individuals called "basking in reflected glory" (BIRGing), which is the tendency of individual to share in the glory of a successful team. Cialdini et al. (1976) was first to note this effect where university students were more likely to wear school-identifying apparel on the Monday after a winning performance by their school's soccer team than after a losing performance. Hirt et al. (1992) note that once a positive relationship between fans and a team is formed, people who evaluate the team positively will also evaluate the associated fan more positively. This may increase the mood of fans and help explain our win effect. Recently, Jones et al. (2012) show the emotional state of Spain's soccer fans during the 2010 World Cup, and show that Spain fans positive emotional state after winning the World Cup persisted over four days while Davis and End (2010) show that a Super Bowl win increases the income of individuals in the metropolitan area suggesting that a winning team may increase the wealth and therefore the mood of individuals. Therefore we attribute our results to BIRGing in that British investors are more affected by a local teams win rather than a loss.

## 5. Firm Level vs. National Level

There is evidence that sports sentiment at the firm level does generate the negative loss effect for American Football (Chang et al., 2012) and for American Basketball (Akhigbe et al., 2017). However, Palomino et al. (2009) show that listed Premier League overreact to wins but not for losses, suggesting that British investors may act differently to US investors. Therefore there is the possibility that British investors may also react differently to the performance of teams. If investors react differently at the firm level to local team wins and loses, it is possible that investors in England react differently to the performance of the national team. On the other hand, it may be that investors react differently at the firm-level than they do at the national level which could be due to their stronger affiliation to their local team or their dis-attachment to the national team performances.

To determine whether this is the case, we follow Edmans et al. (2007) but restrict the analysis to include only England matches for European Championships and World Cups, which include the qualifying phase and the finals. We examine all matches as well as qualifying, group stage and elimination phases of the European Championships and World Cups, respectively. We follow Edmans et al. (2007) and we employ ELO ratings to determine the closeness in the ability of the two opponents as a proxy for importance in order to select games that have a reasonable chance of being important.<sup>19</sup> A qualifying game is defined as close if the Elo rating of the two opponents is within 125 points (after adding 100 points to the team with the home advantage) or if the game is played as part of the knock-out stage between the qualifying rounds and the group stage.

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<sup>18</sup>This is even recognized by Edmans et al. (2007) in footnote 7 of their paper.

<sup>19</sup>For more information see [www.eloratings.net](http://www.eloratings.net).

Following [Edmans et al. \(2007\)](#) we employ a two-stage time-series regression. In the first stage, we use the following time-series regression, defined as :

$$R_{UK,t} = \gamma_0 + \gamma_1 R_{UK,t-1} + \gamma_2 R_{M,t-1} + \gamma_3 R_{M,t} + \gamma_4 R_{M,t+1} + \sum_{j=1}^4 \gamma_{5j} D_{jt} + \sum_{j=1}^5 \gamma_{6j} H_{jt} + \epsilon_{it} \quad (7)$$

where  $R_{UK,t}$  is the return on the total returns index sourced from Datastream (the mnemonic we use is TOTMKUK(RI)),  $R_{UK,t-1}$  is the lagged index return to account for serial correlation,  $R_{M,t}$  is the contemporaneous return on the world portfolio to account for the integration of markets. We additionally include  $R_{M,t-1}$  and  $R_{M,t+1}$  in case the index is leading or lagging the world index. Finally, we include dummies for the day-of-the-week denoted (i.e.  $D_{jt}$ ,  $j=1...4$ , for the day of the week: Monday, Tuesday, Wednesday, and Thursday, respectively) and dummies for the pre-holiday effect (i.e.  $H_{jt}$ ,  $j=1...5$ , for 1, 2, 3, 4 and 5 days before a non-weekend holiday). We adjust the standard errors using the Newey-West procedure ([Newey and West, 1987](#)). In the second stage we regress the residuals from equation (7) on win and loss dummies to define the effects of the outcomes of the national soccer matches on the abnormal UK equity index returns, as follows:

$$\hat{\epsilon}_t = \beta_0 + \beta_{WIN} D_{WIN,t} + \beta_{LOSS} D_{LOSS,t} + v_{i,t} \quad (8)$$

where  $\hat{\epsilon}_{it}$  are the residuals from equation (7) and  $D_{WIN,t}$  ( $D_{LOSS,t}$ ) equals one if the UK national team won (lost) the game, and zero otherwise.

Table 9 reports the results for the national level game outcomes for England on the daily UK equity index returns. We examine three periods, namely the start of [Edmans et al. \(2007\)](#) period (1973) to the end of our sample period (2016); the [Edmans et al. \(2007\)](#) period; and finally our sample period. We find in each case no significant evidence of a win effect or a loss effect. In fact, we find an insignificant loss effect in each case indicating that the loss effect at the national level for England is insignificant compared to the loss effect of other countries documented in [Edmans et al. \(2007\)](#). This also demonstrates that the sentiment induced from national soccer matches and club soccer matches is quite different.

## 6. Conclusion

This paper adds to the literature on investor sentiment by studying the firm-level sentiment between Premier League match outcomes and the returns of FTSE350 firms headquartered geographically near the Premier League teams. The vast majority of literature finds that sporting results are characterized by a negative sentiment, in which returns are significantly negative after a team loses. Contrary to these findings, we document a positive sentiment effect where returns after a win are significantly higher for a firm located geographically close to the Premier League team. We find that the significant win effect is only present for London firms indicating that

London matches are driving the win effect. However, we do not document a negative loss effect. In addition, we find that the win effect is stronger on Saturdays which suggests that investors place more emphasis on Saturday matches than matches during other days of the week. Finally, we show that it is irrelevant whether the match is competitive or noncompetitive, and that there is no dilution effect.

We argue that this win effect can be explained by the psychology literature where individuals take part in BIRGing after an associated team wins ([Cialdini et al., 1976](#)). Finally, to determine whether this effect is only present at the local-level, we examine the national investor sentiment induced from England international matches and we find no significant evidence of the win effect, but we do find an insignificant loss effect indicating that the negative sentiment induced from national soccer losses varies across countries. This also suggests that the sentiment induced from national matches and club matches is quite different in England which could be linked to the allegiance fans have with their own club compared to their country.

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Table 1: Game Day Distribution.

|                | Mon | Tue | Wed | Thu | Fri | Sat  | Sun  | Total | Percent |
|----------------|-----|-----|-----|-----|-----|------|------|-------|---------|
| All Games      | 354 | 304 | 479 | 39  | 36  | 3563 | 1305 | 6080  | 100.00% |
| Home Win       | 160 | 137 | 230 | 12  | 19  | 1661 | 600  | 2819  | 46.37%  |
| Away Win       | 102 | 86  | 118 | 11  | 10  | 998  | 365  | 1690  | 27.79%  |
| Draw           | 92  | 81  | 131 | 16  | 7   | 904  | 340  | 1571  | 25.84%  |
| Game Goals = 0 | 30  | 24  | 37  | 2   | 3   | 284  | 101  | 481   | 7.91%   |
| Game Goals = 1 | 57  | 54  | 95  | 5   | 4   | 660  | 233  | 1108  | 18.22%  |
| Game Goals = 2 | 85  | 81  | 114 | 12  | 8   | 865  | 318  | 1483  | 24.39%  |
| Game Goals = 3 | 83  | 70  | 95  | 6   | 5   | 765  | 273  | 1297  | 21.33%  |
| Game Goals = 4 | 58  | 44  | 68  | 8   | 9   | 538  | 205  | 930   | 15.30%  |
| Game Goals = 5 | 23  | 20  | 34  | 2   | 4   | 259  | 100  | 442   | 7.27%   |
| Game Goals > 5 | 18  | 11  | 36  | 4   | 3   | 192  | 75   | 339   | 5.58%   |
| Win Margin = 1 | 133 | 114 | 182 | 13  | 10  | 1332 | 517  | 2301  | 37.85%  |
| Win Margin = 2 | 76  | 68  | 88  | 8   | 15  | 780  | 272  | 1307  | 21.50%  |
| Win Margin = 3 | 35  | 131 | 42  | 1   | 2   | 358  | 91   | 560   | 9.21%   |
| Win Margin = 4 | 15  | 7   | 27  | 1   | 1   | 120  | 57   | 228   | 3.75%   |
| Win Margin = 5 | 2   | 2   | 8   | 0   | 1   | 45   | 14   | 72    | 1.18%   |
| Win Margin > 5 | 3   | 3   | 9   | 0   | 11  | 69   | 28   | 113   | 1.86%   |

Notes: This table presents the game day distribution employed in this study. Specifically, the table presents the distribution of games throughout the week, the number of home and away wins, as well as draws. It also reports the number of games that contain a certain number of goals as well as the number of games with a certain winning margin.

Table 2: Team distribution.

| Team                    | Games | Seasons | % Wins | % Losses | % Draws |
|-------------------------|-------|---------|--------|----------|---------|
| Arsenal                 | 608   | 16      | 58.72% | 16.78%   | 24.51%  |
| Aston Villa             | 608   | 16      | 30.59% | 38.16%   | 31.25%  |
| Birmingham City         | 304   | 8       | 26.64% | 42.76%   | 30.59%  |
| Blackburn Rovers        | 418   | 11      | 34.69% | 38.52%   | 26.79%  |
| Blackpool               | 38    | 1       | 26.32% | 50.00%   | 23.38%  |
| Bolton Wanderers        | 418   | 11      | 31.10% | 42.11%   | 26.79%  |
| Bournemouth             | 38    | 1       | 28.95% | 47.37%   | 23.68%  |
| Bradford City           | 38    | 1       | 13.16% | 57.89%   | 28.95%  |
| Burnley                 | 76    | 2       | 19.74% | 56.58%   | 23.68%  |
| Cardiff City            | 38    | 1       | 18.42% | 57.89%   | 23.68%  |
| Charlton Athletic       | 266   | 7       | 31.95% | 41.73%   | 26.32%  |
| Chelsea                 | 608   | 16      | 59.21% | 16.94%   | 23.85%  |
| Coventry City           | 38    | 1       | 21.05% | 52.63%   | 26.32%  |
| Crystal Palace          | 152   | 4       | 28.95% | 47.37%   | 23.68%  |
| Derby County            | 152   | 4       | 13.16% | 64.47%   | 22.37%  |
| Everton                 | 608   | 16      | 38.98% | 32.89%   | 28.13%  |
| Fulham                  | 494   | 13      | 29.15% | 43.12%   | 27.73%  |
| Hull City               | 114   | 3       | 21.05% | 52.63%   | 26.32%  |
| Ipswich Town            | 76    | 2       | 38.16% | 42.11%   | 19.74%  |
| Leeds United            | 152   | 14      | 39.47% | 38.16%   | 22.37%  |
| Leicester City          | 190   | 5       | 31.05% | 40.53%   | 28.42%  |
| Liverpool               | 608   | 16      | 50.49% | 24.51%   | 25.00%  |
| Manchester City         | 570   | 15      | 45.44% | 31.40%   | 23.16%  |
| Manchester United       | 608   | 16      | 63.98% | 17.27%   | 18.75%  |
| Middlesbrough           | 342   | 9       | 30.70% | 40.35%   | 28.95%  |
| Newcastle United        | 570   | 15      | 35.79% | 39.12%   | 25.09%  |
| Norwich City            | 190   | 5       | 24.21% | 47.89%   | 27.89%  |
| Portsmouth              | 266   | 7       | 31.95% | 44.36%   | 23.68%  |
| QPR                     | 114   | 3       | 19.30% | 57.89%   | 22.81%  |
| Reading                 | 152   | 4       | 27.63% | 53.29%   | 19.08%  |
| Sheffield United        | 38    | 1       | 26.32% | 52.63%   | 21.05%  |
| Southampton             | 342   | 9       | 34.21% | 37.43%   | 28.36%  |
| Stoke City              | 266   | 7       | 32.33% | 38.72%   | 28.95%  |
| Sunderland              | 494   | 13      | 24.90% | 48.79%   | 26.32%  |
| Swansea City            | 190   | 5       | 32.63% | 40.00%   | 27.37%  |
| Tottenham Hotspur       | 608   | 16      | 43.09% | 31.74%   | 25.16%  |
| Watford                 | 76    | 2       | 22.37% | 48.68%   | 28.98%  |
| West Bromwich Albion    | 342   | 9       | 25.15% | 46.20%   | 28.65%  |
| West Ham United         | 494   | 13      | 31.38% | 42.51%   | 26.11%  |
| Wigan Athletic          | 304   | 8       | 27.30% | 47.37%   | 25.33%  |
| Wolverhampton Wanderers | 152   | 4       | 21.05% | 52.63%   | 26.32%  |

Notes: This table reports the teams included in the sample along with their performance. The second and third columns denote the number of matches and seasons that each team has participated, respectively. The fourth, fifth and sixth columns denote the percentage of wins, losses and draws for each team, respectively.

Table 3: Location of clubs and firms.

| Area          | Postcode  | Teams                                                 | No. Firms |
|---------------|-----------|-------------------------------------------------------|-----------|
| Birmingham    | B         | Aston Villa,Birmingham City and West Bromwich         | 16        |
| Blackburn     | BB        | Blackburn Rovers and Burnley                          | 2         |
| Blackpool     | FY        | Blackpool                                             | 1         |
| Bolton        | BL        | Bolton Wanderers                                      | 2         |
| Bournemouth   | BH        | Bournemouth                                           | 6         |
| Bradford      | BD        | Bradford City                                         | 5         |
| Cardiff       | CF        | Cardiff City                                          | 4         |
| Coventry      | CV        | Coventry City                                         | 7         |
| Derby         | DE        | Derby County                                          | 3         |
| Hull          | HU        | Hull City                                             | 3         |
| Ipswich       | IP        | Ipswich Town                                          | 2         |
| Leeds         | LS        | Leeds United                                          | 6         |
| Leicester     | LE        | Leicester City                                        | 7         |
| Liverpool     | L         | Everton and Liverpool                                 | 5         |
| North London  | N and NW  | Arsenal and Tottenham Hotspur                         | 15        |
| East London   | E and EC  | West Ham United                                       | 112       |
| South London  | SE and SW | Charlton Athletic, Chelsea, Crystal Palace and Fulham | 71        |
| West London   | W and WC  | QPR                                                   | 112       |
| Manchester    | M         | Manchester City and Manchester United                 | 14        |
| Newcastle     | NE        | Newcastle United                                      | 11        |
| Reading       | RG        | Reading                                               | 31        |
| Sheffield     | S         | Sheffield United                                      | 4         |
| Southampton   | SO        | Southampton                                           | 2         |
| Sunderland    | SR        | Sunderland                                            | 1         |
| Watford       | WD        | Watford                                               | 8         |
| Wolverhampton | WV        | Wolverhampton Wanderers                               | 5         |

Notes: This table presents the geographical areas, postcodes, teams within those postcodes and the number of firms in each area.

Table 4: Win and Loss Effects of Premier League soccer game outcomes on daily stock returns.

| Model                                                | $\beta_0$             | $\beta_{WIN}$       | $\beta_{LOSS}$    |
|------------------------------------------------------|-----------------------|---------------------|-------------------|
| <b>Panel A. All Matches</b>                          |                       |                     |                   |
| 1                                                    | -0.0080***<br>(-3.95) | 0.0442***<br>(3.26) | 0.0195*<br>(1.67) |
| 2                                                    | -0.0072***<br>(-3.82) | 0.0393***<br>(3.10) | 0.0167<br>(1.50)  |
| <b>Panel B. London Matches</b>                       |                       |                     |                   |
| 1                                                    | -0.0102***<br>(-4.20) | 0.0572***<br>(3.52) | 0.0163<br>(1.27)  |
| 2                                                    | -0.0093***<br>(-4.01) | 0.0502***<br>(3.42) | 0.0134<br>(1.10)  |
| <b>Panel C. Non-London Matches</b>                   |                       |                     |                   |
| 1                                                    | -0.0015<br>(-0.41)    | 0.0043<br>(0.20)    | 0.0280<br>(1.04)  |
| 2                                                    | -0.0019<br>(-0.53)    | 0.0061<br>(0.25)    | 0.0258<br>(0.99)  |
| <b>Panel D. London excluding West London Matches</b> |                       |                     |                   |
| 1                                                    | -0.0081***<br>(-3.39) | 0.0555***<br>(3.33) | 0.0175<br>(1.28)  |
| 2                                                    | -0.0072***<br>(-3.17) | 0.0483***<br>(3.21) | 0.0134<br>(1.04)  |

Notes: This table presents the win and loss effects of Premier League soccer game outcomes on daily stock returns. Panel A reports the results on the sentiment induced from soccer matches on daily stock returns for our full sample. Panels B, C and D report the results on the sentiment induced from soccer matches on daily stock returns for London only firms/matches, for non-London firms/matches and for London firm/matches but excluding West London, respectively.  $\beta_0$ ,  $\beta_{WIN}$  and  $\beta_{LOSS}$  are the coefficients of equations 2 and 3 for models 1 and 2, respectively. The panel model for equations 2 and 3 is estimated by clustering the standard errors by firm. We also adjust the standard errors by using the White test procedure (White, 1980) modified for use in a panel data set (Petersen, 2009). t-statistics are in parentheses.

\* Denotes significance at the 10% level.

\*\* Denotes significance at the 5% level.

\*\*\* Denotes significance at the 1% level.

Table 5: Win and Loss Effects of Premier League soccer game outcomes on daily stock returns: Competitive and Uncompetitive matches.

| Model                                     | $\beta_0$             | $\beta_{WIN}$       | $\beta_{LOSS}$   |
|-------------------------------------------|-----------------------|---------------------|------------------|
| <b>Panel A. Competitive Matches (a)</b>   |                       |                     |                  |
| 1                                         | -0.0051***<br>(-2.93) | 0.0482**<br>(2.33)  | 0.0177<br>(0.91) |
| 2                                         | -0.0049***<br>(-2.84) | 0.042**<br>(2.09)   | 0.0175<br>(0.94) |
| <b>Panel B. Competitive Matches (b)</b>   |                       |                     |                  |
| 1                                         | -0.0060***<br>(-3.21) | 0.0518***<br>(2.99) | 0.0140<br>(0.86) |
| 2                                         | -0.0058***<br>(-3.13) | 0.0475***<br>(2.85) | 0.0125<br>(0.80) |
| <b>Panel C. Uncompetitive Matches (a)</b> |                       |                     |                  |
| 1                                         | -0.0064***<br>(-3.33) | 0.0504***<br>(3.22) | 0.0092<br>(0.61) |
| 2                                         | -0.0057***<br>(-3.04) | 0.0041***<br>(2.91) | 0.0051<br>(0.34) |
| <b>Panel D. Uncompetitive Matches (b)</b> |                       |                     |                  |
| 1                                         | -0.0054***<br>(-3.03) | 0.0452***<br>(2.60) | 0.0120<br>(0.66) |
| 2                                         | -0.0049**<br>(-2.53)  | 0.0438***<br>(2.83) | 0.0079<br>(0.65) |

Notes: This table presents the win and loss effects of Premier League soccer game outcomes on daily stock returns. Panels A and B report the results on the sentiment induced from soccer matches on daily stock returns for competitive matches. Panels C and D report the results on the sentiment induced from soccer matches on daily stock returns for uncompetitive matches. (a) and (b) denotes the specifications a and b, respectively, following [Palomino et al. \(2009\)](#).  $\beta_0$ ,  $\beta_{WIN}$  and  $\beta_{LOSS}$  are the coefficients of equations 2 and 3 for models 1 and 2, respectively. The panel model for equations 2 and 3 is estimated by clustering the standard errors by firm. We also adjust the standard errors by using the White test procedure ([White, 1980](#)) modified for use in a panel data set ([Petersen, 2009](#)). t-statistics are in parentheses.

\* Denotes significance at the 10% level.

\*\* Denotes significance at the 5% level.

\*\*\* Denotes significance at the 1% level.

Table 6: Win and Loss Effects of Premier League soccer game outcomes on daily stock returns: Saturday Only Matches and Next Day Trading Only.

| Model                                 | $\beta_0$             | $\beta_{WIN}$       | $\beta_{LOSS}$     |
|---------------------------------------|-----------------------|---------------------|--------------------|
| <b>Panel A. Saturday Only</b>         |                       |                     |                    |
| 1                                     | -0.0057***<br>(-3.32) | 0.0397***<br>(2.67) | 0.0177<br>(1.19)   |
| 2                                     | -0.0053***<br>(-3.07) | 0.0293**<br>(2.18)  | 0.0190<br>(1.33)   |
| <b>Panel B. Next Day Trading Only</b> |                       |                     |                    |
| 1                                     | -0.0031*<br>(-1.82)   | 0.0127<br>(0.71)    | -0.0108<br>(-0.58) |
| 2                                     | -0.0032*<br>(-1.85)   | 0.0093<br>(0.52)    | -0.0059<br>(-0.36) |

Notes: This table presents the win and loss effects of Premier League soccer game outcomes on daily stock returns. Panel A reports the results on the sentiment induced from soccer matches on daily stock returns for Saturday only matches. Panel B reports the results on the sentiment induced from soccer matches on daily stock returns for matches whose following day is a trading day.  $\beta_0$ ,  $\beta_{WIN}$  and  $\beta_{LOSS}$  are the coefficients of equations 2 and 3 for models 1 and 2, respectively. The panel model for equations 2 and 3 is estimated by clustering the standard errors by firm. We also adjust the standard errors by using the White test procedure (White, 1980) modified for use in a panel data set (Petersen, 2009). t-statistics are in parentheses.

\* Denotes significance at the 10% level.

\*\* Denotes significance at the 5% level.

\*\*\* Denotes significance at the 1% level.

Table 7: Summary Statistics of the firm characteristics.

| Variable               | Mean      | Q1       | Median   | Q3        | SD         |
|------------------------|-----------|----------|----------|-----------|------------|
| <i>SIZE</i>            | 4024.7594 | 337.1380 | 767.2800 | 1776.0480 | 12309.4199 |
| <i>MV/BV</i>           | 2.24      | 1.21     | 1.88     | 2.90      | 53.98      |
| <i>TANGIBILITY</i> (%) | 54.81     | 23.08    | 47.63    | 77.63     | 44.28      |
| <i>PROFITABILITY</i>   | 4.39      | 2.59     | 5.54     | 8.40      | 13.94      |
| <i>DPS</i>             | 0.1508    | 0.0290   | 0.0790   | 0.1510    | 0.2646     |
| <i>VOLATILITY</i> (%)  | 11.07     | 6.77     | 8.82     | 12.11     | 8.18       |

Notes: This table presents the summary statistics of the firm characteristics for the sample of local firms from 2000 to 2016. Q1 is the 30th percentile, Q3 is the 70th percentile and SD is the standard deviation. Firm characteristics include *SIZE*, *MV/BV*, *TANGIBILITY*, *PROFITABILITY*, *DPS* and *VOLATILITY*. Firm size (*SIZE*) is the market capitalization in millions, *MV/BV* denotes the ratio of the market value of equity to the book value of equity, asset tangibility (*TANGIBILITY*) is the gross property, plant and equipment scaled by total assets, firm profitability (*PROFITABILITY*) is measured by the return on assets (i.e. *ROA*) defined as the ratio of earnings before interest and taxes to total assets, dividend per share (*DPS*) is the total cash dividend divided by the number of shares outstanding and return volatility (*VOLATILITY*) is the standard deviation of monthly returns over the 12 month period ending in June before the soccer game.

Table 8: Win and Loss Effects of Premier League soccer game outcomes on daily stock returns: Firm Characteristics.

| $\beta_0$                | $\beta_{WIN}$       | $\beta_{LOSS}$    | $\beta_0$                 | $\beta_{WIN}$      | $\beta_{LOSS}$     |
|--------------------------|---------------------|-------------------|---------------------------|--------------------|--------------------|
| <b>Small Size</b>        |                     |                   | <b>Large Size</b>         |                    |                    |
| 0.0103<br>(1.09)         | 0.0695*<br>(1.89)   | 0.0142<br>(0.47)  | -0.0120**<br>(-2.34)      | 0.0198<br>(1.23)   | -0.0058<br>(-0.43) |
| <b>Low MV/BV</b>         |                     |                   | <b>High MV/BV</b>         |                    |                    |
| 0.0073<br>(0.84)         | 0.0708**<br>(2.11)  | 0.0348*<br>(1.69) | -0.0207***<br>(-3.24)     | 0.0224<br>(1.15)   | 0.0055<br>(0.24)   |
| <b>Low Tangibility</b>   |                     |                   | <b>High Tangibility</b>   |                    |                    |
| -0.0123*<br>(-1.76)      | 0.0440*<br>(1.87)   | 0.0219<br>(0.89)  | -0.0599<br>(-0.90)        | 0.0166<br>(0.53)   | 0.0081<br>(0.36)   |
| <b>Low profitability</b> |                     |                   | <b>High profitability</b> |                    |                    |
| -0.0419***<br>(-4.55)    | 0.0563**<br>(2.40)  | 0.0001<br>(0.03)  | 0.0095**<br>(1.99)        | 0.0300*<br>(1.92)  | 0.0019<br>(0.09)   |
| <b>Low DPS</b>           |                     |                   | <b>High DPS</b>           |                    |                    |
| -0.0301***<br>(-3.16)    | 0.0969***<br>(3.23) | 0.0099<br>(0.29)  | -0.0001<br>(-0.19)        | 0.0066<br>(0.53)   | 0.0104<br>(0.91)   |
| <b>Low Volatility</b>    |                     |                   | <b>High Volatility</b>    |                    |                    |
| 0.0003<br>(0.08)         | 0.0173<br>(1.16)    | 0.0185<br>(1.36)  | -0.0154<br>(-1.50)        | 0.0746**<br>(2.41) | 0.0139<br>(0.41)   |

Notes: This table presents the win and loss effects of Premier League soccer game outcomes on daily stock returns for firms that are dependent on their characteristics. Firm characteristics include *SIZE*, *MV/BV*, *TANGIBILITY*, *PROFITABILITY*, *DPS* and *VOLATILITY*. Firm size (*SIZE*) is the market capitalization in millions, *MV/BV* denotes the ratio of the market value of equity to the book value of equity, asset tangibility (*TANGIBILITY*) is the gross property, plant and equipment scaled by total assets, firm profitability (*PROFITABILITY*) is measured by the return on assets (i.e. *ROA*) defined as the ratio of earnings before interest and taxes to total assets, dividend per share (*DPS*) is the total cash dividend divided by the number of shares outstanding and return volatility (*VOLATILITY*) is the standard deviation of monthly returns over the 12 month period ending in June before the soccer game. We sort sample firms into thirds based on these firm characteristics at the end of June prior to each soccer season and include the top and bottom percentiles.  $\beta_0$ ,  $\beta_{WIN}$  and  $\beta_{LOSS}$  are the coefficients of equation 3 which corresponds to model 2. The panel model for equation 3 is estimated by clustering the standard errors by firm. We also adjust the standard errors by using the White test procedure (White, 1980) modified for use in a panel data set (Petersen, 2009). t-statistics are in parentheses.

\* Denotes significance at the 10% level.

\*\* Denotes significance at the 5% level.

\*\*\* Denotes significance at the 1% level.

Table 9: Win and Loss Effects of England's national soccer game outcomes on daily UK equity index returns.

| $\beta_0$                 | $\beta_{WIN}$ | $\beta_{LOSS}$ |
|---------------------------|---------------|----------------|
| <b>Panel A. 1973-2016</b> |               |                |
| 0.0001                    | -0.0234       | -0.0162        |
| (0.01)                    | (-0.12)       | (-0.09)        |
| <b>Panel B. 1973-2004</b> |               |                |
| 0.0003                    | -0.0690       | -0.0381        |
| (-0.03)                   | (-0.32)       | (-0.18)        |
| <b>Panel C. 2000-2016</b> |               |                |
| 0.0005                    | 0.0899        | -0.3041        |
| (0.03)                    | (0.36)        | (-0.90)        |

Notes: This table presents the win and loss effects of England's national soccer game outcomes on daily UK equity index returns. Panels A, B and C report the results for the periods 1973-2016, 1973-2004 and 2000-2016, respectively.  $\beta_0$ ,  $\beta_{WIN}$  and  $\beta_{LOSS}$  are the coefficients of equation 8. We adjust the standard errors using the Newey-West procedure (Newey and West, 1987). t-statistics are in parentheses.

\* Denotes significance at the 10% level.

\*\* Denotes significance at the 5% level.

\*\*\* Denotes significance at the 1% level.