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SHARE PRICE REACTIONS TO SPORTY PERFORMANCES OF SOCCER CLUBS LISTED ON THE LONDON STOCK EXCHANGE AND THE AIM

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Share price reactions to sporty performances of soccer clubs listed on the London Stock Exchange and the AIM.

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Abstract : This paper investigates whether or not the share prices of soccer clubs listed on the London Stock Exchange and the Alternative Investment Market are influenced by the soccer teams' weekly sporty performances. Event studies corrected for thin trading and with Baysian updating reveal that at the first day of trading after a game, positive abnormal returns almost 1% were realised expected following a soccer victory. In contrast, defeats or draws are penalised, respectively, by negative abnormal returns of 1.4% and 0.6%. Cumulatively over the week, defeats and draws trigger abnormal losses of 2.5% and 1.7%. These findings are consistent across the English and Scottish, national Cup and European competitions. Much larger abnormal returns are generated subsequent to promotion and relegation games as the Premier League and European games guarantee substantially higher (future) income in terms of television broadcasting rights and sponsoring income. Whereas victories seem to be more rewarded by share price increases for those clubs listed on the LSE in comparison to those listed on the AIM, defeats lead to larger price reductions for AIM listed clubs. In spite of the sporty performance sensitivity of listed soccer clubs and the excellent share price performance of certain clubs like Manchester United, Sunderland and Celtic, Jensen's alpha and the Sharpe ratio of an equally weighted investment in listed soccer clubs since 1996 points out that such an investment has substantially underperformed the market index.

JEL classification : G1, G14

Keywords : Soccer club valuation, Event studies, Share price reactions.

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1. Introduction.

1.1. Initial public offerings and intensified commercialization of soccer.

Soccer has become an important industry in the UK: large corporations – like the sport giants Reebok, Adidas or Umbro - pump enormous sums of sponsoring funds into soccer, television rights are sold for billions of pounds sterling and soccer players' salaries and transfer sums are exorbitant. In order to compete better in English, Scottish and European leagues, soccer clubs have introduced professional marketing- and advertising-strategies, have done substantial investments in large arenas and have aspired to be listed on the stock exchange. The pioneer was Tottenham Hotspur that went public in 1983. During the season 1996-97, a wave of initial public offerings (IPOs) by soccer clubs took place with the successful introduction of 8 clubs on the Official List of the London Stock Exchange (LSE) and 4 on the Alternative Investment Market (AIM). As a result, currently, 20 English and Scottish soccer clubs are listed: 12 on the LSE and 8 on the AIM (see Table 1). In addition, the shares of two clubs (Arsenal and Liverpool) are regularly traded via OFEX.[1] In contrast, so far only two non-British soccer clubs in the European Union were floated: Lazio Roma (on 6/5/98) and Ajax Amsterdam (on 14/5/98).[2] The main reason for an initial public offering is the need for additional funding to attract top players, to establish youth soccer schools and to expand soccer stadiums. Division 1 clubs in the UK hope that additional IPO resources will give them sufficient leverage to make the promotion to the Premier League. Subsequently, this will give them direct access to even larger amounts of money resulting from the sale of television rights to the different broadcasting networks.

Table 2 reveals that not all IPOs have been immediate successes: only half of the soccer clubs introduced on the LSE and the AIM were underpriced. One month after the offering, stock prices had declined below the offer price for 8 of the 12 LSE clubs and for all but 2 AIM soccer teams. Over longer periods of time, from the introduction to the end of 1998, share price increases were

[1] Since its launch in June 1995, more than 400 companies were admitted to the AIM. Most of these companies were USM, OFEX or rule 4.2 transfers. About 250 pure IPOs have taken place mainly through placings but through introductions as well. The LSE sets no minimum trading record or minimum levels for assets, profit, market capitalization, years since creation or free float for admission to the AIM. AIM companies are also exempt from seeking shareholder approval prior to substantial share transactions. However, important to the AIM admissions procedure is the nomination of nominated brokers who organize the actual floatation and the advisor who supervises the floatation and advises the company thereafter. The OFEX is an unregulated trading facility in which JP Jenkins ltd. is the main market maker. Transactions take place ex-exchange between JP Jenkins and other member firms of the stock exchange and are supervised by the Securities and Futures Authority ltd. OFEX does not guarantee liquidity. For shares to be traded via OFEX, the listing-committee of the stock exchange verifies whether the firm's accounting system fulfills certain requirements.

[2] In the whole of Europe, only one additional club is listed: the Zurich Grasshoppers.

recorded for only Manchester United, Tottenham, Southampton and Nottingham. This poor performance of the soccer initial public offerings is reflected in the return of the largest soccer investment fund 'The Football Fund'. This investment fund was created in February 1998 by the investment bank Singer and Friedlander to investment in soccer clubs and companies closely linked to the soccer industry. Its return in its first year was minus 13%. The Nomura UK Football Clubs index went down by 40% over the same period. One only soccer club performed extremely well on the stock exchange: Manchester has a current market capitalization 8 times larger that the one at the first day of trading in 1991.

[Insert about here Tables 1 and 2]

Table 3 shows the turnover of the listed soccer teams. Manchester United vastly outperforms the other clubs with a turnover (excluding income from players' transfers) of almost £ 88 million. Newcastle and Chelsea come next with respectively £ 41.1 million and £ 23.7 million. In terms of turnover, there have been substantial increases for all clubs over the seasons 1996-97 and 1995-96 (apart from Nottingham which degraded from Premier League to Division 1). The main reason for this turnover increase is the advance of £ 50 million from a £ 620 million deal between Premier League clubs and BskyB for the broadcasting rights covering four years (autumn 1997- summer 2001). Furthermore, the number of regular attendants of soccer games has gone up: Table 3 reveals that the occupancy rate in most top clubs' stadiums amounts to more than 80%. This, in turn, attracts more sponsoring companies: the main Premier League sponsor is Carling (Bass plc.) which has signed a four year deal worth £ 36 million (as of 1997-98). Individual clubs also secure sponsoring on team shirts (e.g. Chelsea's £ 4.5 million contract with Autoglass), of the team's equipment (e.g. Aston Villa's contract of £ 2.15 million yearly with Reebok), for stadium expansion (e.g. the Bolton Wanderers stadium has been rebaptised the Reebok Stadium), of publicity panels in the stadium, of the replica of the team's outfits, of specific games (e.g. the Sony sponsoring of all Newcastle games). More and more, a larger part of top club turnover depends on merchandising of club products (like outfits, books, videos), from catering, restaurant and hotel activities, from the rental of business seats and from cinema and fitness clubs managed by the club.

[Insert about here Table 3]

1.2 Profitability of top soccer clubs and the Bosman Verdict.

In spite of substantial increases in turnover, only 7 out of the 20 listed soccer clubs manage to generate profits (see Table 3). This is largely due to the high salaries paid to star players since

the Bosman Verdict (hence called BV) was passed by the European Court of Justice in December 1995. The verdict stated that the UEFA-FIFA transfer rules for soccer players were not in accordance with Article 48 of the Treaty of Rome as these rules prohibited a player who reached the end of his contract with a soccer team to move to another team without a transfer payment by the former employer to the new one. Since the BV, any player reaching the end of a contract can move without restriction to another team. As such, the BV has had an important impact on the (book) value of the football teams: in clubs adhering to the 'asset view', the players' value was booked as Immaterial Fixed Assets which meant that transfer moneys were capitalized. If the player was 'sold' for more than the residual value, the profit and loss accounts are credited.[3] The alternative view is called the 'zero value'- accounting method which does not assign any value to a player. At the end of the contract, players have no value and the difference between all transfer income and expenses was put on the profit and loss-statement. As a result of the BV, the clubs with an 'asset view' were forced to make an additional depreciation to reduce the players' residual book value to zero. For Tottenham and Celtic, this depreciation amounted to respectively £ 7.3 million and £ 3.8 million. The soccer clubs reacted to the BV by offering longer contracts with the intention to 'sell' players prior to the contract end, allowing clubs to reap transfer funds. However, in order to make top players sign up for longer periods of time, cash on the barrelhead is required. Therefore, the BV did not generate profits for the clubs: the savings in transfer payments for players at the end of their contract were counterbalanced by higher remuneration for the soccer players and by the fact that players are now transferred prior to the end of their contracts.

In contrast to industrial and commercial companies which release quarterly (operational) results that may have an immediate impact on the share price performance, the market value of soccer clubs teams may depend to a large extent on weekly information, namely the sporty performance of the team. Indeed, continued poor performance will lead to lower attendance of the games, lower sales of merchandising products, lower income from catering and, in the long run, less sponsoring income. Still, on average, the shareholder structure of soccer clubs usually consists of one or a few stable controlling shareholders, some institutional investors (like the Football Fund) and many individual investors. Often, these individual investors are soccer fans who consider holding some shares as a way of supporting their teams and who just consider the potential profit as a bonus. Owning shares of a football club also gives them some fringe benefits, like priority

[3] Clubs using this method were Chelsea, Celtic, Tottenham, Sunderland, Bromwich and Preston.

rights to purchase a season ticket, discounts on tickets (e.g. 10% at Celtic), discounts to purchase merchandising products in the club shop, discounts in the club restaurants, free subscription to the club magazine, etc.

In sum, we expect that the weekly sporty performance triggers share price reactions, which we investigate in the remainder of this paper. Still a stable shareholding structure and lack of short term speculators may tone down share price fluctuations. Section 2 describes the data sources and the methodology. Section 3 gives the event study results while in section 4 a return generating model for soccer teams is estimated. Section 5 concludes.

2. Data and Methodology.

2.1 Data sources and variable description.

Share prices, risk measures and market capitalization are collected from the London Share Price Database (LSPD) and Risk Measurement Service as of the first day of trading following the floatation until the end of 1998. The share prices, given as indices with the first day of trading equal to 100, were corrected for dividends and stock splits, also collected from the LSPD. The Financial Times All Share index (FTAS) was used as the market index and T-bill return as the risk free rate. All accounting data were gathered from annual reports, the Deloitte & Touche Annual Reviews of Football Finance (Boon, 1992-98), and Feld and Easthope (1997). Information about the IPO (like the offer price) were found in the prospectuses. Information (date of the game and final score) about all the matches since floatation were provided by the soccer clubs or collected from their websites. A distinction was made among games in the English and Scottish, Cup, and European competitions as well as among victories, defeats and draws. In addition, promotion and relegation games were separated out.

2.2 Methodology.

a. Measuring abnormal returns.

In order to measure the abnormal return of share i at day t, the market and risk adjusted return is calculated which assumes that a version of the CAPM generates expected returns. For example, the Black asset pricing model with two uncorrelated assets or the Treynor-Sharpe-Lintner model,

$E(R_{i,t})= E(R_{F,t})+b_i[E(R_{m,t})-E(R_{F,t})]$, generates a return for every share i with $R_{F,t}$ the return of a risk free asset and $R_{m,t}$ the return of the market portfolio. The abnormal return $AR_{i,t}$ equals the difference between the (logarithmic) realised and expected return $R_{i,t}-E(R_{i,t})$. Betas were estimated with daily data over a 6 month period prior to the event window.

In order to test whether or not the equally weighted arithmetic average of the abnormal returns ($\overline{A_t}$) is statistically different from zero, the following test-statistics are used. N stands for the number of events, S stands for the standard deviation of the cross-sectional average abnormal returns, (T-τ) is the number of (trading) days over which the standard deviation of the cross-sectional mean abnormal returns are calculated. If the abnormal returns have an independent and identical distribution, the test-statistic has a Student T-distribution (Ritter 1991).

$$t-stat = \overline{AR}_t \,*/ S(\overline{AR}_t) \qquad \text{with :}$$

$$\overline{AR}_t = \frac{1}{N_t}\sum_{i=1}^{N_t} AR_{i,t}$$

$$S(\overline{AR}_t) = \sqrt{(\sum_{t=t}^{t=T}(\overline{AR}_t - \overline{\overline{AR}})^2 / N(N-1)}$$

$$\overline{\overline{AR}} = \frac{1}{(T-t)}\sum_{t=t}^{t=T}\overline{AR}_t$$

Daily returns deviate more from the normal distribution than monthly returns. Still, if the abnormal returns in the cross section of shares are from independent and identically distributed samples from a distribution with finite variance, the central limit theorem shows that the distribution of abnormal returns converges towards a normal distribution when the number of shares increases. For small samples of 5 or 10 shares, the distribution of abnormal returns deviates from the normal distribution, but the non-normality of daily returns does not have a significant impact on the event study methodology (Brown and Warner 1980, 1985).

Subsequently, the cumulative abnormal return (CAR) can be calculated which cumulates systematic deviations from the expected return over time. For example, the CAR over a (T-τ) day time window following an event can be computed as follows: $CAR_{t,T} = \sum_{t=t}^{t=T} \overline{AR_t}$

b. Beta estimation with thin trading and Baysian updating.

Non-synchronous trading can lead to biased and inconsistent systematic risk and hence distortions of the abnormal returns (Scholes and Williams 1977, Dimson 1979): less frequently traded share will have a downward biased beta and abnormal returns can be serially dependent. In order to correct for this beta-bias, the Dimson and Marsh (1983)-method of the Aggregated Coefficients is applied to calculate the abnormal returns described above.

$$AR_{i,t} = R_{i,t,} - a_i - b_i^D * R_{M,t}$$

and

$$b_i^D = \sum_{k=-3}^{+3} b_{i,k}$$

$$a_i = \frac{1}{(y-x)} \sum_{t=x}^{t=y} R_{i,t} - b_i^D \frac{1}{(y-x)} \sum_{t=x}^{t=y} R_{M,t}$$

The estimated beta (hence called Dimson-beta) consists of the aggregation of 7 estimated beta coefficients which include three lead and lag variables.

The larger the random error with which betas are estimated, the lower the predictive power of the estimated betas for the next period. Empirically, it has shown that the actual beta in the forecast period tends to be closer to the average beta than is the estimate obtained from historical data. To solve this problem, Vasicek (1979) proposed a Baysian updating technique. This weighing procedure adjusts observations with large standard errors further toward the mean more than it adjusts observations with small standard errors. The 'Vasicek-beta' is calculated as follows:

$$b_i^V = \frac{s_{bi}^2}{s_{\overline{b}}^2 + s_{bi}^2} * \overline{b} + \frac{s_{\overline{b}}^2}{s_{\overline{b}}^2 + s_{bi}^2} * b_i$$

and b_i is the beta measured via an OLS regression using historical observations, $\overline{b}$ is the average of the historical beta estimates, s_{bi}^2 is the variance of the security i measured using historical data, $s_{\overline{b}}^2$ is the variance of the distribution of historical estimates of average beta.

c. Determination of events.

Most of the games in the competition are played on Saturday or Sunday, such that Friday was taken as day 0 and the subsequent Friday as day 5. Thus, the time window is necessarily short because longer time windows suffer from interference by the following event, namely the game played in the subsequent weekend. Occasionally, games are played on Wednesday (e.g. in the European competitions). If such games are followed by others in the weekend, the time window is only three days.

All games by soccer clubs listed on the Official List and the AIM are covered apart from Millwall and Preston because these clubs participate in the competition of Division 2 which has an irregular calendar and apart from Birmingham due to data availability. Hence, the results of 17 soccer clubs – Aston Villa, Bolton Wanderers, Leeds United, Hearth of Midlothian, Leicester City, Manchester United, Newcastle United, Sheffield United, Southampton, Sunderland, Tottenham Hotspur, Celtic Glasgow, Charlton Athletic, Chelsea Village, Queens Park Rangers, Nottingham Forrest, West Bromwich Albion - are included in the analysis. As most clubs have only been listed for a few years (see Table 2), only three seasons (1995-96, 1996-97 and 1997-98) are taken into account, representing 840 matches.

The event study analysis will be performed for the following subsamples:

1. Games ending in a victory, a defeat or a draw.
2. Games in the English and Scottish, Cup, and European competitions.
3. Promotion and relegation games.
4. Games of soccer teams listed on the LSE versus the AIM.

3. Results of event study analyses.

3.1 National and European competitions.

We expect that victories and losses trigger, respectively, positive and negative price reactions. Draws should also lead to negative abnormal returns as a draw reduces the clubs chances to play at the European level or to escape relegation.[4] This price decrease is expected to be lower in comparison to the price reaction following a defeat. Still, the alternative hypothesis states that

[4] In an interesting paper, Palomino et al. (1998) formulate a game-theoretical model which combines the team's skills and psychological factors to explaining the probability of scoring. In an empirical verification of the model,

sporty and share price performances are not related. This may result from stable large shareholders and the lack of speculative shareholders. For most soccer clubs, shares are indeed held by some large controlling shareholders, institutions (like the Football Fund) and supporters. The loyalty to the team as well as the non-financial benefits of owning shares (see supra) may prevent this last category of selling its shares as a result of poor team performance.

Figure 1 and panel A of Table 4 show the abnormal returns[5] for the 5 days subsequent to all the games (840) played by all the soccer clubs listed on the LSE or the AIM in the seasons 1995-96, 1996-97 and 1997-98 provided they play in Premier League and the First Division. The strongest price reaction takes place immediately after the game: the share prices of soccer clubs which obtained a victory increase by almost 1% and experience a statistically significant increase of 1.3% in the subsequent week. Defeats are penalised by an immediate share price decrease of 1.4% (statistically significant within the 1% level) and by a negative cumulative abnormal return of 2.5% over the week. The market only seems to reward victories because draws create significant price declines of 1.7% in the subsequent week.

Panel B of Table 4 and Figure 2 show how the market reacts after victories and defeats in the English and Scottish competition in the same three seasons. Each club of the Premier League and of the First Division play two matches (one home game and one away match) against each team of their division. The price reactions are similar as in panel A: victories lead to significant abnormal returns of almost 1% and in the subsequent week the cumulative abnormal returns finish on average with 1.6%. The shares of defeated teams decrease 2.2% in value (during the week) while games ending in a draw generate a (statistically significant) loss of 1.6%.

The market price reactions to games in the Cup competitions are presented in panel C of Table 4 and Figure 3. There are two Cup competitions: the FA Cup and the Coca-Cola Cup to which all clubs of the Premier League and Divisions 1, 2 and 3 participate with immediate elimination upon defeat.[6] As Cup games are generally played on Tuesdays or Wednesdays, the maximum event horizon to compute abnormal returns is three days. Whereas a victory in a Cup game, yields an increase of 0.83%, this increase is eroded in the two following days to 0.42%. Defeats

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they find that apart from the quality of the team and the home field advantage, the current score is an important explanatory variable of the strategy a team develops (attack versus defense) and probability of scoring.

[5] The abnormal returns are computed with Vasicek-betas, but the Dimson-betas give similar results.

trigger stronger (downward) price reactions as a team beaten in the initial rounds is immediately excluded from the Cup competition. As the winner of the Cup competition qualifies for the European competition in the subsequent year, defeated teams forgo potentially lucrative European soccer. The share prices of losing clubs decline by 2% in the first trading day after the game. During the two subsequent days, the share price crumbles off by another 1.4%.

At the European level, there are three competitions: the Champions League, the European Cup of Cup Winners and the UEFA Cup. In this first European competition, the champions of the strongest division are admitted, as well as – for the strongest soccer nations - the runners-up in this division. The winners of the national Cup competitions are admitted to the second European competition. The UEFA is the competition for the soccer teams which came 2^{nd}, 3^{rd} or 4^{th} in the strongest league of the national competitions. In this section, no distinction is made among the three European competitions. Games are usually on Tuesday, Wednesday or Thursday such that the event window is limited to three days. Six teams played at the European level since 1995 (the first season of this study) and since their floatation, whichever comes first: Aston Villa (97-98) , Manchester (95-96, 96-97, 97-98) , Celtic (96-97, 97-98), Chelsea (97-98), Leicester (97-98) and Newcastle (97-98). Victory in the European competition leads to a 1% share price increase (with a p-value of 1.1%). Defeat is disciplined by a negative abnormal return of 2.3% in three days after the game but most of the decline (1.8% within the 1% level of statistical significance) takes place in the first day of trading (see Figure 4 and panel D of Table 4). Draws increase the probability of elimination but only triggers a small negative abnormal return which is not statistically significant. Throughout panels A-D, most of the price reactions happen immediately, at the first day of trading, which provides some support for market efficiency.

[Insert here Figures 1-4 and Table 4]

3.2 Promotion and relegation matches.

Larger share price swings are expected after promotion and relegation games. Promotion from Division 1 to Premier League entails substantial income increases in the subsequent season due to e.g. television rights and sponsoring. Likewise, relegation reduces the main sources of income considerably. Each season, three clubs rise to the Premier League and three teams drop back to Division 1. As it is not easy to determine when clubs are engaged in the promotion or relegation

[6] The eighth, quarterfinal and semi-final are played with home and away matches. Clubs which qualified for European tournaments are exempted from the initial rounds and only participate as of round 3. Other clubs of the Premier League start in round 2.

struggles, it was (arbitrarily) decided that this period starts on 15 February, three months before the end of the competition (around 15 May). Consequently, clubs at the bottom of the Premier League or at the top of Division 1 are considered respectively relegation and promotion clubs as of 15 February. The results of this event study should be interpreted with caution because the number of observations is low. Only three listed soccer clubs – Charlton, Nottingham and Sunderland – qualified as teams participating in the promotion duels. Sunderland was the only team which did not make the upgrade to Premier League due to a loss in the last day of the season in the play-offs. Bolton Wanderers was the only listed team taking part in the relegation tournament in the last three seasons. Table 5 (panel A) and Figure 5 reveal that winning a promotion game triggers extreme share price reactions on the first day of trading subsequent to the match. A victory is followed by a statistically significant increase of 3.2% which goes up towards almost 4% in the subsequent week. In contrast, a defeat leads to a decline in terms of abnormal returns of 3.1%, afterwards tempered to a loss of 2.1%. Even sharper price reactions follow relegation duels: a victory leads to a cumulative return of 10.4% in the subsequent week, with most of in the price rise (5.8%) in the first day (Figure 6 and panel B of Table 5). A similar price reaction, but then downwards, is perceived after a defeat: the share price falls 6.5% in the first subsequent day and the cumulative abnormal return of the subsequent week amounts to 13.8%. Draws also lead to downward price corrections three days after the match.

[Insert Here Figures 5 and 6, and Table 5]

3.3 Price impact of the stock exchange on which the club is listed.

Eleven of the 17 listed soccer clubs included in this study are listed on the London Stock Exchange and 6 on the Alternative Investment Market (see Table 1). Figure 7 reveals whether the stock exchange on which a soccer club is listed influences the size of the price reactions to the team's sporty performances. Differences in size of price swings may be expected because the AIM is characterised by smaller companies and higher illiquidity. Cumulative abnormal returns are measured over the 5 days subsequent the match. Victorious soccer teams listed on the LSE are subject to higher CARs than winning AIM-clubs: CARs of 1.5% versus 0.9%. However, this does not imply that LSE clubs have a higher volatility of abnormal returns since defeats and draws provoke larger negative abnormal returns for clubs listed on the AIM. The realised return of defeated AIM-clubs is 3.2% lower than the CAPM (with Vasicek betas) predicts, whereas defeated LSE-clubs perform only 2.2% worse. Draws also cause larger negative returns for AIM-clubs than for LSE-teams. Table 6 shows that prices incorporate most of the new information in the first day.

[Insert about here Table 6 and Figure 7]

3.4 Seasonal effects and the Manchester-effect.

In this section, we investigate whether the findings are robust with regard to time effects, to the Manchester United-effect and the method of computing betas.

In the above event analyses, the games of three seasons (1995-96, 1996-97, 1997-98) were pooled. However, the number of observations varies across these seasons because the wave of soccer IPOs only started at the end of 1996. In the first season only three teams, Manchester, Tottenham and Celtic, were listed. In the third season, 17 listed soccer teams participate in the Premier League and Division 1 competition. In order to verify whether above results are driven by the results of a single season, the event study by outcome of the games is repeated for each season separately. Figure 8 shows that the cumulative abnormal return in the week following a victory increases on average by 4% (for the three strong teams Manchester, Tottenham and Celtic). Defeats and draws do not trigger price pressure as the weekly CARs are not significantly different from zero. A more detailed analysis of the daily abnormal returns in Figure A1 (appendix) reveals significant results in the three days subsequent to a victory. The first day of trading after a defeat shows a negative abnormal return of 2.1% but the share price recovers later in the week. The season 1996-97 (Figure 8) is characterised by positive weekly CAR of 2.6% after success, a negative one of -3% after a loss and a CAR which is not significantly different from zero after a tie. The detailed analysis of Figure A2 (appendix) reveals positive abnormal returns throughout the week with the largest in the first day of trading. The largest (and statistically significant) negative abnormal returns take place on the first and third day. In the last season, a small but statistically significant abnormal return results from a winning match, but the market penalises losses and ties by 2.6% (Figures 8 and A3).

[Insert here Figure 8]

The richest and one of the most successful soccer clubs of Europe is Manchester United. Its 1997 turnover amounted to more than three times as much as its nearest competitor (Tottenham). Furthermore, Manchester is one of the few listed clubs with positive net earnings (of over £ 27 million). This is reflected in its market capitalisation which increased by 780% in less than 8 years (from its floatation in June 1991 until the end of 1998). The conclusion from previous event studies may be heavily influenced by Manchester United. Firstly, price reactions following the sporty performance of this successful team may be different from the price reactions of other

soccer clubs. Secondly, a high number of matches (events) in this study are played by Manchester United due to the fact that the team was listed since 1991 (and hence included for three seasons), that it played in the European competitions for three seasons and that it survived for long periods of time in the yearly Cup knock-out competition. In this study, 102 Manchester victories are included, as well as 37 defeats and 36 draws. The cumulative abnormal returns subsequent to the Manchester games versus all other teams' games are presented in Figure B1 (appendix). The weekly CARs of Manchester subsequent to victories are higher than for all other soccer teams: 2% versus 1.3%. Moreover, the market does not react as negatively (–1.5% CAR5) to a Manchester defeat or a draw as to that of other teams (-2.5% CAR5).[7]

Finally, it should be noted that the method of beta computation influences the abnormal return. Three different types of betas were calculated: (i) historical betas resulting from the market model (ii) Dimson betas and (iii) Vasicek betas (see section 2). The thin trading correction and Baysian updating are improvements to the simple OLS-beta especially for illiquid shares. In terms of the presented results, the Dimson and Vasicek-betas lead to similar conclusions regarding size and statistical significance of the abnormal returns.

4. Impact of sporty performance of soccer clubs on their share price performance.

In order to analyse the impact of the sporty performance on soccer clubs' share prices, the following model is formulated in which daily stock prices depend upon the evolution of the market index and the final scores of the soccer matches:

$$\ln P_{i,t} = \alpha_i + \beta_1 * \ln Market_t + \beta_2 * D_{victory} + \beta_3 * D_{defeat} + \beta_4 * D_{draw} + \varepsilon_{i,t} \quad (1)$$

$P_{i,t}$ stands for the price of share i at day t. $Market_t$ is a market index and ln is the natural logarithm. D_k represents a dummy variable whereby k stands for a victory, defeat or draw.

To take fixed effects into account, first differences are taken of equation (1):

$$R_{i,t} = \beta_1 * R_{M,t} + \beta_2 * D_{victory} + \beta_3 * D_{defeat} + \beta_4 * D_{draw} + \mu_t$$

With $R_{i,t}$ and $R_{M,t}$ standing for the return of share i ($\Delta \ln P_t$) and the market return (FTSA).

This results in a return generating model that includes dummy variables representing the weekly sporty results of the listed soccer teams. If a match was played in the weekend, one of the

[7] The abnormal returns of Manchester United are given in Figure B2 (appendix).

dummy variables (depending on whether the game resulted in a victory, defeat or draw) was set equal to 1 for the subsequent Monday. Likewise, a game played during the week leads to setting the dummy of the following day equal to one. If the day subsequent to a match was a trading holiday, a dummy equal to one was included for the next day with an open stock exchange. For any day without a game played during the previous day (or two days in case of a Monday), the dummy variables all equal zero.

Table 7 (panel A) shows that the market return explains most of the variation of the daily returns. Furthermore, the sporty results of the matches are highly statistically significant: a victory leads to a return increase of 1.3%, a loss to a return decline of 1.8% and a draw to a return decrease of 0.34%. For a smaller sample of listed soccer clubs and for a shorter time window, Lehman and Weigand (1998) estimated a similar model with the market return and the (weekly) change in rang in the league tables as explanatory variables. They find a parameter estimate for the market return of 0.219, which is close the 0.228 found in panel A of Table 7, which confirms the low sensitivity of soccer clubs' returns to market movements. The explanatory power of the model is 5.8%, which is close to the findings of Lehman and Weigand (1998).

The event study analysis has shown that the share price reactions to sporty results may depend upon the season and upon which stock exchange the soccer clubs are listed. Therefore the regression model was expanded with these variables and the results are presented in panel B of Table 7. The explicative power increases to 6.4% as the last two seasons have a significant negative impact on the returns but only for, respectively, 0.59% and 0.34%. This finding confirms the event study results of Figure 8. The fact whether a soccer team is listed on the LSE or the AIM does not seem to provide any additional explicative power. Independent variables capturing whether the matches were being played in the national league, Cup or European competitions are not correlated to the soccer teams' returns.

The share price performance of most soccer clubs was poor over the past few years. In the last year of this study (1998), only 4 clubs have experienced share price increases: Sunderland (+87%), Manchester (+46%), Celtic (+22%) and Charlton (+0.1%). The Sharpe ratio[8] of an equally weighted portfolio of these 4 best performing teams over the year 1998 yields 18.3%

[8] Sharpe ratio is defined as $(R_{portfolio} - R_F)/\sigma_{portfolio}$ with R_F as the risk free rate and $\sigma_{portfolio}$ as the total risk of the portfolio.

which compares to a Sharpe ratio of the FTSA index of 10.1%. The Jensen's alphas[9] for all listed soccer clubs over the year 1998 reveal that only three clubs perform better than expected: Sunderland with 69%, Manchester with 30% and Celtic with 5%. Investing in an equally weighted portfolio consisting of all listed soccer clubs in the years 1997 or 1998 would have yielded a strongly negative Sharpe ratio and Jensen's alpha suggesting that a diversified soccer portfolios was not a successful investment over this (relatively short) time period. Only superior insights in and predictability of soccer games, or more likely, luck to pick the above mentioned winners would have yielded an acceptable return.

5. Conclusion.

This paper has investigated whether the share prices of soccer clubs listed on the London Stock Exchange or the Alternative Investment Market are influenced by the soccer teams' weekly sporty performances. Event studies corrected for thin trading and with Baysian updating reveal that at the first day of trading after a game, positive abnormal returns almost 1% can be expected following a soccer victory. In contrast, defeats or draws are penalised, respectively, by negative abnormal returns of 1.4% and 0.6%. Cumulatively over the week, defeats and draws trigger abnormal losses of 2.5% and 1.7%. These findings are consistent across the English and Scottish, national Cup and European competitions. Much larger abnormal returns are generated subsequent to promotion and relegation games as the Premier League and European games guarantee substantially higher (future) income in terms of television broadcasting rights and sponsoring income. First day reactions in terms of abnormal returns amount to 3.2% after a victory in a promotion duel and -3.1% after a defeat. Price changes in relegation tournaments are even larger: a victory gives rise to a cumulative abnormal return (over the subsequent week) of 10.4% whereas defeats lead to losses of –13.8%. Whereas victories seem to be more rewarded by share price increases for those clubs listed on the LSE in comparison to those listed on the AIM, defeats lead to larger price reductions for AIM listed clubs. In spite of the sporty performance sensitivity of listed soccer clubs and the excellent share price performance of certain clubs like Manchester United, Sunderland and Celtic, Jensen's alpha and the Sharpe ratio of an equally weighted investment in listed soccer clubs since 1996 points out that this investment has substantially underperformed the market index.

[9] Jensen's alpha = $R_{i,t} - R_F - \beta_I * [R_{M,t}-R_F]$.

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Table 1 : Listed British soccer clubs by stock exchange.

This Table lists the names of soccer clubs traded via the LSE, AIM and OFEX and gives the date of introduction to the stock exchange and the percentage of shares offered to the public.

a. listed on the London Stock Exchange (LSE).
Aston Villa (17/4/97; 25%), Bolton Wanderers (29/4/97;0%)[a], Leeds United (Caspian Group, 5/8/96;60%), Hearth of Midlothian (5/97; 39%), Leicester City Soccer Investments (10/97; 0%), Manchester United (6/91; 38%), Millwall (10/89; 38%), Newcastle United (2/4/97; 28%), Sheffield United (18/12/96;0%)[b], Southampton Leisure Holding (14/1/97;0%)[c], Sunderland (24/12/96; 26%), Tottenham Hotspur (10/83; 41%), Celtic Glasgow (9/95)[d].
b. listed on the Alternative Investment Market (AIM).
Birmingham City (10/3/97; 30%), Celtic Glasgow (9/95)[c], Charlton Athletic (24/3/97; 30%), Chelsea Village (31/3/96; 0%), Queens Park Rangers (Loftus Road) (28/10/96; 44%)[e], Nottingham Forrest (10/10/97; 11%), Preston North End (10/95; 86%), West Bromwich Albion (3/1/97; 0%).
c. traded via OFEX.
Arsenal, Liverpool.
Notes: a. The introduction of Bolton Wanderers took place via a reverse take-over of a corporate shell. Mosaic Investment plc, listed on the LSE, acquired the share of Bolton Wanderers Football & Athletic Company ltd. As a result of the acquisition, the shareholders of Bolton acquired the effective control of the listed firm. b. The bid by Conrad on Sheffield United was accepted conditional upon a name change of Conrad to Sheffield United plc. For every ordinary Sheffield share, 55,540 Conrad shares were offered. c. Introduced via a reverse take-over. The name was changed to Southampton Leisure which acquired 100% of the shares. d. Initially introduced on the AIM, transferred to the Official List of the LSE in September 1998. e. Introduced along with the rugby club Wasps as one company. Source: IPO Prospectuses.

Table 2 : Share price returns following the Initial Public Offering.

This Table shows the month and year of the Initial Public Offering and changes in share price 1 week and 1 month subsequent to the floatation. Source: Own calculations with share price data from the London Share Price Database and the offer price from the prospectuses.

LSE	**IPO**	**Change in Share Price (%)**		**AIM**	**IPO**	**Change in Share Price (%)**	
	month	*After 1 week*	*After 1 month*		*month*	*After 1 week*	*After 1 month*
Aston Villa	4/97	-17	-28	**Birmingham**	3/97	-5	-28
Bolton	4/97	16	-25	**Celtic**	9/95	16	-25
Leeds U.	8/96	46	53	**Charlton**	3/97	46	53
Midlothian	5/97	-20	-19	**Chelsea**	3/96	-20	-19
Leicester City	10/97	0	-25	**QPR**	10/96	0	-25
Manchester U.	6/91	-25	-25	**Nottingham**	10/97	-25	-25
Millwall	10/98	10	10	**Preston**	10/95	10	10
Newcastle U.	4/97	2	-10	**Bromwich**	1/97	2	-10
Sheffield U.	12/96	72	34				
Southampton	1/97	-2	-36				
Sunderland	12/96	28	26				
Tottenham	10/83	-7	-4				

Table 3 : Turnover and profit of listed soccer clubs.

This Table shows the evolution of turnover from 1992-97 and the change in turnover over the season 1996-97 versus 1995-96. Turnover data exclude income from transfer of players. Profit before tax is given in £000 for the seasons 1996-97 and 1995-96. Stadium capacity and occupancy rates are also given. Source: annual reports, Boon (’92, ’93,’94, ’95, ’96, ’97 and ’98) and Feld and Easthope (1997).

	Turnover (£000)						Profit before tax (£000)			Capacity	
	Δ (%) last season	1996-97	1995-96	1994-95	1993-94	1992-93	Δ(%) 1997-95	1996-97	1995-96	Capacity	Occupancy rate (%)
Aston Villa	17	22079	18865	13001	13014	10175	-7852	-3926	50	39339	92
Bolton Wand.	14	7653	6742	5488	4108	2396	-1583	-3293	208	20500	77
Leeds U.	16	21785	18751	14753	13867	13324	137	-9689	-7073	40000	80
Leicester City	83	17320	9465	9697	6223	4775	221	-3594	-1628	22517	90
Manchester U.	65	87939	53316	60622	43815	25177	179	27577	15399	56387	98
Millwall	0	4054	4054	4334	5609	2672	100	-2879	-2879	/	/
Newcastle U.	42	41134	28970	24723	17004	8743	-35	8302	-23957	36610	100
Sheffield U.	19	5133	4311	4325	5431	6060	356	-3054	-859	30370	55
Southampton	24	9238	7477	7397	4732	4307	267	-3624	-1356	15100	100
Sunderland	87	13415	7166	5507	4905	3806	260	7573	2912	42000	50
Tottenham H.	9	27874	25589	21296	17767	16594	-842	-5495	653	33208	94
Birmingham	4	7622	7337	6942	3763	3121	-60	1125	-1866	25812	69
Celtic Rangers	28	22189	16005	10376	8736	9473	-509	5152	-1013	50032	97
Charlton	17	4330	3691	2916	2916	1918	-22	254	-1163	16000	69
Chelsea Village	49	23729	15948	12706	/	7891	13	-376	-2954	31791	85
QPRangers	5	7497	7173	7652	6194	6435	-340	-7052	2077	19148	66
Nottingham F.	-10	14435	16085	10290	8511	7651	-458	-10965	2392	30602	80
Preston	34	3847	2876	1860	1497	1385	182	113	62	/	/
Bromwich A.	12	6073	5428	4592	3751	3162	-108	-185	171	25296	60
Mean	27	18281	13645	12025	9547	7319	-531	-212	-1096	31454	80
Standard dev.	27	19621	12270	13209	9806	5924	1834	8426	7013	11652	16
Minimum	-10	3847	2876	1860	1497	1385	-7852	-10965	-23957	15100	50
Median	17	13415	7477	7652	5902	6060	-22	-2879	-859	30602	80
Maximum	87	87939	53316	60622	43815	25177	356	27577	15399	56387	100

Table 4: Abnormal returns of games in the English, Scottish, Cup and European Competitions.

This Table presents the abnormal returns of the 5 days subsequent to all games played by 18 soccer clubs listed on the London Stock Exchange and Alternative Investment Market (panel A). Panels B, C and D present daily abnormal returns of victories, defeats and draws in the English and Scottish, Cup and European competitions. The English and Scottish competition of panel B excludes promotion and relegation games. The abnormal returns are computed using Vasicek betas (see section 2.2). Cumulative abnormal returns (CAR) over 3 and 5 days are also presented. ***, **, * stand for statistical significance at respectively the 1%, 5% and 10% level. Source: own calculations.

Victories	Defeats	Draws

Panel A : All soccer games played by soccer clubs listed on the LSE and AIM.

t	AR(t)		t-stat	AR(t)		t-stat	AR(t)		t-stat
Day 1	0.00921	***	5.910	-0.01429	***	-7.228	-0.00607	***	-3.132
Day 2	-0.00002		-0.018	-0.00435	***	-2.927	-0.00166		-1.102
Day 3	0.00191	*	1.581	-0.00181		-1.147	-0.00312	*	-1.625
Day 4	0.00116		1.014	-0.00344	*	-1.706	-0.00392	**	-2.367
Day 5	0.00076		0.628	-0.00072		-0.323	-0.00175		-0.923
Observations		407			248			185	
CAR3	0.01109			-0.02045			-0.01085		
CAR5	0.01301			-0.02461			-0.01652		

Panel B : English and Scottish competition.

t	AR(t)		t-stat	AR(t)		t-stat	AR(t)		t-stat
Day 1	0.00948	***	4.651	-0.01220	***	-4.82556	-0.00530	***	-2.65753
Day 2	0.00120		0.830	-0.00520	***	-2.76241	-0.00141		-0.76626
Day 3	0.00296	**	2.106	-0.00017		-0.11573	-0.00285	*	-1.6172
Day 4	0.00116		1.013	-0.00344	*	-1.70634	-0.00392	**	-2.36659
Day 5	0.00076		0.628	-0.00072		-0.32329	-0.00175		-0.92361
Observations		269			172			141	
CAR3	0.01364			-0.01756			-0.00955		
CAR5	0.01555			-0.02172			-0.01522		

Panel C : Cup competition.

t	AR(t)		t-stat	AR(t)		t-stat	AR(t)		t-stat
Day 1	0.00835	***	3.064	-0.01967	***	-6.017	-0.01065		-1.595
Day 2	-0.00188		-1.117	-0.00343		-1.461	-0.00468		-1.524
Day 3	-0.00228		-1.090	-0.01094	*	-1.776	-0.00473		-0.600
Observations		109			53			30	
CAR2	0.00647			-0.02311			-0.01533		
CAR3	0.00419			-0.03405			-0.02007		

Panel D : European competition.

t	AR(t)		t-stat	AR(t)		t-stat	AR(t)		t-stat
Day 1	0.00995	**	2.481	-0.01777	***	-3.142	-0.00439		-0.709
Day 2	-0.00605		-1.060	0.00037		0.073	0.00185		0.720
Day 3	0.00597		1.209	-0.00602		-1.191	-0.00044		-0.284
Observations		29			23			14	
CAR2	0.00390			-0.01740			-0.00254		
CAR3	0.00987			-0.02342			-0.00298		

Table 5: Abnormal returns of promotion and relegation matches.

This Table presents the abnormal returns of the 5 days subsequent to promotion and relegation games of soccer clubs listed on the London Stock Exchange and Alternative Investment Market. The abnormal returns are computed using Vasicek betas (see section 2.2). Cumulative abnormal returns (CAR) over 3 and 5 days are also presented. ***, **, * stand for statistical significance at respectively the 1%, 5% and 10% level. Source: own calculations.

Victories	Defeats	Draws

Panel A : Promotion Duels.

t	AR(t)		t-stat	AR(t)		t-stat	AR(t)		t-stat
Day 1	0.03193	**	2.223	-0.03114	***	-7.636	-0.00504		-1.090
Day 2	-0.00129		-0.730	0.01444		1.211	-0.01182	*	-1.785
Day 3	0.01356	*	1.697	0.03381		1.354	-0.00016		-0.053
Day 4	0.00074		0.099	0.00331		/	-0.00930		-0.463
Day 5	-0.00580		-1.042	0.00038		/	0.00849	***	3.458
Observations		20			2			6	
CAR3	0.044202			0.01712			-0.01702		
CAR5	0.039139			0.02081			-0.01783		

Panel B : Relegation games.

t	AR(t)		t-stat	AR(t)		t-stat	AR(t)		t-stat
Day 1	0.05768	*	1.811	-0.06470	***	-2.847	-0.03794	*	-1.615
Day 2	0.03623		1.540	0.01469		0.954	-0.02070	*	-1.673
Day 3	0.00400		0.554	-0.01208		-1.173	-0.03648		-1.382
Day 4	-0.00600	*	-1.688	-0.03705	**	-2.477	-0.00427	***	-4.483
Day 5	0.01248	*	1.777	-0.03891	*	-1.889	0.12651		/
Observations		5			11			3	
CAR3	0.09790			-0.06210			-0.09512		
CAR5	0.10439			-0.13806			-0.09939	Car4	

Table 6: Abnormal returns of listed on the LSE versus on the AIM.

This Table presents the abnormal returns of the 5 days subsequent to all games (national, Cup and European competitions) of soccer clubs listed on the London Stock Exchange and Alternative Investment Market. The abnormal returns are computed using Vasicek betas (see section 2.2). Cumulative abnormal returns (CAR) over 3 and 5 days are also presented. ***, **, * stand for statistical significance at respectively the 1%, 5% and 10% level. Source: own calculations.

Victories	Defeats	Draws

Panel A : Clubs listed on the London Stock Exchange.

t	AR(t)		t-stat	AR(t)		t-stat	AR(t)		t-stat
Day 1	0.01067	***	5.700	-0.01360	***	-5.550	-0.00660	***	-3.208
Day 2	-0.00033		-0.273	-0.00392	**	-2.238	0.00014		0.074
Day 3	0.00184		1.536	-0.00097		-0.614	-0.00169		-1.024
Day 4	0.00095		0.770	-0.00254		-0.995	-0.00290		-1.446
Day 5	0.00199		1.447	-0.00065		-0.216	-0.00138		-0.601
Observations		270			176			134	
CAR3	0.01218			-0.01848			-0.00815		
CAR5	0.01512			-0.02167			-0.01243		

Panel B : Clubs listed on the Alternative Investment Market.

t	AR(t)		t-stat	AR(t)		t-stat	AR(t)		t-stat
Day 1	0.00632	**	2.276	-0.01592	***	-5.104	-0.00468		-1.033
Day 2	0.00062		0.266	-0.00542	*	-1.936	-0.00635	***	-2.738
Day 3	0.00202		0.759	-0.00378		-1.007	-0.00659		-1.259
Day 4	0.00154		0.667	-0.00559	*	-1.842	-0.00639	**	-2.157
Day 5	-0.00137		-0.637	-0.00089		-0.353	-0.00262		-0.766
Observations		137			72			52	
CAR3	0.00897			-0.02512			-0.01763		
CAR5	0.00914			-0.03160			-0.02664		

Table 7: Impact of sporty results on the daily returns of listed soccer teams.

Panel A Table shows the results of the following regression:

$R_{i,t} = \beta_1 * R_{M,t} + \beta_2 * D_{victory} + \beta_3 * D_{defeat} + \beta_4 * D_{draw} + \mu_t$

with $R_{i,t}$ and $R_{M,t}$ standing for the daily return of share i and the daily market return (FTSA). D_k represents a dummy variable whereby k stands for a victory, defeat or draw. If a match was played in the weekend, one of the dummy variables (depending on whether the game resulted in a victory, defeat or draw) was set equal to 1 for the subsequent Monday. Likewise, a game played during the week leads to setting the dummy of the following day equal to one. If the day subsequent to a match was a trading holiday, a dummy equal to one was included for the next day with an open stock exchange. For any day without a game played during the previous day (or two days in case of a Monday), the dummy variables all equal zero. Panel B shows the results of an expanded regression with dummy variables indicating whether the match was played in one specific season and whether a soccer club is listed on the LSE or AIM (dummy=1 if listed on the LSE). For every listed soccer club, daily returns are included since the beginning of the soccer season (June 1995) of since floatation. Source: own calculations.

	Dependent variable : Daily returns		
	Parameter Estimates	*T- stats.*	*P-value*
Panel A			
Market return	0.228343 ***	5.734	0.0001
Victory	0.012701 ***	11.767	0.0001
Defeat	-0.017902 ***	-13.355	0.0001
Draw	-0.003451 **	-2.321	0.0200
R sq. adjusted	0.058		
Observations	6255		
Panel B			
Market return	0.233681***	5.884	0.0001
Victory	0.012652***	11.756	0.0001
Defeat	-0.017692***	-13.231	0.0001
Draw	-0.003499**	-2.361	0.0182
LSE vs AIM	-0.003453	-0.210	0.833
Season 1997-98	-0.005930***	-5.904	0.0001
Season 1996-97	-0.003478***	-3.052	0.0023
R sq. adjusted	0.064		
Observations	6255		

Figure 1 : Abnormal returns of all games by listed soccer clubs.

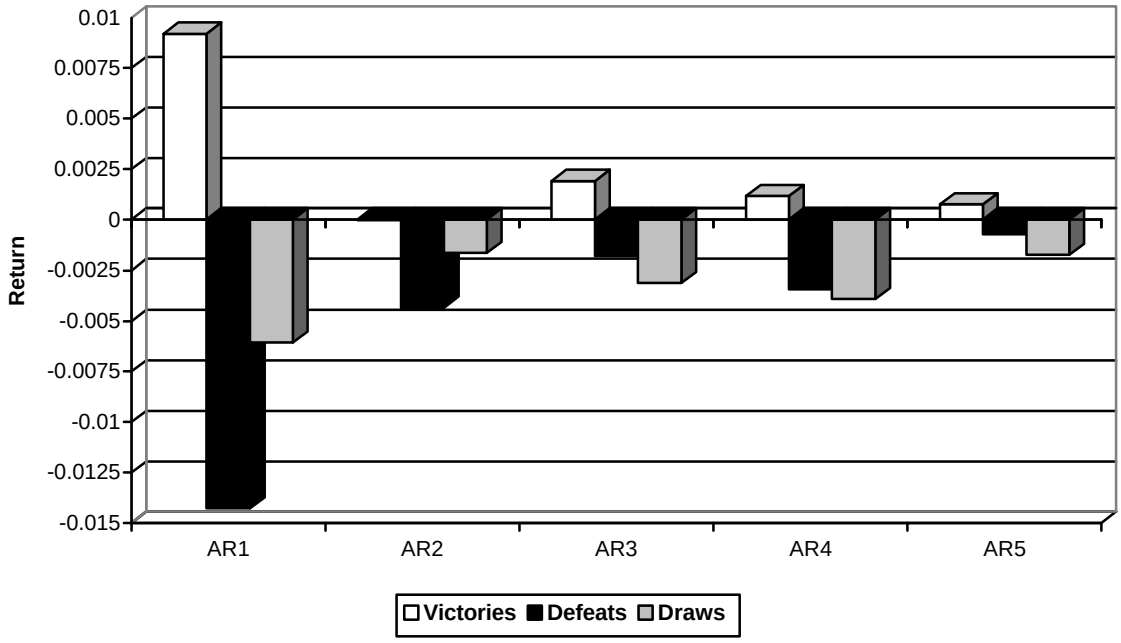

Figure 2 : Abnormal returns of games in the English and Scottish competitions.

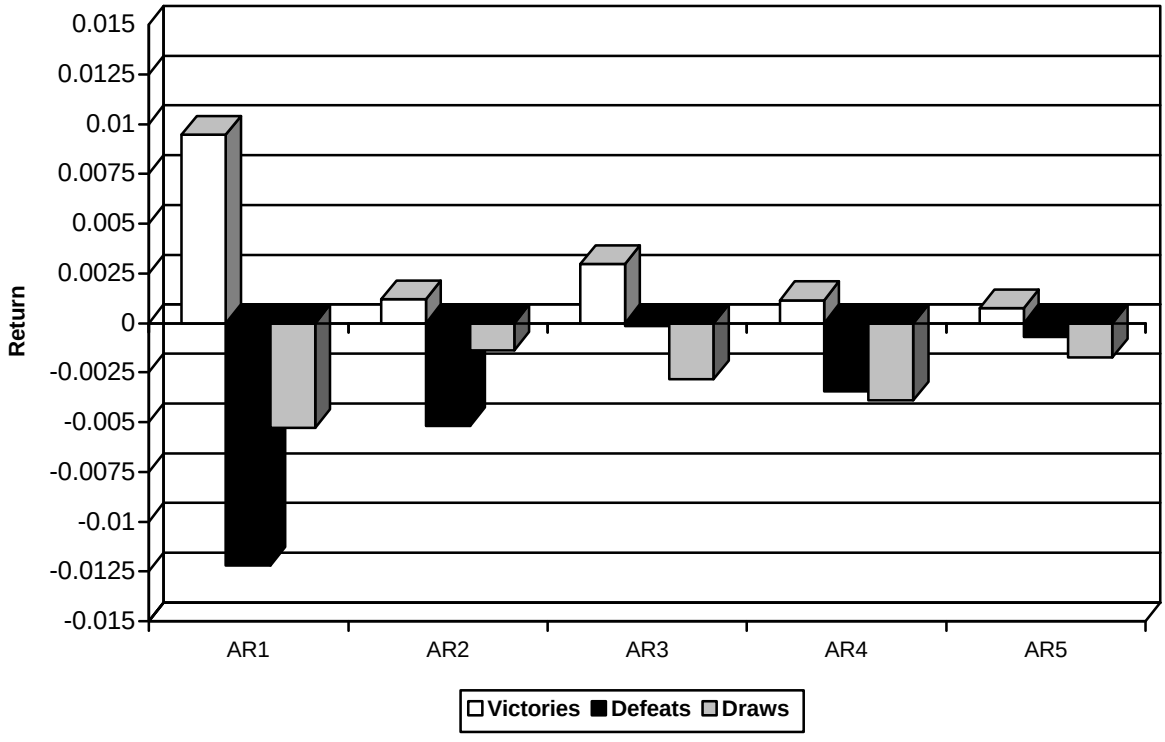

Figure 3 : Abnormal returns of games in the Cup competition.

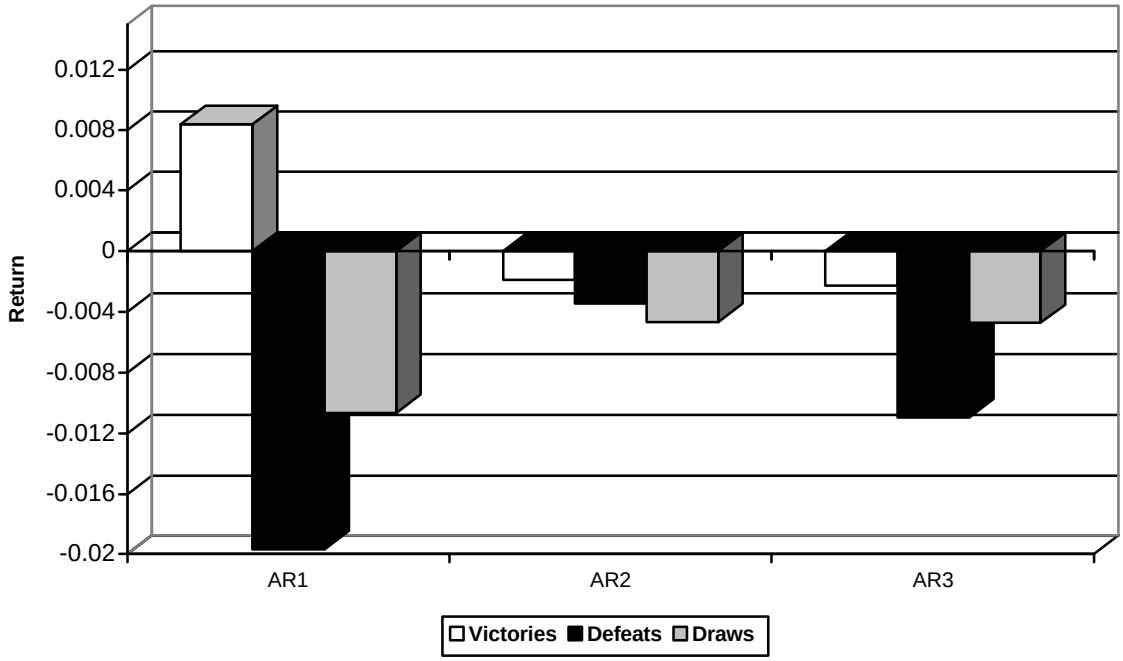

Figure 4 : Abnormal Return of games in European competition.

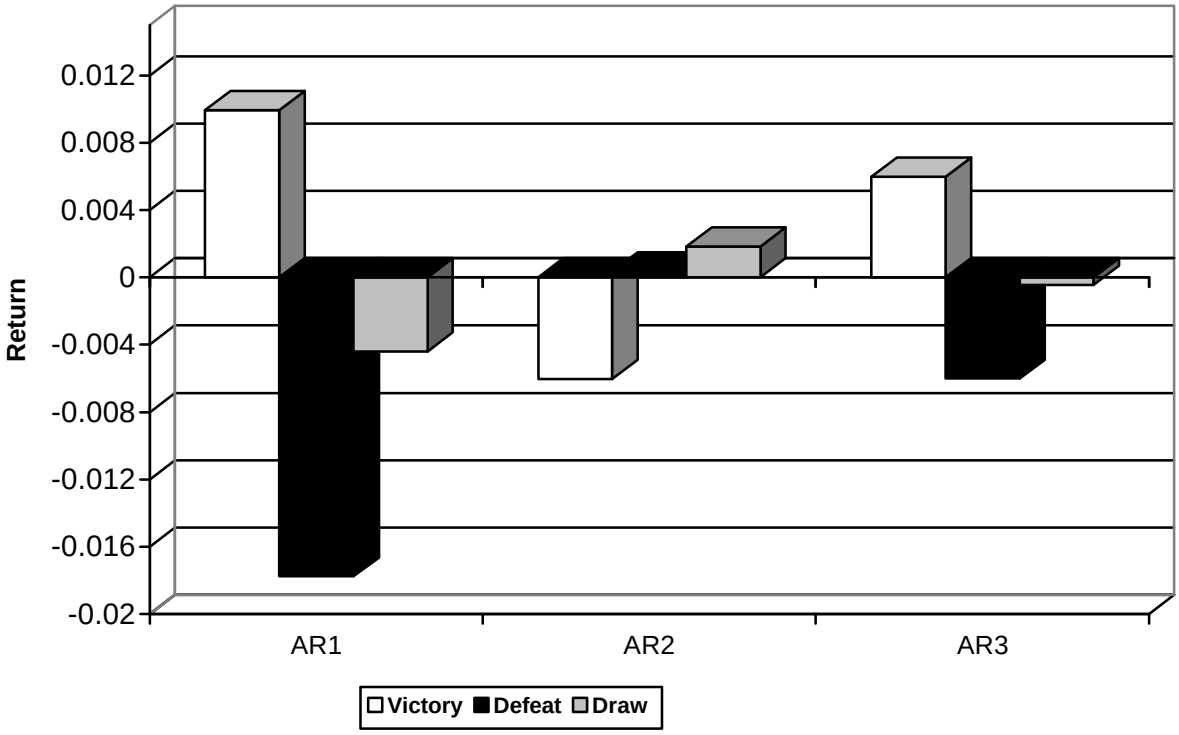

Figure 5 : Abnormal returns of promotion games.

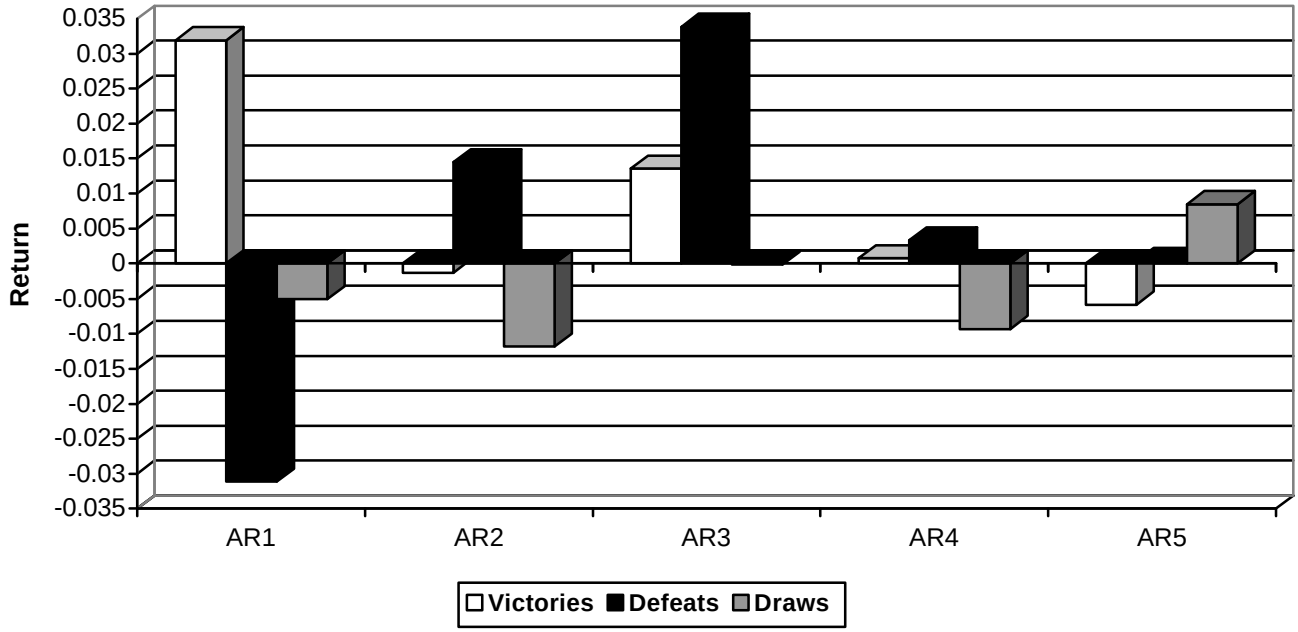

Figure 6: Abnormal returns of relegation games.

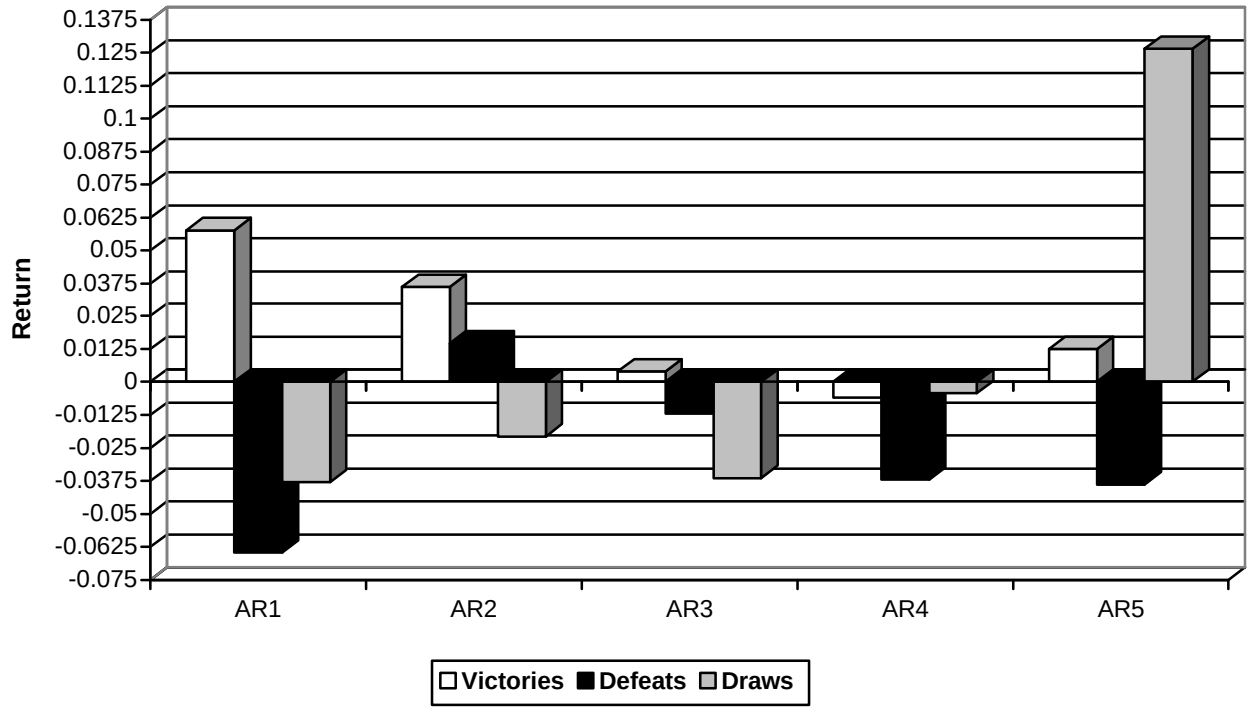

Figure 7: The weekly Cumulative Abnormal Return of clubs listed on the LSE and the AIM

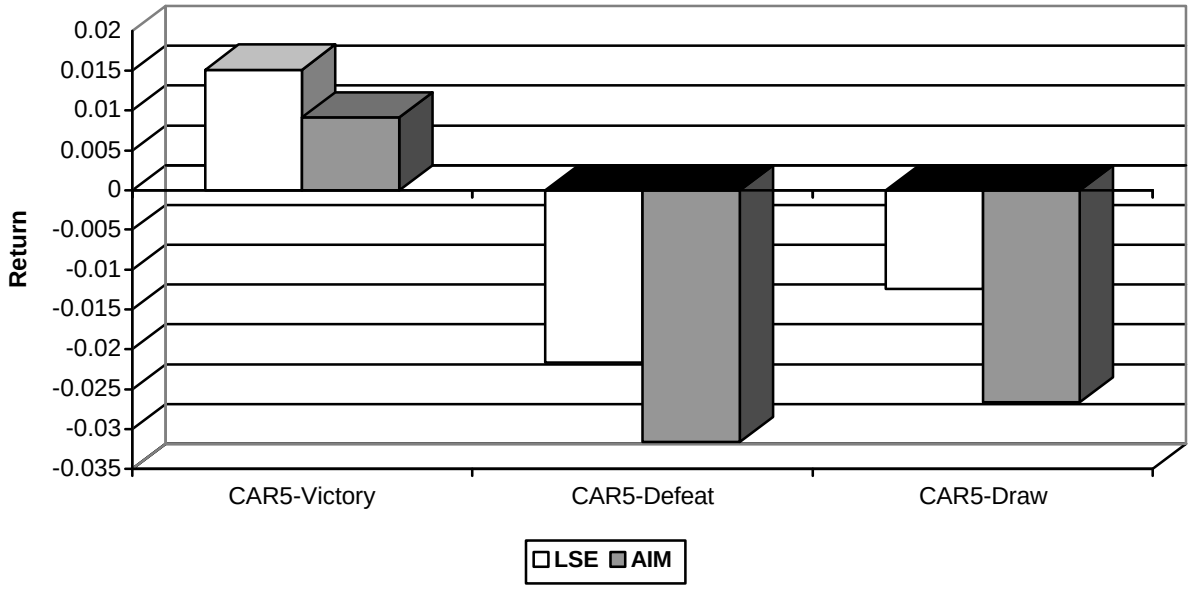

Figure 8: The weekly Cumulative Abnormal Return by season.

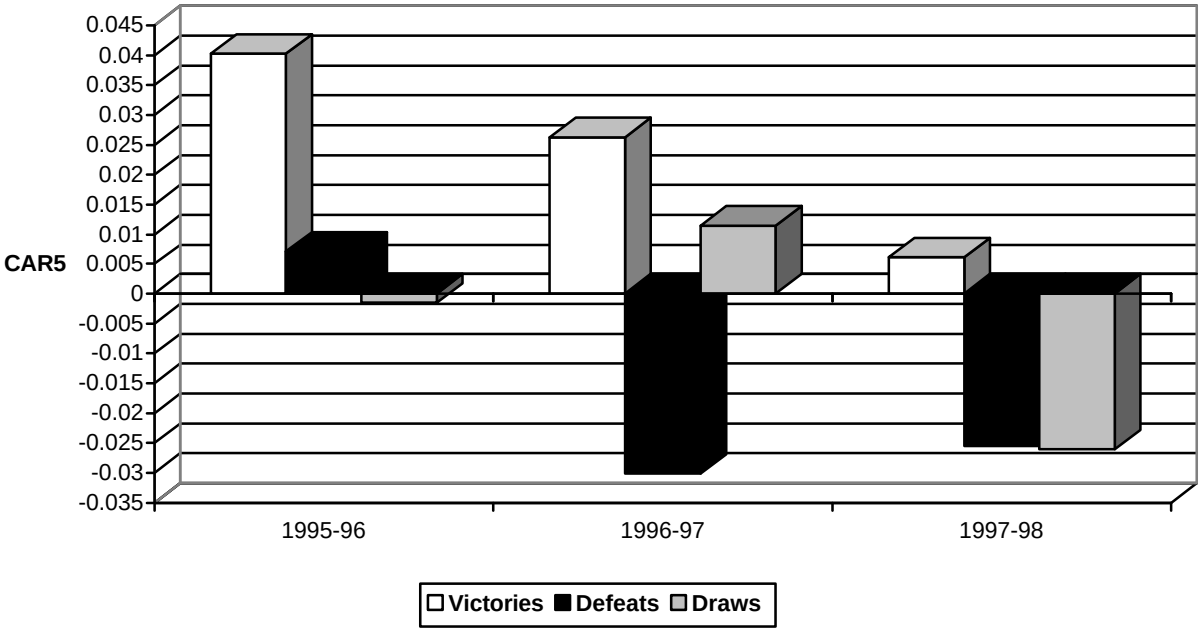

Figure A1: Abnormal returns for the season 1995-96.

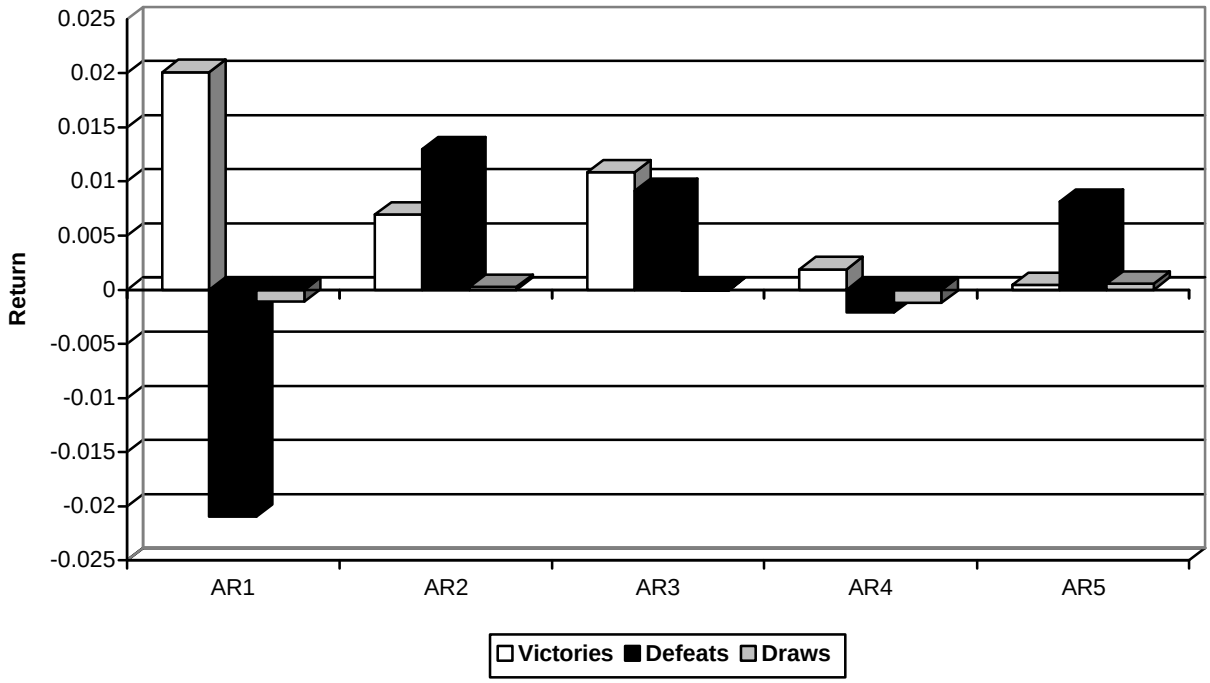

Figure A2 : Abnormal returns for the season 1996-97.

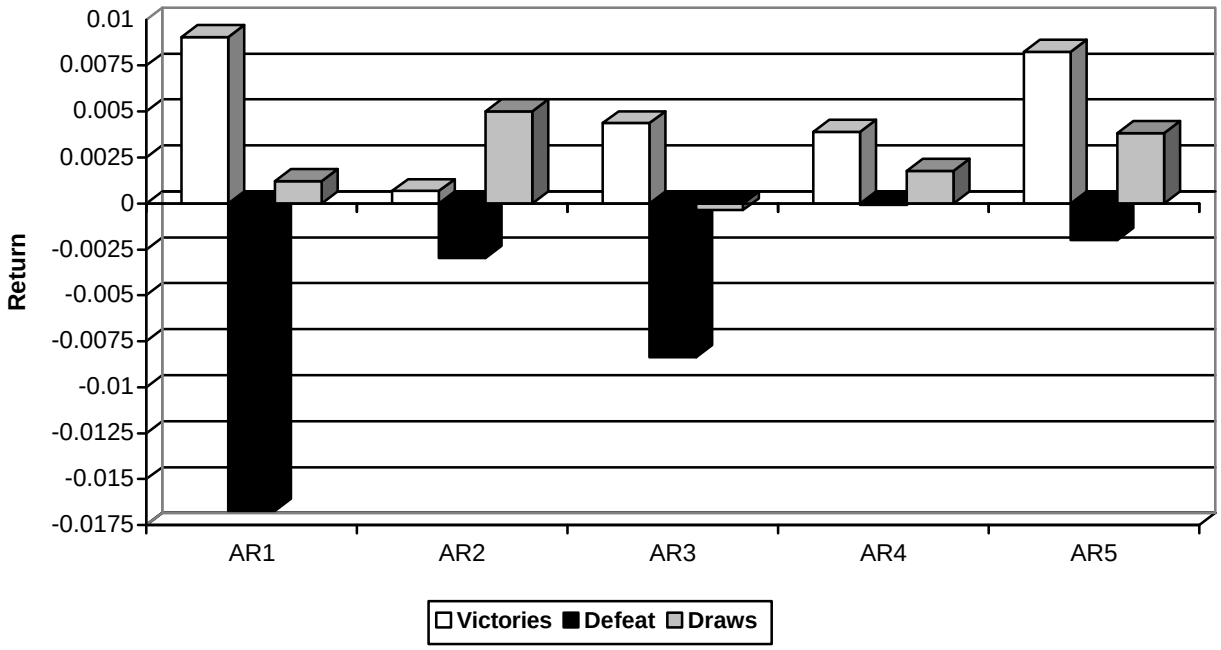

Figure A3 : Abnormal returns for the season 1997-98

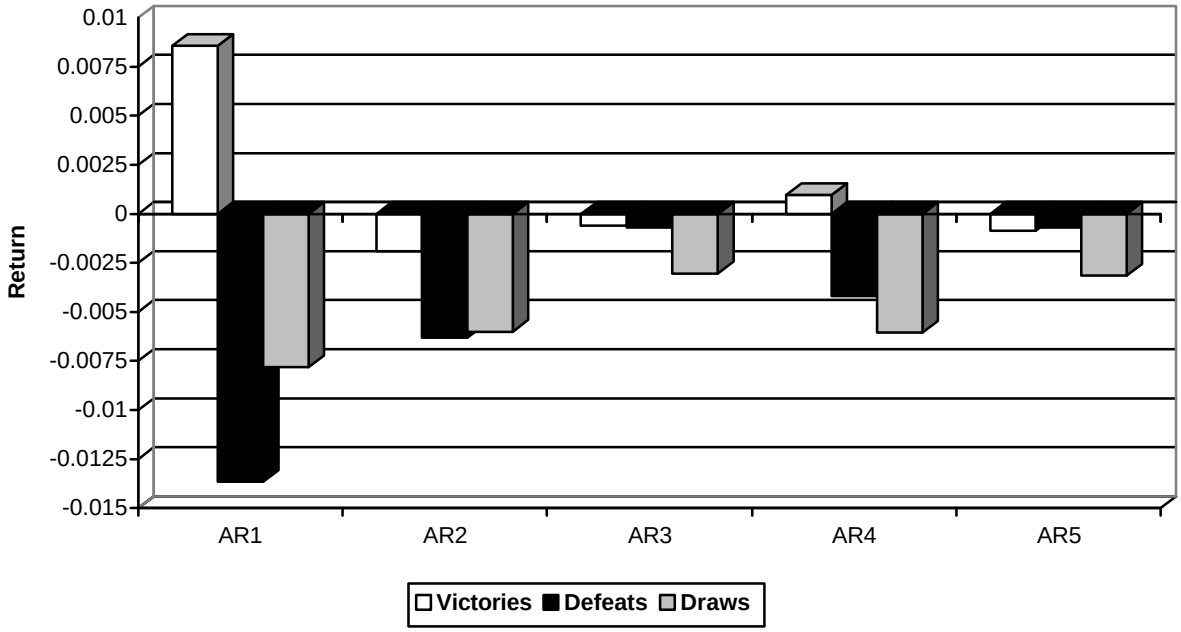

Figure B1 : Weekly Cumulative Abnormal Returns of Manchester United versus all other listed soccer teams.

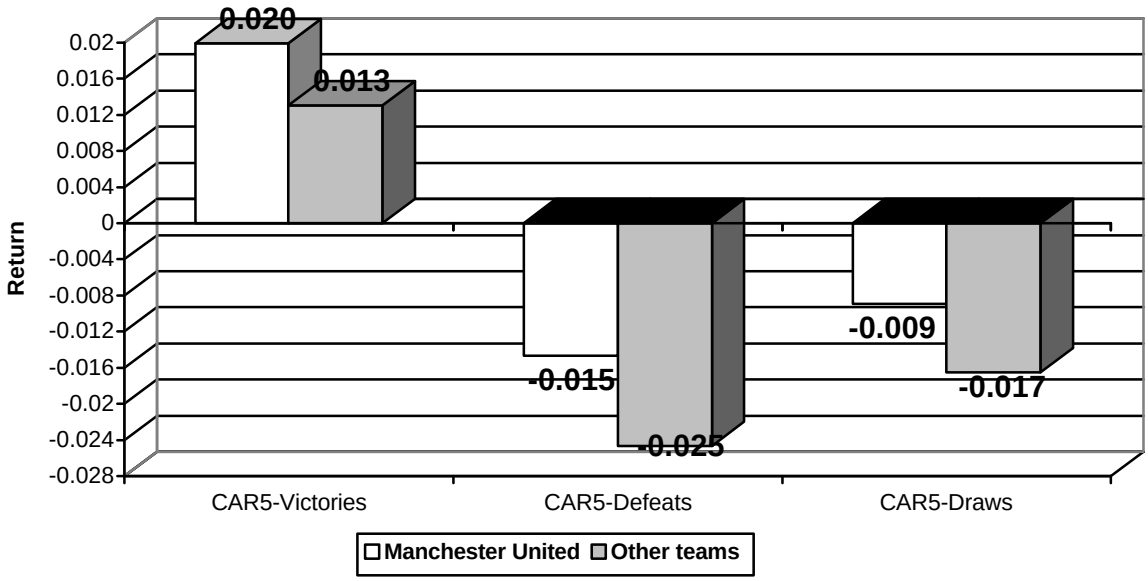

Figure B2 : Abnormal returns of Manchester United.