How do stocks of listed football clubs react to the sportily performance of these football clubs?

A case study for European listed football clubs

Master Thesis

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Abstract

Because of an increasing professionalism in the football industry, football clubs became more and more like ordinary businesses. The purpose of this study is to investigate if match performance still causes abnormal returns for publicly listed football clubs. According to prior research, a positive abnormal return is expected for victories. Draws and defeats are supposed to lead to negative abnormal returns. This study covers a period ranging from 2000 till the end of 2015. The sample includes thirty European football clubs. A mix of event studies and a multiple regression model is used to investigate the relationship between match performance and share price reactions of the football clubs. In the end, it can be concluded that a victory indeed leads to a positive abnormal return (0.48%). For draws and defeats, the results are in line with the existing literature, they both resulted in negative abnormal returns. Respectively -0.59% for draws and -1.02% for defeats.

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1 Introduction

Nowadays, football is one of the world's most popular sport. In the 19th century, the first rules of football were described in London. Between that moment and now, many has changed in the enormous world of football. Over the last decades, the football industry has grown excessively. Football clubs' strategies are modified from utility-maximizers to profit maximizers. A great example of the utility maximizing football club is that the British Premier League rejected millions from the BBC to sell the TV-rights in 1967 (Sloane, 1971). Over the last decades, football clubs changed their strategy to profit maximizing. Nowadays, football clubs are profit maximizers. Compared to the rejection for TV-rights in 1967, Sky Sports and BT Sport are paying 5,14 billion pounds for the television rights for the seasons 2016-2019 (Harris and Sale, 2015). Reading Deloitte's football money league reports, it can be concluded that in the last 20 years revenues are increased enormously. The twenty largest football clubs earned €1.2 billion together in 1996/97, in the Deloitte's 2016 report this was €6.6 billion (Deloitte, 2016). Analyzing these reports a change in revenue streams can be seen. A much higher percentage of total revenues is generated by broadcasting rights today than ten years ago.

The changes in the football industry over the last decades, make football clubs acting much more like professional companies. For some football clubs, this resulted in being a publicly listed company. This change raises interesting research topics. For example, how does match performance relate to financial performance? Moreover, maybe one step further, how is match performance related to stock prices of publicly listed football clubs?

One of the most well-known studies related to match performance and stock prices is the study of Renneboog and Vanbrabant (2000). This study is one of the first studies that investigated in this topic. After them, many followed with several studies regarding this subject. Szymanski and Hall (2001), Edmans et al. (2007) Baur and McKeating (2009) and Bell et al. (2012). All of these studies investigated in abnormal returns related to match performance and developed several hypotheses about potential drivers of the abnormal returns. Most of the studies used different samples and sample sizes. Also, the data included in those studies are outdated.

The purpose of this study is to investigate if match performance still causes abnormal returns. The central research question of this study is: "*Do listed football clubs' match results affect listed clubs' share prices?"* This study examined match results for several European football clubs between 2000 and 2015. Analyzing prior studies, positive abnormal returns for victories, and negative abnormal returns for draws and defeats are expected. This study includes a broader sample size, football clubs from several European countries, instead of only British football clubs, what was used by Renneboog and Vanbrabant (2000). Overall, the

same hypotheses are tested in this study than in prior research is done. A new hypothesis that is tested in this research is the difference between rival and non-rival matches.

The sample used in this study exists of thirty European football clubs. In total, 12622 matches are analyzed. Several matches have to be excluded from the sample because they overlapped the event window for other matches. If this was the case, priority was given to European matches. Therefore, in total 10915 football matches were included in the final sample. Information about the matches is gathered from football-data.co.uk, share price and control variable information is collected from Datastream.

The share price reaction caused by match performances is investigated with event studies. Therefore, a three-day event window [-1,+1] was used. After the event studies, an Ordinary Least Squares (OLS) regression is performed to analyze the main drivers of abnormal returns. The event studies show that a victory leads to a positive abnormal return on the first trading day after the match (0.48%). Over the entire event window, this is 0.67%. A draw affects the share price negatively with -0.59% at the first trading day after the match, where CAR shows a negative result of -0.64%. Football clubs' share prices are mostly dropped if a match is lost. An abnormal of -1,02% arises the first trading day after the lost match.

Studying the main drivers of these abnormal returns, a regression analysis is performed. Not only is the influence of a victory or a loss measured in this regression. Also, goal difference, end-of-season matches, European matches, English matches, rival matches and time effects are included in the regression. The control variable Size was added to see if the abnormal return depends on a football clubs' total assets or not. ROA is included as a measure of profitability. The last control variable, Form, is included to investigate if the abnormal return depends on how well-performing a football club is at that moment. The results of the regressions were in line with the existing literature.

The rest of this study is organized as follows; Section 2 concerns the literature review about prior studies regarding share prices and football matches. Also, the change of the football industry will be discussed. Section 3 will introduce the hypotheses tested. Section 4 deals with the methodology where section 5 presents the empirical results. Section 6 incorporates the main conclusions, limitations, and future research.

2. Literature review

In this chapter, essenial aspects concerning the research topic within the existing literature will be discussed. In the first section, the reason why football clubs choose to become listed on the stock exchange market will be explained. After that, the transformation from the football industry to professional companies will be clarified. In the third part, share price reaction after IPO and the efficient market hypothesis is explained. After that, the different kind of shareholders for football clubs will be introduced. Finally, several aspects that might affect a football clubs' share price are analyzed.

2.1 Why are football clubs going public?

Tottenham Hotspur was the first football club that went public. Tottenham Hotspur became publicly listed on the London Stock Exchange in 1983. Millwall (1989) and Manchester United (1991) followed as second and third listed football club. In the years after many other (British) football clubs became publicly listed as well. It is interesting to see what motivates football clubs to go public and which considerations are made by these football clubs? On the other side, it is interesting as well to understand why other clubs did decide not to become publicly listed.

Football clubs generate unlimited money through usual activities as merchandise and match-related income. Despite this, many football clubs decided to go public. Mitchell and Stewart (2007), concluded in their study that football is one of the most competitive sports in the world. Being world's most competitive sport manifests itself also in a financial way. Because of this enormous competition, football clubs have turned to the stock exchange. Initial public offerings (IPO) are used to raise capital to improve financial positions (Cooper and McHattie, 1997). A better financial position is necessary to finance the objectives where football clubs want to invest in. Cheffins (1998) distinguished two different explanations for going public and raising capital, a short- and a long-term description. Regarding the long-term, many British football clubs followed the expansion route. They bought ventures, built hotel and restaurant facilities, and therefore created a large sporting and leisure group on the long-term. Regarding the short-term, football clubs bought better players to improve sports performances on the pitch (Cheffins, 1998). Better players should result in better performance in football matches. Dobson and Goddard (2001) argued that better performance on the pitch could lead to financial rewards. Better results attract more media attention and therefore, more possibilities for sponsoring (Dobson and Goddard, 2001).

Renneboog and Vanbrabant (2000) corresponded with the short-term view of Dobson and Goddard (2001). They argued in their study that the most important reason for IPOs is to generate more capital to be able to buy better players to improve sports performances. Even though most money is spent on new players, the

additionally generated capital is also used to establish youth football schools and to build new training facilities or a new stadium, which corresponds with a long-term view. Andreff and Staudochar (2000) agreed with Renneboog and Vanbrabant (2000). Moreover, they added that the funds collected from stock sales are also used to repay debts. Here we can see the differences between short- and long-term. Conclusively, attracting better players is used to buy success very quickly (short-term), where developing youth academies and better training facilities focus on the long-term.

2.1.1 Listed vs. Non-Listed football clubs

Szymanski and Hall (2003) did research on the performance of publicly listed football clubs in the United Kingdom about football clubs that not decided to go public. They examined four indicators in performance, pre-tax profits, league ranking, wage expenditures, and revenues. Looking at pre-tax profits, Szymanski and Hall's (2003) findings show that publicly listed football clubs had much larger losses both before and after listing. Relatively, the losses of publicly listed clubs declined after they were listed. When comparing five years before and five years after league performance, the majority performed better in the years after they became listed. However, Szymanski and Hall (2003) also found disadvantages in the period after the football clubs became listed. Wage spending increased for the football clubs relative to the average. After all Szymanski and Hall (2003) concluded that there is a little improvement of performance after football clubs became publicly listed. This is confirmed by the findings of Amir and Livne (2005). They found that revenues of listed companies are larger, listed companies are more profitable and generate more cash flow from operations compared to non-listed companies.

2.1.2 Possible disadvantages of going public

Above, the motives of going public for football clubs are discussed. However, issuing equity on the stock market is associated with changes within the corporation. An organizational restructuring is necessary. Wilkesmann and Blutner (2002) investigated in this part of going public for German football clubs. They found three possible patterns in decision making for German football clubs. Organizational changes have to be made, for example, a board of directors has to be installed. The board of directors will supervise and monitor the operations management. This implies, the management of the corporation will lose its autonomy. Even though this could be seen as a disadvantage, on the other hand, it could be advantageous. Outside directors could improve the level of professionalism inside the club. A higher standard of professionalism could lead to more course knowledge and more productive operations. In the end, this will result in higher profits. Moreover, running a publicly listed company, the management should always be aware of the impact certain decisions could have on the reputation and stock price. All interested parties, including the board, will always be following the strategy and results of the football club.

Furthermore, it is possible that a hostile takeover will occur. A perfect example in the football industry is the takeover of Manchester United. Manchester United decided to become publicly listed in 1990. In 2005, Malcolm Glazer bought a controlling stake in Manchester United Plc, the parent company of Manchester United FC for £800 million. After this, fan shareholders were forced to sell their shares, and leave the club in the hands of Glazer. Glazer was not the first party that was interested in Manchester United. In 1998-99 BSkyB tried a first takeover of the football club. The majority of Manchester United's fans rose a campaign against this takeover, resulting in a win for the fans. After all, Glazer succeeded in taking over the company. This takeover was a disaster for the fans. Nearly 97% of all fans were opposed to the takeover (Brown, 2007). In the end, a part of the Manchester United fans founded a new football club: FC United of Manchester. Though, sports teams which make public offerings of shares can protect against hostile takeovers undertaking several actions. For example, they can decide matters in such a way that complete control by shareholders is not possible. A football club can choose not to sell a certain percentage of the shares of the capital in the stock market. Alternatively, the club can retain a group of shareholders with a controlling interest. The majority of the publicly quoted football clubs are organized in this way. When businesses, and in this case, football clubs decide to go public, they have to deal with many complex requirements. Compared to a non-listed football club, listed football clubs have to provide detailed information about their financial decisions each year. These reports lead to much more administrative controls for football clubs. Before football clubs become listed, all this information was confidential and not available for other people. Now this information is available for everyone who is interested in it, including the media. All this together could be seen as a large disadvantage. To get a football club publicly listed, it involves a lot of costs and time. Experts are needed to make sure that the annual reports are from a good quality. Football clubs have to hire financial experts, accountants, and lawyers. These experts will get paid for their services. After all, going public is related to a lot of high expenditures (Ritter, 1987). When a football club needs to raise their capital, it seems an IPO is a simple step to take. Regarding all additional expenditures and necessary changes in the organization, it is not as easy as it appears to be.

2.2 Football clubs' transformation to real businesses

Nowadays, football is world's most favorite sport (Barak, 2014). In the 19th century, the first rules of football were described. Between that moment and now, many has changed in the world of football. Because the football industry has grown enormously, much more money is involved in the industry. This implies nowadays; football clubs are managed as real businesses.

Just taking a look at the football news on internet or newspapers, it cannot be denied that there is an enormous amount of money involved in the football industry. Transfer fees of football players have increased significantly over the last decades. In 2001, Zinedine Zidane went from Juventus to Real Madrid for €73 Million. Up to that year, by far the most expensive transfer ever (Luis Figo number 2, €58.5 Million). Nowadays, football players are transferred for way higher amounts. In the list of most expensive football transfers, Zidane is listed as number 7. Number 2 in this list is the transfer of Gareth Bale in 2009. He went from Tottenham Hotspur to Real Madrid in 2009 for €100.7 Million. Besides the huge transfer fees that are paid today, the salaries for the football players increased too. For example, Gareth Bale earned $400.000 a week since he signed his contract with Real Madrid (McNulty, 2013). More recently, Wealthy oil sheiks did take over football clubs (Paris-Saint-Germain, AS Monaco, Manchester City). For this reason, some football clubs that did not have enough money in the past can now buy whatever player they want. This ensures that the football industry has exploded regarding money and revenues. In the summer of 2016 transfer period, the old record of Bale is caught up by the transfer of Paul Pogba from Juventus to Manchester United (€105 Million).

At the beginning of 2016, China stirs into the football market. President Xi Jinping has said that China has to win the World Cup over ten years (Gibson, 2016). Therefore, much money is made available to improve the Chinese football competition. This translates into unbelievable high transfer fees for European football players to get them to China. For example, Jackson Martinez, a substitute at Valencia and went to Guangzhou Evergrande for €42 Million (Gibson 2016). Wealthy investors who are taking over football clubs, a booming Chinese football industry and large amounts of money for broadcasting rights makes sure that over the last decades the football industry has transformed to a huge-amount-of-money included industry. Deloitte makes each year (started in 2006) an analysis of the football industry, called Deloitte Football Money League. Looking at these reports, the football industry has transformed. In 2004/05, Real Madrid was the football club with largest revenues that year (€275.7 Million). Where Real Madrid in 2014/15 had revenues more than twice as much as in 2004/05, €577 Million (Deloitte, 2006 and 2016).

Looking into the past, Andreff and Staudohar (2000) studied the evolution of financial models in European professional sports. They distinguished four models: Amateur sports model, Professional sports model: Traditional, Professional sports model: Contemporary and American professional sports model. The European models will be discussed next.

Amateur sports model

In the amateur sports, the least has changed regarding finance. For an amateur sports club, the most primary purpose is recreation and developing youth players. Their main revenues are from subscriptions and private cash donations. Playing on a higher amateur level adds a third revenue stream, gate receipts. Playing at the highest amateur level will also lead to revenues from advertising and sponsorships from outside the business. Concluding the amateur sports model, little has changed compared to the past. The largest revenue sources are derived from local sources (Andreff and Staudohar, 2000).

Professional sports model: Traditional

For professional sports, during the 20th century, gate receipts were the primary source of revenue. In some European countries. In the 1960s, some European countries there were subsidies from national and local governments and large local companies. Such as Fiat, Phillips, and Peugeot. This was typically the case in situations where companies were geographically located close to the football club, such as Phillips and PSV. Where in the 1970s gate receipts became more famous and revenues received from advertising and sponsorships became less important. Looking at table 1 below, it can be seen that in the French division more than 80% of revenues came from spectators and just one per cent from sponsors and advertising. Therefore, this model is referred to as Spectators-Subsidies-Sponsors-Local (SSSL) model. This model existed for a long time in Europe. At the end of the 1970s revenues from television rights started. However, television was not a primary source of revenue at that time (see table 1). This was just because it did not fit with the strategies of sports clubs in the 1960s-70s. A good example for this strategy is the rejection of the British Football Premier League of the BBC proposal of a million pounds. The main objective for sports clubs was utility maximization and not to earn money as much as possible (Sloane, 1971).

Table 1: Evolving structure of French football clubs' Finance. Division 1 and 2 (Andreff and Staudohar, 2000).

	Division 1				Division 2	
Receipts From	1970/1971	1980/1981	1990/1991	1997/1998	1993/1994	1997/1998
Spectators	81	65	29,4	19,9	15,3	12,8
Subsidies	18	20	23,8	11,8	35,7	20,6
Sponsors and advertising	1	14	25,6	20,5	17,3	21,9
TV rights	0	1	21,1	42,5	24,5	34,4
Other	0	0	0	5,3	7,2	10,3
Total	100	100	100	100	100	100

Regarding utility maximization, sports clubs' performances during the season have an impact on the utility (Szymanski and Hall, 2003) This explains why the Premier League rejected the proposal from the BBC in 1967 and why Stade Rennais refused a significant amount for broadcasting a single match in 1965. Between the 1970s and 1980s, a new discussion arose about the objectives of sports clubs. This resulted in a difference between American and European sports clubs. As mentioned above, for European sports clubs utility maximization was the most important objective. For American professional sports clubs, the main purpose was profit maximization. (Gratton, 2000). This resulted in a switch for European countries. By the end of the 1980s, profit maximization moved towards the foreground. To reach this objective, payments to directors were permitted and legislation of dividend payments has changed later on. (Buraimo et al., 2006). Conclusively, it can be said that before 1980 there was a difference between American and European sports clubs, where American sports clubs always have been focusing on profit maximization and European clubs switched over time from utility maximization to profit maximization. European countries switched from a traditional to a contemporary model.

Professional sports model: Contemporary

After 1980 most professional clubs no longer focused on the SSSL-model. In the 1980s and even more in 1990s other revenue sources were introduced, where old revenue streams declined. For example, gate receipts and spectator revenues declined in this period. (Andreff and Staudohar, 2000). Focusing on profit maximization causes changes in the model. In the period of utility maximization television was not relevant at all, after the change to profit maximization the opportunities for the broadcast industry were opened. From this moment, television became a very crucial source of revenues for sports clubs. According to Andreff and Staudohar (2000), the rise of television can be explained by increasing competition in the media industry. Before this period there were only a few public channels available. Nowadays there are infinite numbers of channels available (Andreff, Nys, and Bourg, 1987). The increase in the television industry is perfect for professional sports clubs. For them it is easy to make use of the growing competition,

this ensures greater broadcasting deals and higher revenues. As mentioned by Andreff and Staudohar (2000), television is an increasing factor in collecting revenues for sports clubs and will even grow more in the future. This is confirmed by the Deloitte Football Money League, which will be discussed later. Besides television, another interesting aspect is a new generation of entrepreneurs onto the scene (Andreff and Staudohar, 2000). These new entrepreneurs want to improve financial results through ownership and control. A famous example of this is Silvio Berlusconi, who invested in AC Milan. Focusing on merchandising started between the 80s and 90s and still has an impact on sports clubs today. Clubs with a long history, such as FC Barcelona, Ajax and Bayern München, largest clubs in their country, have highest revenues from merchandising. Bayern München, for example, generated commercial revenues of €278.1 million in 2014-2015.

Since 1990, football clubs switched to the MCMMG model, based on Media, Corporations, Merchandising and Markets (Andreff and Staudohar, 2000). This automatically leads to a change of national sports finance to global sports finance. Two important changes are the introduction of the UEFA Champions League and the Premier League, both in 1992. These two new competitions led to higher revenues from merchandising, sponsorships and TV-rights (Gratton, 2000). The development of the Premier League, football clubs going public and development of merchandising, sponsor contracts and great broadcasting deals led to higher much higher revenues. Some argued that this commercialization was due to the adoption of the American model by the British football industry (Gratton, 2000). Another growing revenue stream was about transfer fees. This source developed in the late as because of the 'Bosman verdict' (Belgian player Jean-Marc Bosman) in 1995 by the European Court of Justice. On December 15th, 1995, the court decided that the current transfer system used for professional football players placed a restriction on the free movement of workers, which was in conflict with Article 39. Before this judgment, the new club had to pay the former club, even if the contract between the player and the former club was expired. After the judgment, new clubs are not obliged to pay fees for players if the contract is expired. Nowadays, transfer fees are crucial for football clubs to generate revenues. Transfer fees increased enormously in the last two decades. In the season 1993/1994, the transfer earnings in the Premier League were equal to 50.6 million. Comparing the season 1993/1994, which was before the 'Bosman verdict', to 2013/2014, we see a huge difference. In 13/14 the earnings due to transfers in the Premier League were equal to 403.77 million. In 20 years it is multiplied almost eight times. As mentioned in the period before 1980, tickets is also an important revenue source. During the 1990s and 00s, many football clubs have upgraded their stadiums. Larger stadiums made it possible to sell more tickets due to a grown capacity. Besides that, football clubs could also ask higher prices for those tickets because of improved facilities. Andreff (1981) concluded that a decrease in price is not favorable due to a very low price elasticity for sports events.

2.2.1 Deloitte Football Money League

Analyzing the Football Money Leagues of Deloitte leads to more interesting insights. These reports give a yearly contemporary and reliable analyses of Europe's largest football club's financial performance. These reports show three different sources of income, namely: Matchday, broadcasting and commercial revenues. Comparing Deloitte's reports of 2006, 2010 and 2016, it can be concluded that many have changed over the last ten years. In the first Football Money League from Deloitte, about the season 1996/97 the 20 largest clubs' combined revenue was €1.2 billion in 2004/05 this total broke the barrier of three billion. Looking at the 2006 report, Real Madrid had highest revenues (€257.7 million), followed by respectively Manchester United (€246.4 million) and AC Milan (€234 million). Real Madrid's revenues are 54% earned by commercial activities, and match day activities make only 23%. Comparing this to Italian clubs, large broadcasting deals exists in Italy. Broadcasting revenues are 59% of total revenues for AC Milan and 54% for Juventus, 58% for Internazionale and also for other Italian clubs it is around 55-60%. Because Italian clubs could negotiate exclusive Pay-TV deals, the revenues from broadcasting are enormous for Italian clubs. For British football clubs, all three sources are almost equally weighted (Deloitte, 2006).

Four years later, in 2010 Real Madrid was the first club in history that earned revenues over €400 million. In just four years, Italian clubs are tumbled out of the top. In Deloitte's reports, it can be confirmed that upgraded stadiums lead to higher match day revenues. For example, Arsenal's match day revenue topped 100 million pounds for the first time (€117.5 million), because of the grown Emirates stadium capacity of 60.400 (Deloitte,2010). Table 2 shows that Premier League clubs score very high on capacity utilization and for that reason score high on match day revenues. Comparing this to Italian teams, the utilization is around 50%; this explains the differences in match day revenues between countries. The most recent analysis from Deloitte is the edition of 2016. It can be seen that revenues are grown enormously over the past five years. This is not surprising, but it is interesting to see what have changed in sources of income exactly. Looking at the huge revenues of British football clubs, the following can be concluded: Broadcasting revenues increased gigantically. This happened due to an immense deal with Skysports. Where in the period 2010-2013 £1.773 billion was paid for broadcasting rights for the Barclays Premier League, for the period 2016-2019 £5.136 billion is paid (Premierleague.com, 2015). Therefore, for English clubs, it is crucial to play in the highest division because then they will receive a larger part of this broadcasting deal. Szymanski (2001) argued that the difference with non-English football clubs is growing which results in a less competitive environment. This means that English clubs can generate more revenues and therefore could buy more expensive players, what will result in a less competitive football competition. Besides that, match day revenue has fallen to its lowest ratio in the Football Money League history. However, this does not mean this income source will be neglected. Top 20 clubs think about how they can

increase this revenue source and try to redevelop their stadiums. Besides that, Broadcasting- and Commercial revenues are way larger revenue streams. They are highly related to the match day product (Deloitte, 2016).

Table 2 Spectators attendances Football Money League. Deloitte, 2010.

Football Club	**Average attendance**			**Capacity Utilization**
	2007/08	*2008/09*	*2009/10*	
Real Madrid	67.600	64.300	64.300	84%
FC Barcelona	64.300	66.800	76.000	77%
Manchester United	75.700	75.300	74.800	99%
Bayern Munich	69.000	69.000	69.000	100%
Arsenal	60.100	60.000	59.800	99%
Chelsea	41.400	41.600	41.400	99%
Liverpool	43.500	43.600	43.300	95%
Juventus	21.800	22.400	23.900	85%
Internazionale	51.400	55.300	52.500	66%
AC Milan	55.900	59.700	41.600	52%
Hamburger SV	54.800	54.800	55.100	97%
AS Roma	36.200	39.400	36.600	50%
Olympique Lyonnais	37.300	37.400	35.800	88%
Olympique de Marseille	52.600	52.300	48.400	84%
Tottenham Hotspur	36.000	35.900	35.800	98%
Schalke 04	61.300	61.400	61.100	99%
Werder Bremen	40.300	40.400	34.800	94%
Borrusia Dortmund	72.500	74.800	76.800	95%
Manchester City	42.100	42.900	45.400	95%
Newcastle United	51.300	48.800	42.300	81%
Average	**51.800**	**52.300**	**50.900**	**85%**

2.2.2 Money earned by European competitions

Another fascinating source of income is money that could be made by participating in the European completions. Participating in the UEFA Champions League is vital from a sportive perspective, but also from a financial viewpoint. Over the last years, each year prize money in this competition has increased. In 2015, only participating in the UEFA Champions League lead to 12 million Euro income. Apart from that, football clubs could earn bonuses by performing well in this competition. Beside sportive compensations, football clubs also earn income due to broadcasting rights of the UEFA Champions League. For these reasons, participating in the largest European competition is critical for football clubs. Both from a sportive and financial perspective. Therefore, National competitions are essential. The ranking at the end of the

National competition decides if a football club is qualified for European competition next season. The importance of the classification at the end of the national competition will also be tested in this study. In the next session, the rules of participating in the UEFA Champions League and UEFA Europa League will be explained.

Participating rules of UEFA Champions League and Europa League

For each club, it is possible to qualify for a European competition. Participation depends on the final position in the National competition in the prior season. Each country which is affiliated with the UEFA has the right to participate in the UEFA Champions League. Depending on the strength of a football country, at least one and at most four football clubs may take part in the largest European competition. The strength of a football country is measured by UEFA Country Coefficients. This is used to rank all football associations of Europe. This coefficient is determined by clubs' performances in the Champions League and Europa League over the past five years. This ranking than determines the number of teams that could participate in the season after the next season. For example, the ranking at the end of the season 2014/15 determines the team allocation by association in the season 2017/18. In the main draw of European competitions, a winning match leads two point, where a draw leads to one point. In the qualification part of the European competitions, points are halved. Reaching the latter rounds of these competitions will lead to bonus points. Qualifying for the group stage of the UEFA Champions League is rewarded with four bonus points, where qualifying for the round of last 16 is rewarded with five bonus points. The total number of points awarded by a country at the end of the season is divided by the total teams that participated for that particular country in that season. Table 3 shows the current coefficient ranking in 2016 (UEFA). It also includes the number of participants by postition for the UEFA Champions League and the UEFA Europa League.

Table 3: Coefficient Ranking 2016. Source: Uefa.com

Ranking 2016	Association	Total Coefficient*	CL Participants**	EL Participants***
1	Spain	87.141	4	3
2	Germany	67.641	4	3
3	England	63.819	4	3
4	Italy	60.998	3	3
5	France	45.332	3	3
6	Russia	44.332	3	3
7	Portugal	43.832	2	3
8	Ukraine	38.633	2	3
9	Belgium	32.800	2	3
10	Turkey	32.200	2	3
11	Czech Republic	29.775	2	3
12	Switzerland	29.475	2	3
13	Croatia	25.250	2	3
14	Greece	24.100	2	3
15	Netherlands	24.063	2	3
16	Romania	21.950	1	3
17	Austria	21.850	1	3
18	Denmark	21.000	1	3
19	Belarus	19.875	1	3
20	Sweden	19.725	1	3

*Total Coefficient: Sum of five-year coefficients

** CL Participants Participant in UEFA Champions League

*** EL Participants: Participants in UEFA Europa League

2.2.3 Negative aspects of a growing industry

A negative aspect of the growing industry is the increasing wage costs. According to Buraimo, Simmons and Szymanski (2006) excessive wage costs reflect over-optimism by owners and the management. Wage inflation is also caused by the liberalization of the labor market, especially after 1995 due to the Bosman verdict. Going public includes a dispersion of equity holders, what will lead to a lack of ownership concentration and also the ability to monitor company management. This problem can be solved through certain regulations on financial disclosure to protect investors. But, this is a costly and longtime process. Besides that, competition between football clubs as buyers of great football players arose. Being competitive led to higher transfer fees. Therefore, football clubs were little better off, if not worse (Gannon, Evans and, Goddard, 2006). In 2013/14 Premier League's wages have increased by £119 million, to a total of £1.9 billion. Where revenues have grown by 29% (735 million), this is the first time since 2007/08 that wage rate have increased at a slower rate than revenue (Deloitte, 2015). One of the greatest business challenges in the football industry is cost control. In 2011, it was the first time since 2003 that debt reduced

compared to the year before (Deloitte, 2011). In 2014 Chelsea became the first Premier League club that passed the 1 billion border for net debt. However, overall in 2014 Premier League's net debt has declined by 6% (Deloitte, 2015).

2.2.3 Financial Fair Play

As mentioned in the previous paragraph, it is a great challenge to control football clubs' debts. To reduce debts, in 2009 the UEFA unanimously approved a new program called: Financial Fair Play. This program is about improving the overall financial health of the European football. The first assessments were introduced in 2011. Since then football clubs that have qualified for UEFA competitions have to prove they do not have overdue payables. They have to show that all bills towards other clubs are paid. Since 2011/12 clubs have to reach a break-even result at least. In other words, the income has to be at least as many as the club want to spend. Any money dedicated to training facilities, youth academies, and infrastructure is not included. These costs are excluded from the break-even calculation to promote such investments. However, clubs can spend five million more than their income is per assessment period. An assessment period is a period of three years. Also, this limit can be exceeded, only if it is covered by a direct payment from club's owners. For the seasons 2013/14 and 2014/15, this limit was set to 45 million Euro. As of the seasons 2015/16, 2016/17 and 2017/18 this limit is 30 million Euro. If a particular football club does not meet these rules, they will be punished by sanctions. These penalties depend on the degree of violation. It starts with a warning or a reprimand, but in the end, it could result in disqualification or a withdrawal of a title or on an award. This means clubs are not automatically excluded from European competitions if they do not meet the regulations. All the rules should result in a more professional financial structure for football clubs and structural lowering debts.

2.3 Share price reaction after IPO

During the 90s many football clubs became publicly listed. First only in the United Kingdom. After the British football clubs, a few European clubs followed as well. British football clubs became listed on the London Stock Exchange or the Alternative Investment Market (Renneboog and Vanbrabant, 2000). Examples of other European football clubs that became publicly traded in those years are AFC Ajax (1998), FC Porto (1998) and Lazio Roma (1998). Unfortunately, it was not the success some clubs expected. Analyzing share prices of IPOs after they became public, most shares devalued (table 4).

During the wave of IPOs in the 90s, financial analysts were not convinced of the business practices of football clubs. They were not sure if football teams could ever be rated on nominal investment criteria. If not, football clubs are legitimate stock market businesses. Cheffins (1998) mentioned that the management

of football clubs was not efficient enough to ensure profits to shareholders. Table 4 below shows that many clubs' share price dropped after IPO. Most of the clubs dropped around more than 20%. Even though, the drops are not as bad as they look like. For example, AFC Ajax has declined by 22.11% in the first six months after IPO. Also, the AEX dropped by around eleven percent in this period. This means that AFC Ajax' share price has dropped, but not as much as it seems to be. What is the reason for the decrease short after the IPO? A possible explanation is over-valuation. Football clubs are overpriced at the time of the IPO. With the IPO much equity is generated by the football club. It could be that this equity is spent on transfers, to buy better players and to buy success. When this success is not attained immediately, the football club could have gone into financial distress. Financial distress could also affect football clubs' share prices. On the other hand, a possible explanation could be the other way around. Supporters and investors could have been very skeptical about the IPO. They could have thought that profit maximization could harm sportive success. Which is related to lower demand for shares. On the contrary, not all football clubs' share prices declined. For example, Tottenham Hotspur's share price increased after the IPO. Tottenham Hotspur was the first football club that went public, in 1983, their share price increased because of increased revenues as mentioned in paragraph 2.1. Gannon et al. (2006) found that a possible reason for an increasing share price could be that football clubs are subject to bids soon. Takeover bids happen more and more since 2000. Many large football clubs are bought by rich investors from all over the world. Examples of such rich investors and football clubs are Manchester United and Glazer (2005), Chelsea and Roman Abramovic (2003).

Table 4: Share price change after IPO

Football club	6 months after IPO	Market Change	Football club - Market
AFC Ajax	-22,11%	-11,00%	-11,12%
AS Roma	16,18%	7,66%	8,52%
Borussia Dortmund	-21,82%	-12,26%	-9,56%
FC Porto	-38,09%	-15,16%	-22,92%
Juventus	-35,95%	-9,04%	-26,90%
Sporting Portugal	-26,42%	-16,51%	-9,91%

2.3.1 Efficient Market Hypothesis

During the twentieth century, finance theory changed to a different direction. Rationality and utility maximization became more important issues. In the 1970s, finance theory was focused on the newly developed Efficient Market Hypothesis. The Efficient Market Hypothesis includes a financial market as one in which prices fully reflect all information available (Fama, 1970). Therefore, security prices will only change when practical information occurs. A direct implication is that it is impossible to beat the market. There is a distinction made between three different forms of market efficiency. In a weak form of

effectiveness, future prices cannot be predicted by analyzing prices from the past. In Semi-strong efficiency, share prices adjust very rapidly to publicly available new information. In strong market efficiency, share prices reflect all public and private information. In general, shareholders collect all publicly available information and use this for their price expectation (Stadtmann, 2006). As Fama (1970) found, changes in asset prices are the outcome of new information, for example, quarterly reports. For football clubs, there is a different situation. Distribution of information occurs very frequently. Information is easy to quantify and becomes public at the same point in time for all agents. Besides that, information could also occur when markets are closed, and it has ex-ante expectations. These differences ensure a different situation for football clubs. Share prices of football clubs seem to be not as biased as other listed firms. This is due to all public and media interest. Decisions and actions taken by some individuals who are running a publicly listed football club are forms of information distribution. For this reason, the management of a football club must carefully choose their actions and decisions. Otherwise, the distributed information linked to these activities could have a negative impact on the share price. Management decisions could lead to pessimistic views for the near future for the shareholders. This possible negative segment will have an unfavorable impact on the share prices (Cheffins, 1998).

2.4 Different types of shareholders

Each company has various types of shareholders. This also counts for football clubs. Overall, each listed company has a group of investors with little or no interest in the business. For football clubs, this means, with no interest in the football club other than the returns they generate, what results in the task for the directors to achieve an as high as possible return for those shareholders (Szymanski and Hall, 2003). According to Renneboog and Vanbrabant (2000), there are three different sorts of shareholder types. At the top, controlling shareholders, followed by some institutional investors. The third group is a broad group of individual investors. Unfortunately, there is enough evidence that tells us that institutional investors only care about returns and not about the football club. For this reason, many real football club fans complained about the commercialization of the football industry. To clarify, Morrow (1999) found that in 1997, just 124 institutional investors of Manchester United owned nearly 60% of the shares. Conversely, Cheffins (1998) argued in his study that many football supporters want to own a share of their favorite football club. These supporters just gain mental satisfaction from being a part of the club because they invest in the club. It is not only rising satisfaction that could be seen as a benefit, Renneboog and Vanbrabant (2000) found a couple of other advantages of having a share of your favorite football club. Being a shareholder of the favorite football club could lead to several privileges and discounts. It could give supporters priority rights when the sale of season tickets starts, discount on individual tickets, and discount on merchandising products in the fan store and so on. Cheffins (1998) agreed with these benefits of Renneboog and

Vanbrabant (2000), but he added some advantages. He concluded that being a shareholder will give the fan voting rights for certain issues as choosing a new chairperson. Having the right to vote will raise the mental satisfaction, fans might think they can influence important decisions of their favorite sports club. In the end, the impact of these voting rights in the decisions is not as large as the supporters might think. Also, Duque and Ferreira (2005) agreed with this; they found that many fans buy shares from their football club only based on the passion for their club. These fans only want to own shares to own a part of the club.

2.4.1 Differences in shareholder's interest

In general, shareholders are profit maximizers; they will expect that firms try to maximize their profits. Each shareholder wants to get as high as possible returns. In the case of the football industry, this can be different. Sloane (1971) proposed the following five objectives for football clubs:

I. Playing success: Playing success is the most important objective of all. All participants, from chairman to players to fans would agree.
II. Profit: Sloane suggested profit is not the primary objective in the football industry, but this does not mean we can exclude profit.
III. Security: Decisions in the football industry are focused on assuring safety.
IV. Attendance: Many fans to be present at football matches could create a great atmosphere which could lead to playing success. Attendance could be seen as a measure of success by themselves.
V. The health of the league: This is important because football clubs in the same league have shared dependence.

From the objectives mentioned above, Sloane suggested football clubs have to maximize the following utility function:

$$U = u(P, A, X, \pi_r - \pi_o - T) \qquad \text{Subject to } \pi_r \geq \pi_o + T$$

In this utility function, u depends on P (Playing success), A (average attendance), X (health of the league), π_r (recorded profit), π_o (minimum profit after tax that would be accepted) and T (tax).

Szymanski and Hall (2003) agree on this to Sloane. For a large group of shareholders, utility maximization is more important than profit maximization. They prefer sports successes on the pitch over profit interest. Taking a better look at the relationship between profits and playing success (utility), it is stated that playing success is often achieved by investing in the football club. Mostly this implies buying better players, but moreover, it also includes investing in a great staff or training facilities. The better all these parts of the club are, the more likely it is to be successful. Szymanski and Kuypers (1999) found evidence for these

relationships. Playing success will be limited if a club does not invest in better players. Besides that, also profits will be lower. Since the club does not invest enough, fans are unlikely to pay high prices for tickets or merchandising. The other way around, when a club does invest, success and profit will increase both. Szymanski and Hall (2003) came up with a financial model that shows the relationship between profits and playing success in different ways. Figure 1 below indicates that the expected relationship is not infinite. At a certain point, investing will increase success on the pitch, but profits will drop.

Figure 1: Profit as a function of success on the pitch (Szymanski and Hall, 2003).

As Sloane suggested in 1971, many owners of football clubs are utility maximizers; the other part is a profit maximizer. This implies that there are two contrasting indifference curves, as is shown in Figure 2. A profit maximizing manager will have horizontal indifference curves. They only care about profit and not about success. Therefore profit maximizers want to reach the highest horizontal curve available. This will give them the highest profit, careless about the success on the pitch. For utility maximizers a bowl-shaped curve counts, increasing profits sounds great, but not if it declines 'playing success'.

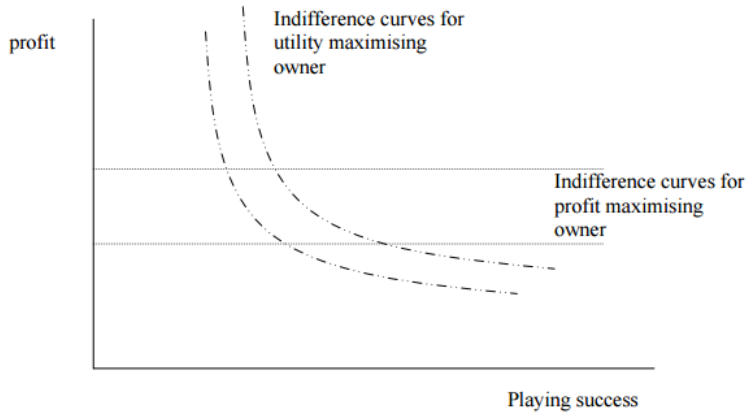

Figure 2: Indifference curves for profit- and utility maximizing owners (Szymanski and Hall, 2003).

Taken figures 1 and 2 into account, optimal choices can be calculated. The outcomes are different for the various types of managers. The profit maximizing manager this will choose the best combination of profit and success based on the highest flat indifference curve. For the utility maximizing manager this will be a combination which implies less profit and more success. This enables the owner to reach a better indifference curve. The optimal choice solution is scheduled below in figure 2.3. According to figure 3 below, we can conclude the following: a profit maximizing manager prefer higher profits over higher playing success, where a utility maximizing manager prefers the opposite. He would like to maximize playing success over profit. This is a direct result of diversity in objectives between several manager types. If a utility maximizing football club floats stock on the market, they expect a slight upward in profit, and therefore a small decrease in success. However, the opposite has occurred. Szymanski and Hall (2003) argued that the reason for this was that football clubs spent the extra income on new players, what results in declining profits and improving playing success

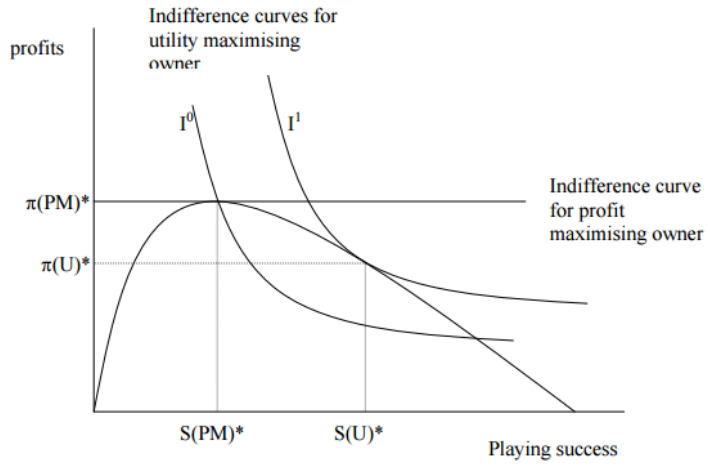

Figure 3: Equilibria for profit- and utility maximizing owners (Szymanski and Hall, 2003).

The outcomes between the difference in profit-maximizing and utility-maximizing businesses are studied by Szymanski and Hall (2003). Most economists argued that in the US, most businesses are run in the same way as profit-maximizing firms. Where in Europe the widely held view is that European football clubs are run as utility maximizing firms. Therefore Szymanski and Hall studied 16 football teams that became publicly listed in de the 1990s. Following the existing theory, after the football club went to the stock market, they should change from a utility-maximizing business to a profit-maximizing one. However, their data shows contrary results. The thought that English football clubs are utility-maximizers is challenged by Szymanski and Hall's findings. If English football clubs were utility maximizers, after floating stock on the market the most expected effect is a little upward going profit and a little downward going performance on the pitch, which is equivalent to playing success. Analyzing the results, the opposite has occurred. Profits

have fallen, and performances have improved. A clarification for this is that football clubs spent the flotation proceeds directly on new players (Szymanski and Hall, 2003).

2.5 What affects the share price of football clubs?

There is much literature available about share prices of football clubs. Most of the researchers focus on the relationship between match results and football club's stock market returns. Besides match results, there are also special events that affect football club's share prices.

2.5.1 Match results

One of the most important aspects in affecting football clubs' share prices are match results. This relationship is first studied in 2000 by Renneboog and Vanbrabant. After their study, many others followed by exploring the link between match results and share prices. Renneboog and Vanbrabant (2000) took a sample of 17 mostly English football clubs, listed on the London Stock Exchange (LSE) or the Alternative Investment Market (AIM). They used match results from the season 1995/96 till 1997/98. The main question they want to answer with their research was to investigate of share prices of listed football clubs were influenced by the performance on the pitch. Interpreting the abnormal returns, a winning match led to a 1% positive abnormal return for the first trading day after the game. On the other hand, draws and losses are negatively related to share prices. A draw leads to a negative abnormal return of 0.6% where a loss is tied to a negative abnormal return of 1.4%. Regarding European or relegation matches, much higher abnormal returns were found. A possible clarification for the difference is that European and relegation matches have more impact on several streams of income, like sponsoring and broadcasting rights (Renneboog and Vanbrabant, 2000). As mentioned above, Renneboog and Vanbrabant's sample exists of football clubs listed on the LSE and AIM. Comparing these two groups, some compelling differences could be registered. Victories are more rewarded with price increases for clubs listed on LSE, where losses lead to a larger price reduction for AIM listed football clubs, compared to LSE listed clubs.

In addition to Renneboog and Vanbrabant, Benkraiem et al. (2009) did research on stock returns and sports performances. A main difference between the two studies is that Benkraiem, Louhichi and Marques (2009) used European football clubs, where Renneboog and Vanbrabant (2000) only used English football clubs. Besides that, Bekraiem et al. (2009) also took trading volumes into account. Regarding defeats and draws Benkraiem et al. (2009) confirm Renneboog and Vanbrabant's (2000) conclusions. Especially defeats at home ensure price drops. For victories, Bekraiem et al. (2009) did not found any significant price reaction. This is explained by the 'allegiance bias'. This bias means that individuals who are psychologically invested in the desired outcome generate biased predictions (Edmans et al., 2007). Supporters consider it as a norm

that their team will win. This could be one of the main reasons that the market punishes defeats one day after the match. Results also show abnormal activity around match days regarding trading volumes. The increase started one day before the game and revealed during the post-match period. This confirms the statement that investor take into account sporting results and revise their portfolios around match days (Bekraiem et al., 2009).

Szymanski (2001) agrees with the outcomes of formerly mentioned studies. He, also, claims that non-competing matches are less affecting share prices. Because the outcome is very predictable, it does not affect the share price that well as competing matches do. Bell, Brooks, Matthews and Sutcliffe (2009) did a comparable study as Renneboog and Vanbrabant (2000), they only used a different period. Their date covered match results for English football clubs between the seasons 2000/01 and 2007/08. Their findings are pretty similar to Renneboog and Vanbrabant (2000); the importance of a match affects the impact on share price reaction. Baur and McKeating (2009) analyzed the performance of football clubs which undergo an IPO. For their study, they used European football clubs. An interesting result is that football clubs do not perform better after the IPO than before in the national league. This is only beneficial for football clubs in lower divisions in great football leagues. Besides this, the majority only marginally perform better in the international football leagues compared to before the IPO. This effect is statistically insignificant. Regarding stock prices of football clubs, Baur and McKeating (2009) found that stock prices depend on previous season's national results and current international performances. They found a small increase in field performance, but this result was statistically insignificant. After all, given the results that football clubs do not take advantage of going public and stock prices do not fully reflect future performance, Bauer and McKeating (2009) concluded that the benefits of the stock market listing for football clubs are limited.
To see how investors respond to football results, Scholtens and Peenstra (2010) analyzed 1247 international and national football matches of 8 European football clubs. Corresponding to Renneboog and Vanbrabant (2000), Scholtens and Peenstra (2010) concluded that football matches lead to abnormal returns. This is positive for victories and negative for defeats. The effect is stronger for defeats as for victories. This could be related to the idea that people, in general, are more sensitive to losses. Furthermore, Scholtens and Peenstra (2010) studied the difference between national and international matches. The stock market is more sensitive to international football matches compared to national matches. For international matches, unexpected results have a higher impact on stock prices than expected results. This is not the case for national football matches.

Aside from studies regarding football, there are also studies investigated in other sports and their relationship to stock prices. For example basketball. Edmans et al. (2007) were motivated by plenty of

evidence showing that sports results affect mood. Their study investigates the stock market effect by analyzing international sports results. Corresponding to prior research, they documented a negative stock market reaction to losses in football matches which was economically significant. Monthly excess returns with a soccer loss exceed 7% (Edmans et al., 2007) in other sports like cricket, rugby, and basketball, they documented a significant but smaller loss effect. For victories, they did not found significant results in any of the sports they have analyzed. Dobson and Goddard (1998) found a difference between unexpected bad and good news. Where unexpected good news increases share price and unexpected, bad news reduces share prices. In addition, they found that promotion increased football club's share price and elimination from national or international cup reduced football club's share price.

Brown and Hartzel (2001) did a specific study for basketball club the Boston Celtics. They analyzed the impact of Boston Celtics' games on their shares and examined trading volume and volatility. This study shows that game results are used by investors. The analysis shows that trading volume and volatility are both higher during the basketball season compared to the off-season. Regarding returns and results, Brown and Hartzel (2001) found an asymmetric reflection. This study shows that losses significantly affect stock prices but victories do not. They also investigated in the importance of basketball games. Games during the playoffs, which are more important, have a greater impact on stock prices.

In contrary to all above findings, Bell et al. (2009) came with other interesting results. They measured the importance of a football match in two different ways. First, they considered the extent to which clubs are close rivals or not. Second, they argued that matches become more and more important when the season almost comes to an end. At the end of the season promotion or relegation is getting closer for the clubs. They analyzed 5187 matches from 19 different clubs between the seasons 2000/01 and 2007/08. Their main finding is that while match results affect football club’s share price, these effects are moderate compared to other variables that affect stock prices. The importance of the game, measured in two ways mentioned above, appear to have a tiny impact on returns (Bell et al., 2009).

2.5.2 Other aspects affecting share price

Match performance is not the only one which affects football club’s share prices. Bell et al. (2009) concluded there are more determinants affecting share prices. Unfortunately, research on this is scarce. Looking to prior research, other sports are studied as well. These studies could be used, keeping in mind that the same findings could count for football clubs. Brown and Hartzell (2001) tried to find if certain events are related to sports clubs share prices. In their study, they analyzed the new stadium for the basketball club the Boston Celtics. Brown and Hartzell (2001) concluded that the new arena had no direct

influence on its share price. The new arena ensured higher revenues from ticket sales. The sales increased from $22 million to $35 million after the first year the new arena was used. Therefore, the new arena was a positive net present value decision. Another event that is studied by Brown and Hartzell (2001) is the moment that a new coach was presented. The difference between the new arena and the new coach was that the new coach was expected to have both impact on the field as financially, while the new arena only had financial implications. This event had been a great sportively move, but this not necessarily means it is a great financial move. Analyzing the share prices around the event, initial optimism was followed by much more caution.

Gannon et al. (2006) also investigated in other factors that affect football clubs' share prices. They argued that share prices also can be explained by the market index. A positive relation was found between the market index and share prices. They investigated in the announcement dates of the broadcasting rights for the Premier League. Unfortunately, Gannon et al. (2006) did not found any significant abnormal returns for an event window of twenty days. Positive news about revenue growth is not necessarily related to positive signals about future profitability. However, the days after the announcement shares of Tottenham Hotspur increased by more than 10%. Zuber, Yiu, Lamb and Gandar (2007) argued that events not related to football matches not have a great impact on share prices because of a lack of response to the new information. Zuber et al. (2007) investigated in the trading volumes for football clubs listed on the London Stock Exchange. The authors argue that investors do not react to information that is expected to affect football clubs financially. They found that trading days without any change in price is four times as high for football clubs compared to the market. This is an indication that this type of investors has a lack of response to new information. Another reasonable answer to this lack of reaction could be that football club's shareholders do not care about financial information; they only want to support their favorite club.

Gerrad and Lossius (2004) concluded that around 50% of share price reaction is explained by match performance. The other 50% is due to specific company, in this case, football club information. In addition to this conclusion, Duque and Ferreira (2005) found industry effects for Portuguese football clubs. Besides match performance, football players also affect share prices. The best players of a sports club are living like real world-known stars. Therefore, Hausmann and Leonard (1997) concluded this is related to higher revenues for merchandising and ticket sales. Also, in the NBA, the pay-per-view system is a major source of income, which underwrites the importance of the players. The best players in a sports team make the team more attractive.

3. Hypotheses

This study has the goal to extend the literature in several ways. First of all, by taking a larger period, it will be tested if conclusions drawn in prior studies are still valid. Secondly, most studies done in the past focused on English football clubs. In this study, we also include other European football clubs. Applying these two points in our study makes it interesting to find out if there are differences compared to studies in the past. Below the hypotheses we want to test in our study are mentioned.

The first hypothesis arises from the main research question of our study: *"Do listed football clubs' match results affect listed clubs' share prices?"* Renneboog and Vanbrabant (2000) were the first that studied this relationship. They came to the conclusion that there is a significant increase in share prices if the match is won, and a significant decrease according to a draw or a loss. This is confirmed by several other studies, for example, Palomino et al. (2008) and Bekraiem et al. (2009). This results in the following hypothesis:

H1: Match results of listed football clubs have significant consequence for the listed clubs' share price; a victory will result in a positive abnormal return, while draws or defeats will lead to negative abnormal stock returns.

The second hypothesis is derived from findings from studies in the past. Corresponding to Duque and Ferreira (2008) and Renneboog and Vanbrabant (2000), Bell et al. (2012) argued that matches which have a larger impact on a club's financial wealth and sports performance also lead to larger changes in share prices. In other words, in a period when the trophies are assigned, match results will lead to larger changes in share prices compared to matches in the rest of the season. This means, matches which make sure the club will play in one of the European competitions next year, or matches which will lead to promotion are expected to have a larger impact on football clubs' share prices. Defining this period, we choose for the last two months of the season.

H2: Match results in the last two months of the season will have larger absolute normal returns compared to matches played in the rest of the season.

The third hypothesis is about the European competitions. Playing in the UEFA Champions League or the UEFA Europa League is crucial for football clubs. Participating in this competition lead to a bonus of 12 million Euro in 2015. Winning a match during the group stage will result in a 1.5 million bonus, where a draw yield 500.000 Euro. Surviving the group stage results in 5.5 million Euro. The amount of money increases every round, winning the Champions League in the season 2015/16 led to a 15 million Euro bonus (UEFA, 2015). Regarding these rewards, success in European competitions is essential to earning high prize money. Besides the rewards football clubs get from the UEFA, also ticket sales will go up because

more matches are played. Renneboog and Vanbrabant (2000) concluded in their study that matches played in European competitions will lead to larger price reactions for listed football clubs compared to National competition matches. This all together leads to the expectation that matches played in European competitions will result in absolute larger abnormal returns compared to matches played in the National leagues. Therefore, hypothesis 3 is formulated as follows:

H3: Matches played in European competitions (UEFA Champions League or UEFA Europa League) will lead to absolute larger abnormal returns compared to matches played in national competitions.

Another interesting point that can be viewed in the data is goal difference. Goal differences in football matches could tell us something about the differences in strength between the two football clubs. When the goal difference is more than two, one could say the result is justly right. This means the winning team is way better than the losing team. For matches with a goal difference below of two or one, one could say both teams are almost equal. Cheffins (1998) mentioned in his study that a large group of shareholders of a football club is fans of this football club. Duque and Ferreira (2005) agreed to Cheffins (1998). Fans of football clubs could react more to a game with a significant goal difference than a match with little goal difference. Therefore, matches with a significant goal difference are expected to have greater absolute returns compared to matches with a small goal difference. This will be tested in this hypothesis:

H4: Matches with larger goal differences lead to larger absolute normal returns compared to matches with lower goal differences.

Comparing the national leagues throughout whole Europe, we cannot ignore the English national leagues. In particular, the Premier League. One of the most striking differences between the Premier League and other leagues is the difference in professionalism. Following the Football Money League (Deloitte, 2016) large differences in, for example, broadcasting rights exist between England and other European countries. It is not only about extra revenues generated from broadcasting rights, but it is also about higher amounts of prize money for being the national champion. This all together led to a significant advantage regarding revenues for English football clubs. For football clubs playing in the Premier League, it is important to get results. Otherwise, they will be punished in a certain way. They will lose a part of the broadcasting rights and receive less income. Taking the above into consideration, it would be expected that results of British football clubs will lead to absolute higher abnormal returns compared to other European football clubs. This results in hypothesis five:

H5: Football matches played by English football clubs will lead to absolute larger abnormal returns compared to football matches played by non-English football clubs.

Andreff and Staudochar (2000) studied the transformation football clubs' have made over the past decades. As mentioned before, overall, strategies has changed for football clubs. This strategy has changed from utility maximizing to profit maximizing. This part of professionalizing the football industry could lead to higher abnormal returns because match results have more important effects on the football club than in the past. This is not the only reason that a difference in abnormal returns is expected between two time periods. Besides professionalism, the football industry is a booming industry over the last years. This is confirmed by acquisitions by rich people. They decide to buy a football club, and since that moment, that particular club can spend much more money than before. Football transfers are becoming more expensive every transfer window. For example, Pogba is bought by Manchester United for more than one hundred million Euro. The booming industry could also be associated with absolute larger abnormal returns. This will be tested by the sixth hypothesis:

H6: Football matches played between 2008-2015 lead to absolute larger abnormal returns compared to football matches played in the period 2000-2007.

Prior hypotheses are mostly focused on financial strategies and possible generated income. However, this is not the only part that could affect share prices. Taking a further look into the shareholders is interesting. In hypothesis three, shareholders' feelings were incorporated. Cheffins (1998) concluded that shareholders of football clubs often are fans of that specific football club. Being shareholder and at the same time, a great fan of the football club could lead to overreacting. This means specifically that this part of the shareholders does not react fully rational to certain events. For this reason, it is very fascinating to take a closer look at derby matches. Derby matches have arisen for several reasons. The most important one is that the fans of both football clubs are rivals. Therefore, derby matches have something extra. It is vital for the fans compared to a 'normal' football match. There are several lists available with the largest sports rivalries by country. Because it is more important for football fans to win a rival match, it is not unexpected that football fans will overreact as shareholders. In a nutshell, this result in larger absolute returns for rivalry matches compared to non-rivalry matches. In our sample, we included rival matches from the official list of sports rivalries by country. The effect of sports rivalries is tested in hypothesis 7:

H7: Rival matches result in absolute larger abnormal returns compared to non-rival matches.

4. Data & Methodology

4.1 Sample selection

Thirty European football clubs that were listed in the period 2000-2015 are included in this sample. We tried to include as many as possible football clubs playing in the highest national divisions. This resulted in 15 football clubs playing in English divisions and 15 clubs playing in other European competitions. The fifteen English football clubs are: Arsenal FC, Aston Villa FC, Birmingham City FC, Bolton Wanderers FC, Charlton Athletic FC, Chelsea FC, Leeds United AFC, Leicester City FC, Manchester City FC, Manchester United FC, Newcastle United FC, Southampton FC, Sunderland AFC, Tottenham Hotspur FC and West Bromwich Albion FC. The other 15 European football clubs are: Juventus FC, SS Lazio, AS Roma (All Italian), FC Porto, Sporting Clube de Portugal, SL Benfica (All Portuguese), Fenerbahçe SK, Galatasaray SK, Beşiktaş JK, Trabzonspor (all Turkish) Olympique Lyonnais (French), Aberdeen FC, Celtic FC (both Scottish), Borussia Dortmund (German) and AFC Ajax (Dutch). Table 16 in Appendix I includes more information about the listing period and how many matches of each club are included in the sample.

4.2 Data sources

To collect all match results for the football clubs in their national leagues, football-data.co.uk is used. This website has an extensive database for almost all European competitions starting from 1993 till last season. Where the period of this study is 2000-2015, all league matches were found. The match results of European matches in de UEFA Champions League and the UEFA Cup/Europa League are gathered from the official website of the UEFA (uefa.com). This results in a total of 12622 football match results of 30 European football clubs. This total of 12622 is reduced to 10915 because in a particular part of the dataset an overlap in event windows between two matches occurred. When this has happened to an international and national match, the national match was removed from the dataset. If the overlap happened to two (inter)national matches, one of the two matches was randomly removed. To collect share price information for each football club, we used Thomson Financial Datastream. Also, the necessary information for the benchmark model and the control variables are gathered from Datastream.

4.3 Methodology

To test the hypotheses mentioned in chapter 3, event studies on several subsamples of the total sample are performed. Event studies are used to determine if, and how much, football club's share prices are affected by football club's performance on the pitch. Regarding Fama's Efficient Market Hypothesis (1970), current prices always reflect all possible and available information. For that reason, a price change short after an

event should be a result of this certain event. In this study, each match result is an event. To organize those event studies, we followed the event study's methodology determined by De Jong and De Goeij (2009).

To be able to conduct an event study, De Jong and De Goeij (2009) set up different steps to follow:

1. Identify the event of interest and in particular the timing of the event.
2. Specify a benchmark model for expected returns
3. Calculate abnormal returns around the event date
4. Test the abnormal returns

Identifying the event

In our study, the events of interest are all football matches included in our sample. The timeline in figure 4 shows how an event study looks like. T_0 is the event date. Our sample includes data between 2000 and 2015. For the estimation window, we used all days available in our sample before the event window. Identifying the timing of the event is more complicated. The events in our sample are football matches. However the date of the football match is not the timing of the event. The first trading day after the match is the first opportunity for shareholders to react to the match result. Therefore, this day is the event date (T_0). The last trading day before the football match is played equals T_{-1}. The second trading day after the football game is T_1. This results in a three-day event window [-1,+1].

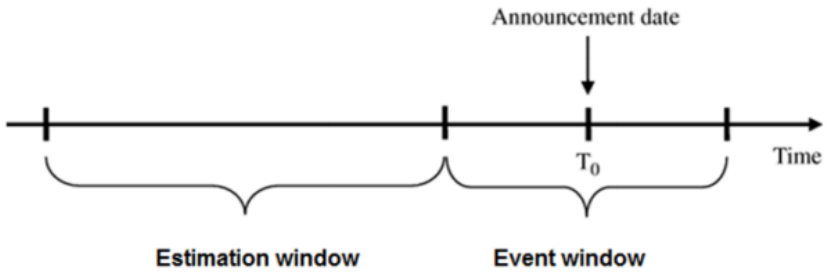

Figure 4: The timeline of an event.

Specify a benchmark model for normal stock returns

The next step in the process is to select a benchmark model. There are several models available, the largest differences between the models are the return models used. After selected a benchmark model, we can continue with the calculation of the abnormal returns. We selected the market model as the benchmark model. We choose this model because it takes differences in beta into account compared to the market-adjusted model. The market-adjusted model assumes that beta is equal to 1. This is obviously not the case for all shares. Therefore, the market model is a good alternative calculating returns. As market return in our

model, we used the MSCI All Country Europe Mid Cap. We did not select the 'normal' MSCI All Country Europe Index because football clubs are more in common with the Mid Cap funds regarding market value and trading volume. The returns (R) and Expected Returns (ER) are calculated using formula 1 and 2.

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (1)$$

$$ER_{it} = \hat{\alpha}_i + \hat{\beta}_i R_{mt} \quad (2)$$

$\hat{\alpha}$ and $\hat{\beta}$ are OLS estimates of the regression analysis coefficients. Shares of English football clubs are less frequently traded. For less frequently- and less volume traded shares, the beta could be downwards biased. Therefore, for some English football clubs, we corrected their beta's upwards.

Calculate abnormal returns

Abnormal returns (AR) are defined as the Return (R) minus the Expected Return (ER) as seen in formula 3 below.

$$AR_{it} = R_{it} - ER_{it} \quad (3)$$

Studying changes in football clubs' share prices, the returns of every single event can be analyzed separately. However, this is not relevant because price movements in shares could be caused by information that is not related to the event. This problem can be solved if we use average abnormal returns of all football. The average abnormal return (AAR) is calculated according to formula 4. The average of all abnormal returns should indicate the effect of the event.

$$AAR_t = \frac{1}{N}\sum_{t=1}^{N} AR_{it} \quad (4)$$

Using formula 4, performance on the event date can be analyzed. However, often this is not the only performance that is tested. Also, the effect over the whole event window [-1, +1] is considered. Therefore, we have to calculate cumulative abnormal returns. This implies all abnormal returns in the event window are combined from the start to the end of the event window (5).

$$CAR_t = AR_{i,t1} + \ldots + AR_{i,t2} = \sum_{t=t1}^{t2} AR_{it} \quad (5)$$

In event studies, the same counts for CAR as for AR. This means that CAR is combined to get the cumulative average abnormal returns (CAAR). This is calculated according to formula 6.

$$CAAR_t = \frac{1}{N}\sum_{t=1}^{N} CAR_{it} \quad (6)$$

Testing abnormal returns

When the abnormal returns are calculated, we can start to analyze them. Regarding the first hypothesis, it has to be tested if these average abnormal returns and cumulative average abnormal returns are significantly different from zero. Therefore, we use a two-sided t-test according to formula 7 and 8.

$$TS = \frac{\bar{X} - \mu_0}{S/\sqrt{n}} \tag{7}$$

$$S = \sqrt{\frac{1}{(T_2 - T_1)+1} \sum_{t=T_1}^{T_2} (AR_{it} - \overline{AR_i})^2} \tag{8}$$

To test hypothesis 2 till 7, for every subsample we tested with the T-statistic according to formula 7. Besides, we want to see whether or not a subsample has significantly different abnormal returns than the other. To see if this difference is statistically significant we use two-sided t-tests assuming unequal sample sizes and unequal variances. Therefore, we used test statistic (9).

$$TS = \frac{\overline{AR1} - \overline{AR2}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \tag{9}$$

4.4 Variable definitions

To test all hypothesis, it is necessary to make several subsamples. To be able to conduct these subsamples, different variables have been constructed. The following variables are conducted:

1. *Victory:* To distinguish victories from draws and defeats, this variable is built. It equals 1 for a victory and 0 for a draw or a loss
2. *Loss:* This variable is constructed to distinguish defeats from draws and victories. If the match ended in a defeat, this variable equals 1. For a draw or a victory, this variable is equal to 0.
3. *End of the Season:* This dummy variable is constructed to distinguish the rest of the season and the end of the season. This variable is equal to 1 if the match of interest has been played in the months April or May. When a match is played in another month, this variable equals 0.
4. *European match:* To be able to make two separate subsamples where European and non-European matches are distinguished, this dummy variable is conducted. This variable equals 1 when the match of interest is played in the UEFA Cup/Europa League or UEFA Champions League. If the match of interest is played in the national competition, the variable equals 0.
5. *Goal Difference:* This variable equals the absolute difference of scored goals between the home- and away team in each match. For the regression analysis also a dummy variable of 'Goal Difference' is conducted. To distinguish 'Large Goal Difference' from 'Small Goal Difference' we decided a two or more goal difference is a large goal difference. The other matches (1 goal difference) are assigned to the Small Goal Difference subsample. The dummy variable is equal to 1 in the case of Large Goal Difference and 0 in all other cases.
6. *English matches:* To be able to test the difference between English and non-English matches, we conducted this dummy variable. Which equals 1 for matches played by English football clubs and 0 if a non-English football club plays the match.
7. *2008-2015:* This variable is conducted to distinguish the time period 2000-07 and 2008-15. This is necessary to test the differences between those two time periods.
8. *Rival:* The dummy variable 'Rival' is true if a match was a football rivalry according to the list of association football rivalries (Wikipedia, 2016). The list of rivalries included in our sample is available in table 17 in Appendix II.

4.5 Descriptive Statistics

Table 5 and 6 demonstrates the descriptive statistics for our sample. Table 5 shows the information for the abnormal returns calculated for the whole sample. This is done for all separate days in our event window (T_{-1}, T_0 and T_1) and the cumulative abnormal return for the three-day event window (T_{-1}, T_1). The average abnormal return of the total sample equals -0,16%. The table shows us also that there are some outliers. A minimum of -46,7% (CAAR) and a maximum abnormal return of 64,4% in one trading day (AR_{-1}).

Table 5 Descriptive Statistics: Abnormal returns and control variables

	N	Mean	St. Dev.	Min.	Q1	Median	Q3	Max.
AR -1	10915	0,00178	0,02909	-0,36093	-0,0678	-0,00006	0,00864	0,64395
AR 0	10915	-0,0016	0,03469	-0,32127	-0,01239	-0,00087	0,00809	0,50951
AR 1	10915	-0,00093	0,0295	-0,32434	-0,01017	-0,00062	0,00736	0,33002
CAR [-1,+1]	10915	-0,00075	0,05278	-0,46670	-0,01912	0,0017	0,01508	0,6410
Size	9917	11.947	0.8723	9.349	11.338	11.9795	12.520	14.083
ROA	9917	-1.521	20.52	-121.25	-10.9	0.48	5.29	76.47
Form	9917	2	1.07	0	1	2	3	4

The original sample included 12622 football matches. Due to overlapping event windows, this sample is reduced to 10915 football matches. For the 10915 matches, the match information is summarized in table 6. Here we distinguished victories, draws and losses for the total sample. Also, all match information per subsample is available in this table. This shows us some interesting differences per sample. In the total sample, 5522 matches are victories. This means, in the total sample, more than 50% of the football matches were won. Therefore, we can conclude that the football clubs included in our sample are well-performing football clubs.

On the other hand, European or rival matches are much less won. This is not unexpected because in the European competitions only the best clubs in Europe take part. The same explanation counts for rival matches. Rival matches are very special matches for both players and fans. This implies those matches are no regular football matches. Therefore, it is expected that it is harder to win a rival match than an ordinary league match. As can be seen in table 6, in the subsample "goal differences" not all 10915 football matches are included. In this subsample, it is tried to compare matches with a significant goal difference to matches without a large goal difference. Matches that ended up in a draw do not have any goal difference at all. That is why draws are excluded to this subsample.

Table 6 Descriptive statistics: Football match information

	Victory	***Draw***	***Loss***	***Total***
Total sample	5522	2593	2800	10915
National League	4691	2140	2231	9062
European League	831	453	569	1853
End of Season	1083	487	535	2105
Rest of Season	4439	2106	2265	8810
Home	3296	1188	954	5438
Away	2226	1405	1846	5477
Large goal diff.	2899	-	1217	4116
Small goal diff.	2623	-	1583	4206
English	1643	1001	1225	3869
Non-English	3879	1592	1575	7046
2000-07	2850	1459	1703	6012
2008-15	2672	1134	1097	4903
Rival	174	143	153	470
Non-rival	5348	2450	2647	10445

5. Results

In this section, the results will be discussed. First, the results of the t-tests. These results will be explained for each hypothesis separately. Besides t-tests, also a regression analysis is performed to find out what the main drivers of the abnormal returns are. How this regression analysis is handled, and the results of this regression analysis will be discussed at the end of this section.

5.1 Event Studies

Hypothesis 1

*Table 7: This table presents the average abnormal returns at each day in the event window for the total sample. The abnormal returns are calculated separately for victories, draws, and losses. Statistically significance at 1%, 5% and 10% is indicated by respectively ***, **, *.*

Total Sample	Victories		Draws		Losses	
Day	*AAR*	*t-stat*	*AAR*	*t-stat*	*AAR*	*t-stat*
T_{-1}	-0,00040	-0,977	-0,00212***	-3,781	-0,00086	-1,625
T_0	0,00482***	9,973	-0,00593***	-9,533	-0,01024***	-15,553
T_1	0,00223***	5,385	0,00171**	3,144	0,00096*	1,893
N	5522		2593		2800	
CAAR [-1,+1]	0,00665***	9,018	-0,00635***	-6,449	-0,01014***	-11,002

To find out if football matches played by listed football clubs would lead to abnormal returns, hypothesis 1 is built. According to the literature, different outcomes for victories, draws and losses are expected. A victory should lead to a positive abnormal return where a draw or loss should result in a negative abnormal return. Table 7 incorporates the results for hypothesis 1, where the total sample is included. Table 7 incorporates the average abnormal returns for each trading day in the event window (-1, 0 and 1) and the corresponding t-values. A distinction is made between victories, draws, and losses. For victories, positive abnormal returns at both day 0 and day 1 occurred. Both abnormal returns are significant at a 1% significance level. At day -1 a slightly negative abnormal return occurs, but this result is insignificant. A victory leads to a 0.48% positive abnormal return the first day after the football match. The second day after the game this return is 0.22%. Over the three-day period, CAAR shows a positive abnormal return of 0.67%, significant at a 1% significance level. For victories, it can be concluded that they lead to positive abnormal returns. Analyzing draws and losses, negative abnormal returns at day 0, -0.59% for a draws and -1.02% for losses appeared. Besides that, CAAR is negative for both draws and losses, respectively -0.63% and -1.01%. The mentioned outcomes for tied and lost matches are significant at a 1% significance level. As referred to in the previous section, the total sample exists of well-performing football clubs. This means that a victory is more expected than a draw or a loss. This could explain the difference in abnormal for victories, draws, and losses. A tied match is a less severe outcome than a loss. For that reason the abnormal

returns for losses are more negative than for draws. Comparing these results to the existing literature, it can be concluded that the results are in line with prior research. Palomino, Renneboog and Zhang (2008), Renneboog and VanBrabant (2000) and Bell et al. (2012) all find larger abnormal returns for tied or lost matches compared to a victory.

Hypothesis 2

*Table 8: This table presents the average abnormal returns for the subsamples 'End of Season' and 'Rest of Season' separately. It also includes the difference between both subsamples at the event date. Statistically significance at 1%, 5% and 10% is indicated by respectively ***, **, *.*

End of Season	Victories		Draws		Losses	
Day	*AAR*	*t-stat*	*AAR*	*t-stat*	*AAR*	*t-stat*
T_{-1}	0,00428***	3,784	0,00239**	2,283	0,00153	1,3254
T_0	0,00269**	2,251	-0,00621***	-4,209	-0,00897***	-5,370
T_1	-0,00065	-0,674	-0,00236*	-1,859	-0,00357***	-2,940
N	1083		487		535	
CAAR [-1,+1]	0,00633***	3,166	-0,00618**	-2,565	-0,01100***	-5,039
Rest of Season	Victories		Draws		Losses	
Day	*AAR*	*t-stat*	*AAR*	*t-stat*	*AAR*	*t-stat*
T_{-1}	0,00173***	3,979	0,00155**	2,486	0,00083	1,465
T_0	0,00534***	10,378	-0,00587***	-5,448	-0,01054***	-15,439
T_1	-0,00034	-0,664	-0,00207***	-3,307	0,00033	0,559
N	4439		2106		2265	
CAAR [-1,+1]	0,00673***	8,657	-0,00639***	-5,932	-0,00993***	-16,828
End of Season - Rest of Season	Victories		Draws		Losses	
	AAR	*t-stat*	*AAR*	*t-stat*	*AAR*	*t-stat*
T_0	-0,00265**	-2,037	-0,00033	-0,206	0,00158	0,874

To test if matches played at the end of the season affecting football clubs' share prices more than matches played in the rest of the season, two subsamples are generated. Firstly, event studies for both subsamples separately are conducted. After that, both subsamples are compared to each other to see if there is a significant difference between the subsamples. Looking to both subsamples separately, they are in line with the results for the whole sample; Positive abnormal returns for winning matches and negative abnormal returns for tied and lost matches. This is not unexpected for 'Rest of Season' because this subsample includes 80% of the total sample. Comparing the differences between the subsamples at the event date (T_0) shows impressive results. It was expected that results at the end of the season would affect share prices more because at the end of the season results are more important regarding next year's revenues. This manifests in next year's income for participating in European competitions, greater sponsor deals and higher

revenues from TV-rights. Unfortunately, the results at the event date are not as expected. For draws and losses, no significant results are found. For victories, a significant result is obtained. Matches played in the rest of the season have a higher abnormal return than matches played in the rest of the season. Although this is not as expected, this result can be explained. At the event date, the average abnormal returns for 'Rest of Season' are much higher than 'End of Season'. Looking to the abnormal returns at day -1, it can be seen that for the subsample 'End of Season' the abnormal return is much higher than 'Rest of Season'. A possible explanation for the unexpected result at the event date could be that for matches at the end of the season a higher abnormal return occurs one day before the event date. Overall, according to the results in table 8, Hypothesis 2 should be rejected.

Hypothesis 3

*Table 9: This table presents the average abnormal returns for the subsamples 'European' and 'National' separately. It also includes the difference between both subsamples at the event date. Statistically significance at 1%, 5% and 10% is indicated by respectively ***, **, *.*

European	Victories		Draws		Losses	
Day	*AAR*	*t-stat*	*AAR*	*t-stat*	*AAR*	*t-stat*
T_{-1}	0,00555***	5,152	0,00456***	3,081	0,00157*	1,274
T_0	0,00042	0,379	-0,00832***	-5,279	-0,01591***	-10,374
T_1	-0,00179	-1,523	-0,00487***	-3,045	0,00084	0,653
N	831		453		569	
CAAR [-1,+1]	0,00419**	2,469	-0,00863***	-3,408	-0,01351***	-6,507
National	Victories		Draws		Losses	
Day	*AAR*	*t-stat*	*AAR*	*t-stat*	*AAR*	*t-stat*
T_{-1}	0,00164***	3,664	0,00110*	1,907	0,00081	1,456
T_0	0,00560***	10,695	-0,00543***	-8,125	-0,00879***	-12,649
T_1	-0,00016	-0,359	-0,00154***	-2,618	-0,00130**	-2,232
N	4691		2140		2231	
CAAR [-1,+1]	0,00709***	4,184	-0,00587***	-5,504	-0,00928***	-6,291
European - National	Victories		Draws		Losses	
	AAR	*t-stat*	*AAR*	*t-stat*	*AAR*	*t-stat*
T_0	-0,00518***	-4,230	-0,00289*	-1,689	-0,00712***	-4,226

To find out whether football matches played in the UEFA Champions League or UEFA Cup will affect share prices more than football matches played in the national competitions, the total sample is divided into two subsamples. Analyzing the results in table 9, a positive, significant abnormal return occurs for European victories on day -1. This abnormal return (0.55%) is much larger than the abnormal return for victories in national leagues (0.16%). The results for domestic leagues are corresponding to the total sample. Analyzing

CAARs, both National league matches, and European league matches show expected significant results. Both subsamples suggest to not reject hypothesis 1 because victories lead to positive abnormal returns over the entire event period, where draws and losses are affecting share prices negatively. According to hypothesis 3, it is expected that European football matches would lead to absolute larger abnormal returns compared to National league football matches. Analyzing the event date, this is not the case for victories. This could be due to a higher abnormal return at day -1 for European matches compared to National matches. For tied and lost matches, it can be concluded that matches played in European competitions lead to absolute higher abnormal returns in comparison to the national competitions. For draws, this results is significant at a 10% significance level, and for lost matches, this is significant at 1%. Comparing these results to the existing literature, Renneboog and VanBrabant found different results. They did not found significant results for losing matches, only for victories and draws. Table 9 also shows significant results for losses. The differences in results compared to Renneboog and VanBrabant could have several reasons. For example, their European subsample was much smaller. They included less than 100 matches in this subsample. The little sample size could affect the outcomes.

Hypothesis 4

*Table 10: This table presents the average abnormal returns for the subsamples 'Large goal difference' and 'small goal difference' separately. It also includes the difference between both subsamples at the event date. Statistically significance at 1%, 5% and 10% is indicated by respectively ***, **, *.*

Large goal diff.	Victories		Losses	
Day	*AAR*	*t-stat*	*AAR*	*t-stat*
T_{-1}	0,00210***	3,619	0,00055	0,737
T_0	0,00566***	8,761	-0,01026***	-10,599
T_1	-0,00071	-1,302	-0,00143*	-1,707
N	2899		1217	
CAAR [-1,+1]	0,00704***	7,087	-0,01114***	-7,824
Small goal diff.	Victories		Losses	
	AAR	*t-stat*	*AAR*	*t-stat*
T_{-1}	0,00238***	4,019	0,00128*	1,851
T_0	0,00390***	5,553	-0,01022***	-12,057
T_1	-0,00006	-0,102	-0,00043	-0,623
N	2623		1583	
CAAR [-1,+1]	0,00622***	5,665	-0,00937***	-7,757
Large - Small	Victories		Losses	
	AAR	*t-stat*	*AAR*	*t-stat*
T_0	0,00175*	1,836	-0,00004*	1,6454

In the fourth hypothesis, it is tried to find out if there is a significant difference between football matches that ended with a small goal difference or a large goal difference. Table 10 shows the results for both subsamples. Overall, both subsamples show expected directions of abnormal returns. Testing this hypothesis, draws are excluded. Comparing the subsamples, only small differences could be mentioned. For winning matches, indeed, the abnormal return at the event date is higher (0.18%) than matches with a small goal difference. For lost matches, the difference is negligible (0.004%). However, both results are significant at a 10% significance level. Comparing these results to prior research, Duque and Fereirra (2005) also found absolute higher abnormal returns for matches with larger goal differences. Therefore, these results are in line with the existing literature. This implies there is no reason for rejecting the fourth hypothesis.

Hypothesis 5

*Table 11: This table presents the average abnormal returns for the subsamples 'English' and 'non-English' separately. It also includes the difference between both subsamples at the event date. Statistically significance at 1%, 5% and 10% is indicated by respectively ***, **, *.*

English	Victories		Draws		Losses	
Day	*AAR*	*t-stat*	*AAR*	*t-stat*	*AAR*	*t-stat*
T_{-1}	0,00010	0,207	0,00017	0,320	0,00065	1,149
T_0	0,00551***	5,536	-0,00124**	-2,147	-0,00582***	-7,589
T_1	0,00213***	3,603	-0,00146***	-2,866	-0,00087	-1,281
N	1643		1001		1225	
CAAR [-1,+1]	0,00773***	3,324	-0,00253	-1,489	-0,00605***	-2,990
Non-English	Victories		Draws		Losses	
Day	*AAR*	*t-stat*	*AAR*	*t-stat*	*AAR*	*t-stat*
T_{-1}	0,00313***	2,736	0,00267***	2,937	0,00121	1,420
T_0	0,00453***	3,337	-0,00889***	-7,283	-0,01367***	-9,761
T_1	-0,00147	-1,367	-0,00254**	-2,516	-0,00086	-0,979
N	3879		1592		1575	
CAAR [-1,+1]	0,00619*	1,882	-0,00943***	-2,903	-0,01332***	-5,063
English – Non-English	Victories		Draws		Losses	
	AAR	*t-stat*	*AAR*	*t-stat*	*AAR*	*t-stat*
T_0	0,00097	0,995	0,00765***	6,597	0,00785***	6,375

To find out if there is a difference in abnormal returns for English football clubs compared to other European football clubs, hypothesis 5 is conducted. Table 11 includes the results for the subsamples. Studying both subsamples, it can be concluded that English football clubs do not have significant abnormal returns at day -1. Both samples exist of a subsequently large part of the total sample. Therefore, the directions of the

abnormal returns are, as expected, in line with the total sample. Analyzing the differences between both samples at the event date, victories do not show significant outcomes. Only tied and lost matches show significant results. Both draws and losses for non-English football clubs show absolute higher abnormal returns than English football clubs. It was expected, due to the booming football industry in England, that share prices would be affected more in England than in the rest of Europe. According to the Deloitte Football Money Leagues (2006, 2010 & 2016) TV-rights and sponsor deals are much higher in England. To take advantage of this, it is important to stay at the highest level. Therefore absolute higher abnormal returns were expected for English football clubs. Table 11 shows that it is not the case in this sample. Apparently, non-English football clubs are punished more for a tie or a loss.

Hypothesis 6

*Table 12: This table presents the average abnormal returns for the subsamples '2000-2007' and '2008-2015' separately. It also includes the difference between both subsamples at the event date. Statistically significance at 1%, 5% and 10% is indicated by respectively ***, **, *.*

2000-2007	Victories		Draws		Losses	
	AAR	*t-stat*	*AAR*	*t-stat*	*AAR*	*t-stat*
T_{-1}	0,00098	1,625	0,00148**	2,381	0,00150**	2,458
T_0	0,00342***	3,309	-0,00421***	-5,249	-0,00906***	-10,402
T_1	0,00060	0,920	-0,00167**	-2,544	-0,00107	-1,522
N	2850		1459		1703	
CAAR [-1,+1]	0,00500**	2,176	-0,00440*	-1,786	-0,00863***	-3,982
2008-2015	Victories		Draws		Losses	
	AAR	*t-stat*	*AAR*	*t-stat*	*AAR*	*t-stat*
T_{-1}	0,00356***	2,727	0,00200**	2,112	0,00014	0,150
T_0	0,00632***	4,276	-0,00815***	-6,718	-0,01208***	-7,792
T_1	-0,00147	-1,198	-0,00271***	-2,646	-0,00055	-0,588
N	2672		1134		1097	
CAAR [-1,+1]	0,00841**	2,242	-0,00887***	-3,445	-0,01249***	-4,629
2000-2007 - 2008-2015	Victories		Draws		Losses	
	AAR	*t-stat*	*AAR*	*t-stat*	*AAR*	*t-stat*
T_0	-0,00290***	-3,034	0,00395***	3,101	0,00302**	2,176

Over the past decades, football clubs are transformed from utility maximizing to profit-maximizing organizations (Andreff and Staudochar, 2000). This means revenues and money became priority number 1. Besides the changing strategy, the football business is booming over the last years. More and more money is invested in the football industry. Transfers reach enormous amounts, and TV-rights generate more and more money. This all taken into account, it is expected that a more recent period should lead to absolute

higher abnormal returns because match results could have far-reaching consequences regarding revenues. The outcomes are summarized in table 12. Comparing the two different periods at the event date, significant results occur, regardless the match result. In subsample '2000-2007' a victory lead to a 0.34% abnormal return. In subsample '2008-2015', which is the most recent time period, this equals an abnormal return of 0.63%. Almost twice as high. For draws and losses, the same counts. Higher absolute abnormal returns occur in the most recent period. For victories and draws the results are significant at a 1% significance level, for losses at a 5% level. Therefore, there is no reason to reject Hypothesis 6.

Hypothesis 7

*Table 13: This table presents the average abnormal returns for the subsamples 'European' and 'National' separately. It also includes the difference between both subsamples at the event date. Statistically significance at 1%, 5% and 10% is indicated by respectively ***, **, *.*

Rivalry	Victories		Draws		Losses	
Day	*AAR*	*t-stat*	*AAR*	*t-stat*	*AAR*	*t-stat*
T_{-1}	-0,00089	-0,542	0,00349*	1,918	0,00564	1,325
T_0	0,00449*	1,842	-0,00483**	-2,532	-0,01134***	-5,370
T_1	-0,00122	-0,734	0,00003	0,014	-0,00318***	-2,940
N	174		143		153	
CAAR [-1,+1]	0,00238	0,760	-0,00131	-0,367	-0,00888**	-2,0088
non-Rivalry						
	Victories		Draws		Losses	
	AAR	*t-stat*	*AAR*	*t-stat*	*AAR*	*t-stat*
T_{-1}	0,00233***	5,496	0,00160**	2,838	0,00069	1,344
T_0	0,00484***	9,969	-0,00600***	-9,240	-0,01018***	-15,516
T_1	0,00484***	11,313	-0,00225***	-3,897	-0,00073	-1,356
N	5348		2450		2647	
CAAR [-1,+1]	0,00679***	8,997	-0,00665***	-6,507	-0,01021***	-10,852
Rivalry – non-Rivalry						
	Victories		Draws		Losses	
	AAR	*t-stat*	*AAR*	*t-stat*	*AAR*	*t-stat*
T_0	-0,00035	-0,140	0,00117	0,582	-0,00116	-0,4123

The last hypothesis tested in this study is about rival matches in football. Cheffins (1998) considered the shareholders who own the football club. He found that a subsequent part of the shareholders is a fan of the particular football club. For football fans, rival matches are the most important matches of the season. For several reasons, a rival match arise. This could lead to overreacting. Especially in rival matches. The rival matches included in the sample can be found in Appendix II, table 17. Analyzing the results in table 13, it can be concluded that rival matches much less end up in a victory. Only 37% of the rival matches are won.

For non-rival matches, this is more than 50%. This is not unexpected because rival matches are very special matches for both the teams as the supporters. Analyzing the subsample 'Rival' shows only significant at 1% for losses. Non-rival matches show very common results to the total sample. This is because around 96% of the total sample exists of non-rival matches. Comparing rival matches to non-rival matches, victories and draws do not show expected results. For losses, the abnormal return at event date is lower than non-rival matches, which is as expected. Unfortunately, all three results are insignificant. A possible explanation for the insignificance could be the small sample size for rival matches.

5.2 Regression Analysis

In addition to the event studies, a regression analysis is performed. This regression analysis is performed to find the drivers of abnormal returns. The cumulative abnormal returns (CAR) are regressed on the independent variables tested in the hypotheses, and three control variables. Before performing the regression analysis, the correlation matrix in table 14 is analyzed. This matrix includes all correlation coefficients between the eight independent variables. As shown in table 14, the most independent variables have small correlation coefficients. Some variables show positive correlation coefficients, for example, Goal difference and Victory (0.3010). Others show negative correlation coefficients, for example, European and End of Season (-0.1363). The results are not shocking, only Victory and Loss shows a highly negative correlation. For the regression analysis, this is not a problem.

Table 14: Correlation matrix; shows correlation coefficients between the independent variables

	Victory	*Loss*	*End of Season*	*European*	*Goaldiff.*	*English*	*200815*	*Rival*
Victory	1,0000							
Loss	-0,5949	1,0000						
End of Season	0,0074	-0,0020	1,0000					
European	-0,0434	0,0484	-0,1363	1,0000				
Goal diff.	0,3010	0,0769	-0,0009	-0,0144	1,0000			
English	-0,1271	0,1082	-0,0117	-0,1461	-0,0234	1,0000		
200815	0,0710	-0,0674	0,0066	0,0970	0,0091	-0,3824	1,0000	
Rival	-0,0602	0,0368	0,0194	-0,0938	-0,0320	-0,0178	0,0076	1,0000

Besides the independent variables, also three control variables are included in the regression analysis. The control variables are Size, ROA and Form. Size is measured by the natural log of total assets. This controls for the size effect. ROA is included as a measurement of profitability. A football club with a high profitability could be related with higher CARs. The last control variable is Form. Form measures how many matches of the last four matches played, are won. This would give an indication how well-performing the football club is at the event date. This variable could have a value from 0 till 4. If clubs have won four

out of four, a next win is not unexpected. A next win could lead to an absolute smaller abnormal return than when Form has value 0. This resulted in the following regression model:

$$CAR_{it} = \alpha_0 + \beta_1 D_{Victory} + \beta_2 D_{Loss} + \beta_3 D_{End\ of\ Season} + \beta_4 D_{European} + \beta_5 D_{Goal\ Difference} + \beta_6 D_{English} + \beta_7 D_{2008-2015} + \beta_8 D_{Rival} + \beta_9 Size + \beta_{10} ROA + \beta_{11} Form + \varepsilon_0$$

The OLS regression results are displayed in table 15. The dummies Victory and Loss are expected to be the most important in this model. Looking at the regression which includes all variables, it can be concluded that a victory is positively related to CAR (0.0141) and a loss is negatively related to CAR (-0.0040). This corresponds with the event studies in hypothesis 1. Analyzing the independent variables further, only the variables English and 2008-2015 show significant results, respectively at a 5% and a 1% significance level. English football matches are positively related to CAR in this regression; this means a higher CAR for English football matches. The coefficient for 2008-2015 has the same direction as English has. Therefore, a football match played in a more recent period is positively related to CAR. In the previous section, it was suggested to reject hypothesis 2. Matches played at the end of the season were affecting CAR less as expected, compared to matches played in the rest of the season. The same outcome can be seen in table 15. However, the results into this relationship are not significant at a 10% significance level. Analyzing the control variables, it can be concluded that Size is negatively related to CAR (-0.0025). ROA and Form do not show significant results.

There are also regressions performed for victories, draws and losses separately. The results of those regressions could be seen in Appendix III, which includes table 18, 19 and 20. Analyzing these results, in general, the same variables shows significant results. Only the directions of the independent variables are more positive for the 'Victory model' and more negative for the Draw and Loss model. This corresponds to the expectations and findings mentioned before. As well as in table 15 as in the performed regression by match outcome, the dependent variable CAR is regressed on all control variables and every time a single independent variable is added. In table 15, the directions of the coefficients cannot be analyzed. The existing literature and findings by previous researches did show different directions for victories compared to draws and losses. This is because a victory is expected to be positively related, where draws and losses are supposed to affect abnormal returns negative. Therefore, the results of the regressions in Appendix III are more impressive. For example, a winning match with a high goal difference affects CAR positive (0.0116) significantly at a 1% significance level. Analyzing goal difference for lost matches, this shows a negative relation (-0.0121), at a 1% significance level. Comparing goal differences in the regressions which include all variables for both victories and losses. It can also be concluded that for victories goal difference is positively related to CAR and for losses negative related to CAR. Respectively (0.0013) and (-0.0200). However, these results are not significant at a 10% significance level.

*Table 15: This table presents the OLS regression results for several regressions. Statistically significance at 1%, 5% and 10% is indicated by respectively ***, **, *.*

	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]
Constant	0,0172**	0,0186***	0,0289***	0,0174**	0,0145*	0,0158**	0,0131*	0,0223***	0,0170**	0,0196**
	(0,019)	*(0,000)*	*(0,000)*	*(0,018)*	*(0,051)*	*(0,031)*	*(0,089)*	*(0,006)*	*(0,021)*	*(0,017)*
Size	-0,0017***	-0,0024***	-0,0023***	-0,0017***	-0,0014**	-0,0017***	-0,0014**	-0,0022***	-0,0016***	-0,0025***
	(0,007)	*(0,000)*	*(0,000)*	*(0,007)*	*(0,026)*	*(0,007)*	*(0,026)*	*(0,002)*	*(0,009)*	*(0,000)*
ROA	0,0000	0,0000	0,0000	0,0000	0,0000	0,000	0,0000	0,0000	0,0000	0,0000
	(0,669)	*(0,894)*	*(0,872)*	*(0,664)*	*(0,662)*	*(0,688)*	*(0,730)*	*(0,556)*	*(0,663)*	*(0,948)*
Form	0,0011**	0,0005	0,0007	0,0011**	0,0012**	0,0010**	0,0013**	0,0010**	0,0011**	0,0008
	(0,033)	*(0,358)*	*(0,163)*	*(0,033)*	*(0,019)*	*(0,048)*	*(0,014)*	*(0,043)*	*(0,031)*	*(0,117)*
Victory		0,0161***								0,0141***
		(0,000)								*(0,000)*
Loss			-0,0134***							-0,0041**
			(0,000)							*(0,011)*
End of Season				-0,0008						-0,0012
				(0,558)						*(0,379)*
European					-0,0041***					-0,0022
					(0,005)					*(0,144)*
Goal diff.						0,0043***				0,0003
						(0,000)				*(0,805)*
English							0,0022*			0,0046***
							(0,068)			*(0,000)*
2008-20015								0,0019		0,0028**
								(0,120)		*(0,026)*
Rivalry									-,00284	-0,0003
									(0,285)	*(0,899)*
adj. R2	0,0007	0,0232	0,0125	0,0007	0,0014	0,0022	0,0010	0,0009	0,0008	0,0250

6. Conclusion, limitations and future research

6.1 Conclusion

Football is one of the most beautiful sports in the world. Since the finding of football in the United Kingdom in the nineteenth century, many has changed in the wonderful world of football. The industry has evolved into a multimillion industry nowadays. According to Deloitte's Football Money League, revenues are increasing every year. In their journey to raise capital, some football clubs decided to be a publicly listed company through an Initial Public Offering (IPO). Unfortunately, recent data shows that most of the IPOs did not succeed (table 4). Many football clubs that were listed once are now delisted.

In this study, the share price reaction caused by football match performance is investigated. Firstly, this is done by event studies. Also, an OLS regression is performed to find out the primary drivers of the CAR. The event studies showed that victories are positively related to abnormal returns (0.482%) at day 0. Day 0 is the first trading day after the football match, the first moment for shareholders to react to the match performance. According to the event studies, draws and losses have an adverse effect on the abnormal returns, respectively -0.59% and -1.02%. These numbers indicate that football clubs are more penalized by a draw or a loss than they are rewarded for a victory. This is in line with the existing literature. Renneboog and Vanbrabant (2000) found a 1% abnormal return for victories and -1,4% for losses. Analyzing the entire event window, CAR is positive and significant for victories, negative and significant for draws and losses. For several types of matches, different hypotheses are generated. Comparing matches played in European competitions to domestic league matches; it was expected European matches would lead to absolute higher abnormal returns. At day 0, the event study shows a significant result that would reject this hypothesis for victories. National league matches show absolute higher abnormal returns. To find out what the reason could be, day -1 is related with much greater abnormal returns for European matches compared to National League matches.

Investigating if there is a difference in abnormal returns for rival matches was a newly introduced hypothesis. It was expected that rival matches would lead to absolute higher abnormal returns because shareholders often are fans of the football club (Cheffins, 1998). In this study, this is the case for losses. However, the results are not significant at a 10% significance level. A reasonable explanation for these insignificant results could be the sample size of Rival matches was too small. Besides that, rival matches are much less won. Investigating the time effect, it can be concluded that a match played in the period 2000-2007 affects share prices less than a match in 2008-2015. The event study presents significant results for victories, draws and losses.

Performing the regression analysis, it was tried to find the primary drivers of the CARs. Therefore, it can be concluded that the match outcome is the most important driver. Positive for a victory (1,4%) and negative for a loss (-0,4%) if all variables are included. Besides that, the variables English and 2008-2015 show significant results. Both variables are positively related to the abnormal returns (0.46% and 0.28%). Therefore hypothesis 5 and 6 will be accepted.

The regression analysis shows an adjusted R^2 is 2.5%, in the study of Renneboog and Vanbrabant (2000) this equalizes almost 6%, which is more as twice as high as this study. 2.5% of the variation in abnormal returns is explained by the regression. However the adjusted R^2 is not as high as the prior studies regarding this topic, different datasets, time periods and methods could lead to different adjusted R^2s.

6.2 Limitations

As there are various studies regarding match performance related to abnormal returns, different methods are used in the studies. There are a few limitations in this study. This study investigates for football clubs in Europe. From the thirty clubs included, fifteen clubs are from England. This implies too many English football clubs are involved. The sample is not equally divided over Europe. This is a result of the simple fact football clubs in the United Kingdom are much more likely to be publicly listed compared to the rest of Europe.

Regarding the regression analysis, data from the control variables Size and ROA were not always available. This resulted in a smaller sample size performing the regression. In the regression only 9917 football matches were included, where the event studies consisted of 10915 football matches. Therefore, the sample size is decreased by almost 10%. Incorporating ROA as a measure of profitability, this study tried to investigate if profitability affects CAR. This is tried both for ROA and a natural log of ROA; both resulted in insignificant miniscule outcomes. This is not what was expected and could be seen as a limitation for this research.

Another limitation could be found regarding the control variables. It was supposed to incorporate country fixed effects in the regression analysis. Unfortunately, the dummy variables per country showed high correlations to the variable English. Therefore, the country fixed effects are only measured for English and non-English countries instead of each country separately.

6.3 Future Research

Overall, the results of this study correspond with the results of researches in the past. Any suggestions regarding future research could be to investigate more in CAR than abnormal returns separately. In this study, different subsamples are compared to find out if there are any differences in abnormal returns. The

abnormal returns of the specific event date are used to test this. As the results show, this is not always what is expected. Analyzing CAR instead of day 0 would solve this problem. The sample consists moreover of well-performing football clubs. Future research could better use more various football clubs from different countries.

Besides that, it is interesting to think about other hypotheses to investigate in. Regarding prior studies, mostly the same hypotheses were tested. An interesting hypothesis could be to check if the capacity utilization in the football stadiums affects the share price. Deloitte (2010) shows in their yearly Football Money League that English football clubs score higher on capacity utilization. This affects the advantage that home playing football teams should have.

Not only other hypotheses could be interesting for future research, but also different tests or methods could give new insights on this topic. Thinking about other beta calculations should help to achieve this. Football clubs have low trading volumes and therefore low betas. Dimson (1979) found a way to correct the betas for small trading volumes. This kind of method innovations could develop research about match performance and share price reactions.

7. References

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8. Appendices

Appendix I: Football clubs included in sample.

Table 16: This table incorporates all football clubs included in this study. Country where the football club comes from, IPO date, Delisting date if available and how many matches of the football club are included in the study.

Club	Country	IPO date	Delisting date	Matches in sample
Aberdeen	Scotland	1-2-2000	4-8-2003	125
Ajax	Netherlands	11-5-1998	still listed	602
Arsenal	England	9-8-2002	still listed	565
AS Roma	Italy	22-5-2000	still listed	615
Aston Villa	England	6-5-1997	14-8-2006	236
Benfica	Portugal	21-5-2007	still listed	290
Besiktas	Turkey	19-2-2002	still listed	500
Birmingham City	England	1-4-1997	12-10-2009	351
Bolton	England	1-4-1997	30-4-2003	88
Borrusia Dortmund	Germany	30-10-2000	still listed	550
Celtic	Scotland	1-9-1995	still listed	659
Charlton	England	20-3-1997	21-9-2006	239
Chelsea	England	29-3-1996	26-8-2003	128
FC Porto	Portugal	1-6-1998	still listed	578
Fenerbache	Turkey	17-9-2004	still listed	415
Galatasaray	Turkey	19-2-2002	still listed	516
Juventus	Italy	19-12-2001	still listed	568
Lazio Roma	Italy	6-5-1998	still listed	612
Leeds United	England	1-8-1996	28-4-2004	171
Leicester City	England	22-4-1997	25-11-2002	108
Manchester City	England	26-2-2002	23-7-2007	156
Manchester United*	England	7-6-1991	still listed	379
Newcastle United	England	1-4-1997	18-7-2007	295
Olympique Lyonnais	France	8-2-2007	still listed	368
Southampton	England	21-4-1994	2-10-2009	354
Sporting Lissabon	Portugal	2-6-1998	still listed	273
Sunderland	England	1-12-1996	5-8-2004	162
Tottenham Hotspur	England	1-10-1983	16-1-2012	447
Trabzonspor	Turkey	15-5-2005	still listed	375
West Bromich Albion	England	1-2-1998	11-1-2005	190

*****Manchester United is delisted in 2006 and listed again on the NYSE in 2012

Appendix II: European Rivalries.

*Table 17: This table incorporates the rival matches included in this study. Source: List of association football club rivalries in Europe (*List of association football rivalries, Wikipedia 2016*)*

Rival match	Derby Name
Aberdeen - Dundee United	*New Firm*
Ajax - Feyenoord	*De Klassieker*
Arsenal - Chelsea	*London Derby*
Arsenal - Tottenham	*North London Derby*
Aston Villa - Birmingham	*Second City Derby*
Aston Villa - West Brom	*West Midlands Derby*
Benfica - Sp Lisbon	*Derby de Lisboa*
Boavista - Porto	*Porto Derby*
Celtic - Rangers	*Old Firm*
Charlton - Crystal Palace	*South London Derby*
Chelsea - Fulham	*West London Derby*
Coventry - Leicester	*M69 Derby*
Dortmund - Schalke	*Revierderby*
Fenerbahce - Galatasaray	*Intercontinental Derby*
Inter - Juventus	*Derby d'Italia*
Juventus - Torino	*Derby della Mole*
Lazio - AS Roma	*Derby della Capitale*
Leeds - Manchester United	*War of the Roses*
Manchester United - Manchester City	*Manchester Derby*
Liverpool - Manchester United	*North-West Derby*
Lyon - Olympique Marseille	*Choc des Olympiques*
Lyon - St Etienne	*Derby Rhônalpin*

Appendix III: Regression results.

*Table 18: This table presents the OLS regression results for victories only. Statistically significance at 1%, 5% and 10% is indicated by respectively ***, **, *.*

	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]
Constant	0,0172**	0.0186***	0.0169**	0.0193***	0.193***	0.0128*	0.0400***	0.0172**	0.0259***
	(0,019)	*(0.000)*	*(0.021)*	*(0.009)*	*(0.008)*	*(0.081)*	*(0.000)*	*(0.019)*	*(0.001)*
Size	-0,0017***	-0.0024***	-0.0017***	-0.0019***	-0.0020***	-0.0015**	-0.0038***	-0.0017***	-0.0030***
	(0,007)	*(0.000)*	*(0.006)*	*(0.003)*	*(0.001)*	*(0.016)*	*(0.000)*	*(0.007)*	*(0.000)*
ROA	0,0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0,669)	*(0.894)*	*(0.711)*	*(0.667)*	*(0.893)*	*(0.867)*	*(0.460)*	*(0.671)*	*(0.971)*
Form	0,0011**	0.0005	0.0010**	0.0010**	0.0007	0.0005***	0.0007	0.0011**	0.0006
	(0,033)	*(0.358)*	*(0.051)*	*(0.045)*	*(0.165)*	*(0.005)*	*(0.157)*	*(0.034)*	*(0.246)*
Victory		0.0161***							0.0121***
		(0.000)							*(0.000)*
End of Season			0.0081***						-0.0011
			(0.000)						*(0.556)*
European				0.0060***					-0.0030
				(0.003)					*(0.167)*
Goal diff.					0.0116***				0.0013
					(0.000)				*(0.371)*
English						0.0111***			0.0037**
						(0.000)			*(0.038)*
2008-20015							0.0146***		0.0064***
							(0.000)		*(0.000)*
Rivalry								0.0025	-0.0057
								(0.572)	*(0.193)*
adj. R^2	0,0007	0.0232	0.0027	0.0015	0.0097	0.0060	0.0134	0.0007	0.0246

*Table 19: This table presents the OLS regression results for draws only. Statistically significance at 1%, 5% and 10% is indicated by respectively ***, **, *.*

	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]
Constant	0,0172**	0.0189***	0.0175**	0.0158**	0.0187**	0.0111	0.0172**	0.0149**
	(0,019)	*(0.010)*	*(0.017)*	*(0.031)*	*(0.012)*	*(0.136)*	*(0.008)*	*(0.049)*
Size	-0,0017***	-0.0016***	-0.0017***	-0.0015**	-0.0018***	-0.0011*	-0.0017***	-0.0013**
	(0,007)	*(0.008)*	*(0.007)*	*(0.014)*	*(0.005)*	*(0.088)*	*(0.008)*	*(0.038)*
ROA	0,0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0,669)	*(0.756)*	*(0.662)*	*(0.666)*	*(0.649)*	*(0.903)*	*(0.669)*	*(0.864)*
Form	0,0011**	0.0010**	0.0010**	0.0011**	0.0010**	0.0011**	0.0011**	0.0011**
	(0,033)	*(0.048)*	*(0.040)*	*(0.024)*	*(0.046)*	*(0.026)*	*(0.033)*	*(0.026)*
Draw		-0.0080***						-0.0089***
		(0.000)						*(0.000)*
End of Season			-0.0068***					-0.0011
			(0.008)					*(0.703)*
European				-0.0085***				-0.0007
				(0.002)				*(0.824)*
English					-0.0027			0.0051**
					(0.145)			*(0.041)*
2008-20015						-0.0096***		-0.0024
						(0.000)		*0.329*
Rivalry							-0.0003	0.0062
							(0.958)	*(0.202)*
adj. R^2	0,0007	0.0047	0.0013	0.0016	0.0009	0.0036	0.0006	0.0061

*Table 20: This table presents the OLS regression results for defeats only. Statistically significance at 1%, 5% and 10% is indicated by respectively ***, **, *.*

	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]	CAR[-1,+1]
Constant	0,0172**	0.0289***	0.0191***	0.0152**	0.0233***	0.0243***	0.0101	0.0169**	0.0250***
	(0,019)	*(0.000)*	*(0.009)*	*(0.039)*	*(0.002)*	*(0.001)*	*(0.171)*	*(0.021)*	*(0.001)*
Size	-0,0017***	-0.0023***	-0.0018***	-0.0015**	-0.0020`***	-0.0021***	-0.0010	-0.0016***	-0.0020***
	(0,007)	*(0.000)*	*(0.005)*	*(0.019)*	*(0.001)*	*(0.001)*	*(0.128)*	*(0.009)*	*(0.002)*
ROA	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
	(0,669)	*(0.872)*	*(0.667)*	*(0.650)*	*(0.844)*	*(0.642)*	*(0.983)*	*(0.660)*	*(0.943)*
Form	0,0011**	0.007	0.0010*	0.0012**	0.0009*	0.0008	0.0011**	0.0011**	0.0009*
	(0,033)	*(0.163)*	*(0.054)*	*(0.019)*	*(0.071)*	*(0.107)*	*(0.035)*	*(0.032)*	*(0.094)*
Loss		-0.0134***							-0.0142***
		(0.000)							*(0.000)*
End of Season			-0.0118***						-0.0020
			(0.000)						*(0.463)*
European				-0.0133***					-0.0013
				(0.000)					*(0.640)*
Goal diff.					-0.0121***				-0.0020
					(0.000)				*(0.335)*
English						-0.0074***			0.0058**
						(0.000)			*(0.018)*
2008-20015							-0.0134***		-0.0003
							(0.000)		*(0.910)*
Rivalry								-0.0106***	-0.0003
								(0.000)	*(0.942)*
adj. R^2	0,0007	0.0125	0.0029	0.0036	0.0058	0.0025	0.0065	0.0012	0.0166