ISCTE Business School
Instituto Universitário de Lisboa

STOCK MARKET RETURNS AND FOOTBALL MATCH RESULTS

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Resumo

Tendo em consideração a escassa pesquisa acerca do comportamento dos investidores no que diz respeito às ações de clubes, este estudo tem como maior preocupação verificar a componente emocional presente na transação deste tipo de ações. Além disso, sabendo que atualmente a performance financeira é de extrema importância para os presidentes e diretores dos clubes de futebol, considerámos ser um bom momento para investigar e adquirir mais conhecimento sobre este tópico.

O objetivo deste estudo é investigar o efeito da performance desportiva no retorno das ações dos clubes de futebol através de um estudo empírico aplicado ao caso português. A dissertação é baseada num estudo anterior feito por Stadtmann (2006), na tentativa de aplicar a sua metodologia ao caso português. Este estudo é baseado na informação do Sport Lisboa e Benfica SAD (Sociedade Anónima Desportiva), Futebol Clube do Porto SAD e Sporting Clube de Portugal SAD, considerados os "três grandes" clubes em Portugal. O método dos mínimos quadrados ordinários foi aplicado para estimar os modelos de modo a verificar o efeito da performance desportiva e a informação não esperada que advém da mesma no retorno das ações, considerando variáveis como os pontos não esperados, o índice de mercado, o tipo de encontro (internacional ou nacional) e o tipo de competição.

Palavras-Chave: *Football Industry, Stock Market, News Model*

Classificação JEL*: G14 – Information and Market Efficiency; Event Studies*

Abstract

Considering that research of the investors' behavior regarding football clubs' shares is very scarce, this study is particularly concerned in trying to assess the emotional component present in these transactions. Moreover, since financial performance is of extreme importance to football clubs' presidents and directors, we considered this as a relevant and adequate time to further investigate and gain more insight into this topic.

The aim of this study is to investigate the effect of performance on the stock return of football clubs through an empirical analysis applied to the Portuguese case. The study is based on a previous work done by Stadtmann (2006), trying to apply its methodology to the Portuguese case. Data of Sport Lisboa e Benfica SAD (Sociedade Anónima Desportiva), Futebol Clube do Porto SAD and Sporting Clube de Portugal SAD, considered the "big three" clubs in Portugal was used as the basis of this study. The ordinary least squares method will be employed in order to determine the effect of sporting performance and its unexpected information on the stock returns, controlling variables as unexpected points, market index, type of match (international or national) and type of competition.

Key words: *Football Industry, Stock Market, News Model*

JEL Classification*: G14 – Information and Market Efficiency; Event Studies*

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1. Introduction

Football is one of the dominant sports in the whole world. Even in countries where a variety of sports exist and divide market share among them, they are observing an exponential growth of football and the impact that this sport has on people. United States is a good example of such phenomena. American soccer, baseball, basketball and ice hockey are the dominant sports. However, football has been gaining a lot of importance among the American people considering the attractiveness that they find around this sport. The proof of that is the amount of European football players with great achievements during their careers that pass their final years playing in the United States. It ends by being a win-win situation: American football grows in terms of quality and attracts fans to watch games, while players get a lot of money in the end of their careers, being useful by showing some qualities and help to develop this sport.

But the real business of football is spread out around the world and has been constantly growing overtime. While in the past teams' presidents and directors were more focused on sporting results, nowadays football is also becoming an industry of moving money. This is called the "modern football", where fans are more neglected and money has become the main concern. The amount of money paid to buy a good player nowadays is massive and records after records are being beaten every year. The transfer of Cristiano Ronaldo from Manchester United to Real Madrid shocked the world by registering the amount of 94 million Euros. Since then, this amount became common for the football industry and some transfers have not been far from beating the record.

However, football clubs do not depend only on transferring players around. They also need to get revenues from different sources, such as: tickets, TV rights, merchandising, etc. In fact, many players pay their own price not only in terms of their performance in the field but also with a lot of merchandising associated with them. Considering that clubs need money to finance their activities, they have two options to get it: getting credit from banks or attracting investors in the stock market, either with bond issuing or capital increase. Since the first football team initial public offering (IPO)[1] many things happened in the stock market, especially the financial crisis during 2000 and 2008. During these crisis, especially the last one, many banks suffered considerably losses, which,

[1] The first IPO was made by Tottenham Hotspur in 1983.

consequently, made the access to credit very difficult. Football teams were also affected by that, especially the ones with connections established with banks. In Portugal, such connections existed in all the three biggest teams, namely with Banco Espírito Santo, and the events registered in the summer of 2014 made all teams suffer in terms of access to credit.

Therefore, the stock market became a great source of resources for football teams, not only to maintain a high level in national competitions, but also to fight for European trophies and be the best team in Europe. The proof of the importance of having investors who believe and invest money in the team is registered by many clubs, being Chelsea one of the most successful cases. While it is not quoted in the stock market, Chelsea has Roman Abramovich as the owner and main investor of the club. He has injected a lot of money and results appeared by wining 4 English championships, 4 English cups, one Champions League and one Europa League since the takeover in 2003.

However, focusing in the stock market, it appears that investors are not just concerned about the financial performance, but also with sporting performance. Therefore, an irrational component seems to be present when investing in football teams quoted in the stock market, driven by the emotions and the passion present in each individual investor that seeks to see its club being successful wherever it is present.

1.1. Portuguese and European Championships

The main competition in Portugal is the Portuguese League, which has been changing its name over the last years according with the sponsor. Last season, 2014/2015, was the 82th edition, since it was founded in 1934. The format has been changing over the years. The number of teams competing started with just 8 and nowadays there are 18 fighting for the title. In the past the number of points for a win used to be 2, while nowadays it is 3. Currently, each team plays 34 matches per season, 17 at home and 17 away and in the end the champion is the team that conquers more points during the season.

Moreover, in Portugal there are three other competitions that slightly differ in terms of importance. First of all, the Portuguese cup which had its 75th edition in the last season and was founded in 1938. It is played in a knockout system and only the semi-finals are discussed in two matches, whereas all the others rounds are solved in just one game. Consequently, the raffle plays an important role since home factor is very important when

considering all rounds with one game. The participants include all teams from the first three national divisions and representatives from the district competitions.

The League Cup is another Portuguese competition, but much more recent than the last one. Created only in 2007, it had the 9th edition last year and its format is different than the Portuguese cup, and has been changing since its creation. In the first round, all clubs from the second league dispute one round with one single game and the winning side advances to the next phase. After that, all the first division teams (except the 4 top teams from the last season) join the winning side and dispute another round with another single game. Then, the winning side and the 4 top teams mentioned before form 4 groups of 4 teams and group winners advance to the semi-final that is discussed in two games, before reaching the final.

Finally, the Supercup, that is the first official game in the season, had the 36th edition last year, since it was founded in 1979. Basically, it joins the Portuguese championship and the Portuguese cup winner of the last season in one single game. However, if they are the same, the Portuguese cup finalist will discuss the Supercup. These three cups are not included in this study since there are no odds available for the Portuguese cup before 2005 and for the first edition of the league cup. Also, for the Supercup the only odds available are from 2008. Moreover, these three competitions assume a lot less importance than Portuguese league and European competitions.

Football is not just played in a national environment. Champions League is the most important competition among Europe, created in 1995 with the name of European Champions Clubs' Cup. Later in 1992 its name and format was changed. Currently, the tournament starts in July with four rounds of eliminations. Afterwards, eight groups of four teams are formed. The first two of each group advances to the final knockout phase, which is disputed with home and away matches, two in each stage until the final which is held at a neutral stadium. This competition is not only crucial for the teams by its sporting dimension but also considering the significant financial prizes. In Portugal, the championship and the second classified enter directly in the group phase, while the third one has to discuss the fourth round of elimination before the groups phase.

Another competition that also has a lot of sporting dimension is the Europa League, created in 1971 with the name of UEFA Cup. In 2009, this competition changed the name

and format. It starts in July with four rounds of qualifying that culminate in a group phase. The group phase is composed by 48 teams in 12 different groups, with some of them coming elimination rounds of Champions League. First two of each group together with eight third classified from group phase of Champions League start the knockout system until the final, with two matches in each stage, one home and one away. The final is disputed in a neutral field. In Portugal, the fourth to fifth placed teams in the league qualify for the Europa League, as well the Portuguese cup winner.

Considering the last years and the time span under analysis, it is possible to verify that Futebol Clube do Porto has been the most successful team in Portugal (see Table A1 in Appendix). In Europe, they have been conquering some titles in the last 15 years, even the Champions League that is the most important competition, beating great teams such as Real Madrid, Manchester United, Barcelona, etc. In fact, they had a great entry in the 21st century, conquering one UEFA Cup, one Champions League and one Europa League, more than they have ever conquered in their history. Sport Lisboa e Benfica has been the second most successful team (see table A2 in Appendix), improving a lot in the last years. They have won 3 championship titles in the last 8 seasons, achieving two Europa League finals as well. Sporting Clube de Portugal is the team with the worst records of the three teams studied (see table A3 in Appendix), being Portuguese champion just one time since 2001. They had the worst season in 2012/2013, by finishing Portuguese league in the 7th place, being out of European competitions during 2013/2014. However, in 2005 they reached the final in the UEFA Cup.

1.2. Sporting success and its advantages

Financially speaking, football teams have a lot of sources of income, but there are some that gains more importance than all the others: associate's fees, tickets, players' sales, advertisement, sponsoring, merchandising, broadcasting rights and prizes by winning games and competitions. Yet, all of these sources of income can achieve a high level of volatility and everything has to do with one crucial thing: the sporting success.

First of all, considering a specific team and their supporters they can become associate just because they love their club. It is possible to think that sporting success has nothing to do with the willingness of everyone to become associate, pay the fees related with that and enjoy their specific status. In fact, this happens with a lot of people but when

considering bigger teams, known across the world, when the sporting success increases, also the desire to be more close to the club increases, having an impact in the revenues. Revenues coming from tickets have exactly the same explanation. Real passionate fans will buy tickets and watch their teams whether the sporting success is high or low. When titles become a habit and winning is more expected than drawing or losing, more fans will come to the stadium and more tickets will be sold. Therefore, revenues will increase with the sporting success.

Considering players' sales, when the quality is undeniable, the biggest and powerful teams in Europe will do anything they can in order to have that player in their squad. Teams like Benfica, Porto and Sporting know that when a good offer is received it has to be accepted, since they do not have many freedom to negotiate, considering the need of monetary resources. However, when the team is successful, the players' value also increase, even for the ones that do not show such a great quality. A good example of that is Porto: when they won the Champions League they managed to sell many of their players at good prices, not only their stars but also their regular players. The sporting success brought visibility and the big "sharks" wanted to count with the players that became European champions in a team that was not so used to that.

When the team has success, advertisement and sponsoring become a great source of revenues. The opportunity of being associated with a successful team is a plus for many sponsors, especially if they participate in European competitions, increasing their own visibility. Also, many sponsors agree to provide graduated revenues depending on the performance of the team and its achievements. It is more interesting for the team to be successful and at the same time it meets the sponsors' expectations.

Prizes by winning games are also a great source of income for teams, especially considering European competitions. If a team achieves a good classification in national leagues, it opens a position to qualify and go directly to a European competition. There, a win leads to the generation of additional funds, as well the qualification for advanced stages in each competitions. Finally, all the broadcasting rights related with each competition are also a source of income, increasing with the amount of games disputed.

1.3. Why invest in football clubs shares?

One of the biggest problems for investors who want to acquire shares from football teams is liquidity. During a normal trading day, there is a small number of shares transacted and there are even days with no transactions at all. Besides making volatility increase it also has the inconvenient of making it difficult to find other investors in order to unwind the initial position.

Other difficulty for investors is to reach the true value of a football team quoted in the stock market. Because there are a great number of assets that depends on the sporting performance, football players' market value for example, the value of the assets and, therefore, the value of the company is hard to obtain. Hence, an investor has to consider not only what happens in the field and the results a team can achieve, but also financial information, regarding the revenues and profits at the end of the fiscal year.

The third negative point associated with that kind of investment in such shares is related with dividends. In Portugal, Benfica, Sporting and Porto never distributed dividends. This is one of the key drivers for investors to enter in the market, expecting some profit in their transaction. Also, history has proved that it is hard to profit in a long-run by having a passive strategy in this kind of shares.

Consequently, there are other ways to participate in the financial wealth of a football team. Bond issues are the easiest way to invest money and get some profit, especially considering the interest rates associated with them, taking into account the risk associated with that kind of operations. Normally, coupon rates are higher than the overall market, in order to attract investors and pay the fair price for the risk they are taking.

Considering that, it is undeniable that when an investor enters in the market to have a position in this type of shares, an emotional component is present in his behavior. Even the riskier investors will consider and think twice before buying or selling a football team share, considering the low liquidity in the market and high volatility associated with that. Moreover, the history is clear regarding clubs that entered in the market: many of them have its current price below the initial price, when the IPO was made, and others have already left the stock market.

1.4. Overview of the dissertation

In order to answer to the main question of this dissertation, two models were used: news model and reversed news model. The first one assumes that stock prices have incorporated the entire public available information. Therefore, stock prices act in a semi-strong form as defined by Fama (1970). Consequently, all the unexpected and new information that arrives drives the stock price to change accordingly to the expectations considered before by the investors. Especially in periods of huge expectation about how the season is going to end in terms of conquers and titles, investors tend to react more according to what they expected before. Mainly because they know that any step taken in the wrong direction can change completely the scenario they idealized.

In order to check how different information such as corporate governance related news may impact the stock price, the reversed news model was also applied, to capture variables that are hard to quantify by models and are still important to understand the stock prices of football teams. These variables are related with acquisition and sale of players, dismiss or entrance of a new coach, etc.

Regarding the structure, this dissertation is divided into 7 chapters. In the first chapter, an introduction to the football world was made: first, it was explained in global terms how football is growing and some financial implications among this industry; then, how football is structured in Portugal and Europe was described, considering the competitions discussed and how they are structured; the third part elucidated why sporting success is important and the advantages associated with that; the fourth part explained why investors choose football clubs' shares to invest; finally, in the fifth part the main goals of this dissertation were presented. The second chapter consists of a chronological literature review of former reports about sports industries and their connection with stock markets, considering the evolution throughout the years and the improvements made more recently. In the third chapter, the studied data and sources are presented. The fourth chapter explains the methodology used in this study and in the fifth chapter all results achieved by using the news model and respective analysis are presented. The sixth chapter discusses the results obtained by using the reversed news model, and finally the seventh chapter concludes the dissertation.

2. Review of Literature

The literature considering this topic is still very scarce, mainly because of the short time of activity of football clubs in the stock market. However, since it became a common behavior among the most important clubs in Europe, researchers started to seek for opportunities where it could be verified some abnormal returns regarding an activity that is becoming more financial directed in a fast pace. Therefore, not only quantitative studies started to appear but also other non-numerical variables began to be considered, which is becoming even more popular in the current days. Table A4, in Appendix, summarizes the main points of each of the following mentioned articles.

Renneboog and Vanbrabant (2000) were one of the first authors studying the effect of soccer results in the stock market performance of football clubs. For this study, they analyzed every English team quoted in the London Stock Exchange (LSE) and Alternative Investment Market (AIM) between 1995 and 1998 using event study's methodology. They concluded that in the day following a win the clubs' stock exchange presents abnormal positive returns of almost 1%. After a lost or a draw they present abnormal negative returns of 1,4% or 0,6%, respectively. The authors did not find any difference between changes after national or international games.

Shortly after, another study not related to football, was done by Brown and Hartzell (2001), where the impact of Boston Celtics' games on club shares was analyzed. They also tried to understand the impact of games on volume and volatility and how results influenced the returns, using the ordinary least squares. Considering the format of the National Basketball Association, they studied the regular season and the playoffs, trying to understand how both of them differ in terms of importance. Results showed that returns reflect game results but in an asymmetric way. Losses affect significantly the stock price, but wins do not. Also, playoff games have a greater impact and here it is possible to observe a symmetric response due to the significance of wins and losses. Furthermore, they tried to understand how non-game events could influence the stock price. The hiring of Rick Pitino as the head coach registered a high volume around the announcement and a net positive return over the period. However, the new Boston Garden did not have any reaction among the trading price nor from the trading volume.

Later, in 2003 Ashton, Gerrard and Hudson (2003) tried to understand the association between the performance of the England football national team and daily changes in the FTSE 100 index, considering a national perspective in contrast to focus in a specific club. By using a regression model with a generalized method of moments estimator, the association could be verified and statistical significance was observed, with good (bad) performances from the national team being followed by good (bad) market returns. Also it could be verified that some matches have more importance than others, which is the case for the tournament matches comparing to the friendly ones.

By analyzing a specific team, Stadtmann (2004) focused his study on Borussia Dortmund and tried to do something different than before. By applying the news model, he analyzed whether new information can explain changes in Borussia's stock price. The conclusions were remarkably good among the news model: only the unexpected part of an information should influence the stock price. Afterwards, Standtmann (2006) repeated his own study with more data using another model: the reversed news model. It was found that also corporate governance related news play an important role in explaining stock price movements of Borussia Dortmund. This model worked as a robustness check when applying first the news model.

In 2005, Duque and Ferreira (2005) focused their study in Portugal and analyzed the only two clubs listed in the stock exchange up then, Porto and Sporting. They studied these two shares quoted in the Euronext Lisbon Stock Exchange using ARCH and GARCH methodologies. The relationship between stock price returns and sporting performance was investigated, as well as the volatility and the clusters that can exist during the season, especially in the end of it. They concluded that whenever a team wins the national championship, share prices always present a positive mean return. The opposite also happened, when the team did not win the tournament. Taking volatility into account, they found that it is related with trading volume, which is in accordance with some findings of previous studies.

Berument, Ceylan and Gozpinar (2006) analyzed the effect of soccer success on stock market returns for the three big teams that usually fight for the Turkish championship: Besiktas, Fenerbahce and Galatasaray. They tried to go further in order to look for the emotions resulting from a victory against a rival, considering that it exists between those three clubs and using the GARCH model. The conclusions were quite clear: Besiktas is

the most affected team by the wins against rivals, considering a significant positive stock return after that specific result. The same effect is not present for the other two big teams.

Considering a wide range of countries, Edmans, Garcia and Norli (2006) tried to investigate the stock market reaction to sudden changes in investor mood. To accomplish this purpose, they used a cross-section of 39 countries and studied the relationship between international soccer results and the stock market returns of each country, by using the GARCH model. One of the main conclusions reached was that a strong negative reaction in the stock market happened when national soccer teams lose. It was also found a statiscally significant yet smaller loss effect for international cricket, rugby and basketball games. However, despite that negative reaction, the opposite was not observed when wins occurred, with no evidence for a reaction.

Samagaio, Couto and Caiado (2008) went further and tried to include another type of information in their study. Considering just English football clubs between 1995 and 2007, they examined the linkages between financial performance, sporting performance and stock market performance, using the structural equation modelling. Regarding financial performance they included many other variables that were not considered until then in the same type of studies: turnover, wages, net transfer fees, etc. The main conclusion was that managers of English football teams try to combine sporting performance with financial performance. Also, sports managers seek to maximize sporting performance with a minimum level of profit. Indeed, there is a financial goal of getting enough revenues to cover operating costs and invest in the acquisition of better players.

Palomino, Reneboog and Zhang (2009) tried to understand the investor's sentiment regarding football match results via regression models. First of all, they examined whether market reactions reflect rational expectations or if the abnormal returns can be explained by the investor's sentiment. Also, they analyzed how the market receives the experts' opinions about the probability of the game outcomes. Considering 16 British clubs, the results indicated that the average cumulative abnormal returns over a three day period are strongly statistically significant and amount to 88 basis points for a victory, -101 basis points for a defeat and -33 basis points for a draw. Also, they registered that investors overreact to a win, especially if it was strongly expected to happen and should

not have created a surprise effect. Finally, no evidence was found about the bookmakers and the time of the release of betting odds.

Klein, Zwergel and Fock (2009) tried to correct the Ashton et al. (2003) event study, doing some corrections that they considered benefic for the final results. First of all, they considered the holiday effect instead of assuming 0% as Ashton et al. (2003) did in their study. Also, they corrected the error of considering a draw when an elimination game was decided in penalties, by checking the final result and apply the win or loss according to the penalty shootout. Finally, they improved the globalization effect, considering that some results are known on the day of the soccer game and digested in the day's closing price. The conclusions reached were very interesting, since small mistakes could have a strong influence on empirical studies' results.

Baur and McKeating (2009) analyzed the performance of European football clubs which undergo an IPO. They used a unique time-series and cross-section dataset consisting of domestic and international performance data to develop an event study to investigate the effects of a football club's on-field performance before and after the IPO. The goal was to prove that football clubs perform better after the IPO, either in domestic or international matches. The conclusions highlight that the majority of football clubs do not perform better in the home league after the IPO than before.

Bell, Brooks, Matthews and Sutcliffe (2009) considered the impact of match results on the stock returns on English football clubs. They proposed that the magnitude of the response to a given result depends on the importance of the game. For that study they used different variables like the closeness to the end of the season, goal difference surprise and rivalry score for a specific game. The resulting conclusions were quite interesting, considering that match results affect the share price but there are other variables with higher effects. Points' surprises and lagged points surprises have a positive influence on returns. Also, points' surprises from home games have an additional positive effect.

Aglietta, Andreff and Drut (2010) investigated how much relevant and successful listing and floating football clubs at the stock exchange have been. In fact, no specific study about the correlation between sporting performance and stock return was performed. They simply analyzed the correlation between TV rights revenues and wages, considering that, in a long-term perspective, the success of a team is measured by the increase in the

TV rights and consequently wages paid to the players. The conclusions achieved were that there is little attractiveness for long-only institutional investors to invest in football clubs with a traditional bond/stock allocation approach. This is due to the fact that there exists high uncertainty about the club's fair value and diversification potential is quite low among that type of stocks.

Benraiem, Roy and Louhichi (2011) studied the effect of sporting performance on the volatility of listed football clubs. First of all, they tried to determine if sporting matches cause high volatility in the price index related to the football clubs in the trading day following the matches. Then, they looked for the club's victory in order to check if it causes high volatility in the trading day following the match. They also investigated whether a club's away win causes higher volatility than a victory at home during the trading day following the match. Fourth, they analyzed if a club's defeat causes high volatility during the trading day following the match. These four assumptions were validated. Finally, they looked if a club's defeat at home produces higher volatility than an away defeat during the trading day following the match. In summary, they highlight that sporting performance of football teams has significant impact on stock market valuation of listed clubs. The magnitude of the market reaction depends on the result of the match and on the match venue. Also, it was possible to detect some difference in the behavior of traditional investors motivated by economic rationality and supporter investors animated by affective rationality.

Jorgensen, Moritzen and Stadtmann (2012) used Brondby IF, a Danish publicly listed football club, to apply the news model, i.e., the model applied by Stadtmann in his former studies. Interestingly, there was strong evidence that new information was the main driver of the Brondby's stock price. Afterwards, Croonenbroeck, Monaco and Christensen (2012) complemented this study by applying the reversed news model for Brondby. They found that corporate governance news are also important to explain the stock price behavior.

Berument and Ceylan (2012) tried to explain the effects of domestic football teams' performances against foreign rivals on stock market returns as well as on the return-volatility relationship. They argued that the return-volatility is also affected: agents become more risk averse after a loss and less risk averse after a win. They found empirical evidence that football match scores affect stock market returns and stock market return-

volatility relationship. In markets where football success is higher (Spain and England) agents become more risk averse after a loss. On the other hand, in countries where football success is lower (Chile and Turkey), agents become more risk loving after a win.

Saraç and Zeren (2013) investigated the effect of soccer performance on the clubs' stock return through an empirical analysis applied on Turkish case. The findings showed that the soccer performance is significantly and positively related with the stock returns for all the three clubs analyzed. The relationship is found to be stronger in Besiktas when compared to Galatasaray and Fenerbahce.

Godinho and Cerqueira (2014) analyzed the link between stock returns and results in national league matches for 13 clubs of six different European countries, assuming that stock prices should only respond to the unexpected component of match results. They concluded that if match results are introduced in an econometric model of stock returns through a variable that gives importance-weighted to the unexpected points, this variable is statistically significant for 11 of the 13 considered clubs.

More recently, Sun and Wu (2015) used also the news model in order to study Juventus Football Club, an Italian publicly traded football club. They found that the unexpected match outcomes are important to explain stock price movements. Furthermore, results indicated that Champions League games are more important than national league games, when the information is considered by investors. Finally, they applied the reversed news model and found that corporate governance news can also have an important role in driving the stock prices.

Concluding, studies have been improving with the increasing of data available. Also, there are also different models applied, which enriches the literature in this field. Regarding Portugal, few studies were done and with few data available. Therefore, this dissertation tries to improve and complete analysis done concerning Portuguese teams, with a lot of more data available and especially with the presence of Sport Lisboa e Benfica SAD, which entered in the stock market just in 2007.

3. Data

The database needed in this study is composed by Sport Lisboa e Benfica SAD, Sporting Clube de Portugal SAD and Futebol Clube do Porto SAD share prices, quoted in the Euronext Lisbon Stock Exchange. The length of data is different between the three clubs, since they entered the stock market in different periods. FC Porto SAD was the first to transact shares in the stock market by entering during the end of June 1998. One year later, during October of 1999 was the time for Sporting CP SAD to do the same. Finally, SL Benfica SAD opted to do its IPO on May 2007. Stock prices were collected from Bloomberg.

In order to study the impact of football performance on stock price returns, the actual points were assigned to the three possible outcomes from a football match. Therefore, a win corresponds to 3 points, a draw to 1 point and a loss to 0 points. All matches and results included in this studied were collected from the website www.zerozero.pt. The expected points were computed from betting odds that were collected from two different data bases: www.football-data.co.uk for Portuguese games since the season 2000/2001 and from www.betexplorer.com for all European games and for the Portuguese season 1999/2000, considering the non-existence of betting odds for that season in the first database mentioned.

In order to compute all the values for the expected points, the first value to be computed is the mark-up that betting houses insert in each game. This is the value that they win instantaneously by receiving bets from investors or more precisely the commission earned by the betting houses. Therefore, this value needs to be controlled in order to compute the probabilities that are associated to the three possible outcomes of each game. Giving a specific example (see Table A5 in Appendix), the average odds for Benfica against Nacional at Benfica's stadium on 4th of April 2015 were 1.21, 5.84 and 14.21 for the home win, draw and away win, respectively. The mark-up is given by the sum of the inverse of the odds (1/1.21 + 1/5.84 + 1/14.21), which in this case is 7.09%. After that, the probability of each outcome is computed by taking into account the mark-up. For example, the probability for Benfica to win the game is given by: 1/(1.21*1.079), taking the value of 77.45% in the end. The same calculation is done for the other two possible match outcomes. Finally, the expected points are calculated regarding each probability and the points associated with each outcome. For this game, the expected points for

Benfica were 2.48 (77.45%*3 + 15.98%*1). Finally, the unexpected points are the difference between the actual points, the ones really conquered in a specific game, and the expected points. Considering that Benfica won the game against Nacional, the unexpected points in this game would be 0.52. That is considered the unexpected information by the investors and what drives the stock price to vary in the day after a match.

Considering all the variables studied, the PSI20 prices were also collected from Bloomberg in order to compute the impact of the overall stock market in each individual team share price.

4. Methodology

The aim of this study is to replicate the study of Stadtmann (2006) and Jorgensen et al. (2012) in Portugal. Contrary to what has been done before, where only a single team was studied, here three different Portuguese teams will be investigated and compared. Moreover, the amount of data is increased, regarding the three clubs and specially Futebol Clube do Porto SAD and Sporting Clube de Portugal SAD for which we consider more than 600 observations.

The news model tests whether the unexpected information influences or not the stock price returns. Therefore, the expected information is said to be incorporated in betting odds, considering that the difference between what really happened in some game and the expected result is what investors did not expect to happen before the game.

Regressions models have been considered and parameters have been estimated by ordinary least squares. Regarding the models, the first one tries to capture the overall stock market effect in stock price returns after a match day and is given by the following equation:

$$\Delta Team_t = \beta 0 + \beta 1 \Delta StockMkt_t + \varepsilon_t, \quad (1)$$

where ΔTeam is the percentage change in the stock prices of the team under analysis and ΔStockMkt is the change in the overall stock market index considered. The second model tries to capture whether a win or loss has effect in stock price returns, given by the following equation:

$$\Delta Team_t = \beta 0 + \beta 1 \Delta StockMkt_t + \beta 2 League\_actual_t + \beta 5 Europe\_actual_t + \varepsilon_t, \quad (2)$$

where League_actual is a variable that measures the number of points conquered in Portuguese league matches, while Europe_actual does exactly the same but for European games. The third model gives an insight about the importance of the unexpected component, being expressed as:

$$\Delta Team_t = \beta 0 + \beta 1 \Delta StockMkt_t + \beta 2 League\_actual_t + \beta 3 League\_exp_t + \beta 5 Europe\_actual_t + \beta 6 Europe\_exp_t + \varepsilon_t, \quad (3)$$

where the League_exp is a variable that measures the number of expected points in a game, taking into account the odds, while Europe_exp measures the same though for all the European games. As described by Stadtmann (2006) and Dobson and Goddard (2001), the unexpected component has an impact on share prices if the coefficient given by the actual points is the negative of the coefficient for the expected points. Therefore, if the condition described above is verified, the unexpected points become a plausible variable to explain the stock price returns. Consequently, a Wald test has to be estimated in order to understand that plausibility. Therefore, if the equality is statiscally significant, the fourth model is estimated by the following equation:

$$\Delta Team_t = \beta 0 + \beta 1 \Delta StockMkt_t + \beta 4 League\_unexp_t + \beta 7 Europe\_unexp_t + \varepsilon_t, \quad (4)$$

where League_unexp is the difference between actual and expected for league games, while European_unexp is the same for European games. Basically, this regression tests the basis of the news model by checking if the unexpected information is significant. Also, it tries to capture if there are any difference between national and international games, considering the Wald test in order to analyze the possibility of the existence of such inequality. The fifth model goes even deeper by analyzing European competitions and differences between unexpected information coming from Champions League and Europa League:

$$\Delta Team_t = \beta 0 + \beta 1 \Delta StockMkt_t + \beta 4 League\_unexp_t + \beta 7 CL\_unexp_t + \beta 7 UEFA\_unexp_t + \varepsilon_t, \quad (5)$$

where CL_unexp controls the unexpected points for Champions League games and UEFA_unexp measures the same for Europa League matches. Finally, the sixth model that measures the unexpected information from the rivals:

$$\Delta Team_t = \beta 0 + \beta 1 \Delta StockMkt_t + \beta 4 League\_unexp_t + \beta 8 CL\_unexp_t + \beta 9 UEFA\_unexp_t + \beta 10 Rival1\_unexp_t + \beta 11 Rival2\_unexp_t + \varepsilon_t, \quad (6)$$

where Rival_unexp controls the unexpected points for each specific rival, considering the time span considered for each different team. Therefore, unexpected points had to be calculated since 1999 for Benfica and Sporting.

All the series were first tested to check if they were stationary using Augmented Dickey-Fuller (ADF) and Kwiatowski-Phillips-Schmidt-Shin (KPSS) tests (see tables A6 to A8 in Appendix), defined by Dickey and Fuller (1979) and Kwiatowski, Philips, Schmidt and Shin (1992), respectively. Also, all the regressions were tested for errors' heteroskedasticity and autocorrelation (see tables A9 to A11 in Appendix). However and even though the data cannot be considered a time series, the autocorrelation test was done in order to control and check if there was any problem with that. When necessary, the robust estimators were used in order to correct heteroskedasticity and/or autocorrelation when observed.

Considering that a great part of football teams' presidents and directors are really concerned with financial health, sporting success has to contribute for the increasing in profitability. Therefore, victories should have a positive impact in the stock price because at the end the club will have more monetary resources and investors will be interested in that, leading, consequently, to higher stock prices. Furthermore, the unexpected information of a game should drive investors to act and react in the stock market, making the stock price to increase or decrease, depending on the type of unexpected information. Hence, the following hypotheses are tested in this study:

- H1: The unexpected component of the final score of a game should influence stock price returns.
- H2: The unexpected component of a European game should influence the stock price returns in a larger extent than the unexpected component of a national competition.

Moreover, the reversed news model was the second one to be applied in this study. This model tries to capture the importance of corporate governance news, a variable difficult to apply quantitatively. To start, large stock price reactions which cannot be explained by the stock market conditions have to be spotted, in order to identify the error terms. Consequently, new information about specific events that happened has to be identified in order to check if the stock price movements can have any type of correlation with specific events that were not captured by the news model. Financial performance, players acquired or sold, coach dismissal, are examples of information that is hard to quantify empirically and better captured by this model.

In order to capture the large stock price reactions referred before, a regression has to be performed considering each team returns and the PSI20 returns to determine which part is explained by the overall stock market reaction. Consequently, the absolute error terms will be the object of analysis, being the 20 largest identified.

This kind of model is very interesting to apply, considering the advantages that it brings. Besides the match outcome, also corporate governance related information provide an important influence in the stock market price. However, they are really difficult to model quantitatively regarding their specific characteristics and the frequency as it occurs.

5. Empirical Analysis

In order to test the hypothesis and obtain some results, regressions were computed for the three different teams separately. Thus, the analysis was performed individually to better understand the impact in each club and relate all the results with what really happened in the past in each different competition.

5.1. Sport Lisboa e Benfica SAD

The estimation results for the news regression model based on Sport Lisboa e Benfica SAD data are shown in the table below.

Table 1 – Sport Lisboa e Benfica SAD Regressions Results

		Model 1	Model 2	Model 3	Model 4	Model 5
β0	Constant	-0.0047	-	0.0099	-0.0064**	-0.0068**
β1	ΔPSI20	0.0386	0.0894	0.0716	0.0811	0.0871
β2	League_actual	-	0.0105***	0.0129***	-	-
β3	League_exp	-	-	-0.0191**	-	-
β4	League_unexp	-	-	-	0.0132***	0.0133**
β5	Europe_actual	-	0.0070**	0.0129***	-	-
β6	Europe_exp	-	-	-	-	-
β7	Europe_unexp	-	-	-	0.0111**	-
β8	CL_unexp	-	-	-	-	0.0023
β9	UEFA_unexp	-	-	-	-	0.0179**
	Obs.	340	340	340	340	340
	R^2	0.0001	0.0514	0.0742	0.0591	0.0665
	Adj. R^2	-0.0029	0.0429	0.0603	0.0507	0.0554

Note: *, ** and *** mean significance at 10, 5 and 1 %-level, respectively.

Regarding the first model it is possible to determine among the 340 observations that the estimate for the slope coefficient is not significantly different from zero, which means that match related information can be more important than the overall market behavior on trading days after a match day.

Considering the second model, both estimated coefficients are statistically different from zero and positive, which means that on average wins and defeats have impact in stock price returns. However, league points' coefficient are more significant and have also a slightly higher value than European points' coefficient (pointing for a bigger economic impact on the dependent variable). Also, it is possible to compare the goodness-of-fit of this model with the first one, regarding that the adjusted R^2 takes a value of 0.0514, which

is way higher than 0.0001, meaning that the explanatory power of sport related variables is higher when compared to the overall Portuguese market index.

Taking into account the third model, it is possible to verify that both actual and expected coefficients are statistically significant. By computing a Wald test, it was also possible to verify that the difference between the estimated coefficients for actual and expected points explanatory variables is not statistically significant, which means that there is no statistically evidence against the equality of the coefficients either for Portuguese league and Europe competitions, which confirms what was described before for these two variables.

As it is justified to combine the information of the actual points conquered on a match and the expected from the odds in a single variable, the model 4 was estimated. The first hypothesis mentioned is verified because both variables have positive and statistically significant estimated coefficients. Moreover, the second hypothesis does not hold regarding the difference between coefficients, with $\beta_4 = 0.0132$ and $\beta_7 = 0.0111$. Also, the Wald test reveals no statistical evidence against the equality of this two coefficients.

Finally, regarding the fifth model it is curious to observe that only Europa League impacts the stock price returns, when Champions League has a lot more visibility and dimension, with also very good match and round prizes. However, there is an explanation for that. Since it became publicly traded, Benfica has done just one good campaign in Champions League competition, achieving quarter-finals. In that same period, two finals of Europa League were reached, when anybody expected that to happen.

Another thing that Stadtmann (2006) concluded was that the success of principal rivals could influence the stock price of Benfica SAD. However, these variables were studied and the coefficients were not significantly different from zero (see Table 12 in Appendix). Therefore, it was dropped from the study.

5.2. Sporting Clube de Portugal SAD

The estimators for regressions computed with Sporting Clube de Portugal SAD data are in the table below.

Table 2 – Sporting Clube de Portugal SAD Regressions Results

		Model 1	Model 2	Model 3	Model 4	Model 5
β0	Constant	-0.0027	-0.0073	0.0060	-0.0031	-0.0029
β1	PSI20	0.1245	0.1106	0.1212	0.1102	0.1127
β2	League_actual	-	0.0028	0.0051**	-	-
β3	League_exp	-	-	-0.0010	-	-
β4	League_unexp	-	-	-	0.0051**	0.0051**
β5	Europe_actual	-	0.0005	0.0019	-	-
β6	Europe_exp	-	-	-0.0040	-	-
β7	Europe_unexp	-	-	-	-0.0021	-
β8	CL_unexp	-	-	-	-	0.0040
β9	UEFA_unexp	-	-	-	-	-0.0042
	Obs.	601	601	601	601	601
	R^2	0.0006	0.0039	0.0091	0.0078	0.0087
	Adj. R^2	-0.0011	-0.0011	0.0008	0.0028	0.0021

Note: *, ** and *** mean significance at 10, 5 and 1 %-level, respectively.

Considering the first model, among the 601 observations it was possible to detect that the slope coefficient is not significantly different from zero. Consequently, it means that match related information can be more important than the overall market behavior on trading days after a match day.

Regarding the second model, it reveals that both coefficients are not statiscally different from zero. Therefore, it means that wins and defeats have no impact in stock price returns. However, it does not mean that unexpected information will not impact stock price returns.

Hence, it is necessary to take a look into the third model, which revealed that only League_actual is significantly different from zero. It is interesting to check that in the second regression this variable was not significant, but with the introduction of the expected points it became significant at a 5% significance level. As explained before, the Wald test was also performed to test if the coefficient given by the actual points is the negative of the coefficient for the expected points. It was possibly to verify that there is no statistically evidence against the equality of the coefficients either for Portuguese league and Europe competitions, which confirms what was described before for these two

variables. Consequently, unexpected information gains importance in order to explain stock price returns.

The fourth model revealed that the first hypothesis mentioned is half verified because only League_unexp is a positive coefficient and significantly different from zero. Therefore, it is also possible to detect that the second hypothesis does not hold since only one coefficient is significant and affects stock price returns.

Finally, the fifth model was estimated from which it is possible to observe that any European competition reveals importance on explaining Sporting stock price returns.

The success of principal rivals and its influence in Sporting SAD stock price was investigated (see table 13 in Appendix). However, these variables showed that the coefficients were not significantly different from zero. Therefore, it was dropped from the study.

5.3. Futebol Clube do Porto SAD

The estimators for regressions computed with Futebol Clube do Porto SAD data are in the table below.

Table 3 – Futebol Clube do Porto SAD Regressions Results

		Model 1	Model 2	Model 3	Model 4	Model 5
β0	Constant	-0.0019	-	-0.0105	-0.0029**	-0.0029**
β1	PSI20	0.2852**	0.2846**	0.2845*	0.2857**	0.2865**
β2	League_actual	-	0.0045***	0.0043***	-	-
β3	League_exp	-	-	-0.0003	-	-
β4	League_unexp	-	-	-	0.0044***	0.0044***
β5	Europe_actual	-	0.0052***	0.0059**	-	-
β6	Europe_exp	-	-	-0.0021	-	-
β7	Europe_unexp	-	-	-	0.0058**	-
β8	CL_unexp	-	-	-	-	0.0061**
β9	UU_unexp	-	-	-	-	0.0051
	Obs.	685	685	685	685	685
	R^2	0.0076	0.0269	0.0272	0.0249	0.0249
	Adj. R^2	0.0061	0.0226	0.0200	0.0206	0.0192

Note: *, ** and *** mean significance at 10, 5 and 1 %-level, respectively.

Considering the first model, contrary to Benfica SAD and Sporting SAD the 685 observations showed that the slope coefficient is significantly different from zero at 5% of confidence, which means that the overall market is important to explain stock price

returns. However, it does not mean that football performance lose importance when explaining stock price returns. It just means that the overall stock market has also influence, even in trading days following match days.

In the second model it is possible to observe that both coefficients are statiscally different from zero and positive, which means that wins and defeats impact the stock price returns of FC Porto SAD. Moreover, they are significant at the same level of confidence of 1%, which validates even more the football performance influence in stock price returns. However, Portuguese league points' coefficient is more significant and also have a slightly higher value than European points' coefficient. The overall stock market continues to be significantly different from zero with the same level of confidence, 5%. It is possible to compare the goodness-of-fit of this model with the first one, regarding that the adjusted R^2 takes a value of 0.0226, which is way higher than 0.0061, meaning that sport related variables are more important in explaining Porto returns than just the overall Portuguese market.

Regarding the third model, League_actual and Europe_actual continues to be significantly different from zero. Again it is important to introduce League_exp and Europe_exp in order to understand if the unexpected component has impact on share price returns. By performing a Wald test, it was possibly to verify that there is no statistically evidence against the equality of the coefficients either for Portuguese league and Europe competitions, confirming what was previously described for these two variables.

The fourth model reveals that the aforementioned first hypothesis is verified because both variables have positive coefficients and significantly different from zero. Moreover, the second mentioned hypothesis could be also verified with $\beta_4 = 0.0044$ and $\beta_7 = 0.0058$, considering the larger coefficient of Europe_Unexp comparing to League_Unexp. Nonetheless, in statistical terms, this difference is not significant.

Finally, the fifth model shows that regarding European competitions, Champions League is the unique to be statiscally different from zero. Also, the coefficient for Champions League is bigger that the Portuguese league coefficient, which means that it is the most valued competition by investors. However, this two variables are not statiscally different from each other. Interestingly, only the Champions League impacts the stock price returns, when Porto have won one UEFA Cup and one Europa League considering the

time span under study. However, regarding their win in 2004 and the importance of that competition in terms of money and prestige, it is easy to understand why investors value more Champions League.

Also, as it was done for Benfica SAD and Sporting SAD, the success of principal rivals was empirically studied in order to understand its influence in the stock price of Porto SAD (see table 14 in Appendix). However, the coefficients were not significantly different from zero, being dropped from the study.

5.4. Summary of results

To sum up, it is possible to observe that unexpected information gains importance when a team is sportingly succeeded. That is possible to observe when comparing those variables for European competitions. Porto SAD has been successful by conquering a Champions League and a Europa League and thereafter, unexpected points in Europe are significant. Benfica SAD had not won a European competition, but two finals were reached and unexpected information coming from Europa League gain significance. For Sporting SAD, considering their bad historical, only unexpected information regarding Portuguese league is significant.

Moreover, it is interesting to verify that Benfica SAD is the team with higher coefficients (pointing for a bigger economic impact on the dependent variable), when significant. Two important facts have to be stated in order to understand that. First, it is the team with more fans and considering that investors are moved by emotions in this industry, they have also more people interesting in transacting their shares. Second, the development registered in the last years, since the IPO. The club had a bad financial health in the beginning of the century, starting to recover in the last years. Since then, three championships were conquered and two European finals were reached.

Finally, the results for Benfica SAD demonstrate the higher R^2, and is possible to enhance the goodness-of-fit of the five models comparing with the other two teams.

6. Reversed News Model

Regarding the news model, it tested how the match outcome affects the behavior of share prices, especially considering the unexpected component of each game. However, there are some drivers that the model cannot accomplish but are still important to explain the movements verified on the stock market. Regarding the sector being studied, the importance of these variables increases considerably if we consider the expectation of the fans and how they act and react to this kind of new information.

Football is highly driven by the expectations and the pre-season is about that. New players entering and going to other clubs, coaches being fired and replaced, rivals becoming weaker or stronger, etc. In fact, investors are trying to anticipate what is going to happen during the season considering their knowledge about what changed and remained the same in their teams and which will be the competitors. Therefore, all this new information is going to affect stock prices but this is not so easily quantified and estimated by models.

6.1. Sport Lisboa e Benfica SAD

The 20th largest price reactions of Sport Lisboa e Benfica SAD stocks, not explained by the overall market reaction, are in the table below.

Table 4 –Results for Reversed News Model for Sport Lisboa e Benfica SAD

No.	Date	Price reaction	Event
1	15/06/2007	54.05%	Launching of a share acquisition public offer (OPA) from Joe Berardo, a Portuguese investor, with a premium of 30,11% when comparing with the last stock price of the former trading day
2	04/10/2011	-37.23%	n.a
3	03/10/2011	35.66%	Monday after home match won: Benfica 4 x 1 Paços de Ferreira, discussed on Saturday
4	24/02/2014	31.22%	Monday after Porto lost against Estoril at Porto's stadium. In that day Benfica would play against Guimarães at home and if a win occurred an advantage of 7 points would be established
5	19/03/2014	27.47%	n.a
6	10/04/2013	26.37%	Bond issue with the value of 45M€
7	21/01/2015	26.11%	Sale of Bernardo Silva to AS Monaco by 15.75M€
8	22/06/2012	26.06%	n.a
9	19/12/2012	26.05%	n.a
10	13/12/2013	25.45%	n.a
11	20/03/2014	25.37%	Match day against Tottenham, for the 2nd leg of the round of 16 of Europa League

12	19/01/2015	22.56%	Monday after away match won: Marítimo 0 x 4 Benfica, discussed on Sunday
13	21/03/2014	-24.18%	Friday after win against Tottenham in the aggregate of two legs, advancing for the Quarter-finals of Europa League
14	06/07/2007	21.41%	Speculation about a possible OPA from Chinese investors
15	26/03/2014	19.80%	Match day of Portuguese cup for the 1st leg of semi-finals against Porto
16	20/02/2013	19.54%	n.a
17	09/01/2012	19.45%	Trading day after away match won: Leiria 0 x 4 Benfica, discussed on Sunday
18	26/11/2013	19.01%	n.a
19	01/11/2011	18.68%	n.a
20	30/09/2009	18.59%	Possible income of 40M€ with the creation of Benfica Stars Fund

Note: n.a means no news identified.

Interestingly, in the case of Benfica SAD, the 20 largest stock price returns that are not explained by the overall stock market, 18 of them are positive. In fact, it had a lot of events that could contribute for this behavior and the development of the club in the last years and, consequently, conquers achieved in that same period could explain the positivism around investors and fans.

However, regarding corporate governance and external events there are three events that could explain better some stock price movements:

- Joe Berardo's OPA, with a premium of 30,11%: Joe Berardo launched in 15/06/2007 an OPA over Sport Lisboa e Benfica stocks with a premium of 30.11%, considering the price of the last day of trading. The market perceived this as good opportunity and in that day the bigger variation was registered since the IPO. The OPA ended by being a flop and was not finished by the private investor. However, if it was completed the investor would have assumed the control of Benfica SAD;
- Speculation about Chinese OPA in response to Joe Berardo's OPA, doubling the price he was willing to pay: in the evening of 5/07/2007 news about a possibility of a Chinese OPA came out, being the price they were willing to pay the most interesting component. Basically, it was said that a Chinese company was interesting in buying a European football team with great international projection. Benfica fitted in their filters and a price of 7€ was announced as the one the

company was willing to offer the club shares, being the double Joe Berardo offered few days before. The market reacted in the next day by fixing the price at 4.5€;

- March 2014, between 19th and 26th: in this period, there were 4 days with large stock price variations. In fact, in the 20th of March Portuguese Securities Market Comission (CMVM), the entity that supervises the market activity in Portugal, asked Benfica SAD about the increase in value the last three days. The value raised more than 80% and each stock were worth 3€, comparing with the 1.2€ in the beginning of March. One possible explanation could be related with the fact that in this exact week there was a lot of expectation about what was going to happen in the end of the season. In fact, fans were apprehensive since they lost three competitions in the last minutes in 2013 and the same sad ending could not be repeated. Therefore, the win of Sporting against Porto in 16th of March and the big win of Benfica in Madeira against Nacional in the next day opened a great door to the title, which could make the fans happier and positively reacting in the stock market. In that exact same week, Benfica eliminated one of the great contenders of Europa League, Tottenham FC, which made very clear that they could win anything they were fighting for. The volume of stocks transacted in that week proves that speculation moved investors to the stock market, something very unusual considering football teams.

Being the last of the three teams to enter in the stock market, Benfica investors witnessed the resurrection after the dark years that that took place from 1994 to 2005, which was also the longest period without a Portuguese championship title. Therefore, variation in prices were a constant, especially near the end of the season. Furthermore, Benfica had always a good amount of transactions volume when compared to Porto and Sporting. This can be related with emotional investors since Benfica has much more fans and it is the best known Portuguese team in the rest of the world due to its football history.

6.2. Sporting Clube de Portugal SAD

The 20th largest price reactions of Sporting Clube de Portugal SAD stocks, not explained by the overall market reaction, are shown in the table below.

Table 5 – Results of Reversed News Model for Sporting Clube Portugal SAD

No.	Date	Price reaction	Event
1	17/05/2013	90.72%	n.a
2	09/10/2012	55.24%	n.a
3	21/03/2013	53.12%	Sale of Ricky van Wolfswinkel for Norwich City by 10M€, in a difficult time for Sporting with some speculation circulating about the capability to pay wages
4	26/04/2013	39.87%	n.a
5	03/10/2012	-38.94%	n.a
6	03/12/2013	38.05%	n.a.
7	23/01/2015	34.95%	Acquistion by loan of Ewerton, central defender
8	01/07/2013	32.99%	Financial restructuration proposed by the president Bruno de Carvalho approved with 97% of positive votes by the associates
9	02/05/2000	32.50%	n.a
10	07/01/2015	30.10%	n.a
11	10/05/2013	-29.83%	n.a
12	14/01/2015	28.57%	n.a
13	07/05/2012	27.88%	Speculation about the possibility of Chinese investors interested in investing around 190M€
14	25/11/2014	27.66%	Game day against Maribor for the group phase of Champions League
15	09/01/2015	-26.62%	n.a
16	20/09/2013	-25.75%	n.a
17	25/11/2011	25.55%	n.a
18	29/04/2002	-25.49%	Day after winning the championship title
19	04/06/2014	-25.46%	n.a
20	27/05/2013	-25.36%	n.a

Note: n.a means no news identified.

It is also interesting that positive stock price movements are dominant when the 20 largest stock price returns not explained by the overall stock market are analyzed. Sporting is in the market for longer since its IPO was done in 1999. However, it is noticeable that 13 of the 20 largest stock price returns occurred since the actual president was elected (March 2013), starting a period to get Sporting to where it deserves to be, fighting for titles and being respected and known in all Europe.

The results in the last years were not as good as its rivals and since the IPO only two times Sporting won the Portuguese championship. In the last two years the figure has slightly

changed and Sporting has been growing at a very good pace, not only sportingly but financially too. External events were more difficult to find in the case of Sporting in order to explain the big price movements. However, there are three events that should be mentioned:

- 21/03/2013, sale of Ricky Van Wolfswinkel for 10M€ in the week before elections. Sporting was living a critical moment and its financial wealth was struggling. The sale of the striker brought some fresh air and money to face some difficulties. Moreover, there were a lot of expectations around the elections though the final was expected;
- Financial restructuring proposed by the president Bruno de Carvalho got accepted with 97% by the associates in the weekend before 01/07/2013. A few months after his election, Bruno understood that Sporting needed to be recovered financially and started a plan that needed to be voted by the associates in order to begin. The president had major support from the associates with 97% of them voting "Yes";
- Speculation about the possibility of a Chinese company to invest up to 190M€ in Sporting. Godinho Lopes, the president at that time, was known to have good relationships with Chinese businessman and a rumor about a possible investment coming from China was circulating among the press. It could represent a good amount of money entering in the club and the market reacted positively, going up by 28.13% in 07/05/2012.

A problem with Sporting arises with the volume of actions transacted in the days when the 20 largest stock price returns were registered. Just by two times there were more than 10,500 stocks being transacted which means that illiquidity is present in this kind of market. Therefore, a bigger order purely speculative can have a great impact in the stock price and, consequently, no external event can explain that same variation. However, it is possible to see that some important corporate governance issues impact the stock price, especially the ones where investors are not expecting for and are not yet incorporated in the stock price.

6.3. Futebol Clube do Porto SAD

The 20th largest price reactions of Futebol Clube do Porto SAD stocks, not explained by the overall market reaction, are presented in the table below.

Table 6 – Results of Reversed News Model for Futebol Clube do Porto SAD

No.	Date	Price reaction	Event
1	05/02/2010	66.95%	n.a
2	04/02/2010	-38.45%	n.a
3	20/12/2012	36.61%	Day after the success of a bond issue with a value of 30M€ with demand being more than 5 times higher than supply
4	06/05/2002	-27.33%	n.a
5	03/04/2002	26.52%	Boost given by the resumption of work at the stadium
6	02/05/2013	-24.16%	n.a
7	10/03/2015	23.30%	News about a possible sale of Danilo for Real Madrid by 35M€
8	25/04/2013	21.45%	n.a
9	12/09/2014	20.08%	n.a
10	21/07/2011	-19.76%	n.a
11	30/04/2014	19.69%	n.a
12	07/11/2013	-18.96%	Day after the draw against Zenit for the 4th round of the group phase of the Champions League
13	07/12/2012	18.48%	Speculation about a bond issue, increasing the initial value of 25M€ for 30M€ considering the high demand
14	22/01/2002	18.35%	Rescission of the contract with the coach Octávio Machado, acquiring José Mourinho for his place
15	21/03/2014	17.80%	Friday after win against Napoli in the aggregate of two legs, advancing for the Quarter-finals of Europa League
16	26/08/2013	17.69%	Day after home match won against Marítimo at home by 3x0
17	20/07/2012	17.59%	n.a
18	07/05/2015	17.42%	Day after the announcement of a bond issue with the value of 40M€
19	22/04/2015	-17.19%	Day after the defeat in Munich against Bayern by 6x1, in the 2nd leg of the quarter-finals of the Champions League
20	19/02/2013	17.01%	n.a

Note: n.a means no news identified.

Porto is a peculiar and very interesting case study. Porto has been the most successful team, either nationally or internationally when comparing to Sporting and Benfica. In fact, since Porto entered the stock market it has been Portuguese champion nine times,

more than all the other teams combined. They conquered one Champions League, one UEFA Cup and one Europa League.

Therefore, it is easy to understand that with a lot of conquers, a lot of money came into the club. The principal was obtained from players' sells, especially in 2004 when Porto won the Champions League and all Europe was searching and biding for their best players. However, it is hard to understand how share prices have been decreasing so much since the IPO in 1998, considering all the sporting success mentioned above.

Porto SAD also had a lot of positive stock price returns in the selection of the 20 largest. However, it is difficult to understand and verify corporate governance information that could explain stock price movements and even the two largest ones had no explanation for them to occur, being the lower level of volume of transaction the main reason. There are three corporate governance events that were important to understand some variations:

- 20/12/2012, the day after the success of a bond issue, raising the expected 30 million euros with demand being more than 5 times higher than supply. By offering a competitive interest rate, Porto SAD was able to attract a lot of investors that bought these securities, and many of them could not even reach all the quantity they wanted to have in their portfolio. Even being considered a risky investment, there was many people interested in buying this kind of titles, meaning that many emotional investors participated in the transaction. This is due to the fact that market interest rates, compared to this kind of operation presents a lower risk and offers a good remuneration at that time as well; Furthermore, this bond issue was also responsible for another big stock price variation occurred on 07/12/2012. In that day, investors reacted positively to the announcement of Porto SAD stating that the bond issue would increase its value from 25 to 30 million euros. This revealed how investors were reacting to the bond issue, reflecting a lot of demand and Porto SAD knew that more money could be raised from that initiative;
- Another bond issue also had a great impact in Porto SAD stock price returns on 07/05/2015. In that day, it was announced that 40 million euros would be raised in this market in order to satisfy financing needs. Again, the interest rate of this instrument was higher than the rest of the market, showing all the risks that investors were facing by buying this kind of product. However, market reacted

positively as they knew that this would be a good way for the club to finance itself and be financially more comfortable;

- Porto faced a difficult period in January of 2002 when it had lost too many games. Porto's coach ended to be fired and market reacted promptly in the next day, the 22nd. In fact, Porto president and their assistants did not lose time and found the best solution: José Mourinho as the new coach. Fans supported the choice because they knew him and what he had achieved in other teams. Stock prices showed exactly that by moving increasing more than 18%. One has to recognize that this was one of the best decisions Porto SAD has ever made. Later, Mourinho conquered one UEFA Cup and another Champions League and two consecutive Portuguese championships.

The same problem present in the Sporting SAD case also occurred when analyzing Porto stock price variations: illiquidity. Considering the 20 largest stock price movements not explained by the overall stock market, only three of them registered a volume of transactions higher than 20,000. In fact, Porto SAD was asked by the market regulator at 2010 when in 2 days in a row stocks registered the largest variations ever, being the low volume the explanation, considering that a great order could influence the price in a great scale.

6.4. Summary of results

To sum up, it is possible to observe corporate governance related information is important to explain stock price returns. While sporting results assumes a crucial relevance, also the actions taken by team managers and directors assumes importance, especially considering that they have consequences in sporting performance, like the acquisition of new players or the dismiss and acquiring of a new coach.

There are a lot of events that can have a great impact in only one trading day, regarding corporate governance. Speculation about an OPA is one of them and Benfica had an historical regarding that, especially considering the amounts involved and the premiums speculated among such operations. Also, debt issues are important to explain stock price variations considering that an higher amount of monetary resources able any team to invest that same amount in acquiring new and better players, becoming more competitive like Porto did.

However, the most interesting case of the three teams is Sporting Clube de Portugal. Since the actual president was elected many things changed inside the club, considering some actions and politics implied by the new leader. Even the results in the field got better and Sporting is now fighting for the Portuguese championship, something that was not so usual in the last years. Even though this is not observable in table 5, Sporting SAD stock prices have been registering many changes, being some of them connected with the acquisition of the rival coach, Jorge Jesus, who was 6 years in Benfica's bench, and the restructuring of Sporting squad with the acquisition of better players.

In summary, it is possible to observe that corporate governance news are important to explain stock price variations. This gains more relevance considering the difficulty to estimate the significance of this kind of variables quantitatively, being the reversed news model a good tool to control the results obtained in the news model.

7. Conclusions

In this dissertation the news model was applied in order to understand how new information about matches outcome can explain stock prices movements in the football industry namely in the case of Sport Lisboa e Benfica SAD, Sporting Clube de Portugal SAD and Futebol Clube do Porto SAD. This model is better applied to this kind of shares, regarding that new information arrives to the investors at the same time and when the markets are closed. Therefore, it is incorporated in the following trading day by the agents, considering that they all have access to the same information.

The empirical findings of this dissertation are in accordance with previous studies regarding the news model. However, results differ between the different football teams analyzed. First of all, for Sport Lisboa e Benfica only new information about Portuguese league and Europa league games is significant. Also, the hypothesis that states that a European game should influence the stock price in a larger extent than a Portuguese game was not verified. Although the coefficient for Europa League is larger, the difference between them is not significant in statistical terms. Considering Sporting Clube de Portugal, only new information about Portuguese league games was significant. Finally, for Futebol Clube do Porto new information coming from both the Portuguese league and the Champions league games was significant in statistical terms. Although Champions league games observe a higher coefficient, the difference is not significant.

In order to check and control the analysis done with news model, a reversed news model was applied and events that had a great impact on the stock price of the three studied football teams were identified. Therefore, the 20 largest stock price returns that were not explained by the overall stock market were listed for the three different teams. Findings were in line with previous studies that used this model, considering that corporate governance related news have an important role when explaining stock price movements. Yet, it was easier to find corporate governance news for Benfica than it was for Sporting and Porto.

A problem that could emerge with the use of reversed news model is the fact that there are some news that can have significant but rather small impact on stock returns and are not captured in the 20 largest stock price movements. On the other hand, it is a good way to capture categories that cannot by identified empirically.

Finally, it is important to mention that the illiquidity dominates transactions of football shares. While it is a good industry to apply the news model, considering all the circumstances mentioned before it loses strength when considering the difficult in many trading days to find a counterparty. Some of the 20 largest stock price returns coming from reversed news model had no news to explain them while at the same time volume was too low, presenting trading days with less than 100 shares transacted.

In order to improve this kind of studies, one thing that could be done would be to control betting odds of the second legs in knockout phases. It would correspond better to the investors' expectations regarding the final result, because a win in some match could not correspond exactly to pass to the next phase, making the probabilities and the expected points biased.

Also, the unexpected points for wins and losses could be separated in order to understand the difference of the effect regarding each match outcome. Finally, betting exchange prices should be use instead of betting odds, because it is a better approximation for investors' belief. However, betting prices are hard to find, which could difficult the research.

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Appendix

Table A1: Historical Futebol Clube do Porto Results

Season	Portuguese League	Champions League	Uefa Cup/Europa League
1999/2000	2nd place	Eliminated in quarter-finals against Bayern Munchen	No participation
2000/2001	2nd place	Lost in the third qualification stage, moving to Uefa Cup	Eliminated in quarter-finals against Liverpool
2001/2002	3rd place	Eliminated in the second group phase, before quarter-finals	No participation
2002/2003	Champion	No participation	Winner
2003/2004	Champion	Winner	No participation
2004/2005	2nd place	Eliminated in the round of sixteen against Inter	No participation
2005/2006	Champion	Eliminated in the group phase (last place)	No participation
2006/2007	Champion	Eliminated in the round of sixteen against Chelsea	No participation
2007/2008	Champion	Eliminated in the round of sixteen against Schalke 04	No participation
2008/2009	Champion	Eliminated in quarter-finals against Manchester United	No participation
2009/2010	2nd place	Eliminated in the round of sixteen against Arsenal	No participation
2010/2011	Champion	No participation	Winner

2011/2012	Champion	Eliminated in the group phase, moving to Europa League	Eliminated in the round of thirty two against Manchester City
2012/2013	Champion	Eliminated in the round of sixteen by Málaga	No participation
2013/2014	3rd place	Eliminated in the group phase, moving to Europa League	Eliminated in quarter-finals against Sevilla
2014/2015	2nd place	Eliminated in quarter-finals against Bayern Munchen	No participation

Table A2: Historical Sporting Clube de Portugal Results

Season	Portuguese League	Champions League	Uefa Cup/Europa League
2000/2001	3rd place	Eliminated in the first group phase (last place)	No participation
2001/2002	Champion	No participation	Eliminated in the third round against AC Milan
2002/2003	3rd place	Eliminated in the third round of qualification against Inter, moving to Uefa Cup	Eliminated in the first round against Partizan
2003/2004	3rd place	No participation	Eliminated in the second round against Gençlerbirligi
2004/2005	3rd place	No participation	Lost in the final against CSKA Moscow
2005/2006	2nd place	Eliminated in the third round of qualification against Udinese, moving to Uefa Cup	Eliminated in the first round against Halmstads
2006/2007	2nd place	Eliminated in the group phase (last place)	No participation
2007/2008	2nd place	Eliminated in the group phase, moving to Uefa Cup	Eliminated in quarter-finals against Rangers

2008/2009	2nd place	Eliminated in the round of sixteen against Bayern Munchen	No participation
2009/2010	4th place	Eliminated in the qualification playoff against Fiorentina, moving to Uefa Cup	Eliminated in the round of sixteen against Atletico Madrid
2010/2011	3rd place	No participation	Eliminated in the round of thirty two against Rangers
2011/2012	4th place	No participation	Eliminated in Semi-finals against Athletic
2012/2013	7th place	No participation	Eliminated in the group phase
2013/2014	2nd place	No participation	No participation
2014/2015	3rd place	Eliminated in the group phase, moving to Uefa Cup	Eliminated in the round of thirty two against Wolfsburg

Table A3: Historical Sport Lisboa e Benfica Results

Season	Portuguese League	Champions League	Uefa Cup/Europa League
2007/2008	4th place	Eliminated in the group phase, moving to Uefa Cup	Eliminated in the round of sixteen against Getafe
2008/2009	3rd place	No participation	Eliminated in the group phase
2009/2010	Champion	No participation	Eliminated in quarter-finals against Liverpool
2010/2011	2nd place	Eliminated in the group phase, moving to Uefa Cup	Eliminated in semi-finals against Braga
2011/2012	2nd place	Eliminated in quarter-finals against Chelsea	No participation
2012/2013	2nd place	Eliminated in the group phase, moving to Uefa Cup	Lost in the final against Chelsea
2013/2014	Champion	Eliminated in the group phase, moving to Uefa Cup	Lost in the final against Sevilla
2014/2015	Champion	Eliminated in the group phase (last place)	

Table A4: Previous empirical studies

Authors	Team(s) Analyzed	Explanatory variables considered	Method	Conclusions
Renneboog & Vanbrabant (2000)	17 clubs listed in LSE and AIM	English market index, game results	Event studies	At the first trading day after a game day, positive abnormal returns of almost 1% were realized considering a win, while a defeat and a draw would be associated to -1,4% and -0,6%, respectively.
Brown & Hartzell (2001)	Boston Celtics (Basketball)	Winning percentage, cumulative spread, cumulative points. Coach hiring and new pavilion (non-game events)	Regression and non-game events.	Losses significantly affect the stock price while wins do not.
Stadtmann (2004)	Borussia Dortmund	German market index, game results, new transfers, players sold, contract's durations	Regression	Only the unexpected part of an information should influence the stock price.
Ashton, Gerrard & Hudson (2003)	England national football team	FTSE 100 Index, game results	GMM	Significance found between football performance and change in price shares. Greater influence of more important games, such as tournament matches.
Duque & Ferreira (2005)	Futebol Clube do Porto and Sporting Clube de Portugal	Portuguese market index, game results, daily volume, risk-free return	ARCH-GARCH	Sporting performance is associated with movements in share prices in the stock exchange.
Stadtmann (2006)	Borussia Dortmund	German market index, betting odds, game results	News Model and Reversed News Model	Corporate governance related news play an important role in explaining stock price movements of Borussia Dortmund.
Berument, Ceylan & Gozpinar (2006)	Besiktas, Fenerbahce, Galatasaray	Turkish market index, game results	GARCH	Besiktas wins agains foreign rivals increased stock market returns. The same effect is not present for the other two teams.

Edmans, Garcia & Norli (2007)	39 coutries, considering their national teams	Results in international games	GARCH	Strong negative stock market reaction to losses by national soccer teams.
Samagaio, Couto & Caiado (2008)	20 British teams	Turnover, salaries, net transfer fees, net income, game results	Structural Equation	Sport performance is related with financial performance. Stronger association between turnovers and major competitions, larger when compared with salaries.
Palomino, Renneboog & Zhang (2009)	16 British teams	Game results, goals difference, probabilities	Regression	The average cumulative abnormal returns over a three day period are strong statiscally significant. Also, the investors overreact to a win.
Baur & McKeating (2009)	22 European teams listed on the Dow Jones STOXX football index	Game results, IPO effect (dummy variable considering the realization of an IPO)	Panel Data Regression	The majority of football clubs do not perform better in the home league after the IPO than before. Considering international championship, they only perform slightly better.
Klein, Zwergel & Fock (2009)	England football team	Replication of Ashton et al. (2003) to verify results	Regression	It was demonstrated that even small mistakes could have a strong influence on empirical studies' results, considering changes done to the previous study.
Bell, Matthews, Brooks & Sutcliffe (2009)	19 England teams	English market index, game results, goal difference, match venue, betting odds	Regression	Match results affect the share price but there are other variables with higher effect. Points surprises and lagged points surprises have a positive influence on returns. Points' surprises from home games have an additional positive effect.
Aglietta, Andreff & Drut (2010)	Clubs quoted in Dow Jones Stoxx Index	Market share, income from TV rights, wages	Regression	High relationship between TV income and players' salaries.
Benraiem, Le Roy & Louhichi (2010)	8 British clubs listed on the AIM	Game results	EGARCH	The sporting performance of football teams has significant impact on stock market valuation of listed clubs. The magnitude of the market reaction depends on the result of the match (defeat, draw or victory) and on the match venue (away or home).

Jorgensen, Moritzend & Stadtmann (2012)	Brondby IF	Danish market index, betting odds, game results	News Model	Strong evidence among the impact of unexpected information measured by betting odds on stock price.
Berument & Ceylan (2012)	4 Chile clubs, 2 Spain clubs, 2 Turkish clubs, 4 English clubs	Respective country indices, game results	EGARCH	Empirical evidence that football match scores affect stock market returns and stock market return-volatility relationship.
Croonenbroeck, Monaco & Christensen (2012)	Brondby IF	Danish market index	Reversed News Model	Financial and corporate governance news have a huge impact on stock price.
Saraç & Zeren (2013)	3 Turkish clubs: Besiktas, Galatasaray, Fenerbahce	Turkish market index, type of match (international or derby), betting odds, venue of the match	Regression	The findings show that the soccer performance is significantly and positively related with the stock returns for all the three clubs.
Godinho & Cerqueira (2014)	13 clubs of six different European countries	Unexpected points, importance-weighted of unexpected points, Portuguese market index,	GARCH	Importance-weighted unexpected points are significant for 12 of 13 clubs considered in the study.
Sun & Wu (2015)	Juventus FC	Italian market index, betting odds, game results	News Model and Reversed News Model	Unexpected match outcomes are important to explain stock price movements. Also, corporate governance news can also have an important role in driving the stock.

Table A5: Betting odds, probabilities and unexpected points

Date	Teams	Result	Betting Odds			Mark-up	Implicit Probability			Actual Points	Expected Points	Unexpected Points
			Home win	Draw	Home win		Home win	Draw	Away win			
4/4/2015	SL Benfica vs Nacional	3-1	1.21	5.84	14.21	7.09%	77.45%	15.98%	6.57%	3	2.48	0.52

Table A6: ADF and KPSS Tests Results for Sport Lisboa e Benfica SAD variables

Variables	ADF Test	KPSS Test
ΔBenfica	-18.50593***	0.023107
ΔPSI20	-19.36953***	0.049802
League_actual	-24.42065***	0.067634
League_exp	-8.417395***	0.089529
League_unexp	-19.19812***	0.038298
Europe_actual	-6.842058***	0.116279
Europe_exp	-5.795932***	0.138310
Europe_unexp	-18.48881***	0.040646
CL_unexp	-18.67668***	0.064640
Uefa_unexp	-18.54184***	0.074888
Sporting_unexp	-18.28502***	0.065229
Porto_unexp	-18.93097***	0.062289

Note: *, ** and *** mean significance at 10, 5 and 1 %-level, respectively.

Table A7: ADF and KPSS Tests Results for Sporting Clube de Portugal SAD variables

Variables	ADF Test	KPSS Test
ΔSporting	-22.27295***	0.054501
ΔPSI20	-24.81943***	0.078049
League_actual	-11.83105***	0.151976
League_exp	-9.542721***	0.158543
League_unexp	-24.78116***	0.070942
Europe_actual	-8.089908***	0.158825
Europe_exp	-9.661104***	0.162283
Europe_unexp	-24.32089***	0.047754
CL_unexp	-24.47488***	0.050771
Uefa_unexp	-24.39502***	0.032221
Benfica_unexp	-24.28527***	0.043549
Porto_unexp	-25.25230***	0.116155

Note: *, ** and *** mean significance at 10, 5 and 1 %-level, respectively.

Table A8: ADF and KPSS Tests Results for Futebol Clube do Porto SAD variables

Variables	ADF Test	KPSS Test
ΔPorto	-29.23163***	0.011664
ΔPSI20	-25.31263***	0.042980
League_actual	-12.40011***	0.066228
League_exp	-12.86900***	0.025784
League_unexp	-27.05637***	0.121695
Europe_actual	-9.303195***	0.081223
Europe_exp	-12.45238***	0.169517
Europe_unexp	-26.35062***	0.049146
CL_unexp	-25.90312***	0.037960
Uefa_unexp	-27.42892***	0.084546
Benfica_unexp	-28.34427***	0.062009
Sporting_unexp	-27.19605***	0.063210

Note: *, ** and *** mean significance at 10, 5 and 1 %-level, respectively.

Table A9: White and Breusch-Godfrey Tests Results for Sport Lisboa e Benfica SAD models

Models	White Test	Breusch-Godfrey Test
Model 1	5.536140	0.855634
Model 2	6.657095	0.988748
Model 3	12.61075	0.692920
Model 4	6.673372	0.655561
Model 5	9.140191	0.443848

Note: * means Probability < 0.05.

Table A10: White and Breusch-Godfrey Tests Results for Sporting Clube de Portugal SAD models

Models	White Test	Breusch-Godfrey Test
Model 1	1.733813	6.278928*
Model 2	14.22692	6.390294*
Model 3	53.72624*	6.273077*
Model 4	30.60334*	6.362866
Model 5	47.60493*	6.036990*

Note: * means Probability < 0.05.

Table A11: White and Breusch-Godfrey Tests Results for Futebol Clube do Porto SAD models

Models	White Test	Breusch-Godfrey Test
Model 1	0.104857	9.382017*
Model 2	3.958137	10.92209*
Model 3	7.375857	10.73569*
Model 4	2.591844	10.50147*
Model 5	3.326921	10.51890*

Note: * means Probability < 0.05.

Table A12 – Sport Lisboa e Benfica SAD Model 6 Results

		Model 6
β0	Constant	-0.0061**
β1	ΔPSI20	0.1016
β4	League_unexp	0.0128***
β8	CL_unexp	0.0022
β9	UEFA_unexp	0.0182***
β10	Sporting_unexp	0.0000
β11	Porto_unexp	-0.0035
	Obs.	340
	R2	0.0691
	Adj. R2	0.0523

Note: *, ** and *** mean significance at 10, 5 and 1 %-level, respectively.

Table A73 – Sporting Clube de Portugal SAD Model 6 Results

		Model 6
β0	Constant	-0.0030
β1	ΔPSI20	0.1233
β4	League_unexp	0.0052**
β8	CL_unexp	0.0041
β9	UEFA_unexp	-0.0040
β10	Benfica_unexp	0.0035
β11	Porto_unexp	-0.0018
	Obs.	601
	R^2	0.0120
	Adj. R^2	0.0020

Note: *, ** and *** mean significance at 10, 5 and 1 %-level, respectively.

Table A84 – Futebol Clube do Porto SAD Model 6 Results

		Model 6
β0	Constant	-0.0029**
β1	ΔPSI20	0.2962**
β4	League_unexp	0.0044***
β8	CL_unexp	0.0061**
β9	UEFA_unexp	0.0050
β10	Benfica_unexp	0.0008
β11	Sporting_unexp	-0.0016
	Obs.	685
	R^2	0.0266
	Adj. R^2	0.0018

Note: *, ** and *** mean significance at 10, 5 and 1 %-level, respectively.

Figure A1: Sport Lisboa e Benfica SAD and PSI-20 prices

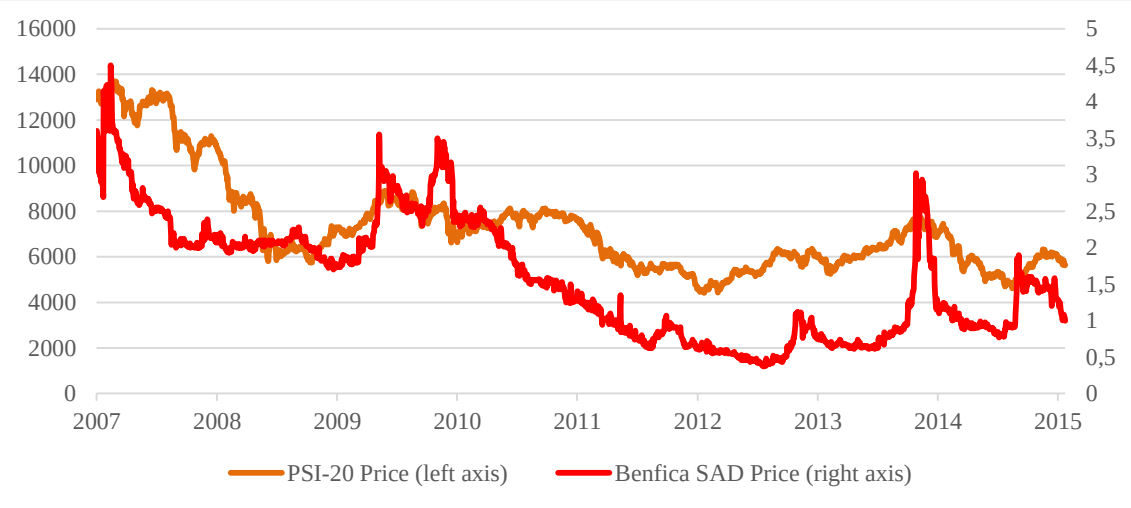

Figure A2: Sporting Clube de Portugal SAD and PSI-20 prices

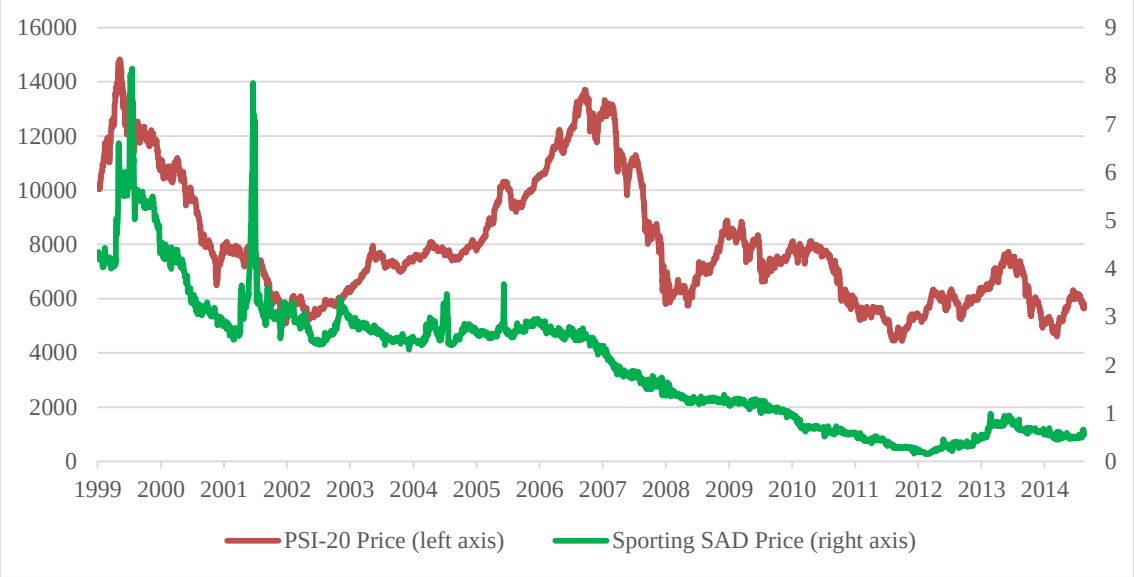

Figure A3: Futebol Clube do Porto SAD and PSI-20 prices