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## Master Thesis U.S.E

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### *Analyzing Abnormal Returns: Impact of Unexpected Game Results on Main Sponsors of the European Soccer Leagues*

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#### *Abstract*

*Sports exert a profound influence on individuals' lives, social connections, and notably, investor sentiment. An unexpected sports result can have a huge impact on the mood of the people in the city or even an entire country. Different studies have found a relationship between sports teams, locally associated businesses, and unexpected results. However, limited studies have looked at how the primary sponsor of a team is impacted by an unexpected result. Therefore, the main question of this study is as follows: "Do unexpected results in soccer matches result in abnormal returns for the primary sponsor of the team?". To facilitate the main question above, this research will utilize two hypotheses. Hypothesis (1) is that an unexpected win/loss creates abnormal returns for the primary sponsor and (2) this is further strengthened when the market contains either Bullish or Bearish sentiment. This research found evidence to support the first claim that sports and unexpected losses lead to abnormal returns. However, this paper also finds that unexpected wins could lead to negative abnormal returns, this may be caused by insufficient sponsoring strategies. This paper found little to no evidence to support the second hypothesis. Concluding, that unexpected losses or wins have a significantly greater impact than mere sporting performance.*

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## Introduction

Sports profoundly influence people's lives, social connections, and notably, investors' sentiments. An unexpected sports result can have a huge impact on the mood of a city or even an entire country. For instance, think about the effect the Chicago Cubs had when ending the 71-year Billy the Goat curse (Baseball), Liverpool winning the Premier League for the first time in over 50 years (Soccer), Verstappen winning his first world title as a Dutch driver (Formula 1). All the above events brought hysteria to entire cities and even countries. Besides having a positive effect on the revenue streams of the local pubs, unexpected sports events can even impact financial markets.

Studies conducted by Chen and Chen (2011) show positive abnormal stock returns for the parent companies when their teams qualified for the final baseball championship. This could be explained by an economic mechanism which shows that when a sports team wins a match, its investors get happier thereby creating positive sentiment and impacting its stock price (Chen & Chen, 2011). A recent study by Kim and Lee (2022) found that investor sentiment has a significant impact on stock returns (Kim & Lee, 2022). This can also be explained by the role of the media and how they cover the game. Evidence shows that games that get a lot of media coverage like playoffs and rivalries games, impact the trading behavior of investors (Engelberg & Parsons, 2011).

From a business perspective, sports outcomes can have positive and negative impacts on the primary sponsor of a team. For example, brands are associated with warm feelings when their sports teams are winning. Alternatively, an unexpected defeat can tarnish this effect. Logically, increasing brand recognition is useful for the marketing department, however, one would not expect the results of an individual game to have an impact on the day-to-day operations or its value. However, existing scientific studies suggest otherwise (see Literature Review).

The number one sport in Europe is soccer, this is illustrated by facts like the Champions League having a price pot of over \$2.19 billion, and the Premier League getting a new television deal that is worth £6.7 billion (Evans, 2024) (Seal & Hellier, 2023). These huge figures show that soccer has a huge impact on both business and society. Notably, numerous companies experience a significant impact in value due to specific special sporting events, and this can have echoes on the national stock indexes (Sevil, Kamishu, & Kamish, 2014). Consequently, this paper will analyze European soccer results during the past decades, with a particular emphasis on unexpected results. In the context of this paper, these unexpected results will be shown by reviewing betting odds as determined by the sports betting industry (more detailed definition in the Methodology section). This research wants to determine if the primary sponsor is similarly impacted as other studies have suggested, therefore making the main research question as follows:

*“Do unexpected results in soccer matches translate into abnormal returns for the primary sponsor?”*

The remainder of this paper will review the literature currently available on this topic. From the literature, gaps will be identified, and a hypothesis will be developed. Lastly, the data collection strategy will be shown, and the Methodology will be explained (Data and Methodology).

## Literature review

### *Sports and Financial Markets*

Sports and the financial market are connected in various ways. Gimet and Montchaud (2016) demonstrated that sports teams are influenced not only by real and financial contexts but also by internal variables within the organization. Factors such as profit reflect accounting discipline, capitalization indicates size, and stadium attendance serves as a proxy for reputation (Gimet & Montchaud, 2016). Moreover, their study revealed that these factors could influence the volatility of the stock price of the team. Similarly, Scholtens and Peenstra (2010) found abnormal returns associated with soccer matches. Their research further emphasized the significance of sports events in shaping market outcomes, particularly for teams traded on the stock market (Scholtens & Peenstra, 2010). The above studies focused on sports teams that are traded on the stock market. However, companies closely affiliated with the teams have also experienced repercussions from these results.

A study performed by Chang, Chen, Chou, and Lin (2012) looked at the correlation between the results of sporting matches and the economic impact this had on local economies. Their research found that there was a significant correlation between these factors and the effects would be strengthened if the team won/lost unexpectedly. Therefore, suggesting that the game outcomes of local sports teams influence investor sentiment, which significantly affects the returns of localized trading stocks in the US (Chang, Chen, Chou, & Lin, 2012). Similarly, an economic mechanism was found in Europe with soccer matches. Castellani, Pattitoni, & Patuelli (2013) found a relationship between market returns, sentiment, and sports betting. The above studies found more significant results when the outcome of the game was unexpected (Castellani, Pattitoni, & Patuelli, 2013) (Chang, Chen, Chou, & Lin, 2012). Both researchers describe a mechanism wherein sports outcomes evoke a psychological response that influences the investor's sentiment and results in abnormal returns.

Research conducted by Palomino, Renneboog, & Zhang (2009) looked at the returns of British Soccer teams on the financial market and how outcomes influenced the stock price in the following days. They found a strong abnormal return for the winning team, which is not necessarily day-to-day operations but namely due to the overreaction of investor sentiment (Palomino, Renneboog, & Zhang, 2009). They also looked at how betting odds influence the returns: ‘We conclude that investors ignore some non-salient public information such as betting odds, and betting information predicts a stock price overreaction to game results which are influenced by investors' mood (especially when the teams are heavily favored to win)’ (Palomino, Renneboog, & Zhang, 2009).

### *Impact of sponsoring*

Sponsorship is an important contribution to the income of the different sports teams. However, the question is if this is also a lucrative opportunity for the sponsoring companies. Research conducted by Kim (2010) found a positive relationship between sponsoring US firms and stock returns. The study found abnormal returns of sponsored companies during the PGA tour and the World Cup (Kim J.-W., 2010). Alternatively, this return is not always found, as research in South Africa showed that in their sports leagues no abnormal returns for their sponsoring firms (Blake, Fourie, & Goldman, 2018). Theoretically, these differences could be explained by numerous factors, such as cultural differences, less public information available, and the amount of media coverage for these sponsors.

Similar studies were also conducted within Europe. A study conducted in the Netherlands about sponsorship efficiency suggests that sponsorship clutter negatively affects sponsorship efficiency, whereas sponsorship duration has a positive effect. Therefore, the length of the sponsorship could have a positive impact on the company (Walraven, Koning, Bijmolt, & Los, 2015). Specifically, a sponsoring company's brand image on a national level, can be enhanced by sponsoring the national team. The most significant results are experienced when the fans are already customers of the sponsoring company (Brochado, Dionisio, & Leal, 2018).

## *Investor Sentiment*

As shown above, the return on stocks could be impacted by investor sentiment that is derived from sports games. Numerous studies have looked at the correlation between investor sentiment and its impact on society and financial markets. For instance, Polk & Sapienza (2004) found a positive relation between investment and several factors of mispricing concluding that overpriced/underpriced firms tend to overinvest/underinvest due to investor sentiment (Polk & Sapienza, 2004). Danso (2019) found evidence that investor sentiment causes projects to be overvalued and therefore results in projects with negative NPV (net present value). A negative NPV is harmful to society, as it shows that people could have utilized their cash flow more efficiently or have lost parts of their investment. Further, he also suggests that the impact of sentiment on investment correlates with a financial crisis as people come into a negative spiral and therefore tend to invest in negative NPV's (Danso, et al., 2019).

Similar patterns are observed in the world of sports. When people favor sports teams, it could impact investor sentiment and in return reflect on the market (as shown above). Media has also been shown to influence investor sentiment. Research indicates that media pessimism is associated with negative market returns and market volatilities (Kräussl & Mirgorodskaya, 2017). Likewise, Wann, Dolan, McGeorge, and Allison (1994) indicate supporters who feel extremely close to a sports team tend to have an increase in positive reactions following a win, and an opposite feeling following a defeat (Wann, Dolan, McGeorge, & Allison, 1994).

Most of the research above shows a strong correlation of reaction after the game. However, some research has also found evidence for pre-game abnormal returns, especially with huge sporting events. Payne, Tresi, and Friesen (2016) observed local clubs and their stock returns before the Super Bowl. They found anticipatory behavior from investors, could lead to extensive returns. Further, they found that similar findings could also be generated by post-game results (Payne, Tresi, & Friesen, 2016). As previously mentioned, media coverage could also generate abnormal returns before the game. This shows a mechanic that starts with the anticipated outcome of a sports game being strengthened by media coverage which in turn affects investor sentiment, which leads to abnormal returns in the coming days (Dechow, Lawrence, & Luo, 2019).

## *Gaps in Literature and Hypothesis Development*

The sections above highlighted how sports impact the financial markets. Especially sports teams and strongly associated local businesses. However, no research has been conducted about the primary sponsors of the team and how they are impacted by unexpected outcomes generated by the games. Based on the findings outlined above, it is reasonable to expect that the primary sponsor of the team would experience a similar impact or greater impact than other associated businesses. Thus, the hypothesis is the following:

*Hypothesis 1A: There is a significant positive abnormal return for the primary sponsor of the team after an unexpected win for the team.*

*Hypothesis 1B: There is a significant negative abnormal return for the primary sponsor of the team after an unexpected loss for the team.*

Most research shows a similar connection with market sentiment. An unexpected outcome of the sports game impacts the mood of the investors and that is then translated through to the financial market. Therefore, for the second hypothesis, this paper expects the following:

*Hypothesis 2A: Positive market sentiment (bullish) further strengthens the effect on the abnormal return of the primary sponsor of the winning team.*

*Hypothesis 2B: Negative market sentiment (bearish) further strengthens the effect on abnormal return of the primary sponsor of the losing team.*

## Data and Methodology

### *Data Collection*

The data collection process for this paper came from various sources. Firstly, the data regarding the abnormal return was collected with FactSet. This tool was similarly utilized for the control variables presented in the Methodology section. Data was gathered from four prominent soccer leagues: Bundesliga, Serie-A, Premier League, and La Liga. These leagues were chosen for their status as top leagues in Europe right now, ensuring a more accurate representation of the relationship under study. Market Sentiment was collected by the VIX index, accessed through Alternative. me. This index will give a score between 1-100, with 0-20 indicating a bearish sentiment and a score of 80-100 signaling bullish. Additionally, odds before the games were collected from Oddsportal.com. All the data was collected and saved within Excel and a template was created to calculate the abnormal returns. All the data was then analyzed with the tool STATA. An overview of all the variables is presented in the Methodology section.

All data obtained through this research was gathered through FactSet, Alternative. me (Market Sentiment), or Oddsportal. FactSet is available for the public and can be used to replicate the data herein. FactSet uses data sets from different online sources such as annual reports and other public records. Further, the other two tools are reliable online sources accessible to everyone and based on past information. This ensures that anyone could look these numbers up and calculate them, ensuring high reliability for this paper.

There are numerous papers about sports and the financial market. As presented in the literature review, a lot of research covers how sports affect the outcome of companies, and mostly a link is found through market sentiment. Therefore, this research would expect to find equivalent results to strengthen its validity. Finally, this research has selected the following two control variables: total assets (size of the company) and return on assets. These were selected because prior research has employed similar factors, aiming to encompass the most dependent variables and mitigate the possibility of omitted variables.



## Methodology

For abnormal returns, an event window of 10 days before the event and 10 days has been used. This involved analyzing data for both winning and losing teams, along with their respective main sponsors. An unexpected win or loss was determined by the odds before the game. If the winning team had an odd higher than 4 (1/4=25% probability) it will be considered as an unexpected win/loss. Equation (1) shows the expected excess return, which regresses the company's stock return and the return of the market portfolio (represented by the indexes of the specific competition), where alphas and betas are calculated based on the estimation period [-300, -11]:

$$1. E(R_{i,t}) = a - b_i R_{i,t} + u_t$$

Further, to construct abnormal returns, denoted  $AR$ , which are calculated by subtracting the expected (excess) return from the actual (excess) return, as shown in equation (2):

$$2. AR_{it} = R_{it} - E(R_{it})$$

Moreover, the abnormal return will then be added up together and an event window is created (10 days before and 10 days after), as illustrated below (3):

$$3. CAR_i(t_{-10}, t_{10}) = \sum AR_i(t)$$

Next, the following equation is made to determine if it can explain the abnormal returns:

$$4. CAR_i = \beta_0 + \beta_1 win_{i,t} + \beta_2 loss_{i,t} + \beta_3 Bullish\ Sentiment_{i,t} + \beta_4 Bearish\ Sentiment_{i,t} + \beta_5 Win * Bullish\ Sentiment_{i,t} + \beta_6 loss * Bearish\ Sentiment_{i,t} + \beta_7 controll_{i,t} + \varepsilon_{i,t}$$

This paper sometimes needs to utilize the cumulative average abnormal return (CAAR).

Therefore, if applicable, the CAR will be substituted with the CAAR as follows:

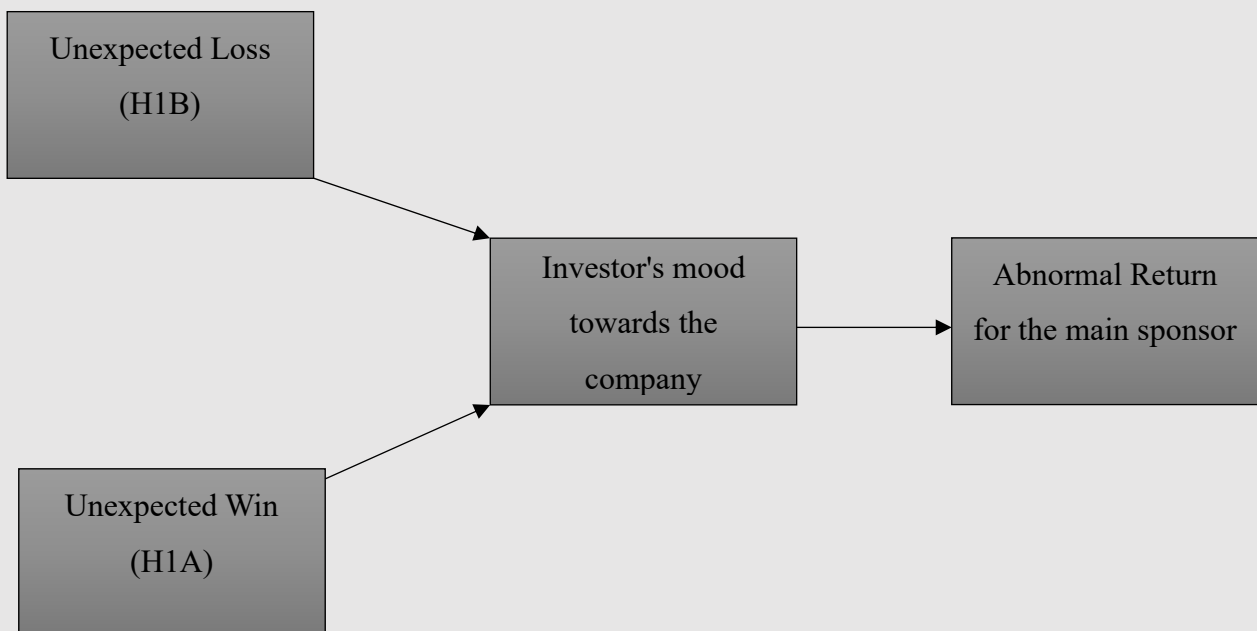
$$5. CAAR_i = \frac{1}{N} \sum CAR_i(t)$$

All the variables from the previous equation can be found in the table below:

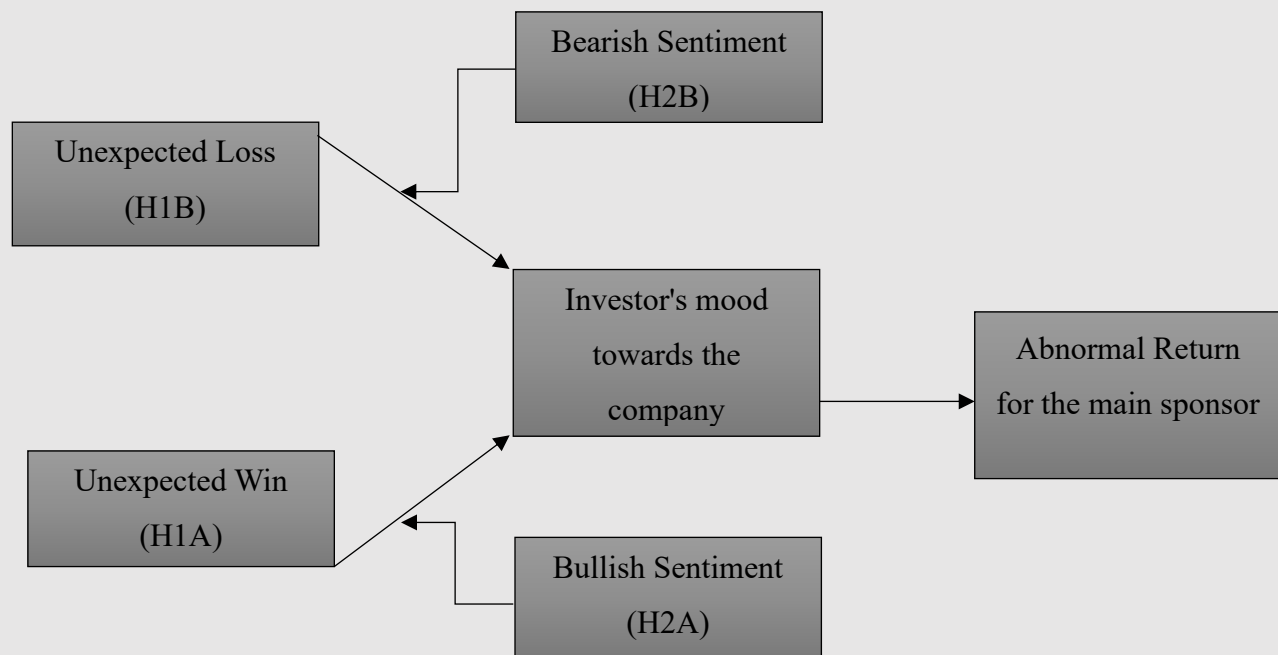
Variable	Meaning
CA(A)R	Cumulative abnormal (Average) Return of the 10 days window or
Win/Loss	A dummy variable whether the team unexpectedly won or lost the game based on the odds before the game
Investor sentiment	A dummy variable if the investor sentiment is bullish (score between 80-100) or bearish (score between 0-20)
Investor sentiment *Win/loss (Interaction term)	An interaction term between investor sentiment and whether the team won or lost
SMB=Size of the company (Control Variable)	Total Assets
HML= Return on Assets (Control Variable)	Net Income / Total Assets

Table 1: Shows the meaning of the different variables.

Here below is the theoretical framework this paper will follow for the first and second hypotheses:



Graph 1: Shows the theoretical framework of the first hypothesis. (H= hypothesis).



Graph 2: Shows the theoretical framework of the second hypothesis. (H= hypothesis).

For the First Hypothesis, it is hypothesized that before the event no abnormal return will be shown and thereafter there will be a statically significant abnormal return. This entails that for the first hypothesis the following:

*H0: No Abnormal return after the unexpected loss/win for the main sponsor of the team*

*H1: Abnormal return after the unexpected loss/win for the main sponsor of the team*

For the second hypothesis, an interaction term was made to see if the sentiment of the market strengthens the effects. Previous research has used an IV instrument or interaction terms for sporting events. Papers that used IV instruments argued a connection between the result of the event influencing investor sentiment and transferring this to the financial market. At the same time, having no affiliation between sports events and the financial market. However, this argument cannot be made for sponsors of the team. The main argument is that the main sponsor of the team will probably be impacted directly by the team's results. Therefore, electing to choose the interaction terms to capture the proxy of investor sentiment. Making the second hypothesis for this paper:

*H0: Market sentiment does not strengthen the abnormal returns of the main sponsor of the team after an unexpected win/loss.*

*H1: Market sentiment further strengthens the abnormal returns of the main sponsor of the team after an unexpected win/loss.*

# Results

## General Statistics

For this paper, there were in total 353 different events collected and analyzed. The time window was established as follows: Two weeks before the event (10 days), the day of the event (1 day), thereafter every day of the coming week, and weeks after the event (5 days). This entails that for each event there were 21 days analyzed, thus  $21 * 353 = 7,413$  individual observations. All the data was assessed for correctness and corrected if necessary. These include heteroskedasticity, unit root, and autocorrelation. From the data collected the following descriptive statistics are made (the description from the individual competitions can be found in the appendix):

Variable	Observation	Mean	Std. dev	Min	Max
<b>Cumulative Abnormal Return (CAR)</b>	7413	-0.4833	4.4883	-38.0613	69.8191
<b>Cumulative Abnormal Return with a Win (CAR)</b>	7413	-0.1774	2.5965	-38.0613	69.8191
<b>Cumulative Abnormal Return with a Loss (CAR)</b>	7413	-0.3070	3.3770	-36.7719	138.3330
<b>Win</b>	7413	0.3343	0.4718	0	1
<b>Loss</b>	7413	0.6601	0.4737	0	1
<b>Market Sentiment</b>	7413	45.1918	21.9873	5	95
<b>Bullish Sentiment</b>	7413	0.1155	0.3196	0	1
<b>Bearish Sentiment</b>	7413	0.2220	0.4156	0	1
<b>Win * Bullish</b>	7413	0.0375	0.1900	0	1
<b>Loss * Bearish</b>	7413	0.1396	0.3466	0	1
<b>SMB (Size)</b>	7413	1,240,403	3,591,182	9,177	24,300,000
<b>HML (Return on Assets)</b>	7413	-0.0488	0.6843	-8.1531	1.0874

Table 2: Shows the descriptive statics of this paper.

## Results Hypothesis 1

Firstly, this paper will look if H0 of the hypothesis as presented in the methodology section can be rejected for all the competitions. This paper will first analyze if evidence of hypothesis 1B (unexpected loss) can be found. Therefore, the following table with the CA(A)R and the statistics scores for all the competition when a team unexpectedly loses the game:

Loss	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.5537%***	-0.6301%***	-0.3763%	-0.6006%***	-0.1471%	0.5034%	-0.2661%	-0.5234%***
T-Value	-6.94	-3.84	-1.41	-3.17	-0.71	0.65	-0.80	-5.25
P-value	0.000	0.000	0.160	0.002	0.478	0.518	0.424	0.000
F-test	0.000	0.005	0.267	0.0250	0.1781	0.0336	0.1742	0.000

Table 3: Shows the CA(A)R for a loss with the time window with the score of all the competitions (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

Comparing these results, shows a negative trend on the day of the event, as hypothesized earlier in the paper. This trend continues for day two after which no significant results can be found for the rest of the event window [3,5]. Further, it is noticeable that there are statistically relevant results weeks before the event and a week after. Furthermore, a similar table was developed for the unexpected win:

Win	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.5222%***	-0.2865%	-0.5125%*	-1.004%***	-0.7365%***	-0.3971%	0.0564%	-0.6242%***
T-Value	-3.24	-0.87	-1.93	-3.62	-2.84	-1.63	0.09	-5.11
P-value	0.001	0.383	0.054	0.000	0.005	0.105	0.930	0.000
F-Test	0.000	0.0416	0.015	0.001	0.003	0.008	0.149	0.000

Table 4: Shows the CA(A)R for a win with the time window with the score of all the competitions (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

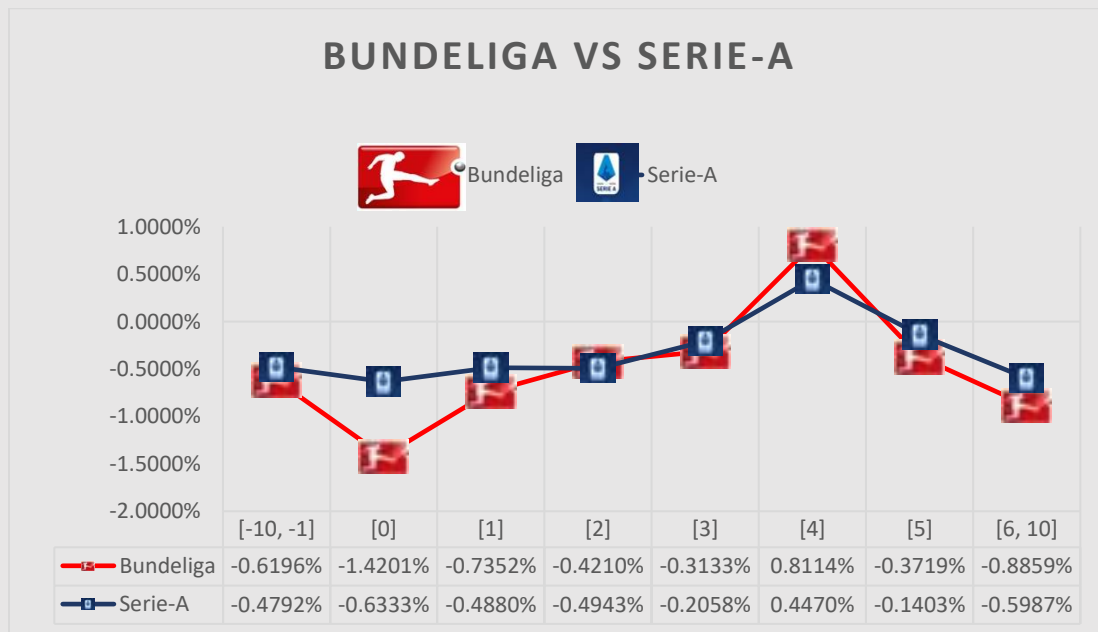
In both tables, there is a similar trend, as both show that before the event and after the event the prices of the main sponsor of the team go down. The biggest difference is that the day of the event is not significant [0]. Further, it is noticeable that the winning team also shows a negative CAR. It was hypothesized that an unexpected win would lead to abnormal positive returns, not negative. This could imply, that sponsoring may harm the value of the company.

The table below shows the CA(A)R of the individual competitions. Note, that for the La Liga competition, a relatively small fraction of data was available and therefore the other three competitions we will be primarily focused on for this paper and La Liga will just be presented and no statistical conclusion will be given (more specific data about the competitions can be found in the appendix).

Loss	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
Bun	-0.6196%***	-1.4201%***	-0.7352%	-0.4210%	-0.3133%	0.8114%	-0.3719%	-0.8859%***
Serie-A	-0.4792%***	-0.6333%**	-0.4880%*	-0.4943%*	-0.2058%	0.4470%*	-0.1403%	-0.5987%***
Prem	-0.5762%***	-0.4093%	0.1028%	-1.2239%	-0.1374%	1.0922%	-0.4077%	-0.2423%
La Liga	-0.7707%***	0.2682%	0.2111%	-0.0741%***	0.6536%	-0.8806%	-0.3608%	-0.2999%

Table 5: Shows the CA(A)R for a loss with the time window with the score of the individual competitions (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

If zoomed into the specific competition itself, a couple of results are noticeable. For instance, in the British Premier League, there is no statistical evidence during the event window [0,5] and only before (which is the case for all listed competitions). For the Serie-A and Bundesliga the day of the event [0], the days before, and the week after are statistically relevant. This follows a similar trend for abnormal returns, as shown in the graph below:



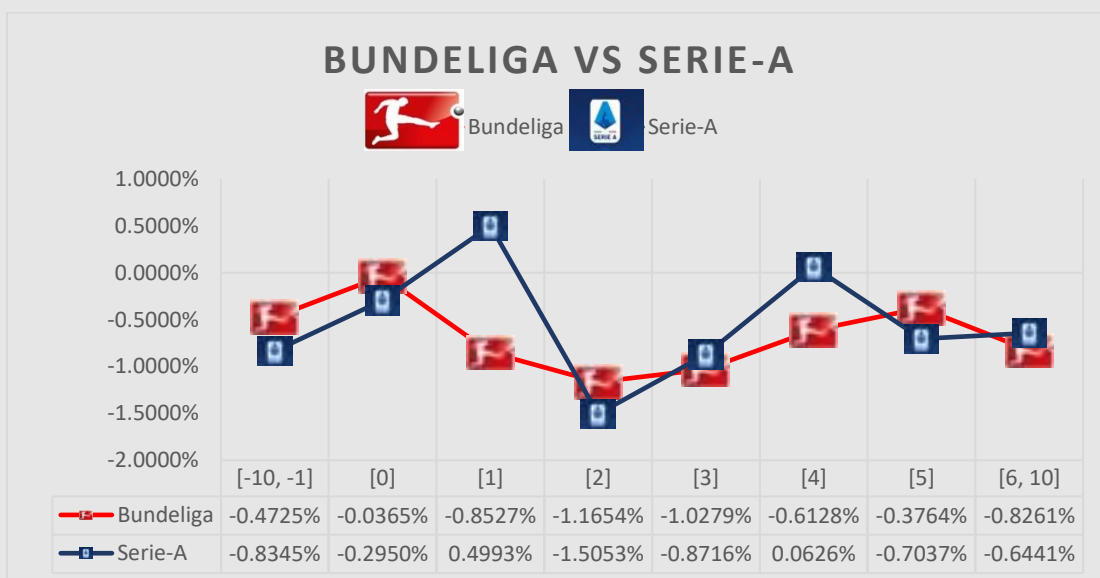
Graph 3: Shows the Difference in CA(A)R for the Bundesliga (Germany) and Serie-A (Italy) with an unexpected loss.

Graph 3 shows the development of the CA(A)R after an unexpected loss (please note that not all the numbers are statically significant). Both competitions show a similar trend. Shows a downward trend on the day of the event [0], and this trend continues in the days after. However, less than the initial day of the event. This is best illustrated with the Serie A, as it shows a significant decrease in the first days, but then recovers on day 4 (which is statistically significant under 10% level) and after that goes back to the initial level in the week to come. A similar table is developed as before, this time it includes the CA(A)R of an unexpected win:

Win	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
Bun	-0.4725%	-0.0365%	-0.8527%**	-1.1654%***	-1.0279%**	-0.6128%	-0.3764%	-0.8261%***
Serie-A	-0.8345%***	-0.2950%	0.4993%	-1.5053%***	-0.8716%**	0.0626%	-0.7037%	-0.6441%***
Prem	-0.5302%***	-0.6617%	-0.7013%	-0.7704%	-0.0602%	-0.2817%	0.5069%	-0.4288%*
La Liga	-0.4782%***	-0.1131%	0.1707%	-0.7580%*	-1.4133%***	-0.7071%*	-0.8759%	-0.3451%**

Table 6: Shows the CA(A)R for a win with the time window with the score of the individual competitions (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

If looking at an unexpected win in the different competitions. It shows a similar trend as with unexpected losses. However, it is noticeable that in comparison to the unexpected loss, the highest abnormal return occurs on the second day [2] for both the German Bundesliga and the Italian Serie-A. Further, it is noticeable the day of the event is not statistically significant.



Graph 4: Shows the Difference in CA(A)R for the Bundesliga (Germany) and Serie-A (Italy) with an unexpected win.

## Results Hypothesis 2

For the second hypothesis, this paper wanted to look if sentiment could strengthen the impact of unexpected results. Therefore, two different interaction terms were created to determine if this factor could be part of the economic mechanism that explains abnormal returns. Firstly, this paper will look at what will happen when a team unexpectedly loses a game with extremely negative market sentiment (bearish):

Loss	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.5207%***	-0.6570%***	-0.6785%**	-0.7558%***	-0.4495%*	1.2231%	-0.4990%	-0.4420%***
T-Value	-5.58	-3.43	-2	-3.39	-1.93	1.06	-1.08	-4.24
P-value	0.000	0.001	0.046	0.001	0.055	0.291	0.282	0.000
Loss * Bearish	-0.0744%	-0.2080%	-1.4156%**	0.2558%	0.5447%	-2.3259%*	0.7075%	-0.4429%
T-Value	-0.46	-0.43	-2.07	0.59	1.37	-1.89	1.01	-1.48
P-value	0.647	0.670	0.040	0.559	0.172	0.059	0.312	0.140
F-Test	0.000	0.013	0.450	0.050	0.407	0.06	0.282	0.000

Table 7: Shows the CA(A)R and the interaction term for a loss within the time window with the score of all the competitions (\*, \*\*, or \*\*\* indicating whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

In the table above, the CA(A)R and the interaction term (Loss \* Bearish) scores are shown. From the individual interaction term, it is shown that there is almost no statistical significance. The only days are day 1 (under a 5% significant level) and day 4 (under a 10% significant level). On both days it was demonstrated that the competition had a significant abnormal return as suggested by the literature. However, the F-test for the first day is not relevant, thus only finding statistical evidence for the fourth day. Therefore, there is little evidence to support hypothesis 2(B).



Win	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.3255%*	0.1836%	-0.5254%	-0.8284%**	-1.0366%***	-0.3357%	0.3393%	-0.5826%***
T-Value	-1.8	0.42	-1.55	-2.36	-3.46	-1.27	0.39	-4.35
P-value	0.074	0.677	0.123	0.019	0.001	0.205	0.694	0.000
Win * Bullish	-0.3495%	-0.6485%	0.7652%	-0.6196%	1.4339%	1.1525%	-0.4300%	0.5805%
T-Value	-1.1	-0.77	1.02	-0.73	1.22	1.4	-0.42	1.43
P-value	0.272	0.442	0.310	0.467	0.222	0.164	0.677	0.154
F-Test	0.001	0.096	0.053	0.003	0.007	0.023	0.312	0.000

Table 8: Shows the CA(A)R and the interaction term for a win within the time window with the score of all the competitions (\*, \*\*, or \*\*\* indicating whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

An unexpected win in combination with an extremely positive market sentiment shows similar results as before. It is shown that the Win\*Bullish variable is not statistically relevant at any level. Therefore, concluding that there is no evidence to support hypothesis 2(A). Suggesting that sentiment would probably have none to limited effect on the economic mechanism.

## Discussion of the Results and Limitations

### *Discussion First Hypothesis*

The first hypothesis of the paper was as follows: There is a significant negative abnormal return for the primary sponsor of the team after an unexpected loss for the team (1B). If compared with the results, there is strong evidence to support this claim. As shown in Table 3, the day of the event showed significant results under a significant level of 1%. If zoomed in on competitions individually, it is shown that this effect is mostly found in the German and Italian markets. If compared with the literature presented, these results are quite aligned. For instance, Scholtens and Peenstra (2010) found abnormal returns with soccer matches in different European countries between 2000 and 2004. Further, this research also supports the findings from Kim (2010) who claimed that sponsorship is an important contribution to the income of the different sports teams and found a positive relationship between sponsoring US firms and stock returns. Moreover, that abnormal return is not found in all competitions is also aligned with existing literature. For instance, research in South Africa showed that in their sports leagues no abnormal returns for their sponsoring firms (Blake, Fourie, & Goldman, 2018). Showing that return in Italy/Germany could be more aligned with research conducted in the US/Japan and England/Spain is more supported with the South African study. Further, this paper strengthens the findings from Payne, Tresl, and Friesen (2016) as they observed local clubs and their stock returns before a sporting event. They found anticipatory behavior from investors, could lead to extensive returns, and found that could also be generated by post-game results (Payne, Tresl, & Friesen, 2016). This paper found evidence of abnormal returns before the event and after the event, similar to this research.

For hypothesis 1A, this paper found less evidence to support this claim. Table 4 does show some significant results; however, it shows that abnormal return harms the stock returns. This could be explained by the research conducted by Walraven, Koning, Bijmolt, & Los (2015) as they suggest that sponsorship clutter negatively affects sponsorship efficiency, whereas sponsorship duration has a positive effect. Therefore, this could indicate that these sponsors are not efficiently cluttered, leading to negative results even with positive outcomes (Walraven, Koning, Bijmolt, & Los, 2015). For this paper, it was noticeable in the data that a considerable number of clubs

changed their sponsorships quite rapidly (sometimes only sponsoring a team for one season). Thus, limiting the positive impact the length of the sponsorship could have on the company. However, this is not always due to the companies, as national legislation also changes rapidly in some countries. For instance, some countries banned sports betting companies on their t-shirts, therefore forcing some clubs to find new sponsors extremely quickly. Possibly resulting in a negative impact on the sponsor deal.

### *Discussion second hypothesis*

The results for the second hypothesis show a different outcome than hypothesized in the previous sections. For the Win\*Bullish variable, none of the results show any significance. Whereas the Loss\*Bearish variable shows some relevant results, with a delayed effect. The only noteworthy result occurred on day 4, and it showed the expected outcome as hypothesized. Comparing this with the literature, a different effect was expected. For instance, Wann, Dolan, McGeorge, and Allison (1994) indicate supporters who feel extremely close to a sports team tend to have an increase in positive reactions following a win, and an opposite feeling following a defeat (Wann, Dolan, McGeorge, & Allison, 1994). Therefore, it would be expected that market sentiment would be reflected in the abnormal return for the sponsor, however, this paper does not find evidence to support the first finding and little for the second claim. A possible explanation for this could be the role of the media. Research indicates that media pessimism is associated with negative market returns and market volatility with big games (Kräussl & Mirgorodskaya, 2017). These unexpected results were in the regular seasons when the games had less coverage airtime than for instance the playoffs or a cup game. This could suggest that the effect of sentiment could be impacted by how much airtime a teams get and the media attention towards it, rather than only the feelings people have on the market. Therefore, this paper would argue that there would be other factors that play a role besides market sentiment in this economic mechanism. Further, another explanation for why the role of sentiment is limited could be due to the way sentiment was measured in this paper. As the VIX index utilized in this paper primarily looks at the American investors and this paper looked at the European market. Which could be an explanation for why there was little evidence to support the hypothesis.

## *Limitations*

This paper had a couple of limitations. Firstly, in total, there were 353 different events analyzed over four different competitions, and not all the competitions had the same number of observations. This has numerous reasons, the most plausible is that some competitions have more publicly traded companies as their main sponsors. For instance, the La Liga (Spain) sometimes only had two or three teams where the main sponsor was traded publicly. This meant there were only 56 observations, and no real conclusion could be made about this specific competition/country. Further, another explanation for this could be certain laws in place in countries. A good comparison is the English Premier League (20 teams) and the German Bundesliga (18 teams). In England, there are less strict laws in place concerning sponsoring the main football team, and therefore a lot of teams are sponsored by sports gambling companies, who are due to numerous legal reasons less likely to be publicly traded. Therefore, there were over 136 single observations made in Germany and only 114 observations in England, even though England has more teams and games per season. Thus, this paper could give a good indication of the different hypotheses for all the competitions combined. However, for the individual competition more specific research would be needed.

Originally, this paper had set unexpected results with an odd result of 5 (a.k.a. 20%) or higher. However, during the data collection process, it was discovered that there were too few results with this specific odd, and therefore it decreased to 4 ( $1/4=25\%$ ). This could have the effect that the unexpected results had less of a reaction than anticipated. Further, this paper only looked at the regular games of the season to get the most accurate data. However, some research found evidence that during the playoffs the most significant abnormal returns were observed (Chen & Chen, 2011). Due to the set-up of all these competitions, there are no playoffs in any of the competitions and therefore it was difficult to determine which games were more important than others. For instance, if a team was already champion and had nothing to play for and would not play its best players, it still could be considered an unexpected result. Therefore, it would limit the influence it has on the sentiment of the team.

A possible solution for this in future research could be to look at more playoff-based games. For instance, the national cup competition (FA Cup or the German Cup) or the European competitions (Champions League or UEFA League). These games have a setup comparable to US playoff games, typically involving playing against only one team per round and featuring just a few matches.

## Conclusion

In conclusion, this research wanted to investigate the relationship between unexpected sports results and the impact it has on the main sponsor of the team. Therefore, the following research questions were developed: “Do unexpected results in soccer matches translate into abnormal returns for the primary sponsor?”. Most literature found a relationship between sports teams and stock returns with a positive return with a team wins and a negative when a team loses. Therefore, this research hypothesis is that this would have a matching impact on the main sponsor of the sports team. More specifically, if the team would have lost it would result in a negative abnormal return for the main sponsor of the team, and the opposite would happen when an unexpected win would have occurred (1A and 1B). Moreover, different literature also found a similar economic mechanism that was strengthened by market sentiment. Therefore, this research hypothesis (2A and 2B) is that market sentiment could strengthen abnormal returns.

Different conclusions can be drawn from the results of the research of this paper. Firstly, there is strong statistical evidence for abnormal return in the event window for unexpected losses. If zoomed in more specifically on the national competitions, it is shown that this is primary in the German competition and the Italian competition. This is completely aligned with previous literature also found evidence of abnormal return, primarily in the US, Europe, and Japan (Kim J.-W., 2010) (Chen & Chen, 2011) (Castellani, Pattitoni, & Patuelli, 2013). Similarly, it was hypothesized that with unexpected wins the same reaction would happen, but rather positivity. However, this is not the case, even though abnormal return did occur (with a small delay), the sign was negative (where positively was anticipated). This phenomenon could be explained that sponsorships if not correctly executed could harm companies even with unexpected wins (Walraven, Koning, Bijmolt, & Los, 2015). Therefore, companies should carefully consider their sponsoring strategy. Further, this paper also looked at how market sentiment could have impacted the economic mechanism. However, from the results of this paper, no statistical evidence has been found for this conclusion. Suggesting, that this variable may be influenced by other factors such as the amount of media attention a game gets, or just does not have any influence on abnormal returns.

Future research could explore individual competitions more deeply and over a longer time frame. This research only looked at the national regular competition games and the odds before the game. Furthermore, future research could also investigate the relationship between abnormal returns in cup games, national (for instance the FA Cup or the Spanish Cup) and international (Champions League or the Europa League). These games are more playoff structure based and most research in the US has shown that the biggest abnormal returns are observed during these kinds of matches. Lastly, future research could explore the role of the media. More specifically, if games that get more airtimes generate higher abnormal returns and if this is possibly strengthened by market sentiment. This research has demonstrated that unexpected losses or wins have a significantly greater impact than mere sporting performance.

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## Appendix

Variable	Observation	Mean	Std. dev	Min	Max
<b>Different events</b>	136	-	-	1	136
<b>Abnormal Return (CAR)</b>	2856	-0.5973	5.4790	-38.0612	138.3330
<b>Abnormal Return Win (CAR)</b>	2856	-0.2364	3.6934	-38.0613	69.8191
<b>Abnormal Return Loss (CAR)</b>	2856	-0.3500	4.0630	-36.7719	138.3330
<b>Win</b>	2856	0.4118	.4922	0	1
<b>Loss</b>	2856	0.5809	0.4935	0	1
<b>Win * Bullish</b>	2856	0.1162	0.32057	0	1
<b>Loss * Bearish</b>	2856	0.0836	0.2770	0	1

Table 9: Shows the descriptive statics of the Bundesliga.

Variable	Observation	Mean	Std. dev	Min	Max
<b>Observations</b>	76	-	-	1	76
<b>Abnormal return (CAR)</b>	1596	-0.5167	2.2510	-14.3734	11.5586
<b>Abnormal Return Win (CAR)</b>	1596	-0.1769	1.4040	-14.3734	11.5609
<b>Abnormal Return Loss (CAR)</b>	1596	-0.3413	1.7836	-11.1411	11.5586
<b>Win</b>	1596	0.3026	0.4595	0	1
<b>Loss</b>	1596	0.6842	0.4650	0	1
<b>Win * Bullish</b>	1596	0.0583	0.2343	0	1
<b>Loss * Bearish</b>	1596	0.0764	0.2659	0	1

Table 10: Shows the descriptive statics of the Serie-A.

Variable	Observation	Mean	Std. dev	Min	Max
<b>Observations</b>	114	-	-	1	114
<b>Abnormal Return</b>	2394	-0.4029	3.8322	-25.4717	117.9012
<b>Abnormal Return Win (CAR)</b>	2394	-0.1235	1.700	-18.8582	14.5860
<b>Abnormal Return Loss (CAR)</b>	2394	-0.2793	3.4444	-25.4717	117.9012
<b>Win</b>	2394	0.2719	0.4450	0	1
<b>Loss</b>	2394	0.7281	0.4450	0	1
<b>Win * Bullish</b>	2394	0.0543	0.2267	0	1
<b>Loss * Bearish</b>	2394	0.08354	0.2768	0	1

Table 11: Shows the descriptive statics of the Premier League.

Variable	Observation	Mean	Std. dev	Min	Max
<b>Observations</b>	51	-	-	1	51
<b>Abnormal return (CAR)</b>	1071	-0.4011	2.5200	-24.1464	19.0279
<b>Abnormal Return Win (CAR)</b>	1071	-0.1449	1.1749	-8.7738	10.0963
<b>Abnormal Return Loss (CAR)</b>	1071	-0.2563	2.2459	-24.1464	19.0279
<b>Win</b>	1071	0.2941	0.4558	0	1
<b>Loss</b>	1071	0.7058	0.4558	0	1
<b>Win * Bullish</b>	1071	0.0737	0.2615	0	1
<b>Loss * Bearish</b>	1071	0.0261	0.1596	0	1

Table 12: Shows the descriptive statics of La Liga.

Loss-Bun	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.6196%***	-1.4201%***	-0.7352%	-0.4210%	-0.3133%	0.8114%	-0.3719%	-0.8859%***
T-Value	-4.01	-3.93	-1.15	-1.06	-0.75	0.53	-0.47	-4.72
P-value	0.000	0.000	0.254	0.290	0.456	0.594	0.640	0.000
F-Test	0.000	0.000	0.063	0.000	0.136	0.439	0.147	0.000

Table 13: Shows the CA(A)R for a loss within the time window with the score of the Bundesliga (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

Loss-Serie A	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.4792%***	-0.6333%**	-0.4880%*	-0.4943%*	-0.2058%	0.4470%*	-0.1403%	-0.5987%***
T-Value	-4.15	-1.99	-1.92	-1.74	-0.70	-1.84	-0.53	-3.88
P-value	0.000	0.050	0.059	0.086	0.489	0.070	0.596	0.000
F-Test	0.000	0.088	0.053	0.134	0.686	0.157	0.717	0.000

Table 14: Shows the CA(A)R for a loss within the time window with the score of the Serie A (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

Loss-Prem	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.5762%***	-0.41%	0.10%	-1.22%***	-0.14%	1.09%	-0.41%	-0.24%
T-Value	-3.64	-1.21	0.25	-3.66	-3.36	0.59	-1.13	-1.11
P-value	0.000	0.229	0.805	0.000	0.716	0.559	0.259	0.271
F-Test	0.000	0.000	0.013	0.000	0.035	0.216	0.152	0.334

Table 15: Shows the CA(A)R for a loss within the time window with the score of the Premier League (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

Loss-La Liga	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.7707%***	0.2682%	0.2111%	-0.0741%	0.6536%	-0.8806%	-0.3608%	-0.2999%
T-Value	-0.15	0.69	0.18	-0.14	1.44	-0.83	-1.14	-1.14
P-value	0.003	0.554	0.861	0.891	0.155	0.413	0.260	0.260
F-Test	0.014	0.890	0.202	0.473	0.181	0.001	0.514	0.171

Table 16: Shows the CA(A)R for a loss within the time window with the score of La Liga (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

Win-Bun	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.4725%	-0.0365%	-0.8527%**	-1.1654%***	-1.0279%**	-0.6128%	-0.3764%	-0.8261%***
T-Value	-1.47	-0.07	-2.13	-2.64	-2.06	-1.6	0.29	-3.94
P-value	0.144	0.946	0.035	0.009	0.041	0.111	0.772	0.000
F-Test	0.136	0.023	0.119	0.009	0.028	0.079	0.228	0.000

Table 17: Shows the CA(A)R for a win with the time window with the score of the Bundesliga (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

Win-Serie-A	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.8345%***	-0.2950%	0.4993%	-1.5053%***	-0.8716%**	0.0626%	-0.7037%	-0.6441%***
T-Value	-4.37	-0.33	0.87	-3.07	-2.01	0.17	-1.36	-2.76
P-value	0.000	0.743	0.386	0.003	0.048	0.864	0.179	0.007
F-Test	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 18: Shows the CA(A)R for a win with the time window with the score of the Serie-A (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

Win-Prem	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.5302%***	-0.6617%	-0.7013%	-0.7704%	-0.0602%	-0.2817%	0.5069%	-0.4288%*
T-Value	-3.19	-1.02	-1.23	-1.25	-0.15	-0.52	1.45	-1.84
P-value	0.002	0.312	0.222	0.216	0.882	0.605	0.149	0.069
F-Test	0.044	0.507	0.686	0.177	0.771	0.569	0.424	0.344

Table 19: Shows the CA(A)R for a win within the time window with the score of the Premier League (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

Win-La Liga	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.4782%**	-0.1131%	0.1707%	-0.7580%*	-1.4133%***	-0.7071%*	-0.8759%	-0.3451%**
T-Value	-2.6	-0.27	0.58	-1.68	-2.88	-1.9	-1.47	-2.18
P-value	0.012	0.786	0.563	0.098	0.006	0.063	0.149	0.034
F-Test	0.005	0.431	0.000	0.162	0.000	0.210	0.221	0.083

Table 20: Shows the CA(A)R for a win within the time window with the score of La Liga (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

Loss-Bun	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.4558%***	-1.2586%***	-1.5347%*	-0.4123%*	-0.7417%*	1.8224%	-0.7204%	-0.8771%***
P-value	0.006	0.000	0.063	0.083	0.083	0.419	0.552	0.000
Loss*Bearish	-0.4476%	-1.0475%	3.7359%**	-0.7935%	0.4329%	-3.3378%	1.0159%	-0.0938%
P-value	0.109	0.367	0.012	0.396	0.590	0.144	0.521	0.887
F-Test	0.000	0.000	0.053	0.000	0.127	0.170	0.222	0.000

Table 21: Shows the CA(A)R for a loss within the time window with the score of the Bundesliga (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

Loss-Serie-A	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.4211%***	-0.4864%	-0.6225%**	-0.7057%**	-0.1351%	-0.2263%	-0.1143%	-0.7029%***
P-value	0.005	0.187	0.020	0.044	0.754	0.472	0.729	0.000
Loss*Bearish	-0.0743%	-0.2859%	1.2867%	0.4990%	0.0937%	-0.3631%	-0.3616%	0.3482%
P-value	0.818	0.623	0.521	0.499	0.880	0.559	0.629	0.308
F-Test	0.000	0.192	0.117	0.201	0.988	0.657	0.840	0.002

Table 22: Shows the CA(A)R for a loss within the time window with the score of the Serie A (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

Loss-Prem	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.6487%***	-0.5205%	-0.1162%	-1.1827%***	-0.5654%	1.6178%	-0.6858%*	-0.1626%
P-value	0.001	0.184	0.707	0.006	0.222	0.478	0.088	0.505
Loss*Bearish	0.2381%	0.379%	1.2867%	-0.4423%	1.5032%*	-2.6001%	1.9041%	-0.938%*
P-value	0.412	0.644	0.521	0.443	0.088	0.216	0.139	0.084
F-Test	0.001	0.000	0.482	0.000	0.000	0.284	0.102	0.468

Table 23: Shows the CA(A)R for a loss within the time window with the score of the Premier League (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

Loss-La Liga	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.7668%**	0.1419%	0.5690%	0.1069%	0.7096%	-0.9569%*	-0.1334%	-0.1269%
P-value	0.012	0.813	0.703	0.873	0.213	0.082	0.799	0.676
Loss*Bearish	-0.1494%	-0.2048%	-1.0579%	-0.1269%	-0.1655%	0.2495%	-0.7024%	-0.6006%
P-value	0.632	0.770	0.358	0.883	0.813	0.710	0.395	0.228
F-Test	0.010	0.943	0.254	0.741	0.277	0.002	0.725	0.212

Table 24: Shows the CA(A)R for a loss within the time window with the score of La Liga (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

Win-Bun	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.2282%	0.4487%	-0.9543%*	-0.8775%	-1.6975%***	-0.4924%	1.3841%	-0.8461%***
P-value	0.552	0.598	0.082	0.112	0.001	0.337	0.473	0.001
Win*Bullish	-0.5564%	-0.8609%	1.161%	-1.1621%	2.8908%	-0.203%	-2.8736%	1.0113%
P-value	0.296	0.518	0.206	0.419	0.244	0.841	0.114	0.116
F-Test	0.414	0.973	0.058	0.403	0.042	0.194	0.145	0.050

Table 25: Shows the CA(A)R for a win within the time window with the score of the Bundesliga (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

Win-Serie A	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.5600%***	0.0311%	0.7200%	-1.6715%***	-1.2856%**	0.0822%	-1.3218%***	-0.6741%**
P-value	0.007	0.975	0.389	0.005	0.015	0.843	0.007	0.025
Win*Bullish	-0.8003%*	0.1913%	-0.2649%	1.0122%	1.5403%	1.8834%	3.5642%***	-0.2728%
P-value	0.087	0.906	0.807	0.517	0.204	0.209	0.000	0.630
F-Test	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012

Table 26: Shows the CA(A)R for a win within the time window with the score of the Serie A (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

Win-Prem	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.4780%***	-0.0796%	-0.5186%	-0.4852%	0.1506%	-0.1585%	0.3884%	-0.3160%
P-value	0.008	0.909	0.445	0.562	0.792	0.660	0.325	0.124
Win*Bullish	0.4588%	-1.4388%	0.1028%	-0.8211%	-0.5713%	2.1066%	0.4622%	0.7512%
P-value	0.218	0.237	0.967	0.498	0.490	0.204	0.641	0.281
F-Test	0.261	0.603	0.978	0.415	0.954	0.541	0.731	0.500

Table 27: Shows the CA(A)R for a win within the time window with the score of the Premier League (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level).

Win-La Liga	[-10, -1]	[0]	[1]	[2]	[3]	[4]	[5]	[6, 10]
CA(A)R	-0.2363%	0.1973%	-0.0131%	-0.6856%	-1.8967%***	-0.4585%	-1.3743%**	0.3066%
P-value	0.320	0.662	0.973	0.172	0.005	0.408	0.037	0.127
Win*Bullish	-0.4324%	0.7266%*	NA	1.602%***	N/A	0.5453%	3.6687%***	-0.4720%
P-Value	0.167	0.095	NA	0.004	N/A	0.339	0.003	0.391
F-Test	0.065	0.000	NA	0.000	N/A	0.000	0.060	0.238

Table 28: Shows the CA(A)R for a win within the time window with the score of La Liga (\*, \*\*, or \*\*\* indicates whether the result is statistically significantly different from zero at the 10%, 5%, or 1% level). Note that for some days not enough data was available (N/A).