

MASTER
FINANCE

Connection between international football success and stock returns - an Iberian analysis

Eduardo José Sousa e Silva

M

2022



FACULDADE DE ECONOMIA



Connection between sporting success and stock returns - an Iberian analysis

Eduardo José Sousa e Silva

Dissertation
Master in Finance

Supervised by
PhD Júlio Fernando Seara Sequeira da Mota Lobão

2022

Acknowledgments

First and foremost, a big thank you to my supervisor, PhD Júlio Fernando Seara Sequeira da Mota Lobão, who was always present and always at one's disposal to provide knowledge, support, and reinforcement in the long journey it took to complete this work.

A big thank you as well to my family, friends and colleagues that have always pushed me as much as they could to help me surpass my difficulties.

The final of my acknowledgments goes to all of the School of Economics and Management of the University of Porto, especially to all of the teachers that I had the pleasure to learn from. Thank you for this enriching journey.

Abstract

In a society where sports are taking on a more and more relevance, it is of interest to find out how far that relevance goes and if it goes as far as having implications on the financial lives of everyone. Given the appeal that specially the major football competitions have, along with the support behind a country's national team, this study is focused on determining whether the outcome of games in such events has a meaningful impact on the markets in question.

Here the focus is on both Portugal and Spain and through the usage of econometric models, along with the usage of financial data between 1993 and 2021, comprising of 7566 trading days, the aim is to assess how much of the price deviations verified in their stock market, are actually linked to the results of the matches in the chosen competitions. In this case, those competitions being the FIFA World Cup and the UEFA European championship.

That being said, this study brings a unique analysis on the Iberian markets and helps to deepen the literature on similar topics as well as the literature on the theories around the efficiency of the markets and human behaviour. In the end, some price variations were found, in a somewhat consistent manner across the different sub-sections but not without a few exceptions. With that in mind we can make the argument for the existence of a few inefficiencies in the markets, since some of the findings in this study show a slight pattern, with a few exceptions, but that still hints at the possibility of investors possibly taking advantage of.

Keywords: stock market; mood effects; sport event; market returns; price variation; behavioural finance

Resumo

Numa sociedade onde o desporto assume cada vez mais relevância, interessa saber até onde vai essa relevância e se chega a ter implicações na vida financeira de todos. Dado o apelo que especialmente as grandes competições de futebol têm, juntamente com o apoio que a seleção nacional de um país envolve, este estudo pretende determinar se o resultado dos jogos nesses eventos tem um impacto significativo nos mercados em questão.

Aqui o foco é tanto em Portugal como em Espanha e através da utilização de modelos econométricos, juntamente com a utilização de dados financeiros entre 1993 e 2021, compreendendo 7566 dias de mercado aberto, pretende-se avaliar quanto dos desvios nos preços verificados nos seus mercados de ações, estão realmente ligados aos resultados das partidas nas competições escolhidas. Neste caso, sendo essas competições o Mundial da FIFA e o campeonato europeu da UEFA.

Posto isto, este estudo traz uma análise única sobre os mercados ibéricos e ajuda a aprofundar a literatura sobre temas semelhantes, bem como a literatura sobre as teorias em torno da eficiência dos mercados e do comportamento humano. No final, foram encontradas algumas variações de preços, de forma algo consistente nas diferentes subsecções, mas não sem algumas exceções. Com isso em mente podemos argumentar a existência de algumas ineficiências nos mercados, uma vez que alguns resultados deste estudo mostram um pequeno padrão, com algumas exceções, mas que ainda assim apontam para a possibilidade de os investidores tirarem partido.

Palavras-chave: mercado de ações; efeitos de humor; evento desportivo; retornos de mercado; variação de preços; finanças comportamentais

Index

Abstract.....	i
Resumo	iii
Index.....	iv
Index of Tables	v
Index of Graphics.....	vi
1. Introduction	1
2. Literature Review.....	3
2.1 Behavioural Finance	3
2.2 Mood effects of Sport Events.....	4
2.3 Sport Events and the Stock Market	5
3. Research Questions and Methodology	8
3.1 Research Questions	8
3.2 Data.....	8
3.3 Methodology.....	9
4. Findings	16
4.1 Descriptive Statistics.....	16
4.2 Spain.....	18
4.3 Portugal	20
5. Robustness Analysis.....	23
6. Discussion	27
7. Conclusion.....	29
References.....	31
Annex	34

Index of Tables

Table 1. Markets descriptive statistics.....	13
Table 2. FIFA World cup results	14
Table 3. UEFA European Championship results.....	15
Table 4. IBEX 35 quotation movements	17
Table 5. PSI20 quotation movements.....	18
Table 6. Quotation Movements after International Soccer Matches – IBEX 35.....	19
Table 7. Abnormal Market Returns after International Soccer Matches – IBEX 35	19
Table 8. Quotation Movements after International Soccer Matches – PSI20	20
Table 9. Abnormal Market Returns after International Soccer Matches – PSI20.....	21
Table 10. IBEX35 quotation movements without extreme values	23
Table 11. IBEX35 returns without extreme values	24
Table 12. PSI20 quotation movements without extreme values	25
Table 13. PSI20 returns without extreme values	25
Table 14. IBEX 35 quotation before summer months dummy	34
Table 15. IBEX 35 returns before summer months dummy.....	34
Table 16. PSI20 quotation before summer months dummy.....	35
Table 17. PSI20 returns before summer months dummy	36

Index of Figures

Figure 1. Value of 100€ invested in 1993 on IBEX 35 and PSI20	16
--	----

1. Introduction

Nowadays, major sporting events are tied to incredible marketing efforts from different brands to significant investment in the organization and preparations to such competitions and to the immense appeal and attention to numerous fans around the world. In a work from Zawadzki (2013), the author states that “The channels of impact from such huge events include: public, political, and cultural life, information, education, sport, and psychological aspects.” (pp. 2-3).

The research topic is mainly linked with Behavioural Finance and when interpreting the basics of behavioural finance, one could think that the results of a country's in such events will affect the mood and overall spirit of the population of said country.

Hirt et al. (1992) found that there is a positive correlation between sporting team success and the investors' judgment of their own future success and capabilities. Archer (1976), when explaining the emotions sports can bring, quoted a Scottish fan after an international match “For a time before, throughout and after [the match] I have the feeling that my personal worth is bound up with Scotland's success or failure” (p. 76).

Keeping in mind that the risk taking, and trading behaviour is impacted by the frame of mind of the investor, the major success or failure could be a catalyst to higher or lower returns in the Stock Market.

Specifically, the study focuses on the impact of the performance in International Sporting events, more specifically football, on the Iberian Financial Markets, given the prominence and the importance that sports have in the daily lives of the population of both Portugal and Spain. This particular choice of markets makes an exceptional study field since both countries have recently won major international competitions, which will allow to assess if the drastic impacts on the moods of its population is enough to impact its financial markets.

In the end, this study helps to deepen the current literature, due to its focus on still unexplored markets, like the ones in the Iberian Peninsula, all while incorporating the most recent samples, which makes this an unique research in relation with previous ones. In the end, some correlations were found, however some subgroup revealed different results than the ones behavioural finance would lead to believe.

After this introductory Chapter, this document is structured as follows: Chapter 2 reviews the literature on the topic. Chapter 3 describes the methodology used to answer the research questions. Chapter 4 presents the results, which are then subject to a robustness analysis in Chapter 5. Chapter 6 proceeds with a discussion of the results and finally, Chapter 7 concludes this research.

2. Literature Review

2.1 Behavioural Finance

Jensen (1978) explained that in the Efficient Market Hypothesis (EMH) it is asserted that financial markets are efficient. Fama (1970) claims that a market is efficient in respects to information if that information is fully reflected in the price of the assets. That fact would mean that revealing the information set to all the investors and participants in the market would cause no impact in the price of the assets (Malkiel, 1992).

However, as Statman (1995) argues, investors are “Normal” people instead of the Homo-economicus perceived by traditional finance, that is always fully rational in all of its decisions. This difference in judgment of the investor is ultimately one cornerstone of Behavioural Finance. For instance, Stracca (2004) underwent a study where the author goes over a significant number of research in which there is evidence of irrational behaviour from the agents.

The literature suggests several impacts that mood and psychological states can have on the trading behaviour and the amount of risk taken by the investors. For example, works from Saunders (1993) and Kamstra et al. (2000) claim that prices in the stock market are influenced by economically neutral events that can affect the psychological state of investors.

Saunders (1993) in order to check if the psychology of the investor influenced the asset prices, decided to study the history of correlations between the New York weather and the major stock indexes, concluding that “The economic effect produced is surprisingly large, considering that the weather event that influences the psychological mood is such a minor one” (p. 1345).

On the study from Kamstra et al. (2000), when studying the impact of the daylight-saving time change, in which there is a change in the time and sleep was thus affected, led in the United States alone to a \$31 billion one day loss on the NASDAQ, NYSE and AMEX exchanges.

From the weather and daytime, like the previous authors, to the effect of holidays (Lakonishok & Smidt, 1988) and the day of the week (Pettengill, 2003), many are the studied factors that affect the mood and consequently the investing activities of the agents. In the paper above mentioned from (Lakonishok & Smidt, 1988), the authors tested for the

existence of persistent seasonal patterns in the rates of return, having found “evidence of persistently anomalous returns around the turn of the week, around the turn of the month, around the turn of the year, and around holidays” (p. 403). In all of them, the reasons as to why such anomalies existed had to do with psychological effects that the specific time had in the mood of the investor.

2.2 Mood effects of Sport Events

More related to this dissertation in specific is the psychological effects caused by sports on their fanbases. As mentioned by Whitfield (2003), sports bring a distinct society impact and a substantial morale factor. Wins and general success being linked to an overall proud feeling along with a certain gratification and the lack of such things being tied with a uneasiness and unhappiness. With such factors, as Ashton et al. (2003) claim, investment and financial decisions are impacted by the success or failure of their supported teams since the trader mood and wellbeing are in question, giving the example of an increment in bullish behaviour in cheerful and confident investors and brokers.

Showing harsher impacts that sports can have mentally, are the findings that match outcomes can have adverse health effects. In a study from Carrol et al. (2002) showed that the three following days after a particular important and tense game where England lost on Penalties against Argentina in the World Cup, the hospital admissions due to heart attacks increased 25%.

In a study from Trovato (1998), the author showed that whenever the Montreal Canadians suffer an early elimination from the Stanley Cup Playoffs, the number of suicides in Canada rises considerably.

Not only suicides but similar results regarding homicides have been documented by White (1989). In his study, there was evidence that the cities from the teams involved in matches, following the games where the team was eliminated from the NFL Playoffs, had a significant rise in homicides. Wann (1993) showed that this aggression levels are particularly common the more the fans are identified with the team, which in a later work, Wann et al (2001), is also linked with an increase with the number of riots documented whenever the teams have unfavourable results.

2.3 Sport Events and the Stock Market

Leaning to a more general view of the impacts of such events on markets, the examples of effects on the hosting countries can be used. For instance, Harjito et al. (2022) states that “major sports events that have been hosted with international coverage might also be one of the many market factors affecting how well the stock market performs” (p. 9). Given the gigantic investments that they prompt and eyeballs that they bring, Zawadzki (2013) focused his study on “mutual relations between mega sports events and the capital, particularly equity, markets in the organising states” (p. 3), which resulted in some correlations “Out of the eight analysed markets positive changes in the indices on the announcement day were recorded in four cases” (p. 7), explaining the author that it was prevailing in countries whose markets did not expect the selection, favouring from a positive surprise effect.

Linking the mood effects that sports have and their impact on the stock market, over the years several studies have been made. Boyle and Walter (2010) studied the effect on New Zealand’s Stock Market that their famous Rugby national team (All Blacks) had. In 1999, Morgan (1999) showed that even activities without the massive support and attention that other sports have could play a role by showing that there is correlation between horse races and abnormal market performances.

Prompted by the economically significant effect from previous studies, in his research, Edmans et al. (2005) studied the impact of sports other than football, in this case operating with cricket, basketball and rugby games, having found when compared to football “a statistically significant but smaller loss effect” (p. 18).

Tied to the American competitions is the study from Fan et al. (2017) where the four major sports leagues in terms of fan interest were subject to the analysis: the National Hockey League (NHL), Major League Baseball (MLB), National Basketball Association (NBA) and the National Football League (NFL). The authors opted for a particular approach where they “get the daily local rate of returns for every fan base city by constructing portfolios of US stocks whose headquarter is in the team’s fan base location” (p. 918). The results showed that in all of the competitions, a loss will reduce the return on the stock market. Not only that but the popularity of the sports dictated how big the loss effect was, the more popular the league, the bigger the magnitude of the loss effect.

Also tied to American competitions is the study from Krueger and Kennedy (1990) that showed that there was a strong relationship between the performance of the stock market the day following the Super Bowl and whichever sub-league the Winner played in.

However, not always are these effects found in the stock market. In an article from Gerlach (2011), the author states that differently from a lot of the most recent research, where a strong association between abnormal returns and the results from international sporting events can be found, in evidence in his article was not in line with the previous works. In his words “The evidence presented in this article, though, indicates that the correlation between international sports and stock market returns is not caused by national team performances” (p. 880). Similarly, Reid et al (2013) found that the major competitions in basketball (NBA) and baseball (MLB) did not have any correlation with the U.S stock market and that the correlations found between sports events and the stock market could easily become a trap for the investor since in their words “There is no economic rationale for anyone to believe that there is some connection between such events and the performance of the market” (p. 26).

Focusing now on football, Edmans et al. (2005) studied the reaction of the stock market to sudden changes in the investor mood motivated by the strong evidence suggesting a strong link between mood and football outcomes. In his work the authors used as the primary mood variable international soccer results. The results showed "a strong negative stock market reaction to losses by national soccer teams" (p. 18).

Ashton et al. (2003) studied the market in England after games of the English national soccer team and noticed that the returns in general were higher following a win and lower after losses from the national team. Kaplanski and Levy (2010) went as far as stating that soccer matches could influence markets that are neutral and whose national teams did not play.

A very similar study is the one from Graziano and Vincentini (2016) whose results confirm that the performance of the Italian national football has a positive influence on the returns on the stock market, something that the authors attribute to it being a strong and consistent part of the Italian lifestyle.

Now in an Asian financial market, Kang and Park (2014) reach similar conclusions, stating that although being short-lived effects, whenever the Korean football team has a win in the World Cup or in the Asian Cup, the stock market experiences an increase the following day

while having lower returns the day following a loss. An example from Africa, more precisely from the Nigerian football team comes from the study from Osuala et al. (2015), reaching the same positive market results in case of wins and negative results in the case of losses. These results were, however, only found in the men's team, with no effects found in the women's team, which, according to authors, whether for cultural or religious prejudice could have obscured the enthusiasm of the stock market participants.

A study from Berument et al. (2006), focused on finding any financial implications deriving from the outcomes of the games of some of the main football teams from the chosen country (Turkey). This research put to the test the hypothesis that it does not take the support ensuing mood influence of a whole country (like what happens with national teams) to impact the stock market from a nation. This time the games of Turkish teams against foreign opponents were studied. Even though not verifiable with every team, in some, like in this case the results from the team "Besiktas", led to an increment in stock market returns in case of victory.

Opposed to this positive link between football and the stock market is the work from Klein et al. (2008), that using the study from Ashton et al. (2003) as a base, decisively reject any connection between market returns and international soccer results, stating that there is not any economic reason for the anomaly, along with their own results of the research. Between all of this, the authors make an extensive enumeration of the different "pitfalls" that the studies tend to have (including the one from Ashton et al. (2003). One of the examples was the fact that often games that are decided on penalties are considered a draw or for instance the fact that the matches are often played in various parts of the world, thus implying different time zones, which could mean that different days should be considered according to the country in question.¹

¹ This study was later subject to response from the targeted authors in their later work, Ashton et al. (2010), where they aim to prove that none of the called "pitfalls" would alter the ultimate result.

3. Research Questions and Methodology

In order to determine the impact of the performance in international football events on the Iberian Financial Markets, this chapter contains a detailed description of the research question, the collected data as well as the regression model used to test the hypothesis.

3.1 Research Questions

Assuming that markets are efficient, and investors are rational, the markets should not be impacted by the outcomes of the matches. That view constitutes the null hypothesis. Looking at the literature that claims that wins and losses are associated, respectively, with good and bad moods, the alternative hypothesis would be that wins in the matches produce a positive market reaction and losses a negative market reaction.

Keeping all that in mind one can assess if the mood effects that the sporting success of the countries will have any correlation with the differences in the financial performance. For instance, one study whether a win has bigger impacts than a loss, or whether games with more importance have a larger effect than the rest.

3.2 Data

In order to assess the effect of sporting results on the Stock Market, the data will be regarding the Nacional Teams, since one could assume that most of the population supports the Nacional colours, helping to ensure a country-wide impact. To aid to the research is the fact that both countries attribute a lot of significance to Sports (especially Football).

In order to have a good understanding of the analysis, basic information about both countries and their respective markets is needed. The Portuguese market is part of the Euronext since 2002 - (Euronext Lisbon), whose 20 highest quoted enterprises make up the PSI20, it being the biggest index and main reference point of the Portuguese financial market.

The country immediately to the East has its financial systems, financial market and all of Spain's stock exchanges (Valencia, Bilbao, Barcelona and Madrid Stock exchanges) run by BME (Bolsas Mercados Españoles) and whose market's main index is the IBEX 35, compiling the 35 biggest companies from the Madrid's Stock exchange.

Keeping that in mind, to maximise the possible results, the competitions that are going to be tested are the ones that attract the bigger number of spectators and the bigger audiences. For

that purpose, the ones that best apply are the FIFA World Cup and the UEFA European Championship, in short “UEFA Euro” (Football). Considering that both competitions take place once every four years, a good time horizon to conduct the research could be between 1993 and 2021, since both countries indexes have an official creation date of 1992, totalling in the end a combined 7566 trading days.

With the data from the games results taken from the respective football federation website the study may proceed. The financial data, with the index quotations, was retrieved from Datastream, and with all the data collected, the following step was to calculate the log daily returns on the country’s market indices.

In the competitions in question, it must be noted that they both take place in a relatively short period, usually a few weeks during the summer months, normally in June and July. In the data, there will be two types of matches, elimination, and group games. In elimination matches the losing team is eliminated and unable to continue its campaign in the competition and on the other hand, group games are where a set of defined teams in a group play each other in a mini championship to decide the ones that advance to the elimination stage.

3.3 Methodology

Regarding the methodology, it is closely tied and pretty much revolving around Econometrics. Two types of inputs will be needed, one with the game and event results and the other with the price and returns from the financial markets, which will hopefully allow to assess the existence of correlations and the drawing of conclusions.

Most of the previous studies followed a very similar approach to the one from Edmans et al. (2007) when dealing with times series variability of Stock Returns. In this *modus operandi*, firstly, the following model is estimated for both countries (i) in order to obtain the impact of wins and losses, while simultaneously keeping control over several factors like for example the Monday Effect:

$$R_{it} = \gamma_{0i} + \gamma_{1i}R_{it-1} + \gamma_{2i}R_{mt-1} + \gamma_{3i}R_{mt} + \gamma_{4i}R_{mt+1} + \gamma_{5i}D_t + \gamma_{6i}Q_t + \epsilon_{it} \quad (1)$$

The model includes:

- R_{it} - Continuously compounded daily local currency return on a stock market index for country i on day t .
- R_{it-1} - Lagged index return for country i to account for first-order serial correlation.
- R_{mt} - Continuously compounded daily US dollar return on the world market index, added in order to control for the correlation between the returns of the countries local index, which is expected since the markets are integrated.
- R_{mt-1} and R_{mt+1} , since the local markets maybe lagging or leading the world Index.
- D_t - Dummy variables for the days of the week.
- Q_t - Dummy variable for non-weekend holidays.
- ϵ_{it} - Residuals.

For a different view on the impacts of wins and losses, equation (1) may be used but this time focusing solely on the Stock quotation:

$$Q_{it} = \gamma_{0i} + \gamma_{1i}Q_{it-1} + \gamma_{2i}Q_{mt-1} + \gamma_{3i}Q_{mt} + \gamma_{4i}Q_{mt+1} + \gamma_{5i}D_t + \gamma_{6i}Q_t + \epsilon_{it} \quad (2)$$

The model includes:

- Q_{it-1} - Lagged index quotation to account for first-order serial correlation
- Q_{mt} - World market index quotation, added in order to control for the correlation between the returns of the countries local index, which is expected since the markets are integrated.
- Q_{mt-1} and Q_{mt+1} , since the local markets maybe lagging or leading the world Index.
- D_t - Dummy variables for the days of the week
- Q_t - Dummy variable for non-weekend holidays
- ϵ_{it} - Residuals

However, in a later work from Kaplanski and Levy (2010), that had significant inspiration from the previous work from Edmans (2007), some possible issues and potential drawbacks

were mentioned that could lead to a mere spurious correlation as well as proposals and additional empirical steps to employ in order to make sure they were not.

An important one has to with the eventuality of the competitions possibly having taken place in an "outlier year", in other words an abnormally bad year which would naturally mean that the returns and price movements would be impacted. In order to take such possibility into account, we conduct a special analysis. It begins with the examination of the returns of each of the periods in which the competitions take place and compare it to the returns of the entirety of the year. If it turns out that the competition in fact happens in a bad year, the next step is to test the possibility that the days of the competition are even worse than the rest of the year. If any of these "outlier years" come upon, they are eliminated and the analysis proceeds to next regression.

Another caveat is tied with the time during which the competitions take place, which is usually short and recurrent, always taking place between June and July, with exception for some instances in which small portions of May and August are also included. With that in mind, there must be acknowledged the possibility of some sort of seasonal effect leading to the achieved results instead of the outcomes in the competition games. Mindfully of such possibility, the authors note the relevance of also including to the regression a dummy variable consisting of June and July, in order to inspect any seasonal effect. This Dummy will be included in the regression as (T) , for accounting for that specific time of the year.

In short, after the addition of the mentioned dummy variable, we reach the following version of regression (1), regression (3):

$$R_{it} = Y_{0i} + Y_{1i}R_{it-1} + Y_{2i}R_{mt-1} + Y_{3i}R_{mt} + Y_{4i}R_{mt+1} + Y_{5i}D_t + Y_{6i}Q_t + Y_{7i}T + \epsilon_{it} \quad (3)$$

The model includes:

- R_{it} - Continuously compounded daily local currency return on a stock market index for country I on day t.
- R_{it-1} - Lagged index return for country i to account for first-order serial correlation.

- R_{mt} - Continuously compounded daily US dollar return on the world market index, added in order to control for the correlation between the returns of the countries local index, which is expected since the markets are integrated.
- R_{mt-1} and R_{mt+1} , since the local markets maybe lagging or leading the world Index.
- D_t – Dummy variables for the days of the week.
- Q_t – Dummy variable for non-weekend holidays.
- T - Dummy variable for summer months
- ϵ_{it} – Residuals.

And the following version of regression (2), regression (4):

$$Q_{it} = Y_{0i} + Y_{1i}Q_{it-1} + Y_{2i}Q_{mt-1} + Y_{3i}Q_{mt} + Y_{4i}Q_{mt+1} + Y_{5i}D_t + Y_{6i}Q_t + Y_{7i}T + \epsilon_{it} \quad (4)$$

The model includes:

- Q_{it-1} – Lagged index quotation to account for first-order serial correlation
- Q_{mt} - World market index quotation, added in order to control for the correlation between the returns of the countries local index, which is expected since the markets are integrated.
- Q_{mt-1} and Q_{mt+1} , since the local markets maybe lagging or leading the world Index.
- D_t – Dummy variables for the days of the week
- Q_t – Dummy variable for non-weekend holidays
- T - Dummy variable for summer months
- ϵ_{it} – Residuals

Afterwards, with the residuals from equation (3) and (4), the following regression model was used in order to assess the impact of the outcomes of the football matches:

$$\widehat{\epsilon}_{it} = B_0 + \beta_W W_{it} + \beta_L L_{it} + v_{it} \quad (5)$$

This model includes:

- W_{it} – Dummy variable for Wins in different types of “sub-groups”
- L_{it} – Dummy variable for Losses in the same “sub-group”

Example of “sub-group” – Elimination games vs Group Stage Games

In the end to account for the possibility having disproportional impact from outstandingly good or bad returns after a game, those outcomes are removed, and the results are analysed in a separate table.

Obviously, some troubles can be expected. Unfortunately, the Iberian markets, both the Portuguese as well as the Spanish are not known for their liquidity which can make the achievement of some sort of correlation more difficult. Not only that but at every moment the investors are affected by several factors that could contribute and explain some of the variations in the returns. In essence, in order to truly identify the differences in returns purely created by the sporting results, some caveats are to be expected. Bellow, on table 1 there is a series of descriptive statistics to allow for a general view of the markets.

Table 1. *Markets descriptive statistics*

	IBEX 35	PSI20
Average	8666	6929
Median	9051	6061
Maximum	15946	14823
Minimum	2345	2918
St. Dev	2802	2546
Kurtosis	3.0759	2.9388
Skewness	-0.315	0.9069
St. Dev	2802	2546
Daily Volatility	1.8%	1.1%
Monthly Volatility	8.3%	5.2%
Annual Volatility	28.7%	18%

Notes: Descriptive statistics of both markets using a broadly based stock market index for each country as a basis.

Table 2. *FIFA World cup results*

		Spain Match Results				Portugal Match Results			
		Win	Draw	Loss	Total	Win	Draw	Loss	Total
FIFA World Cup USA 1994	Group Games	1	2	-	3	-	-	-	-
	Elimination Games	1	-	1	2	-	-	-	-
France 1998	Group Games	1	1	1	3	-	-	-	-
	Elimination Games	-	-	-	-	-	-	-	-
South Korea/Japan 2002	Group Games	3	-	-	3	1	-	2	3
	Elimination Games	1	-	1	2	-	-	-	-
Germany 2006	Group Games	3	-	-	3	3	-	-	3
	Elimination Games	-	-	1	1	2	-	2	4
South Africa 2010	Group Games	2	-	1	3	1	2	0	3
	Elimination Games	4	-	-	4	-	-	1	1
Brazil 2014	Group Games	1	-	2	3	1	1	1	3
	Elimination Games	-	-	-	-	-	-	-	-
Russia 2018	Group Games	1	2	-	3	1	2	-	3
	Elimination Games	-	-	1	1	-	-	1	1

Notes: Distribution of game outcomes from the Spanish and Portuguese national football team in the FIFA World Cup between 1993 and 2020. Matches divided between group games and elimination games. In the elimination games that went to over time or penalties only the final outcome was considered, in short no draws exist.

Table 3. UEFA European Championship results

		Spain Match Results				Portugal Match Results			
UEFA European Championship		Win	Draw	Loss	Total	Win	Draw	Loss	Total
England 1996	Group Games	1	2	-	3	2	1	-	3
	Elimination Games	-	-	1	-	-	-	1	1
Belgium/ Netherlands 2000	Group Games	2	-	1	3	3	-	-	3
	Elimination Games	-	-	1	1	1	-	1	2
Portugal 2004	Group Games	1	1	1	3	2	-	1	3
	Elimination Games	-	-	-	-	2	-	1	3
Austria/ Switzerland 2008	Group Games	3	-	-	3	2	-	1	3
	Elimination Games	3	-	-	3	-	-	1	1
Poland/ Ukraine 2012	Group Games	2	1	-	3	2	-	1	3
	Elimination Games	3	-	-	3	1	-	1	2
France 2016	Group Games	2	-	1	3	-	3	-	3
	Elimination Games	-	-	1	1	4	-	-	4
Europe 2020 ²	Group Games	1	2	-	3	1	1	1	3
	Elimination Games	2	-	1	3	-	-	1	1

Notes: Distribution of game outcomes from the Spanish and Portuguese national football team in the UEFA European championship between 1993 and 2020. Matches divided between group games and elimination games. In the elimination games that went to overtime or penalties only the final outcome was considered, in short no draws exist.

² The 2020 UEFA European Championship, due to the COVID-19 pandemic, took place in 2021, but remained denominated “2020 UEFA European Championship”.

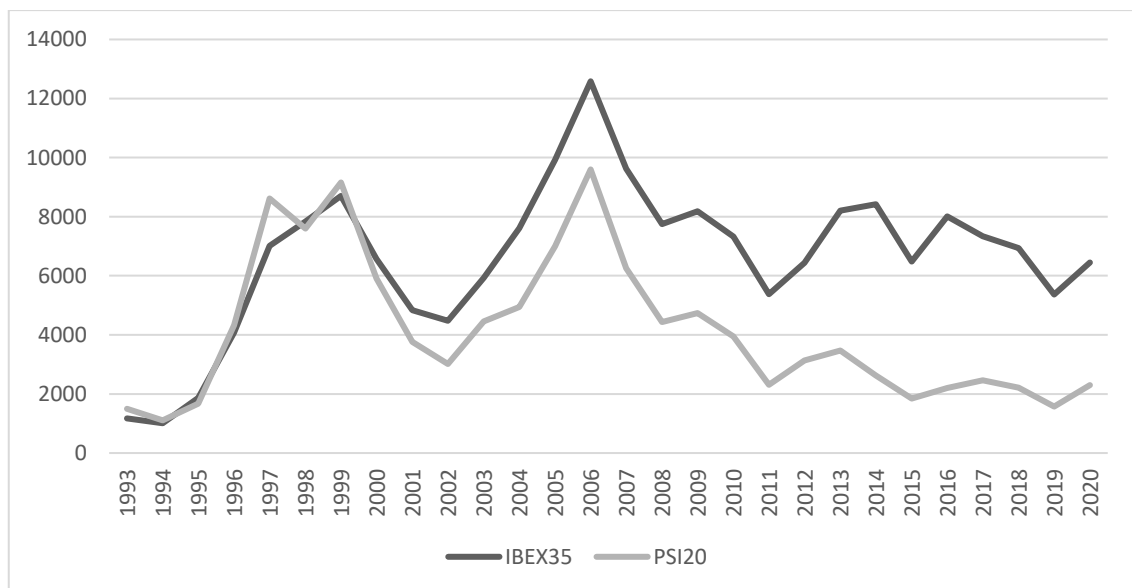
4. Findings

In this chapter, the data obtained from the regression is presented, firstly regarding the Spanish market, and secondly regarding the Portuguese market.

4.1 Descriptive Statistics

Before moving onto the different regressions, it has to be assessed if no additional adjustments have to be made due to the eventuality of the tournaments having taken place in a particularly bad year. For that reason, below there are present in figure 1 as well as in tables four and five some descriptive statistics.

Figure 1. *Value of 100€ invested in 1993 on IBEX 35 and PSI20*



Note: Variation in the value of a hypothetical investment of 100€ on both indexes' in 1993 and the evolution in the value of such investment.

Table 4. *IBEX 35 quotation movements*

	1993	1994	1995	1996	1997	1998	1999	2000	2001
Average	704	1173	1008	1870	4074	7009	7842	8703	6573
% Change		66.7	-14	85.5	117.8	72.1	11.9	11	-24.5
	2002	2003	2004	2005	2006	2007	2008	2009	2010
Average	4836	4478	5929	7609	9927	12584	9622	7748	8184
% Change	-26.4	-7.4	32.4	28.3	30.5	26.8	-23.5	-19.5	5.6
	2011	2012	2013	2014	2015	2016	2017	2018	2019
Average	7328	5378	6442	8208	8422	6482	8012	7343	6942
% Change	-10.5	-26.6	19.8	27.4	2.6	-23	23.6	-8.3	-5.5
	2020	2021							
Average	5367	6451							
% Change	-22.7	20.2							

Note: Average quotation of the IBEX35 from 1993 to 2021 along with the % Change from year to year.

Table 5. *PSI20 quotation movements*

	1993	1994	1995	1996	1997	1998	1999	2000	2001
Average	686	1500	1106	1670	4330	8614	7602	9164	5904
% Change		118.6	-26.2	51	159.3	98.9	-11.7	20.6	-35.6
	2002	2003	2004	2005	2006	2007	2008	2009	2010
Average	3765	3012	4459	4941	6999	9600	6252	4431	4742
% Change	-36.2	-20	48	10.8	41.7	37.2	-34.9	-29.1	7
	2011	2012	2013	2014	2015	2016	2017	2018	2019
Average	3945	2307	3138	3474	2622	1840	2198	2466	2213
% Change	-16.8	-41.5	36	10.7	-24.5	-29.8	19.5	12.2	-10.3
	2020	2021							
Average	1577	2303							
% Change	-28.8	46							

Note: Average quotation of the PSI20 from 1993 to 2021 along with the % Change from year to year.

In these global descriptive statistics, it's clear that some years are pretty exceptional when it comes to their returns and with significant quotation variations that could affect the study. Amongst them is for instance 1997 where both countries indexes' more than doubled in quotation. Despite that fact, for that year in particular no adjustments will be made since no competition took place. Also, no adjustments will be made for 1994 that also had significant increments since it was only the second year of the indexes' life, and those bigger swings are less impactful with the smaller quotations verified at that time.

4.2 Spain

To analyse the impact of the game outcome from the Spanish football national team, bellow, tables six and seven present the results from regression (5).

Table 6. *Quotation Movements after International Soccer Matches – IBEX 35*

	Wins			Losses		
	N =	β_W	T-Statistic	N =	β_L	T-Statistic
Panel A: World Cup						
Group Games	12	44.82115	1.629011*	4	-6.695285	-0.140566*
Elimination Games	6	42.39987	1.090142*	4	-70.41839	-1.478483*
Panel B: UEFA Euro						
Group Games	12	-13.30043	-0.483347*	3	48.61344	0.883849*
Elimination Games	8	-0.215703	-0.006402*	4	-11.72581	-0.246138*

Note: Results from regression (5), with the calculation of the variation of the index quotation that is attributable to the game results. Next to the t-statistic, ***, ** and * indicate a significance level of 1%, 5%, and higher than 5% respectively.

Table 7. *Abnormal Market Returns after International Soccer Matches – IBEX 35*

	Wins			Losses		
	N =	β_W	T-Statistic	N =	β_L	T-Statistic
Panel A: World Cup						
Group Games	12	0.004979	1.695355*	4	0.000567	0.111471*
Elimination Games	6	0.004680	1.127446*	4	-0.009581	-1.884707*
Panel B: UEFA Euro						
Group Games	12	-1.59E-05	-0.005417*	3	0.004508	0.767739*
Elimination Games	8	-0.000329	-0.091376*	4	0.001722	0.338619*

Note: Results from regression (5), with the calculation of the returns that are attributable to the game results. Next to the t-statistic, ***, ** and * indicate a significance level of 1%, 5%, and higher than 5% respectively.

Looking at the results one can see that victories in the World Cup group stage led to a quotation increase of 45 points and losses to a quotation decrease of 9 points. Focusing only

on the elimination games, even though the difference when compared to the group games is not much in the case of a victory, it is significantly worse in case of defeat, with a defeat leading to a decrease of 70 points. Here there is a notable loss effect. This is perhaps due to the fact that a victory only guaranties the continuity in the tournament while a defeat dictates the end altogether. Not only that but the overall game importance and the added media attention and exposure that elimination games naturally have may lead to the exacerbation of the mood effect. However, looking into continuously compounded returns the values are not particularly significant, in fact, even the bigger felt impact, which happened in the case of a loss in elimination games, only revealed a 1 basis points decrease.

In the European Championship, the results are opposite with wins linked to an overall quotation drop of 13 points and losses to a quotation increase of 49. Focusing on elimination games both led to a quotation decrease with a loss having a bigger impact with a quote drop of 12 points. These findings were very different from the expected with price movements in the group stage significantly opposed to what the mood effects would lead to believe. Here once again in terms of returns none of the sub-groups even reach a basis point variance.

4.3 Portugal

To analyse the impact of the game outcome from the Portuguese football national team, below, tables eight and nine present the results from regression (5).

Table 8. *Quotation Movements after International Soccer Matches – PSI20*

	Wins			Losses		
	N =	β_W	T-Statistic	N =	β_L	T-Statistic
Panel A: World Cup						
Group Games	7	5.946697	0.209586*	3	-25.96663	-0.599278*
Elimination Games	2	-10.09260	-0.190196*	4	25.23135	0.672352*
Panel B: UEFA Euro						
Group Games	12	6.873992	0.317095*	4	-15.36818	-0.409517*
Elimination Games	8	6.044015	0.359860*	6	-67.11095	-2.190608**

Note: Results from regression (5), with the calculation of the variation of the index quotation that is attributable to the game results. Next to the t-statistic, ***, ** and * indicate a significance level of 1%, 5%, and higher than 5% respectively.

Table 9. *Abnormal Market Returns after International Soccer Matches – PSI20*

	Wins			Losses		
	N =	β_W	T-Statistic	N =	β_L	T-Statistic
Panel A:						
World Cup						
Group Games	7	0.000379	0.108549*	3	-0.002276	-0.426389*
Elimination Games	2	-0.003253	-0.497538*	4	0.003868	0.836626*
Panel B:						
UEFA Euro						
Group Games	12	0.001548	0.579441*	4	0.000987	0.213508*
Elimination Games	8	0.004386	1.341527*	6	-0.006497	-1.721326*

Note: Results from regression (5), with the calculation of the returns that are attributable to the game results. Next to the t-statistic, ***, ** and * indicate a significance level of 1%, 5%, and higher than 5% respectively.

In the case of the PSI20, the effects of the game outcomes were more in line with what behavioural finance and the premise of this work would lead to believe. On the Continental Cup, in the group games, wins led to a small change in quotation, a seven-point increment and losses led to a significant decrease of almost 15. These findings are even more pronounced in the case of elimination games. Within the elimination games, it is visible that the negative impact from losses was very pronounced. While the quotation variation in these elimination games in case of victory is virtually the same as in the group games (six-point increment), the negative impact from losses rose to 67 points, a further 52-point decline than the 15 points decrease found in the group games. That fact like expressed previously goes in line with the findings that the human mind is more affected by negative results than positive ones and shows the greater importance of elimination games. Once more, similarly to what happened in Spain, in terms of continuously compounded returns, none of the findings is particularly significant with none surpassing the threshold of 0.1 basis points.

In case of the World Cup, the results follow this trend for the most part. Here in the group games the findings are similar, with wins leading to an increment in quotation, even if very small at nearly six points, and losses linked to negative quote variations, here more pronounced at around 26 points. In the elimination games however, that orientation is reversed, with wins linked to decreases in price and losses to increments. In this particular subgroup, the results were far from what behavioural finance and what the mood effects from bad results would lead to believe. This could perhaps be due to the very small number of observations within this sub-group, with only two observations for wins in elimination games and four for losses in elimination games. Once more, speaking in terms of continuously compounded returns, both are neglectable.

5. Robustness Analysis

As noted in chapter 4.1, some years are pretty exceptional in terms of their returns, however the decision was that there was no reason for those years to not be included in the analysis.

Nevertheless, the study will still include an analysis without games that could be considered "outliers", meaning that could have a disproportional impact on the results a thus being considered an anomaly. For that effect the 4 games will be excluded, 2 wins and 2 losses, to see how much impact was being produced. As there is no "special" number, the selected option was four since the number of observations is not particularly big. For that specific reason, the entirety of the games was analysed, not separating between group games and elimination games, as in that case there would be too few elimination games which could make the analysis somewhat disproportional. The results for the analysis on the Spanish index are present in tables ten and eleven, and for the Portuguese index, in tables twelve and thirteen.

Table 10. *IBEX35 quotation movements without extreme values*

	Wins			Losses		
	N =	β_W	T-Statistic	N =	β_L	T-Statistic
Panel A: World Cup						
All Games	18	44.03426	1.959636*	8	-38.52478	-1.143724*
Without Extreme values	16	46.14546	1.995713**	6	-7.043605	-0.165337*
Panel B: UEFA Euro						
All Games	20	-8.071142	-0.378444*	7	14.13006	0.392300*
Without Extreme values	18	24.88743	0.976891*	5	78.49386	1.427297*

Note: Results from regression (5) for the Spanish index. Comparison of the variation of the index quotation that was attributable to the game results, with and without the inclusion of extreme values. Separated in two panels, (A) for the values from the FIFA World cup, and (B), for the values from the UEFA European Championship. Next to the t-statistic, ***, ** and * indicate a significance level of 1%, 5%, and higher than 5% respectively.

Table 11. *IBEX35 returns without extreme values*

	Wins			Losses		
	N =	β_W	T-Statistic	N =	β_L	T-Statistic
Panel A: World Cup						
All Games	18	0.004881	2.035178**	8	-0.004504	-1.252644*
Without Extreme values	16	0.004978	2.016996**	6	-0.001161	-0.255315*
Panel B: UEFA Euro						
All Games	20	-0.000140	-0.061481*	7	0.002917	0.758724*
Without Extreme values	18	0.003797	1.396342*	5	0.009336	1.590578*

Note: Results from regression (5) for the Spanish index. Comparison of the variation in returns that was attributable to the game results, with and without the inclusion of extreme values. Separated in two panels, (A) for the values from the FIFA World cup, and (B), for the values from the UEFA European Championship. Next to the t-statistic, ***, ** and * indicate a significance level of 1%, 5%, and higher than 5% respectively.

For the results without the "outliers" some differences are present. In some instances, some values change into what was believed would happen in the beginning of the work, like what happened in the World Cup for the IBEX 35, since wins went from a negative impact to a positive one. However, both in the World Cup and in the European Cup, the negative impact from losses was either reduced, or when it was already positive, that positive impact got even bigger. Those results could be linked to a much smaller sample of when it comes to games with loss as an outcome.

Table 12. *PSI20 quotation movements without extreme values*

	Wins			Losses		
	N =	β_W	T-Statistic	N =	β_L	T-Statistic
Panel A:						
World Cup						
All Games	9	2.389655	0.095483*	7	3.291202	0.115992*
Without Extreme values	7	-26.48588	-0.864320*	3	28.95631	0.545705*
Panel B:						
UEFA Euro						
All Games	20	6.035836	0.359350*	10	-46.43803	-1.956259**
Without Extreme Values	18	35.33888	1.630532*	8	-26.02478	-0.980692*

Note: Results from regression (5) for the Spanish index. Comparison of the variation of the index quotation that was attributable to the game results, with and without the inclusion of extreme values. Separated in two panels, (A) for the values from the FIFA World cup, and (B), for the values from the UEFA European Championship. Next to the t-statistic, ***, ** and * indicate a significance level of 1%, 5%, and higher than 5% respectively.

Table 13. *PSI20 returns without extreme values*

	Wins			Losses		
	N =	β_W	T-Statistic	N =	β_L	T-Statistic
Panel A:						
World Cup						
All Games	9	-0.000427	-0.138443*	7	0.001235	0.353264*
Without Extreme values	7	-0.003891	-1.030714*	3	0.002955	0.451929*
Panel B:						
UEFA Euro						
All Games	20	0.002684	1.296793*	10	-0.003502	-1.197287*
Without Extreme values	12	0.005780	2.164730**	4	-0.002894	-0.885267*

Note: Results from regression (5) for the Portuguese index. Comparison of the variation in returns that was attributable to the game results, with and without the inclusion of extreme values. Separated in two panels, (A) for the values from the FIFA World cup, and (B), for the values from the UEFA European Championship. Next to the t-statistic, ***, ** and * indicate a significance level of 1%, 5%, and higher than 5% respectively.

For the PSI20, once again, the competition with more observations, maintains to some degree the positive impact from wins and negative impacts from losses. On the competition with less observation, the World Cup, like suggested in the beginning of the Chapter, by eliminating observations, being that they were already few, could have had a disproportional impact since as we can see the values without the “outliers” have altered significantly but without any order or some sort of direction.

In the annex we can find tables 14 through 17 where we find the results from the regressions without taking into consideration the possibility of an impact from the summer months, meaning that we also ran the regressions without the summer months dummy. Comparing with the results above we can see that including the dummy, for the most part, meant a higher positive impact from wins and a higher negative impact from losses, especially in the case of the Portuguese index.

6. Discussion

In this study, the findings were not as clear as some of the papers beforementioned in the literature review. For instance, Morgan (1999) managed to find significant correlation between sports with a much lower overall attention than the ones studied in this research. In the present research, such correlation was only achieved in specific conditions even with the much bigger audiences. However, it was still possible to find the negative stock market reaction to losses that Edmans et al. (2005) had mentioned, even if not consistently throw out all the competitions.

Not even the work from Fan et al. (2017), that showed that the bigger the audience of the competition the bigger the magnitude of the loss effect would, can be corroborated since both competitions studied are amongst the most viewed. For instance, the World Cup, which in its last edition (2018) had nearly 3.3 billion in TV viewership around the globe, with an average of nearly 3 million in Portugal for the national team games, and the results did not follow the expected pattern.

Also, very differently from what Kaplanski and Levi (2010) stated regarding neutral markets being affected by other countries' national team performances, in this study the returns from the home countries were not very substantial, nor were they consistent. In some competitions the markets behaved in a different manner from that that would be expected given the team's performance. Having that in mind a hypothetical impact in foreign markets seem unlikely.

Several studies previously conducted achieved similar results, results in line with what behavioural finance would lead to believe. Ashton et al. (2003) showed in England the expected positive returns resulting from wins and lower returns following a loss. In this work, in some instances those results were also found, for instance with Portugal in the UEFA European Championship and Spain in the FIFA World Cup. In the case of Portugal, also the group games of the World Cup followed that tendency, meaning that in all of the subgroup studied, only one out of the four sub-groups was not in line with the expected. That shows that, to some extent this study has followed to what was expected from the beginning.

With that in mind we can see this study getting further way from the conclusions found the article from Gerlach (2011) where the author concluded that the stock market returns are

not affected by the investors' mood following the national football team matches. With this study we can find indication of a certain influence to some degree, something that was denied altogether by Gerlach (2011).

Similar results to this study were the ones achieved by Berument et al. (2006), since in that research, even though not always verifiable, for some teams, those market movements were present.

In the previously mentioned work from Reid et al. (2013) the authors make the claim that the mind may be tricked into what can easily be a trap. In their words, even if betting on market movements after certain competitions holds a certain level of predictive capability, there is no rational reason to do so, adding that there is no economic rationale to believe in such connection "Our minds are wired to take short-cuts and this is a reason for caution. This can hurt wealth accumulation" (p. 27). The lack of concrete evidence in the present work goes slightly in line with that idea while also leaving room for the scrutiny of future works regarding this thematic.

7. Conclusion

Edmans et al. (2007) suggests that in many countries, and particularly soccer is of ‘national interest’. Graziano and Vincentini (2016) state that “It is hard to imagine other regular events that produce such substantial and correlated mood swings in a large proportion of a country’s population” (p. 4). Keeping that in mind, emerged the interest to study the implications on the closest financial markets, since it is something never studied in the region.

The empirical work consisted of the application of econometric models to a set of financial data spanning from 1993 to 2021 as well as its application on an equally long set of sporting data. More precisely, a list of outcomes of football games of the Portuguese and Spanish national teams in two competitions, the FIFA World Cup and the UEFA European Championship.

The findings of this research show that at least to some extent, and in specific conditions/sub-groups wins indeed lead to positive returns and defeats lead to negative returns. Both countries had one competition in which the results go accordingly with the expected and another with results slightly different from the expected. The Portuguese index (PSI20) followed the premise of better market performance in case of victories and worse market performance in case of defeats in the UEFA Euro, as well as in the World Cup, this instance only on the bigger of the sub-groups. In the end, in the case of the Portuguese analysis, only one of the four sub-group did not follow the expected premise. The Spanish index (IBEX 35) followed that premise in the World Cup but not on the UEFA Euro, where in one of the two sub-groups there was a loss effect but not a win effect. The results are definitely interesting but lack persistency that would allow to make definitive conclusions about the efficiency of the financial markets. In the end there is a partial trend that suggest some degree of inefficiency that could allow investors to predict some of the price movements and achieve abnormal gains. The incorporation of this information, from football results and its mood impacts seems however to be reasonably fast, suggesting markets more in line with a semi-strong definition. However, the frequency and amount of those price movements are probably not enough to defend a strategy solely focused on taking advantage of this game outcome effect, especially smaller investors with higher transaction costs, which would probably hinder any chance to have a representative sample of each index. Like Edmans et al. (2007) explain “Our principal contribution is not to identify a

profitable trading strategy, however, but to document that mood can have a large effect on stock returns”

Looking closely, in the case of Portugal, the results differed from the anticipated in the competition with less observations, having only 16 games in the World Cup. Only a few major sporting events have taken place since the beginning of the available data for the PSI20 and the IBEX 35. Worsening this problem is the fact that not only do the competitions need to take place but the national team also needs to qualify, further diminishing the available data since for instance Portugal has only qualified to 5 out of the 7 World Cups since 1993. That leads to the key suggestion for future studies. It would be beneficial in a future research on the topic to include more observations when more sporting events have had taken place which would most likely allow for even more conclusive results.

Overall, the study managed to gather detailed information and data on a specific region that had yet to be specifically targeted to an analysis of this type. Moreover, the fact that in some specific cases, abnormal returns are indeed linked to the outcomes of sporting events, helps deepen the available literature linked with mood effects and their impact on financial markets.

References

- Archer, I., & Royle, T. (1976). *We'll Support You Evermore, the impertinent saga of Scottish Fitba*. Transworld Publishers Ltd.
- Ashton, J. K., Gerrard, B., & Hudson, R. (2003). Economic impact of national sporting success: evidence from the London stock exchange. *Applied Economics Letters*, 10(12), 783-785. <https://doi.org/10.1080/1350485032000126712>
- Berument, M. H., & Ceylan, N. B. (2012). Effects of soccer on stock markets: The return–volatility relationship. *The Social Science Journal*, 49(3), 368-374. <https://doi.org/10.1016/j.soscij.2012.03.003>
- Berument, M. H., Ceylan, N. B., & Ogut-Eker, G. (2009). Soccer, stock returns and fanaticism: Evidence from Turkey. *The social science journal*, 46(3), 594-600.
- Boyle, G., & Walter, B. (2003). Reflected glory and failure: international sporting success and the stock market. *Applied Financial Economics*, 13(3), 225-235. <https://doi.org/10.1080/09603100210148230>
- Demirhan, D. (2013). Stock market reaction to national sporting success: Case of Istanbul stock exchange. *Pamukkale Journal of Sport Sciences*, 4(3), 107-121. <https://dergipark.org.tr/tr/pub/psbd/issue/20581/2193>
- Edmans, A., Garcia, D., & Norli, O. (2007). Sports Sentiment and Stock Returns. *The Journal of Finance*, 62(4), 1967-1998. <https://doi.org/10.1111/j.1540-6261.2007.01262.x>
- Fama, E. F. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance*, 25(2), 383-417. <http://www.jstor.com/stable/2325486>
- Fan, Q., Lei, W., & Zhang, X.-P. (2017, 14-16 Nov. 2017). The impact of sports sentiment on stock returns: A case study from professional sports leagues. *2017 IEEE Global Conference on Signal and Information Processing (GlobalSIP)*, Montreal, QC, Canada. <https://doi.org/10.1109/GlobalSIP.2017.8309094>
- Fan, Q., & Wang, T. (2018). Game day effect on stock market: Evidence from four major sports leagues in US. *Journal of Behavioral and Experimental Finance*, 20, 9-18. <https://doi.org/10.1016/j.jbef.2018.03.005>
- Gerlach, J. R. (2011). International sports and investor sentiment: do national team matches really affect stock market returns? *Applied Financial Economics*, 21(12), 863-880. <https://doi.org/10.1080/09603107.2010.543069>
- Graziano, E. A., & Vicentini, F. (2017). Football cultural events and stock market returns: the case of FIFA World Cup. *International Journal of Environmental Policy and Decision Making*, 2(2), 167-178.
- Harjito, D. A., Alam, M., & Dewi, R. A. K. (2021). Impacts of international sports events on the stock market: evidence from the announcement of the 18th Asian games

- and 30th Southeast Asian games. *International journal of sport finance*, 16(3), 139-147. <https://doi.org/10.32731/ijsf/163.082021.03>
- Hirshleife, D., & Shumway, T. (2003). Good Day Sunshine: Stock Returns and the Weather. *The Journal of Finance*, 58(3), 1009-1032. <https://doi.org/10.1111/1540-6261.00556>
- Hirt, E. R., Zillmann, D., Erickson, G. A., & Kennedy, C. (1992). Costs and benefits of allegiance: Changes in fans' self-ascribed competencies after team victory versus defeat. *Journal of Personality and Social Psychology*, 63(5), 724-738. <https://doi.org/10.1037/0022-3514.63.5.724>
- Jensen, M. C. (1978), Some anomalous evidence regarding market efficiency, *Journal of Financial Economics* 6(2– 3), 95–101.
- Kamstra, M. J., Kramer, L. A., & Levi, M. D. (2000). Losing Sleep at the Market: The Daylight Saving Anomaly. *American Economic Review*, 90(4), 1005-1011. <https://doi.org/10.1257/aer.90.4.1005>
- Kang, I., & Park, C. (2015). Soccer sentiment and investment opportunities in the Korean stock market. *Asia-Pacific Journal of Accounting & Economics*, 22(2), 213-226.
- Kaplanski, G., & Levy, H. (2010). Exploitable Predictable Irrationality: The FIFA World Cup Effect on the U.S. Stock Market. *Journal of Financial and Quantitative Analysis*, 45(2), 535-553. <https://doi.org/10.1017/S0022109010000153>
- Krueger, T. M., & Kennedy, W. F. (1990). An Examination of the Super Bowl Stock Market Predictor. *The Journal of Finance*, 45(2), 691-697. <https://doi.org/10.2307/2328679>
- Lakonishok, J., & Smidt, S. (1988). Are Seasonal Anomalies Real? A Ninety-Year Perspective. *The Review of Financial Studies*, 1(4), 403-425. <http://www.jstor.org/stable/2962097>
- Malkiel, B. G. (1989). The Efficient market hypothesis and its critics. *Journal of Economic Perspectives*, 17(1), 59-82. <http://doi.org/10.1257/089533003321164958>
- Morgan, J. W. (1999). "Bulls, Bears and Ponies". *New York: Barron's*
- Nwansi, G. U., & Osuji, J. I. (2015). Comparative Analysis of the Impact of International Soccer Wins on the Stock Market: Evidence from Nigeria. *International Proceedings of Economics Development and Research*, 85, 89.
- Pettengill, G. N. (2003). A Survey of the Monday Effect Literature. *Quarterly Journal of Business and Economics*, 42(3/4), 3-27. <http://www.jstor.org/stable/23292837>
- Reid, I. P., Goebel, J. M., Sundaram, S., Ogden, W. A., & Seymoure, S. (2013). Sports and The Stock Market. *Journal of Accounting and Finance*, 13, 21-28.
- Saunders, E. M. (1993). Stock Prices and Wall Street Weather. *The American Economic Review*, 83(5), 1337-1345. <http://www.jstor.org/stable/2117565>

Zawadzki, K. (2013). The Impact of Mega Sports Events on the Stock Markets. *Munich Personal RePEc Archive*, Article 44834. <https://mpra.ub.uni-muenchen.de/44834/>

Annex

Table 14. *IBEX 35 quotation before summer months dummy*

	Wins			Losses		
	N =	β_W	T-Statistic	N =	β_L	T-Statistic
Panel A: World Cup						
Group Games	12	42.20819	1.533899*	4	-9.305921	-0.195357*
Elimination Games	6	39.78817	1.022917*	4	-73.02603	-1.533119**
Panel B: Continental cup						
Group Games	12	-15.90461	-0.577942*	3	46.00615	0.836384*
Elimination Games	8	-2.814885	-0.083534*	4	-14.31986	-0.300568*

Note: Results from regression (5) for the Spanish index. Comparison of the variation in quotation that was attributable to the game results, with and without the inclusion of the summer month dummy. Separated in two panels, (A) for the values from the FIFA World cup, and (B), for the values from the UEFA European Championship. Next to the t-statistic, ***, ** and * indicate a significance level of 1%, 5%, and higher than 5% respectively.

Table 15. *IBEX 35 returns before summer months dummy*

	Wins			Losses		
	N =	β_W	T-Statistic	N =	β_L	T-Statistic
Panel A: World Cup						
Group Games	12	0.004692	1.597259*	4	0.000280	0.055011*
Elimination Games	6	0.004393	1.058178*	4	-0.009869	-1.941128**
Panel B: Continental Cup						
Group Games	12	-0.000303	-0.103071*	3	0.004220	0.718764*

	Wins			Losses		
	N =	β_W	T-Statistic	N =	β_L	T-Statistic
Elimination Games	8	-0.000617	-0.171422*	4	0.001434	0.281934*

Note: Note: Results from regression (5) for the Spanish index. Comparison of the variation in returns that was attributable to the game results, with and without the inclusion of the summer month dummy. Separated in two panels, (A) for the values from the FIFA World cup, and (B), for the values from the UEFA European Championship. Next to the t-statistic, ***, ** and * indicate a significance level of 1%, 5%, and higher than 5% respectively.

Table 16. *PSI20 quotation before summer months dummy*

	Wins			Losses		
	N =	β_W	T-Statistic	N =	β_L	T-Statistic
Panel A						
World Cup						
Group Games	7	1.494297	0.052646*	3	-30.47757	-0.703135*
Elimination Games	2	-14.62787	-0.275562*	4	20.70316	0.551483*
Panel B						
Continental Cup						
Group Games	12	2.386559	0.110051*	4	-19.81665	-0.527865*
Elimination Games	8	1.544592	0.091935*	6	-71.65135	-2.338051**

Note: Results from regression (5) for the Portuguese index. Comparison of the variation in quotation that was attributable to the game results, with and without the inclusion of the summer month dummy. Separated in two panels, (A) for the values from the FIFA World cup, and (B), for the values from the UEFA European Championship. Next to the t-statistic, ***, ** and * indicate a significance level of 1%, 5%, and higher than 5% respectively.

Table 17. *PSI20 returns before summer months dummy*

		Wins		Losses		
		N =	β_W	T-Statistic	N =	β_L T-Statistic
Panel A						
World Cup						
Group Games		7	-0.000148	-0.042243*	3	-0.002812 -0.526573*
Elimination Games		2	-0.003789	-0.579425*	4	0.003333 0.720633*
Panel B						
Continental Cup						
Group Games		12	0.001015	0.380047*	4	0.000461 0.099682*
Elimination Games		8	0.003858	1.179587*	6	-0.007035 -1.863053*

Note: Results from regression (5) for the Portuguese index. Comparison of the variation in returns that was attributable to the game results, with and without the inclusion of the summer month dummy. Separated in two panels, (A) for the values from the FIFA World cup, and (B), for the values from the UEFA European Championship. Next to the t-statistic, ***, ** and * indicate a significance level of 1%, 5%, and higher than 5% respectively.