Lisbon School of Economics & Management
Universidade de Lisboa

MASTER OF SCIENCE IN

FINANCE

MASTER FINAL WORK

DISSERTATION

THE IMPACT OF THE PURCHASE AND SALE OF FOOTBALL PLAYERS AND COACHES ON PORTUGUESE FOOTBALL CLUBS' SHARE PRICES – EFFICIENCY TEST

GONÇALO MATIAS RIBEIRO PALMA

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Abstract

The main goal of this paper is to study how the 3 Portuguese listed football clubs' share prices react to the announcement of transfers of their first-team football players and coaches in order to test market efficiency with regard to this type of event.

From January 2015 to March 2020, 69 events were disclosed through the Portuguese regulator (CMVM) regarding these transfers from Futebol Clube do Porto, Sport Lisboa e Benfica and Sporting Clube de Portugal.

An event-study methodology was used to analyse this hypothesis. The Average Abnormal Return (AAR) and Cumulative Average Abnormal Return (CAAR) were calculated using different event time window periods in order to observe the reaction of investors to such announcement.

The results show that investors do not react to these announcements with no evidence of any type of abnormal return on any of the days throughout the event window. This result may be justified by the low liquidity of such shares. Football investors are normally fans of their clubs which often lead them to make decisions on an emotional rather than rational basis.

Keywords: Football clubs' share prices, Portugal, market efficiency, event study analysis

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Lastly, I would like to dedicate this work to my grandfathers, who, although are no longer with me, I am sure I made them proud. Thank you for teaching me to be the person I am today. I will always keep you in my thoughts.

Index

List of tables

Appendix index

List of abbreviations

AR – Abnormal Return

AAR – Average Abnormal Return

CMVM – Comissão do Mercado de Valores Mobiliários

CAAR – Cumulative Average Abnormal Return

EMH – Efficient Market Hypothesis

FCP – Futebol Clube do Porto

NBA - National Basketball Association

OLS – Ordinary Least Squares

SAD – Sociedade Anónima Desportiva

SLB – Sport Lisboa e Benfica

SCP – Sporting Clube de Portugal

UEFA - Union of European Football Associations

1. Introduction

What do football and finance have in common? Among many objects of study between these two fields, one of the common grounds is the world of football clubs that were turned into public listed companies. According to KPMG's 2017 Football Benchmark, in 2017, there were 22 listed clubs on European stock exchanges and tracked in the Stoxx Europe Football, the main index for European clubs. Among these, 4 were in Turkey, 3 in Italy, 3 in Portugal, 2 in England, 1 in France, Germany, the Netherlands and in Scotland, etc.

Starting from the premise that the Top-5 Leagues in the world are played in England, France, Germany, Italy, and Spain, it is possible to see that of the 22 listed clubs, only 7 are from these Top-5 Leagues. For example, none of the Spanish clubs is publicly listed. Therefore, we may ask why does a peripheric country like Portugal have 3 clubs currently listed? This is an example of the importance that football may have in a country. It is one of the most important social phenomena and it has the capacity to produce other diverse phenomena, mobilising crowds and generating money. Nowadays, more than ever, football is not only about the game itself, but also more than that, it has become a business. It has changed outside of the pitch.

One example of the impact of football in the economy is the market for broadcasting rights. In 2019, the cost of English Premier League broadcasting rights reached the value of £9.2 billion for the next three upcoming seasons. This represented an increase of almost 8% compared with the previous year. In addition, foreign broadcasters are now paying 30% more for games. Another example is the money received by football clubs in England from both broadcasting and commercial revenues. According to the Premier League's 18/19 Payments to Clubs Report, the total payment to all 20 clubs in that season alone was of £2.5 billion, with Manchester City being the team that received the biggest amount (£151 million) and Huddersfield Town the one with the smallest (£97 million). An EY study found that the Premier League contributed more than £3.3 billion in tax revenue to the United Kingdom's economy in the 2016/2017 season, with its clubs supporting almost 100,000 jobs. EY's Economic and Social Impact Assessment also found the League contributed £7.6 billion to the UK's Gross Domestic Product.

In Portugal, the value of these deals is not as high as the ones in the United Kingdom, but it is still impressive and some of the clubs negotiated substantial contracts considering the country's reality. In 2015, Sporting Clube de Portugal (SCP) and Sport Lisboa e Benfica (SLB)

announced deals with NOS, a Portuguese media holding company, worth of €515 million and €400 million respectively, with different clauses. Futebol Clube do Porto (FCP), by its turn, also in 2015, officialised its deal with MEO, a mobile and fixed telecommunications service and brand, totalling €458 million.

Portugal currently has three listed football clubs: Futebol Clube de Porto – Futebol, SAD; Sport Lisboa e Benfica – Futebol, SAD; and Sporting Clube de Portugal – Futebol, SAD. These correspond to the three major Portuguese football clubs' public companies constituted, with their shares being traded on the Euronext Lisbon Stock Exchange. The original rationale behind this creation was to participate in sporting activities and competitions of a professional nature in a particular sport, to promote and organise sporting events and to encourage and develop activities related to the practice of that sport.[1]

In the past, Portuguese clubs would generate the majority of their revenues through merchandising and ticket sales. However, with the recent introduction of the Financial Fair Play Rules (FFPR) imposed by the Union of European Football Association (UEFA) in the beginning of the 2011–12 football season, in order for clubs to comply with it, they must rely on other important sources of income like the broadcasting rights and the sale of players. Both of these have seen a major increase in the last decade. Taking now for example the football players' market, in 2000, the beginning of the 21st century, the most expensive footballer was Luís Figo when he moved from Fútbol Club Barcelona to Real Madrid Club de Fútbol for a fee of approximately €62 million (today it ranks only the 41st highest fee of all time); comparing it to recent times, in 2017, the Brazilian player Neymar swapped FC Barcelona for Paris Saint German for a fee of approximately €222 million.

In 2004, Portugal hosted the UEFA European Football Championship, an event that for 22 days registered 1.156.473 people in attendance, around 10.000 journalists from all over the world, had ten new stadiums specifically built for it and according to a professor from ISEG, had an economic impact of €440 million. The country also hosted in 2019 the first edition of the UEFA Nations League, which had its finals in Porto and Guimarães and, according to a professor from IPAM, its economic impact may have been around 150€ million. One final example is how present the matter is in the media, which increases the volume of information circulating about clubs every day. A study by Cision in 2014, a Portuguese PR news company,

[1] Decreto-Lei nº 146/95, de 21 de junho, art.º 2.º, nº.1

from July 2014 to June 2015, concluded that the Portuguese media produced more than 500 thousand news reports regarding football. Strictly looking at television, it represented 11.187 hours of emission among 21 channels. This totals 466 days. These are some examples of the growth that the sport has had in Portugal over the past years.

The increasing financial interest around football clubs' capital structures and the amount of money that the sport generates and circulates, makes the share price of those which are listed a topic interesting to study. Together with this, the outside factors that may impact the price also play an important role.

Given the context, it is expectable that investors are interested in acquiring shares of football clubs. Previous literature provides evidence that investors trade football clubs' shares for two likely reasons: one is the transversal reason for any investment which is to generate future profit; and the second is an irrational investment based on the fact that they support a specific team and want to contribute or help it in a certain financial way, the so-called "investor-fans", (Gandar, Lamb, Zuber and Yiu, 2005).

With this in mind, it becomes relevant to know whether these markets work in an efficient way whenever faced with transfers like these. Or, on the other hand, if they lead the markets to react in an inefficient way. The idea of market efficiency is very important for investors since it allows them to make wiser choices. The only way that they can obtain above average profits through investments is by taking advantage of abnormalities when they occur. When the market is running efficiently it will not be possible for investors to make above average profits, but any abnormalities can be exploited. Over time, these abnormalities tend to be removed. This is why market efficiency is important. If the market is efficient in responding to new information, we expect to find a significant relationship between players and coaches – related events and the value of the clubs' shares. If the market does not respond to such events that may materially affect the financial condition of the firm, then it might not be efficient in interpreting the news, and/or the events are anticipated prior to their press coverage or occurrence, and/or investors do not consider the announcements as significant and/or investors are aware of the financial implications of the announcements but choose to deliberately disregard their significance.

For the Portuguese reality, which is the main scope of this paper, this dissertation aims to analyse which price sensitivity factors, related to the players and coaches, really have an

influence on the price and subsequently how markets react in terms of efficiency to their disclosure.

In football, due to the fact that the analysed clubs are publicly listed, it is mandatory to disclose some information to the Portuguese Securities Market Commission (CMVM – Comissão de Mercados de Valores Mobiliários). This can be classified in two categories: the first, "price sensitive event", which according to Duque and Pinto (2007) is an event that should lead to a substantial change in share prices; and the second, "other communications" which is information that should not have a significant impact on stock prices. In general, examples of these disclosers can range from the announcement of earnings to general business related information like, for example, a change in the composition of the Board of Directors or restructuring related information.

After analysing the information disclosed by the clubs, we verified that events such as acquisitions and sales of first-team players and coaches, contract renovations and revocations of first-team players and coaches, information regarding issued bonds, the announcement of the earnings, changes in the Board of Directors and information related to the clubs' general assemblies are examples of events communicated by clubs to the market. We will conduct an analysis on how investors incorporate information regarding acquisitions and sales of first-team players and coaches. That is, verifying the efficiency of the market. Amongst every disclosure made, these events are the ones more closely related to the sport itself and to football clubs' biggest assets, its players.

A representation of how important these sales and purchases can be for Portuguese teams, is observable in the markets for football players and coaches. Three recent transfers must be highlighted. The first, in the footballers' market, is the sale of the player João Félix from Sport Lisboa e Benfica to Club Atlético de Madrid in 2019 for a fee of approximately €126 million. At the time, it represented the fourth biggest transfer of all time in the world, and the biggest one in Portugal by a large distance (the closest was of Bruno Fernandes from Sporting Clube de Portugal to Manchester United Football Club in January 2020 for €55 million). The second, this time in the market of football coaches, is the sale of André Villas-Boas from Futebol Clube do Porto to Chelsea Football Club in 2011, when the English side paid €15 million to acquire the coach (to this day, it is still the highest transfer fee ever paid for a football manager). In addition, recently, in March 2020, in a transfer within Portuguese teams, Sporting Clube de Braga sold the manager Rúben Amorim to Sporting Clube de Portugal for an amount

of €10 million, ranking it the third highest fee ever paid for a manager. These notable transfers highlight their significant value to Portuguese clubs and how they have established a noticeable presence in the top of the rankings in the past years. All of these involved values become even more impressive given that it comes from a non-Top-5 League like Liga NOS (Portugal's first division) and from a peripheric country like Portugal.

Since players are the key assets of any football club, it is therefore crucial to acquire, develop and retain playing talent. Overall increases in revenue, growing internationalisation, as well as the professionalisation of practices in clubs' sports departments (e.g., scouting, investments in academy infrastructures, etc.) are some reasons explaining why clubs are always looking to build successful squads. This accelerated a global race for talent among the European elite, and Liga NOS is one of the most wanted markets. It is understandable how player trading activity has become in recent years an essential component of clubs' business models, as the acquisition or sale of talents places a significant weight on their financial sustainability and on-pitch success. So, whilst top clubs benefit from having star players and secure income streams, clubs with lower sporting potential tend to look at talent development as an essential way to bridge the gap and increase their chances of success. In Portugal, most of the clubs are not of a high tier, so they are placed in the lowest-potential one, having to depend on the sales, purchases and academy players' developments to achieve success and financial stability. This challenge has to be combined with the fact that players, coming from a non-Top-5 League, understandably would aspire to transfer to a high-profile one where they can boost both their salaries and careers. This can be exemplified with the wage discrepancy between Portugal and the UK. According to the consulting company Sport Intelligence, cited by a Portuguese newspaper, in 2018, Premier League clubs were paying, in average, €3.4 million per month. The Portuguese League ranked 15th with a number of €307 thousand per month. Such transfers are therefore understandable.

In this way, I believe it becomes interesting to see how the stock price of football clubs in Portugal changes after they announce sales and purchases of key players and coaches and how the market will absorb such changes regarding the clubs' main face, the footballers. Having assessed the academic literature on this topic, I have found it has not been researched extensively by academics. The few literature available tends to focus more on the accounting topic or in one or two clubs only. This research becomes therefore relevant because, it not only studies something new for the Portuguese reality, but also dives deeper into the sporting side and the effects of very specific important information, which has never been investigated

before, filling a gap. On an international level, the only similar existing literature is focused on the impacts of match results on the shares. Hence, considering this in different way, it is how investors assimilate information regarding sales and purchases of a company's crucial assets.

The topic gains more relevance when taking into account how particular and different investors in football clubs are. Considering that some of them are the previously mentioned "investor-fans", who find value in simple ownership, it is curious to perceive how they react to these events, or if they acquired the shares once and never cared about them again. Blose, Gandar, Lamb and Zuber (1999) while analysing the NBA team Boston Celtics, found evidence of a significant relationship between stock returns and game-related events only during the first two years of the club's public life. After that, no significant relationship was observed. Rather than concluding that the market was inefficient, evidence of a shift in the type of investors was found. After the two year period, most of the shareholders liquidated their holdings, leaving the majority of ownership in the hands of investor-fans, insensitive to financial information. In addition, Murgea and Schank (2016) concluded that these investors, in countries in which individuals are characterised to more extroverted behaviour as observed in Italy and Portugal, there is a positive correlation between the games and the clubs' returns. They find it hard to separate their love of the football club from their investment. So, how is a fan/investor going to react if the club's main star is sold? Or if they purchase the next big thing?

2. Literature Review

The strong economic growth that the football industry witnessed since the nineties obviously has begun to attract the attention not only of investors, but also of academics who are interested in having a better understanding of this sector. In this stage of the paper, it is important to define some concepts, narrow down its scope and quote and show academic literature that helps supporting the topic.

Independent from the original club, the created company is called a Sociedade Anónima Desportiva (SAD). A SAD can be defined as a private rights company, constituted by shareholders, that may or not be listed, with the intent of participating in professional sporting competitions. It has as a minimum share capital requirement in the Portuguese first division €997.595.79 and they are under the same legislation as anonymous societies in Portugal. With a study regarding the economic-financial viability of the SADs in Portugal, Félix da Silva

(2013) founds evidence that it is possible for these companies to have financial, economic, and sporting success. The author highlighted that FC Porto's and SC Braga's SADs are two clubs that were able to accumulate sporting success as well as economic and financial, within a certain range of criteria.

There are also researchers that investigate the association between financial performance, sporting performance and stock market performance in other countries and other professional football leagues. Samagaio, Couto and Caiado (2009) studied this relation for English football clubs over the period from 1995 to 2007 and found evidence of strong correlation between the variables and also that football clubs tried to combine sporting performance with financial performance. In addition, Renneboog and Vanbrabant (2000) also studied the influence of the football teams' weekly sporty performances on the share price of the listed clubs on the London Stock Exchange and the Alternative Investment Market (AIM). They concluded that a positive abnormal result can be expected following a victory while defeats and draws led to abnormal losses. Going even further, promotions and relegations generate much larger abnormal results. Even outside the football industry field, there have been many studies regarding how certain events affect stock prices. For example, Correia (2018) studied how the market reacted to the recent terrorist attacks that occurred in Europe in order to test the capital market efficient market hypothesis and concluded that some markets in Europe showed to be efficient (in Belgium and Sweden) while others not so much (in England, Germany, and Spain).

This paper will analyse certain specific events that may impact the Portuguese football clubs' share price and check if the market is efficient with regards to the information disclosure to the regulator. Events like the acquisitions and sales of first-team players and coaches. Duque and Pinto (2007) researched, through the reaction of the market, the appropriateness of the disclosure rule to which listed companies in Portugal are subjected to. The study found evidence supporting the thesis that firms, on average, experience a statistically significant stock price reaction around the event day and a subsequent fast return to equilibrium. Internet came to be the primary source of investors' disclosures. Another academic paper on the matter, Wysocki (1998), concluded that overnight message-posting volume is found to predict changes in next day stock trading volume and returns and also that, changes in daily posting volume are associated with earnings-announcement events and daily changes in stock trading volume and returns.

According to Fama (1970), market efficiency refers to the degree to which market prices reflect all available and relevant information. If they are efficient, then all information is already incorporated into prices and investors cannot "beat" it because there are no undervalued or overvalued securities. The author developed a theory called the Efficient Market Hypothesis (EMH), which states that there are three different versions of it: Weak, Semi-Strong, and Strong. However, academics and investors have a wide range of viewpoints regarding the actual efficiency of the market and different practitioners advocate for the three different versions of the EMH and some do not even believe in an efficient market point.

In the first version, weak form, the EMH limits itself to just one subset of public information, the historical information regarding the share price. This is the less strict one and the rationale behind it is that new information has to be unrelated to previous one, otherwise it would not be new. It follows that every movement in the share price in response to new information cannot be predicted from the last price or movement. If it was possible to obtain profits based on the observation of past prices, all investors would easily do it. Augustin (2019) shows findings that the Indonesian Sharia Stock Index is not efficient in the weak form during the period of study and Angelovska (2018) reached the same conclusion for the Macedonian Stock Exchange.

The second version, semi-strong form, is more rigorous than the previous one and states that a market is efficient if all relevant publicly available information is quickly reflected in the market price. The market will quickly absorb the publication of relevant new information by moving the price to a new equilibrium level that reflects the change in supply and demand caused by the appearance of that new information. One issue with this form is the identification of "relevant publicly available information". Alekneviciene, Kviedaraitiene and Alekneviciute (2018) showed that the Lithuanian, Latvian and Estonian stock markets were not efficient in semi-strong form in the periods of analysis. The authors reached this conclusion by dividing the period of 2006-2016 into two and checking every publicly disclosed event about dividends paid and financial statements release.

The third and last version, strong form, says a market is efficient if all public and private information relevant to the value of a share, whether or not generally available to existing or potential investors, is quickly and accurately reflected in the market price. This is the strictest form of market efficiency. Here, insiders could not generate abnormal returns by trading on private information because it would be already figured into market prices.

In football, and specially in Portugal, where this sport in the last few years has gained a special importance not only in the media but also in most peoples' lives, the volume of information that comes out on a daily basis is very high, so signals to the market are very frequent and hard to assess. This happens not only because teams participate in different competitions like the national championship, internal cups and in international ones like the UEFA Champions League and Europa League; but also, because the interest generated around their performances makes it an attractive topic to be featured in the media, which ultimately leads to more news being published about clubs on a regular basis. Stadtmann (2005) by studying the team Borussia Dortmund, in Germany, found evidence that, besides matches' outcomes, several corporate governance related news played an important role on the club's stock price. As previously mentioned, outside football and Europe, in the United States of America, an NBA team, the Boston Celtics' fans (the most recognized publicly-traded sports franchise) were the firsts to demonstrate a new way to show passion for a team by owning a part of it. Blose, Gandar, Lamb and Zuber (1999) continued concluding that although it appears that the market is inefficient in responding to important events in the life of the Boston Celtics, it may instead be that the profile of the investor changed. Furthermore, Gandar, Lamb, Zuber and Yiu (2005), when analysing this type of investor in the English Premier League, reached the conclusion that their teams' investors do not respond to information that is expected to have a measurable impact on financial condition. No material return differences are found between on-season and off-season performances, despite a dramatically higher level of information distribution during the on-season. When compared to tradition investors, football team investors are less active. Mere ownership is enough for them regardless of what the cash flows may be.

Brown and Hartzell (2001), among other things, observed the effects of a hiring of a coach, Rick Pitino, in the Boston Celtics too. His hiring was expected to have both an on-court and financial impact and the stock price behaviour throughout the timeline of his hiring showed initial optimism followed by more caution. Overall, the stock price response was very large with volume soaring to about 70 times its daily average and over a month, during the event, the price rose 8.2%. By applying this to the three major teams in Portugal, whose characteristics in terms of investors are very similar to the Boston Celtics, it is curious to see how they react to these key signings and sales, having in mind how much volume of news circulate everyday about them and especially during transfers' windows.

Most of the literature up until today was mainly related to the impact of football matches' outcomes on the stock price of publicly-traded clubs. They simply investigate that

relationship using a couple years of data and find the market reacts positively to wins and negatively to losses and draws. Most of the price reactions happen immediately at the first day of trading, which provides some support for market efficiency (Renneboog and Vanbrabant, 2000). In addition, they note that most publicly-traded clubs underperform the market index and that many investors are fans who hold shares as a way of supporting their club. Also, a vast majority of literature focuses on the betting markets and how they relate to football and finance. These topics represent the majority of the existing relationship between clubs' stock prices and clubs' related news. I believe that this paper fills a gap by going more in deep and investigating the relation between the acquisition of a player, the sale of a player, the acquisition of a coach or his sale, among others. Since clubs' main assets are the players and in Portugal teams cannot barely comply with the regulations imposed by UEFA every year without being somehow forced to sell their most valuable ones, I think that the topic gains even more relevance.

3. Data and methodology

3.1 Data

Football is a global marketplace and players are constantly reallocated. These transfers only happen in two annual periods. The longer transfer window occurs in the summer, and in most European countries it starts on the 1st of July and finishes on the 31st of August, the exact timing is set by individual countries' associations. The second and shorter window falls mid-season, lasting the entire month of January. Outside of these periods, players can sign for other clubs, but can only complete the move when the market opens. Regarding football coaches, the operative is different. There is no specific window in which moves have to be done. The marketplace is always open in this situation.

According to FIFA's Global Transfer Market Report (2019), every year since 2012, there has been an increase in the total number of international transfers, with 2019 being the year in which it was registered the biggest number, 18,042. In Portugal, the number of outgoing transfers in 2019 was 627, ranking third in Europe and fourth worldwide (a 28.2% increase from the previous year) and the number of incoming ones was 654 (a 18.3% increase from the previous year), placing second in Europe and third worldwide.

The analysed period comprises all the transfers of first-team players and coaches from January 2015 until March 2020 disclosed to the Portuguese Securities Market Commission (CMVM – Comissão de Mercados de Valores Mobiliários).

The impact of these transfer moves was analysed for Portugal, and, through *DataStream*, it was collected the adjusted close price of the three listed clubs.

The total number of events analysed was 69. From those, 19 were from Futebol Clube do Porto, 24 from Sport Lisboa e Benfica and 26 from Sporting Clube de Portugal, as it can be seen in the table below on a more detailed breakdown.

Table 1 - Number of events by football club and category

	FCP	**SLB**	**SCP**	**Total**
Players				
Purchase	4	5	7	16
Sale	9	17	10	36
Coaches				
Purchase	3	1	5	9
Sale	3	1	4	8
Total	19	24	26	**69**

3.2 Methodology

The methodology used to perform this analysis was an event study. First introduced by Fama, Fisher, Jensen, and Roll (1969), the model used was further explored by Dodd & Warner (1983), Brown & Warner (1985) and MacKinlay (1997) – who investigated the effects of many events such as earnings announcements.

The first model starts with the *Abnormal Return (AR)*. It was computed for the club i throughout the event time window $[t_1; t_2]$, where t_0 represents the day where the transfer was disclosed to the regulator. Two different time windows were used to analyse the data: One

contemplating five days before the announcement and five days after and another considering ten days before and after. The first period (which considers a total of 11 days – five before, the event day itself, and five after) is used by Brown & Warner (1985), Carter & Soo (1999), Kuipers et al (2002), Duque & Fazenda (2002), and Duque & Pinto (2008). The second period consists of a 21 day window (ten days before the disclosure, the day itself, and ten days after it) and it was analysed with the exact same model. The choice of using a second time windows lays with the fact that the market is not a very liquid one and also because, usually, initial rumours about the transfers are typically released by the media some days before the official announcement, so having a second, big enough time window that can capture these possible reactions is therefore important and relevant.

The *Abnormal Return (AR)* is hence computed following the equation below:

(1)

$$AR_{i,t} = R_{i,t} - \hat{\alpha} - \hat{\beta} * R_{m,t}$$

where, $R_{i,t}$ is the real return observed for the stock i in the day t. $\hat{\alpha}$ and $\hat{\beta}$ are parameters estimated through an OLS (Ordinary Least Square) regression with 250 observations prior to the defined time window. Lastly, $R_{m,t}$ represents the return of the national stock index in which the clubs are registered (PSI 20 for Portugal). Both $R_{i,t}$ and $R_{m,t}$ were computed with ln $(\frac{P_{it}+D_{it}}{Pit})$. This market model is used to estimate the expected return, and is the most commonly used in similar research.

Afterwards, the *Average Abnormal Return (AAR)* was computed for every event using the following equation:

(2)

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{i,t}$$

To test the null hypothesis that the AAR=0, the following statistical tests were used, using Student's t-distribution

(3)

$$t = \frac{AAR_t}{S(AAR_t)}$$

where, $S(AAR_t)$ is an estimate of the standard deviation of the average abnormal returns.

In order to test the statistical significance of the results, it was considered the null hypothesis (H_0) of the event having no impact on stock price returns.

However, it is common to sum the returns in order to conclude about the results on a more general level, (MacKinlay, 1997). This is done by summing all the values throughout the days in the time windows. We compute the *Cumulative Average Abnormal Return* (CAAR) for the stock i, throughout the entire time window through the following equation:

(4)

$$CAAR = \sum_{t=t_1}^{t_2} AAR_{i,t}$$

To test the results, the t-statistics must be computed too, and it is done through the same method as in (3) but instead of having the AAR in the denominator, now we have the CAAR computed in (5). Lastly, the results are computed considering the null hypothesis (H_0) of the event having no impact on stock price returns for a level of significance of 5%.

After testing the results, one further analysis was performed, given the outcome that was observed: "Good news and bad news". In this analysis, first the events must be divided into good news and bad news following the criteria that when the return on the event date (in t=0) is positive, it is classified as "good news". When the return is negative, it is classified as "bad news".

After having this division done, we compute the AAR as explained above for each of the two news. The standard test θ is calculated the following way:

(5)

$$\theta = \frac{AAR_t}{(var(AAR_t))^{1/2}}$$

The final statistic is tested for the same significance level as in our first analysis (5%).

4. Results

In following chapter, the results regarding the *event study* will be presented. More specifically, the ones regarding equation (3). Furthermore, the results from the additional test ("Good and bad news") will also be presented and analysed.

The data was split into 7 different categories: a) Purchase and sale of players – all together from all three clubs, b) Purchase and sale of coaches – all together from all three clubs, c) Purchase of players– all together from all three clubs, d) Sale of players – all together from all three clubs, e) Purchase of coaches – all together from all three clubs and f) Sale of coaches – all together from all three clubs and g) Purchase and sale of both players and coaches.

4.1 Results by category

4.1.1 Purchase and sale of football players

Regarding the purchase and sale of footballers from all three clubs, 52 events were analysed (16 purchases and 36 sales). It is possible to see through Table II that for a 5% significance level, the events did not have an impact on the share price of the football clubs for a 11 days' time window. This can be concluded because for this significance level, the t-statistic computed from the AAR was inferior to the t-value correspondent to a 5% significance level (1.96), leading us to reject the null hypothesis (H_0). The results yield the same conclusion once analysed for the CAAR.

The exact same events were further studied using a different time window. One comprising 21 days (ten days before the disclosure, the day itself, and ten days after it) and the conclusion was the same as for the previous window.

Table II - Results of the tests to AAR and CAAR for the purchase and sale of football players for a 11 day window

Days	AAR	t-stat	CAAR	t-stat
-5	0.20%	-0.09	0.20%	0.09
-4	-0.07%	-0.03	0.13%	0.06
-3	-0.40%	-0.13	-0.27%	-0.09
-2	0.15%	0.07	-0.13%	-0.06
-1	-0.06%	-0.03	-0.19%	-0.08
0	0.15%	0.06	-0.04%	-0.02
1	0.41%	0.12	0.36%	0.11
2	-0.11%	-0.04	0.25%	0.09
3	-0.25%	-0.10	0.01%	0.00
4	-0.49%	-0.17	-0.48%	-0.17
5	0.32%	0.10	-0.16%	-0.05

The additional test ("Good and bad news") is in line with the results we have come across so far. In Table III, we can see that for an 11 days' time window, the theta (θ) for Good news and for Bad news was always inferior to the t-values for significance level we have been testing for. Once the window is increased for a 21 day one, the results show the same we have been observing, non-significance of the results.

Table III – Results of the tests to AAR and CAAR for the purchase and sale of football players for a 11 day window – "Good and Bad News"

"Good news"					"Bad news"			
Days	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**
-5	0.81%	0.05	0.81%	0.05	-0.37%	-0.03	-0.37%	-0.03
-4	-0.79%	-0.06	0.02%	0.00	0.59%	0.04	0.23%	0.01
-3	0.05%	0.00	0.07%	0.00	-0.82%	-0.05	-0.59%	-0.04
-2	-0.03%	0.00	0.04%	0.00	0.31%	0.02	-0.28%	-0.02
-1	0.06%	0.00	0.10%	0.01	-0.18%	-0.02	-0.46%	-0.04
0	1.71%	0.11	1.81%	0.12	-1.30%	-0.11	-1.76%	-0.14
1	-0.07%	0.00	1.75%	0.09	0.84%	0.06	-0.92%	-0.06
2	-0.27%	-0.02	1.48%	0.09	0.04%	0.00	-0.88%	-0.05
3	-0.12%	-0.01	1.36%	0.10	-0.37%	-0.02	-1.25%	-0.07
4	0.28%	0.02	1.64%	0.10	-1.19%	-0.07	-2.44%	-0.15
5	-0.27%	-0.01	1.37%	0.07	0.86%	0.05	-1.58%	-0.10

4.1.2 Purchase and sale of football coaches

The second segmentation done in this paper is for the purchase and sale of football coaches for the three listed clubs we have been analysing. The total number of events studied here was 17.

As it is possible to see in Table IV, the results regarding the AAR analysis conclude that the purchase and sale of football coaches, for an 11 days' time window for a 5% significance level, were not significant (rejection of the null hypothesis). Once the results were analysed using the CAAR, the same conclusion was reached (all the values were inferior to the t-values for the significance level). Performing the same analyses for a 21 days' time window, we reach the same conclusions for both the AAR and CAAR as before.

Table IV – Results of the tests to AAR and CAAR for the purchase and sale of football coaches for a 11 day window

Days	AAR	t-stat	CAAR	t-stat
-5	0.77%	0.36	0.77%	0.36
-4	-0.18%	-0.06	0.59%	0.19
-3	-0.42%	-0.16	0.17%	0.06
-2	0.68%	0.25	0.85%	0.32
-1	0.16%	0.07	1.01%	0.45
0	0.67%	0.25	1.68%	0.63
1	-0.96%	-0.39	0.72%	0.29
2	-0.34%	-0.13	0.38%	0.14
3	0.99%	0.38	1.37%	0.52
4	-1.41%	-0.59	-0.05%	-0.02
5	-0.05%	-0.02	-0.10%	-0.03

Regarding the "Good and bad news" test, looking at Table VI the results proved to be non-significant once more. Once split into "Good" and "Bad" news, the theta was inferior to the t-value for all significance levels in both time windows.

Table V – Results of the tests to AAR and CAAR for the purchase and sale of football coaches for a 11 day window – "Good and Bad News"

"Good news"					"Bad news"			
Days	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**
-5	1.11%	0.10	1.11%	0.10	0.47%	0.03	0.47%	0.03
-4	0.25%	0.02	1.36%	0.10	-0.56%	-0.03	-0.09%	0.00
-3	-1.08%	-0.08	0.28%	0.02	0.16%	0.01	0.07%	0.00
-2	1.43%	0.09	1.72%	0.11	0.01%	0.00	0.08%	0.00
-1	0.75%	0.04	2.47%	0.14	-0.36%	-0.04	-0.29%	-0.03
0	2.45%	0.15	4.91%	0.30	-0.90%	-0.07	-1.19%	-0.10
1	-1.27%	-0.08	3.64%	0.23	-0.69%	-0.04	-1.88%	-0.12
2	-0.57%	-0.03	3.08%	0.19	-0.15%	-0.01	-2.03%	-0.12
3	1.62%	0.11	4.69%	0.33	0.44%	0.02	-1.59%	-0.09
4	-0.97%	-0.06	3.72%	0.22	-1.81%	-0.12	-3.40%	-0.23
5	0.19%	0.01	3.91%	0.20	-0.26%	-0.02	-3.67%	-0.25

4.1.3 Purchase of football players

The third segmentation performed in this thesis is now purely for the purchase of football players, which we believed to be a more accurate analysis to do since it does not aggregate different market operations (purchases vs. sales). The total number of events analysed here was 16.

If we look at Table VI, we can see that the t-statistic derived from both the AAR and CAAR has always been inferior to the t-valued generated from significance level, leading us to

reject the null hypothesis, once more, for an 11 days' time windows. Furthermore, once the same analyses are done, but this time for a larger time windows (21 days), the results obtained yielded the same conclusions as before.

Table VI – Results of the tests to AAR and CAAR for the purchase of football players for a 11 day window

Days	AAR	t-stat	CAAR	t-stat
-5	0.32%	0.16	0.32%	0.16
-4	-0.17%	-0.07	0.15%	0.06
-3	0.08%	0.02	0.23%	0.07
-2	-0.11%	-0.05	0.12%	0.06
-1	-0.18%	-0.07	-0.06%	-0.02
0	0.46%	0.19	0.40%	0.16
1	0.42%	0.13	0.82%	0.25
2	0.03%	0.01	0.85%	0.31
3	-0.59%	-0.30	0.27%	0.14
4	-0.38%	-0.16	-0.11%	-0.05
5	0.35%	0.12	0.24%	0.08

The additional test of "Good and Bad news" (Table VII) strengthens the results seen so far – once again, since theta is inferior to the t-value generated for the significance levels, we must reject the null hypothesis for all significance levels in the two time windows.

Table VII – Results of the tests to AAR and CAAR for the purchase of football players for a 11 day window – "Good and Bad News"

"Good news"					"Bad news"			
Days	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**

-5	1.56%	0.08	1.56%	0.08	-1.03%	-0.08	-1.03%	-0.08
-4	-0.54%	-0.04	1.02%	0.08	0.54%	0.03	-0.49%	-0.03
-3	-1.87%	-0.11	-0.84%	-0.05	-1.25%	-0.09	-1.74%	-0.12
-2	-0.01%	0.00	-0.86%	-0.08	1.16%	0.07	-0.58%	-0.04
-1	0.71%	0.04	-0.15%	-0.01	-0.10%	-0.01	-0.68%	-0.07
0	1.54%	0.11	1.39%	0.10	-1.82%	-0.13	-2.50%	-0.18
1	-1.75%	-0.09	-0.35%	-0.02	1.64%	0.09	-0.86%	-0.05
2	0.25%	0.03	-0.10%	-0.01	-0.83%	-0.04	-1.69%	-0.09
3	0.39%	0.03	0.29%	0.02	0.60%	0.03	-1.09%	-0.05
4	1.66%	0.08	1.95%	0.10	-2.17%	-0.12	-3.26%	-0.19
5	-1.17%	-0.05	0.78%	0.04	1.11%	0.07	-2.16%	-0.14

4.1.4 Sale of football players

The following section will only contemplate events related to the sale of football players contrasting with section 4.1.3, and now there are 36 events. Looking at Table VIII, it is possible to see that, again, the results are not significant, leading us to reject the null hypothesis for our 5% significance level with an 11 days' time window. The same conclusion is reached once the analysis is done through the CAAR – rejection of the null hypothesis. Once the time window is increased for a 21 days one, the results generated by both the AAR and CAAR are in line with the ones that have been observed throughout the paper.

Table VIII – Results of the tests to AAR and CAAR for the sale of football players for a 11 day window

Days	AAR	t-stat	CAAR	t-stat
-5	0.32%	0.16	0.32%	0.16
-4	-0.17%	-0.07	0.15%	0.06
-3	0.08%	0.02	0.23%	0.07
-2	-0.11%	-0.05	0.12%	0.06
-1	-0.18%	-0.07	-0.06%	-0.02
0	0.46%	0.19	0.40%	0.16
1	0.42%	0.13	0.82%	0.25
2	0.03%	0.01	0.85%	0.31
3	-0.59%	-0.30	0.27%	0.14
4	-0.38%	-0.16	-0.11%	-0.05
5	0.35%	0.12	0.24%	0.08

Moving to the additional test we have been performing so far – "Good news and Bad news" – we reach the exact same conclusion: the results are not significant as theta is inferior to the value retrieved by the 5% significance level for the two time windows, possible to see in Table IX for the first window.

Table IX – Results of the tests to AAR and CAAR for the sale of football players for a 11 day window – "Good and Bad News"

"Good news"					"Bad news"			
Days	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**
-5	0.58%	0.04	0.58%	0.04	0.03%	0.00	0.03%	0.00
-4	-0.87%	-0.06	-0.29%	-0.02	0.62%	0.04	0.65%	0.04
-3	0.66%	0.04	0.36%	0.02	-0.56%	-0.03	0.08%	0.00
-2	-0.03%	0.00	0.33%	0.03	-0.19%	-0.01	-0.10%	-0.01
-1	-0.14%	-0.01	0.18%	0.01	-0.23%	-0.02	-0.33%	-0.03
0	1.76%	0.11	1.95%	0.12	-1.00%	-0.09	-1.33%	-0.12
1	0.47%	0.02	2.41%	0.12	0.38%	0.03	-0.95%	-0.08
2	-0.43%	-0.02	1.98%	0.11	0.55%	0.04	-0.40%	-0.03
3	-0.28%	-0.02	1.70%	0.13	-0.93%	-0.06	-1.34%	-0.09
4	-0.16%	-0.01	1.54%	0.10	-0.62%	-0.04	-1.96%	-0.13
5	0.02%	0.00	1.56%	0.09	0.71%	0.04	-1.24%	-0.08

4.1.5 Purchase of football coaches

These final segment sections now look at the transfers of coaches. First we will analyse the impact of the purchase of football coaches through 9 different events.

By looking at Table X, we can conclude that the results through AAR and CAAR are not significant since the t-value is inferior to the t-value retrieved from the significance level under the first time window (11 days).

Once again, and now increasing the time window to a 21 days one, the same results we keep obtaining are once again reached – rejection of the null hypothesis (H_0).

Table X – Results of the tests to AAR and CAAR for the purchase of football coaches for a 11 day window

Days	AAR	t-stat	CAAR	t-stat
-5	0.62%	0.29	0.62%	0.29
-4	0.79%	0.23	1.40%	0.40
-3	-0.33%	-0.13	1.07%	0.42
-2	0.84%	0.29	1.91%	0.66
-1	0.43%	0.15	2.34%	0.84
0	-0.38%	-0.16	1.96%	0.84
1	-1.15%	-0.43	0.80%	0.30
2	0.45%	0.18	1.25%	0.50
3	0.28%	0.09	1.53%	0.48
4	-2.22%	-0.89	-0.69%	-0.27
5	0.51%	-0.43	-1.20%	-1.01

Moving to the "Good news and Bad news" test, through Table XI, it is possible to see how theta is inferior to the value retrieved for the significance levels, leading us to, once again, reject the null hypothesis for both windows.

Table XI – Results of the tests to AAR and CAAR for the purchase of football coaches for a 11 day window – "Good and Bad News"

"Good news"					"Bad news"			
Days	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**
-5	0.95%	0.12	0.95%	0.12	0.45%	0.03	0.45%	0.03
-4	1.17%	0.10	2.12%	0.18	0.60%	0.03	1.04%	0.05
-3	0.00%	0.00	2.13%	0.96	-0.50%	-0.03	0.54%	0.03
-2	1.13%	0.07	3.25%	0.19	0.69%	0.04	1.24%	0.07
-1	2.22%	0.10	5.48%	0.25	-0.47%	-0.05	0.76%	0.08
0	1.53%	0.10	7.01%	0.45	-1.34%	-0.10	-0.57%	-0.04
1	-3.21%	-0.38	3.80%	0.45	-0.13%	-0.01	-0.70%	-0.04
2	1.07%	0.07	4.86%	0.33	0.14%	0.01	-0.55%	-0.03
3	0.50%	0.04	5.37%	0.39	0.16%	0.01	-0.39%	-0.02
4	-3.38%	-0.20	1.99%	0.12	-1.63%	-0.11	-2.03%	-0.13
5	0.32%	-0.04	1.66%	0.18	-0.61%	-0.05	-2.63%	-0.22

4.1.6 Sale of football coaches

This section addresses the sale of football coaches. The number of events considered here was 8. By looking at Table XII, the results come in line with what we have been observing so far – for the 5% significance level in both windows, the results are not significant.

Table XII – Results of the tests to AAR and CAAR for the sale of football coaches for a 11 day window

Days	AAR	t-stat	CAAR	t-stat
-5	0.95%	0.41	0.95%	0.41
-4	-1.27%	-0.49	-0.32%	-0.12
-3	-0.52%	-0.19	-0.85%	-0.30
-2	0.50%	0.20	-0.34%	-0.13
-1	-0.14%	-0.08	-0.48%	-0.29
0	1.86%	0.69	1.37%	0.51
1	-0.75%	-0.32	0.63%	0.27
2	-1.24%	-0.45	-0.61%	-0.22
3	1.80%	1.05	1.18%	0.69
4	-0.51%	-0.25	0.67%	0.33
5	0.47%	0.11	1.14%	0.26

The additional test of good and bad news yielded the same results as in previous sections – statistical insignificance of the results for 5% significance level in both time windows, like it is possible to observe in table XIII for the smaller window.

Table XIII – Results of the tests to AAR and CAAR for the sale of football coaches for a 11 day window – "Good and Bad News"

"Good news"	"Bad news"

Days	AAR	(θ_1)	CAAR	(θ_1)	AAR	(θ_1)	CAAR	(θ_1)
-5	1.21%	0.09	1.21%	0.09	0.52%	0.03	0.52%	0.03
-4	-0.31%	-0.02	0.90%	0.06	2.88%	-0.17	-2.37%	-0.14
-3	-1.72%	-0.11	-0.82%	-0.05	1.48%	0.09	-0.89%	-0.06
-2	1.62%	0.11	0.80%	0.05	-1.36%	-0.09	-2.25%	-0.15
-1	-0.14%	-0.01	0.66%	0.04	-0.14%	-0.02	-2.39%	-0.38
0	2.99%	0.18	3.65%	0.21	-0.04%	-0.02	-2.42%	-1.34
1	-0.10%	-0.01	3.55%	0.22	-1.82%	-0.15	-4.25%	-0.35
2	-1.55%	-0.10	2.00%	0.12	-0.72%	-0.04	-4.97%	-0.27
3	2.28%	0.16	4.29%	0.31	0.98%	0.10	-3.99%	-0.39
4	0.48%	0.04	4.77%	0.40	-2.16%	-0.16	-6.15%	-0.45
5	0.50%	0.02	5.26%	0.23	0.42%	0.02	-5.73%	-0.3

4.1.7 Purchase and sale of football players and coaches

In this final section, the aggregate of events is going to be analysed. All purchases and sales of both football players and football coaches, leading to a total of 69 observations. Looking at table XIV, we can see that for these segment, the AAR and CAAR are again non-significant for an 11 days' time window at a 5% significance level. Even when we widen the window for a 21 days' one, the same conclusions hold for this significance level.

Table XIV – Results of the tests to AAR and CAAR for the purchase and sale of football players and coaches for a 11 day window

Days	AAR	t-stat	CAAR	t-stat
-5	0.38%	0.17	0.38%	0.17
-4	-0.05%	-0.02	0.33%	0.13
-3	-0.42%	-0.14	-0.09%	-0.03
-2	0.31%	0.13	0.22%	0.10
-1	-0.01%	-0.01	0.20%	0.09
0	0.27%	0.11	0.48%	0.19
1	0.08%	0.02	0.56%	0.18
2	-0.16%	-0.06	0.39%	0.14
3	0.03%	0.01	0.42%	0.16
4	-0.69%	-0.25	-0.26%	-0.10
5	0.22%	0.07	-0.04%	-0.01

The additional test of good and bad news yielded the same results as in every previous section – statistical insignificance of the results for a 5% significance level in both time windows, as we can observe in Table XV below for the smaller window.

Table XV – Results of the tests to AAR and CAAR for the purchase and sale of football players and coaches for a 11 day window – "Good and Bad News"

"Good news"					"Bad news"			
Days	AAR	(θ_1)	CAAR	(θ_1)	AAR	(θ_1)	CAAR	(θ_1)
-5	0.89%	0.06	0.89%	0.06	-0.08%	-0.01	-0.08%	-0.01
-4	-0.54%	-0.04	0.35%	0.02	0.39%	0.02	0.31%	0.02
-3	-0.22%	-0.01	0.12%	0.01	-0.59%	-0.04	-0.28%	-0.02

-2	0.33%	0.02	0.45%	0.03	0.29%	0.02	0.01%	0.00
-1	0.23%	0.01	0.68%	0.04	-0.23%	-0.02	-0.23%	-0.02
0	1.89%	0.12	2.57%	0.16	-1.21%	-0.10	-1.44%	-0.12
1	-0.36%	-0.02	2.21%	0.11	0.48%	0.03	-0.96%	-0.06
2	-0.34%	-0.02	1.87%	0.11	0.00%	0.00	-0.96%	-0.06
3	0.30%	0.02	2.17%	0.15	-0.22%	-0.01	-1.18%	-0.07
4	-0.02%	0.00	2.15%	0.13	-1.30%	-0.08	-2.47%	-0.16
5	-0.16%	-0.01	1.99%	0.11	0.57%	0.04	-1.90%	-0.12

In conclusion, results show that investors do not react to the purchase and sale of football players and coaches' announcements with no evidence of any type of abnormal return on any of the days throughout the different event time window periods. This result may be related to the fact that the sentimental attachment of clubs' supporters leads football investors to act more in an emotional way which may affect market efficiency. (Bell et al., 2012). Therefore, even if the announcement represents a change in future revenues and profitability, football investors may want to keep their shares without being concerned with the financial profitability of their investment.

5. Conclusion

Transfers of football players and coaches in Portugal is one of the most debated topics given the historical relevance of the sport in the country. Whenever there is a significant transfer between two local clubs, it is a news covered by the media for days. And the tendency is for this to keep being a hot topic, especially in the summer and winter, where clubs are allowed to trade their players.

This paper studied the relationship between these transfers and their impact on how the investors perceived them - if the market was efficient. We began by collecting the disclosed transfers to the national regulator and then the share prices of Futebol Clube do Porto, Sport Lisboa e Benfica and Sporting Clube de Portugal, together with the prices of the Portuguese national index – the PSI20 – in order to perform an event-study. To test the significance of these events, we used a Cross-Sectional Test.

After having all the data, it was split into seven different categories to see if a more detailed breakdown would lead to potential curious conclusion. The data was therefore divided into a) Purchase and sale of players – all together from all three clubs, b) Purchase and sale of coaches – all together from all three clubs, c) Purchase of players– all together from all three

clubs, d) Sale of players – all together from all three clubs, e) Purchase of coaches – all together from all three clubs and f) Sale of coaches – all together from all three clubs and g) Purchase and sale of both players and coaches – all together from all three clubs.

For each one of these segments, we looked at an eleven days' time window, first testing both the AAR and the CAAR. After this, we performed an additional test, the "Good and Bad News" test, where the events were split into good and bad news according to the sign of the return in day zero – if positive, the event was considered a good news, and the other way around. Following this first analyses, we decided to increase the window to a twenty-one days' time window.

The results we have observed were not significant for any of the windows in all segments. Even the additional test followed the same conclusion. This can be explained by three reasons. First, because the stock market in Portugal is not very liquid. An OECD report about the delisting of companies from Portuguese stock market reveals that in the past decades, the number of listed companies decreased by around two-thirds, with most of them being voluntary exits. The second reason is that these transfers, most of the times, are not rational. Investors of football clubs in Portugal do not buy and sell shares hoping to make a profit. They do it because they are investor-fans and want to help their club, (Gandar, Lamb, Zuber and Yiu, 2005). The last one is, in Portugal, given the impact of the sport in the media, these transfers start to be talked about many days before they actually take place, and so, even if some of them do not end up happening, fans and investors get a feeling of what can actually happen with some player or coach.

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Appendix

Table I – Results of the tests to AAR and CAAR for the purchase and sale of football players for a 21 day window

Days	AAR	t-stat	CAAR	t-stat
-10	0.07%	0.04	0.07%	0.04
-9	0.05%	0.03	0.12%	0.07
-8	0.38%	0.12	0.50%	0.16
-7	0.13%	0.08	0.63%	0.40
-6	-0.68%	-0.31	-0.05%	-0.02
-5	0.19%	0.08	0.14%	0.06
-4	-0.07%	-0.03	0.07%	0.03
-3	-0.40%	-0.13	-0.34%	-0.11
-2	0.14%	0.06	-0.20%	-0.09
-1	-0.07%	-0.03	-0.27%	-0.12
0	0.15%	0.06	-0.12%	-0.05
1	0.40%	0.12	0.29%	0.09
2	-0.08%	-0.03	0.21%	0.08
3	-0.28%	-0.11	-0.07%	-0.03
4	-0.47%	-0.17	-0.54%	-0.19
5	0.31%	0.10	-0.23%	-0.08
6	-0.35%	-0.20	-0.58%	-0.33

7	-0.37%	-0.19	-0.95%	-0.48
8	0.18%	0.10	-0.77%	-0.41
9	-0.45%	-0.26	-1.22%	-0.70
10	0.28%	0.15	-0.94%	-0.50

Table II – Results of the tests to AAR and CAAR for the purchase and sale of football players for a 21 day window – "Good and Bad News"

"Good news"					**"Bad news"**			
Days	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**
-10	0.17%	0.01	0.17%	0.01	-0.02%	0.00	-0.02%	0.00
-9	0.04%	0.00	0.20%	0.02	0.06%	0.00	0.04%	0.00
-8	0.18%	0.01	0.38%	0.02	0.56%	0.03	0.60%	0.04
-7	0.27%	0.02	0.65%	0.05	0.01%	0.00	0.61%	0.05
-6	-0.88%	-0.05	-0.23%	-0.01	-0.49%	-0.04	0.12%	0.01
-5	0.79%	0.05	0.55%	0.03	-0.36%	-0.03	-0.24%	-0.02
-4	-0.79%	-0.06	-0.24%	-0.02	0.59%	0.04	0.35%	0.02
-3	0.04%	0.00	-0.20%	-0.01	-0.81%	-0.05	-0.46%	-0.03
-2	-0.02%	0.00	-0.22%	-0.02	0.28%	0.02	-0.19%	-0.01
-1	0.07%	0.00	-0.15%	-0.01	-0.19%	-0.02	-0.37%	-0.04
0	1.73%	0.11	1.58%	0.10	-1.31%	-0.11	-1.68%	-0.14

1	-0.04%	0.00	1.54%	0.07	0.81%	0.05	-0.87%	-0.06
2	-0.20%	-0.01	1.34%	0.08	0.03%	0.00	-0.84%	-0.05
3	-0.17%	-0.01	1.17%	0.08	-0.38%	-0.02	-1.22%	-0.07
4	0.29%	0.02	1.46%	0.09	-1.18%	-0.07	-2.40%	-0.15
5	-0.29%	-0.02	1.17%	0.06	0.87%	0.05	-1.53%	-0.09
6	-0.58%	-0.04	0.60%	0.04	-0.14%	-0.01	-1.68%	-0.14
7	-0.37%	-0.03	0.23%	0.02	-0.37%	-0.02	-2.05%	-0.13
8	0.31%	0.02	0.54%	0.04	0.06%	0.00	-1.98%	-0.14
9	-0.91%	-0.07	-0.37%	-0.03	-0.03%	0.00	-2.01%	-0.16
10	0.35%	0.03	-0.02%	0.00	0.21%	0.02	-1.80%	-0.13

Table III – Results of the tests to AAR and CAAR for the purchase and sale of football coaches for a 21 day window

Days	AAR	t-stat	CAAR	t-stat
-10	-1.27%	-0.39	-1.27%	-0.39
-9	0.97%	0.72	-0.31%	-0.23
-8	-0.56%	-0.28	-0.87%	-0.43
-7	1.03%	0.47	0.16%	0.07
-6	-0.46%	-0.21	-0.29%	-0.14
-5	0.79%	0.36	0.50%	0.23

-4	-0.22%	-0.07	0.28%	0.09
-3	-0.45%	-0.17	-0.17%	-0.06
-2	0.68%	0.26	0.51%	0.19
-1	-0.22%	0.10	0.73%	0.32
0	0.67%	0.25	1.40%	0.53
1	-0.95%	-0.39	0.46%	0.19
2	-0.37%	-0.13	0.09%	0.03
3	0.99%	0.38	1.08%	0.41
4	-1.39%	-0.58	-0.31%	-0.13
5	0.00%	0.00	-0.31%	-0.10
6	-0.88%	-0.35	-1.19%	-0.47
7	-0.22%	-0.13	-1.41%	-0.87
8	0.29%	0.07	-1.12%	-0.28
9	-0.17%	-0.04	-1.29%	-0.32
10	-0.33%	0.12	-1.62%	-0.57

Table IV – Results of the tests to AAR and CAAR for the purchase and sale of football coaches for a 21 day window – "Good and Bad News"

"Good news"	**"Bad news"**

Days	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**
-10	-1.95%	-0.13	-1.95%	-0.13	-0.51%	-0.03	-0.51%	-0.03
-9	1.35%	0.11	-0.60%	-0.05	0.54%	0.05	0.03%	0.00
-8	-0.29%	-0.03	-0.90%	-0.09	-0.87%	-0.05	-0.84%	-0.05
-7	1.15%	0.07	0.25%	0.02	0.90%	0.06	0.06%	0.00
-6	-0.32%	-0.02	-0.07%	0.00	-0.61%	-0.04	-0.55%	-0.04
-5	1.47%	0.11	1.40%	0.11	0.02%	0.00	-0.52%	-0.03
-4	-0.51%	-0.03	0.89%	0.05	0.12%	0.01	-0.41%	-0.02
-3	-0.55%	-0.03	0.34%	0.02	-0.33%	-0.02	-0.74%	-0.05
-2	0.84%	0.05	1.17%	0.07	0.51%	0.03	-0.23%	-0.01
-1	0.71%	0.04	1.88%	0.11	-0.33%	-0.04	-0.56%	-0.06
0	2.15%	0.13	4.03%	0.25	-0.99%	-0.08	-1.55%	-0.12
1	-1.14%	-0.07	2.89%	0.19	-0.73%	-0.05	-2.28%	-0.14
2	-1.10%	-0.06	1.79%	0.11	0.46%	0.03	-1.82%	-0.12
3	1.39%	0.10	3.19%	0.22	0.54%	0.03	-1.28%	-0.07
4	-0.89%	-0.06	2.29%	0.14	-1.95%	-0.13	-3.23%	-0.22
5	-0.12%	-0.01	2.17%	0.11	0.13%	0.01	-3.10%	-0.22
6	-0.41%	-0.03	1.76%	0.11	-1.42%	-0.09	-4.52%	-0.28
7	-0.99%	-0.08	0.77%	0.06	0.66%	0.06	-3.86%	-0.35
8	-1.68%	-0.10	-0.91%	-0.06	2.50%	0.12	-1.36%	-0.07
9	0.22%	0.02	-0.68%	-0.05	-0.61%	-0.03	-1.97%	-0.08
10	0.50%	0.03	-0.19%	-0.01	-1.26%	-0.07	-3.23%	-0.19

Table V – Results of the tests to AAR and CAAR for the purchase of football players for a 21 day window

Days	AAR	t-stat	CAAR	t-stat
-10	0.01%	0.01	0.01%	0.01
-9	0.34%	0.20	0.35%	0.20
-8	0.17%	0.06	0.51%	0.18
-7	-0.02%	-0.01	0.49%	0.33
-6	-0.75%	-0.36	-0.26%	-0.13
-5	0.30%	0.15	0.03%	0.02
-4	-0.16%	-0.07	-0.13%	-0.06
-3	0.09%	0.03	-0.04%	-0.01
-2	-0.10%	-0.05	-0.14%	-0.07
-1	-0.18%	-0.08	-0.33%	-0.14
0	0.47%	0.19	0.14%	0.06
1	0.45%	0.14	0.59%	0.18
2	0.07%	0.03	0.66%	0.24
3	-0.63%	-0.32	0.03%	0.02
4	-0.37%	-0.16	-0.34%	-0.15
5	0.35%	0.12	0.01%	0.00
6	0.01%	0.00	0.02%	0.01
7	-0.60%	-0.30	-0.58%	-0.29

8	0.21%	0.12	-0.37%	-0.22
9	-0.34%	-0.18	-0.71%	-0.37
10	0.03%	0.02	-0.67%	-0.35

Table VI – Results of the tests to AAR and CAAR for the purchase of football players for a 21 day window – "Good and Bad News"

"Good news"					**"Bad news"**			
Days	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**
-10	1.08%	0.08	1.08%	0.08	-0.31%	-0.02	-0.31%	-0.02
-9	-0.90%	-0.08	0.18%	0.02	-0.42%	-0.03	-0.73%	-0.05
-8	1.79%	0.08	1.97%	0.09	0.29%	0.02	-0.45%	-0.03
-7	0.65%	0.05	2.63%	0.19	0.37%	0.03	-0.07%	-0.01
-6	-1.12%	-0.06	1.50%	0.08	-0.14%	-0.01	-0.21%	-0.02
-5	1.56%	0.08	3.06%	0.15	-1.02%	-0.08	-1.23%	-0.09
-4	-0.54%	-0.04	2.52%	0.20	0.52%	0.03	-0.71%	-0.04
-3	-1.87%	-0.11	0.65%	0.04	-1.28%	-0.09	-1.99%	-0.14
-2	0.01%	0.00	0.66%	0.06	1.08%	0.07	-0.92%	-0.06
-1	0.69%	0.04	1.35%	0.09	-0.10%	-0.01	-1.01%	-0.11
0	1.55%	0.11	2.90%	0.21	-1.83%	-0.13	-2.85%	-0.20

1	-1.76%	-0.09	1.14%	0.06	1.53%	0.09	-1.31%	-0.07
2	0.27%	0.03	1.41%	0.17	-0.82%	-0.04	-2.13%	-0.11
3	0.40%	0.03	1.81%	0.12	0.56%	0.03	-1.57%	-0.08
4	1.66%	0.08	3.48%	0.17	-2.13%	-0.12	-3.70%	-0.21
5	-1.16%	-0.05	2.32%	0.11	1.05%	0.07	-2.65%	-0.17
6	-2.16%	-0.13	0.15%	0.01	-0.55%	-0.05	-3.20%	-0.26
7	-0.07%	-0.02	0.08%	0.02	0.27%	0.02	-2.93%	-0.19
8	1.07%	0.06	1.15%	0.07	-0.44%	-0.03	-3.37%	-0.24
9	-1.20%	-0.10	-0.05%	0.00	-0.42%	-0.04	-3.78%	-0.34
10	0.65%	0.05	0.60%	0.05	0.94%	0.07	-2.85%	-0.22

Table VII – Results of the tests to AAR and CAAR for the sale of football players for a 21 day window

Days	AAR	t-stat	CAAR	t-stat
-10	0.01%	0.01	0.01%	0.01
-9	0.34%	0.20	0.35%	0.20
-8	0.17%	0.06	0.51%	0.18
-7	-0.02%	-0.01	0.49%	0.33
-6	-0.75%	-0.36	-0.26%	-0.13
-5	0.30%	0.15	0.03%	0.02

-4	-0.16%	-0.07	-0.13%	-0.06
-3	0.09%	0.03	-0.04%	-0.01
-2	-0.10%	-0.05	-0.14%	-0.07
-1	-0.18%	-0.08	-0.33%	-0.14
0	0.47%	0.19	0.14%	0.06
1	0.45%	0.14	0.59%	0.18
2	0.07%	0.03	0.66%	0.24
3	-0.63%	-0.32	0.03%	0.02
4	-0.37%	-0.16	-0.34%	-0.15
5	0.35%	0.12	0.01%	0.00
6	0.01%	0.00	0.02%	0.01
7	-0.60%	-0.30	-0.58%	-0.29
8	0.21%	0.12	-0.37%	-0.22
9	-0.34%	-0.18	-0.71%	-0.37
10	0.03%	0.02	-0.67%	-0.35

Table VIII – Results of the tests to AAR and CAAR for the sale of football players for a 21 day window – "Good and Bad News"

"Good news"	**"Bad news"**

Days	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**
-10	-0.12%	-0.01	-0.12%	-0.01	0.15%	0.01	0.15%	0.01
-9	0.33%	0.03	0.21%	0.02	0.34%	0.02	0.49%	0.03
-8	-0.33%	-0.02	-0.12%	-0.01	0.72%	0.05	1.22%	0.08
-7	0.14%	0.01	0.02%	0.00	-0.20%	-0.02	1.01%	0.08
-6	-0.81%	-0.05	-0.78%	-0.05	-0.69%	-0.06	0.32%	0.03
-5	0.54%	0.04	-0.24%	-0.02	0.02%	0.00	0.34%	0.03
-4	-0.87%	-0.06	-1.11%	-0.08	0.63%	0.04	0.97%	0.06
-3	0.64%	0.03	-0.47%	-0.03	-0.53%	-0.03	0.44%	0.03
-2	-0.03%	0.00	-0.49%	-0.04	-0.19%	-0.01	0.25%	0.02
-1	-0.13%	-0.01	-0.62%	-0.04	-0.24%	-0.02	0.00%	0.00
0	1.78%	0.11	1.16%	0.07	-1.00%	-0.09	-1.00%	-0.09
1	0.51%	0.02	1.67%	0.08	0.38%	0.03	-0.61%	-0.05
2	-0.34%	-0.02	1.32%	0.07	0.53%	0.04	-0.08%	-0.01
3	-0.36%	-0.03	0.97%	0.07	-0.93%	-0.06	-1.01%	-0.07
4	-0.14%	-0.01	0.83%	0.05	-0.62%	-0.04	-1.64%	-0.11
5	-0.02%	0.00	0.81%	0.05	0.76%	0.04	-0.88%	-0.05
6	-0.07%	-0.01	0.73%	0.06	0.10%	0.01	-0.78%	-0.07
7	-0.46%	-0.04	0.27%	0.02	-0.75%	-0.05	-1.53%	-0.10
8	0.07%	0.01	0.34%	0.03	0.36%	0.03	-1.17%	-0.08
9	-0.81%	-0.06	-0.47%	-0.03	0.20%	0.01	-0.97%	-0.07
10	0.25%	0.02	-0.22%	-0.02	-0.21%	-0.01	-1.18%	-0.08

Table IX – Results of the tests to AAR and CAAR for the purchase of football coaches for a 21 day window

Days	AAR	t-stat	CAAR	t-stat
-10	-1.07%	-0.26	-1.07%	-0.26
-9	0.70%	0.73	-0.36%	-0.38
-8	-0.79%	-0.30	-1.16%	-0.44
-7	1.27%	0.66	0.12%	0.06
-6	-0.86%	-0.46	-0.75%	-0.40
-5	0.64%	0.29	-0.11%	-0.05
-4	0.81%	0.23	0.70%	0.20
-3	-0.31%	-0.12	0.39%	0.15
-2	0.84%	0.29	1.23%	0.42
-1	0.42%	0.15	1.65%	0.60
0	-0.36%	-0.16	1.29%	0.56
1	-1.13%	-0.42	0.16%	0.06
2	0.50%	0.21	0.66%	0.27
3	0.30%	0.10	0.96%	0.31
4	-2.22%	-0.88	-1.25%	-0.50
5	-0.46%	-0.43	1.71%	-1.61
6	-0.59%	-0.22	-2.31%	-0.87
7	-0.08%	-0.04	-2.38%	-1.18

8	0.72%	0.22	-1.66%	-0.51
9	0.46%	0.09	-1.20%	-0.24
10	-1.09%	-0.33	-2.30%	-0.68

Table X – Results of the tests to AAR and CAAR for the purchase of football coaches for a 21 day window – "Good and Bad News"

"Good news"					"Bad news"			
Days	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**
-10	-2.43%	-0.13	-2.43%	-0.13	-0.38%	-0.02	-0.38%	-0.02
-9	0.68%	0.09	-1.76%	-0.22	0.71%	0.07	0.33%	0.03
-8	0.16%	0.04	-1.59%	-0.37	-1.27%	-0.07	-0.94%	-0.05
-7	1.25%	0.09	-0.35%	-0.03	1.28%	0.09	0.35%	0.02
-6	-0.84%	-0.10	-1.19%	-0.13	-0.87%	-0.06	-0.53%	-0.03
-5	0.93%	0.12	-0.26%	-0.03	0.50%	0.03	-0.03%	0.00
-4	1.16%	0.10	0.90%	0.07	0.63%	0.03	0.60%	0.03
-3	-0.02%	-0.01	0.88%	0.54	-0.46%	-0.03	0.15%	0.01
-2	1.12%	0.07	2.00%	0.12	0.70%	0.04	0.85%	0.05
-1	2.19%	0.10	4.20%	0.19	-0.47%	-0.05	0.38%	0.04
0	1.51%	0.10	5.70%	0.36	-1.30%	-0.10	-0.92%	-0.07
1	-3.24%	-0.39	2.47%	0.30	-0.07%	0.00	-0.99%	-0.06
2	1.05%	0.07	3.51%	0.24	0.23%	0.01	-0.76%	-0.05
3	0.50%	0.04	4.01%	0.29	0.20%	0.01	-0.56%	-0.03
4	-3.40%	-0.20	0.61%	0.04	-1.62%	-0.11	-2.18%	-0.14
5	-0.36%	-0.04	0.25%	0.03	-0.51%	-0.05	-2.70%	-0.24
6	0.76%	0.06	1.01%	0.08	-1.27%	-0.07	-3.97%	-0.23
7	-1.99%	-0.15	-0.98%	-0.07	0.88%	0.08	-3.08%	-0.26
8	-0.10%	-0.01	-1.08%	-0.13	1.13%	0.06	-1.95%	-0.10
9	0.60%	0.03	-0.48%	-0.03	0.39%	0.02	-1.57%	-0.06
10	-0.16%	-0.01	-0.64%	-0.03	-1.56%	-0.08	-3.13%	-0.17

Table XI – Results of the tests to AAR and CAAR for the sale of football coaches for a 21 day window

Days	AAR	t-stat	CAAR	t-stat
-10	-1.50%	-0.69	-1.50%	-0.69
-9	1.26%	0.75	-0.24%	-0.14
-8	-0.31%	-0.27	-0.55%	-0.48
-7	0.76%	0.30	0.22%	0.08
-6	0.00%	0.00	0.21%	0.09
-5	0.96%	0.41	1.18%	0.50
-4	-1.37%	-0.55	-0.19%	-0.08
-3	-0.61%	-0.21	0.80%	-0.27
-2	0.50%	0.20	-0.30%	-0.12
-1	-0.01%	0.00	-0.31%	-0.18
0	1.84%	0.70	1.53%	0.58
1	-0.74%	-0.33	0.79%	0.35
2	-1.34%	-0.47	-0.55%	-0.19
3	1.77%	-1.00	1.22%	0.69
4	-0.46%	-0.23	0.76%	0.38
5	0.52%	0.12	1.27%	0.30
6	-1.21%	-0.47	0.06%	0.02

7	-0.37%	-0.34	-0.31%	-0.28
8	-0.20%	-0.04	-0.51%	-0.10
9	-0.88%	-0.28	-1.39%	-0.45
10	0.53%	0.27	-0.86%	-0.44

Table XII – Results of the tests to AAR and CAAR for the sale of football coaches for a 21 day window – "Good and Bad News"

	"Good news"				"Bad news"			
Days	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**
-10	-1.71%	-0.12	-1.71%	-0.12	-0.88%	-0.05	-0.88%	-0.05
-9	1.68%	0.13	-0.03%	0.00	0.00%	0.00	-0.88%	-0.38
-8	-0.52%	-0.05	-0.55%	-0.05	0.33%	0.05	-0.55%	-0.08
-7	1.10%	0.07	0.55%	0.03	-0.24%	-0.02	-0.79%	-0.05
-6	-0.06%	0.00	0.49%	0.03	0.17%	0.05	-0.61%	-0.16
-5	1.74%	0.12	2.23%	0.16	-1.39%	-0.10	-2.00%	-0.14
-4	-1.35%	-0.08	0.89%	0.05	-1.44%	-0.10	-3.44%	-0.24
-3	-0.82%	-0.04	0.07%	0.00	0.04%	0.01	-3.40%	-0.98
-2	0.69%	0.04	0.76%	0.04	-0.06%	-0.01	-3.47%	-0.57
-1	-0.04%	0.00	0.72%	0.05	0.07%	0.02	-3.39%	-0.81
0	2.47%	0.15	3.19%	0.19	-0.06%	-0.05	-3.46%	-2.45
1	-0.09%	-0.01	3.10%	0.21	-2.70%	-0.55	-6.15%	-1.26
2	-2.17%	-0.13	0.93%	0.06	1.13%	0.08	-5.02%	-0.37
3	1.84%	0.13	2.77%	0.19	1.56%	0.27	-3.46%	0.60
4	0.36%	0.03	3.14%	0.28	-2.92%	-0.21	-6.38%	-0.46
5	-0.01%	0.00	3.13%	0.14	2.08%	0.12	-4.30%	-0.24
6	-0.99%	-0.06	2.14%	0.13	-1.86%	-0.12	-6.16%	-0.39
7	-0.49%	-0.04	1.65%	0.15	-0.03%	-0.02	-6.18%	-4.69
8	-2.47%	-0.15	-0.82%	-0.05	6.58%	0.36	0.40%	0.02
9	0.03%	0.00	-0.79%	-0.10	-3.60%	-0.14	-3.20%	-0.12
10	0.82%	0.06	0.04%	0.00	0.34%	-0.05	-3.54%	-0.52

Table XIII – Results of the tests to AAR and CAAR for the purchase and sale of football players and coaches for a 21 day window

Days	AAR	t-stat	CAAR	t-stat
-10	-0.23%	-0.10	-0.23%	-0.10
-9	0.29%	0.17	0.06%	0.04
-8	0.14%	0.05	0.20%	0.07
-7	0.34%	0.19	0.54%	0.31
-6	-0.64%	-0.29	-0.10%	-0.05
-5	0.37%	0.16	0.27%	0.12
-4	-0.06%	-0.02	0.21%	0.09
-3	-0.42%	-0.14	-0.21%	-0.07
-2	0.30%	0.13	0.09%	0.04
-1	0.00%	0.00	0.09%	0.04
0	0.27%	0.11	0.36%	0.14
1	0.08%	0.03	0.44%	0.14
2	-0.15%	-0.05	0.30%	0.11
3	0.01%	0.00	0.31%	0.12
4	-0.67%	-0.24	-0.36%	-0.13
5	0.23%	0.08	-0.13%	-0.04
6	-0.48%	-0.24	-0.61%	-0.30

7	-0.33%	-0.17	-0.94%	-0.50
8	0.08%	0.03	-0.86%	-0.37
9	-0.21%	-0.09	-1.07%	-0.45
10	0.14%	0.06	-0.93%	-0.43

Table XIV – Results of the tests to AAR and CAAR for the purchase and sale of football players and coaches for a 21 day window – "Good and Bad News"

"Good news"					"Bad news"			
Days	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**	**AAR**	**(θ_1)**	**CAAR**	**(θ_1)**
-10	-0.39%	-0.03	-0.39%	-0.03	-0.07%	0.00	-0.07%	0.00
-9	0.38%	0.03	-0.01%	0.00	0.18%	0.01	0.11%	0.01
-8	0.05%	0.00	0.04%	0.00	0.22%	0.01	0.33%	0.02
-7	0.50%	0.04	0.54%	0.04	0.02%	0.00	0.36%	0.03
-6	-0.73%	-0.04	-0.19%	-0.01	-0.42%	-0.04	-0.06%	-0.01
-5	0.97%	0.06	0.78%	0.05	-0.34%	-0.03	-0.40%	-0.03
-4	-0.71%	-0.05	0.06%	0.00	0.76%	0.05	0.36%	0.02
-3	-0.12%	-0.01	-0.06%	0.00	-0.86%	-0.05	-0.50%	-0.03
-2	0.21%	0.02	0.15%	0.01	0.52%	0.03	0.02%	0.00
-1	0.24%	0.01	0.39%	0.02	-0.22%	-0.02	-0.21%	-0.02
0	1.84%	0.12	2.23%	0.14	-1.29%	-0.10	-1.49%	-0.12
1	-0.33%	-0.02	1.90%	0.10	0.49%	0.03	-1.00%	-0.07
2	-0.43%	-0.03	1.46%	0.09	0.27%	0.02	-0.73%	-0.05
3	0.24%	0.02	1.70%	0.12	-0.22%	-0.01	-0.95%	-0.05
4	-0.02%	0.00	1.68%	0.10	-1.32%	-0.08	-2.27%	-0.14
5	-0.25%	-0.01	1.44%	0.08	0.80%	0.05	-1.47%	-0.09
6	-0.53%	-0.04	0.90%	0.06	-0.46%	-0.03	-1.93%	-0.14
7	-0.53%	-0.05	0.37%	0.03	-0.13%	-0.01	-2.06%	-0.13
8	-0.22%	-0.01	0.15%	0.01	0.34%	0.02	-1.72%	-0.11
9	-0.61%	-0.05	-0.45%	-0.03	0.19%	0.01	-1.53%	-0.09
10	0.39%	0.03	-0.07%	0.00	-0.12%	-0.01	-1.65%	-0.11