

FOOTBALL PLAYER ACQUISITIONS

A STUDY OF THE TOP FOUR PUBLICLY LISTED FOOTBALL
CLUBS

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Football Player Acquisitions – A Study of the Top Four Publicly Listed Football Clubs

Abstract:

The previous decade has experienced a large increase in football player transfer fees, more than quadrupling for the top five European Leagues. In light of this development, our thesis examines the effect on share prices of the top four publicly listed football clubs, following the announcement of a new player purchase during the period of 2009-2019. In line with the selected top clubs' strong brands and high investor expectations, we hypothesise that in contrast to previous findings, the abnormal returns ought to be positive when solely investigating top ranked clubs. By conducting an event study on 174 player purchases, we find empirical support for positive abnormal returns five days post an announcement. Complemented by a Spearman's rank correlation test, we present strong empirical support of a positive interrelatedness between transfer fee expenditures and commercial revenues. Overall, the results indicate different outcomes when solely examining more equal clubs compared to addressing a larger sample as in previous literature.

Keywords: Football and Transfers, Player Purchases, Abnormal Returns, Market Behaviour, Brand Equity, Revenues, Event Study

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1. Introduction

In the year of 2019, FC Barcelona reached €840.8 million in total revenue with €383.5 million derived from commercial operations, e.g. shirt sales, positioning them at the number one position of highest revenue amongst European football (soccer) clubs. (Deloitte, 2020) In the year of 2009, Real Madrid FC reached €401.4 million in total revenue, with €139.2 million derived from commercial operations, gaining them the number one position of highest European football club earners. (Deloitte, 2010) Simply put, the last decade has exhibited an enormous increase in especially top football clubs' revenues, which can be seen in the above presented numbers but also the increase in football player transfer expenditures for the top five European leagues; a number which has grown more than four times from €1.5 billion in 2009 to €6.6 billion in 2019. (Poli et al. 2019) A development that indicates commercialization of the football industry and highlights the importance of football clubs to maintain a substantial financial performance to stay competitive, e.g. acquiring new top players and increasing revenue. Circumstances that have contributed to top ranked clubs' exploration of new fan bases overseas, to expand a lucrative cash-cow business. (Bernstein, J., 2017) For example, the Spanish Super Cup flew over four Spanish football clubs to play the semi-finals and finals in Saudi Arabia. Also, most top European clubs perform their pre-season training campaigns in either Asia or North America, which is a new set of marketing strategies that were scarce dating only ten years back. (BBC Sport, 2020; White J, 2019; Bodet and Chavanet, 2010)

Historically, football has mostly been about the achievements in the field with little focus on the financial aspect. However, in 1998, Szymanski provided empirical support addressing the correlation between league performance and increased revenues, as well as between increased wage expenditure and better league performance. A relationship between two factors that has inarguably only increased since 1998. (Deloitte, 2000-2020) As football is the most followed sport in the world (Total Sportek, 2020) and being an industry in the remaking, financial effects on football clubs have been analysed in several studies. Regarding publicly listed football clubs, the primary focus has been on how matchday results have affected a club's share price. The results have been very similar, especially with a short-term positive effect on a win and a negative effect given a loss with high stakes such as championship knockout games. (Stadtman, 2006; Sarac & Zeren, 2013)

To the best of our knowledge, research investigating the interconnectedness between player purchases and effect on the respective clubs' share price has been scarce. However, Fotaki et al. (2007) did, among other things, address the announcement effect on player transfers, but did so on all 15 UK listed football clubs, between 1997 and 2004. That being stated, we believe that the issue with investigating a broad spread of football clubs is the imbalance of marketability possibilities and financial strength between a large club like Manchester United FC and a smaller club like Leeds United. (The European Business Review, 2019) Investor expectations may also differ between perceiving a new player purchase as feasible when transferred to a top club compared to being transferred to a smaller club with more limited earn-back opportunities, something previous research has not particularly addressed.

Within this research gap, our thesis aims to provide additional explanatory components by conducting an event study that will investigate how the market reacts to the selected clubs' transfer investments, by researching how the clubs' respective abnormal returns evolve following the announcement of a new player. The findings will also be compared to the data published by Fotaki et al. (2007), where we hypothesize that by solely analysing the top ranked clubs, instead of all publicly listed clubs, will provide a result of more positive abnormal returns. In addition, our study will also conduct a correlation analysis, in order to address at what extent the previous decade's development of transfer fees has been correlated to the development of different revenue streams as well as examining if the ROE (return on equity) ratio for the respective clubs is correlated to the yearly share price return. These results will, furthermore, contribute to a more profound understanding regarding what role the brand strength of the respective clubs have played, when trying to balance the increase of fee expenditures and revenues. Ultimately, the following research question will be investigated:

How does the stock market react to top ranked football clubs' acquisitions of professional football players?

We will analyse the research area of interest by addressing two clear perspectives. The first perspective concerns *accounting*, where the event study will be able to provide empirical results on how the market has reacted regarding the enormous increase of transfer fees in the top four listed clubs, between 2009-2019. The results will be compared to some of the findings of Fotaki et al. (2007) to conclude if our narrow approach contributes to different results. The second perspective of this study addresses the *marketability* of a new player purchase. Putranto (2019)

illustrated that market reactions are not always the result of financial factors; instead, non-financial factors, e.g. brand equity, may play an even more significant role when influencing investor expectations and behaviour. Our analysis, by selecting a smaller sample in which we only include the top four publicly listed football clubs, may result in the possibility of finding explanatory indications whether the selected clubs' revenues have experienced a similar growth as transfer expenditures.

Concludingly, this study finds significant empirical support for the primary hypothesis (H1) to be partially accepted, as five days following an announcement indicates positive abnormal returns of $\sim 0.28\%$. We also find empirical support that offensive players provide more positive cumulative abnormal returns compared to defensive players. Moreover, the correlation tests find that the previous decade's development of transfer fee expenditures is positively correlated with foremost commercial revenues, indicating that the marketability operations conducted by the top clubs have been successful.

1.1. Contribution

The primary purpose of this study is to contribute with additional explanatory material to the research area regarding publicly listed football clubs' interconnectedness between sports activities and share price development. Firstly, we will conduct the research with more recent data than what has been used in previous literature, stretching between 2009-2019. As previously discussed, a time frame of great interest given the unprecedented development of transfer fees. Moreover, by examining this period, we aim to provide an additional understanding of how the market has reacted to this development, both regarding investor- and supporter behaviour. Secondly, previous research in the related area has, to the best of our knowledge, mainly focused on examining a broad sample (≥ 10) of football clubs (i.e. Renneboog & Vandabrant, 2000; Zuber et al., 2005; Fotaki et al., 2007). Ultimately, in a fast-paced evolving industry, we believe that it is essential to stay updated on investor behaviour and company performance in order to provide a better understanding of how sustainable and effective the development has been.

1.2. Delimitation

A couple of delimitations have been made to contribute with as relevant and precise results as possible, regarding our main research question. Firstly, regarding player transfer types, we limit

this study to only address player *purchases*, since we aim to research the market effect following a club investment. Secondly, the study will focus on the top four European football clubs publicly listed on a stock exchange: 1: Manchester United FC (Man Utd), 2: Juventus FC, 3: Borussia Dortmund (BVB), and 4: AS Roma. Thirdly, a delimitation has been made to solely select the top five transfers per club and season in regard to the absolute value of the transfer fee, covering the period of 2009-2019. A delimitation that will contribute with updated results, but also ensure that the transfers investigated are of a significant fee. As the data was collected, we found that more than five player purchases per season seldom occur in the top four clubs, although when they did, they tended to be of an insignificant fee and would, therefore, experience modest media coverage and hence, low investor activity. (Nofsinger, 2001; transfermarkt.com, 2020) Fourthly, the event study will cover a short-term perspective to reduce the potential influence of the clustering-effect and the amount of noise being incorporated. A critical delimitation since football clubs only acquire players during two periods a year, for a total of three months, which brings forth the problem of player signings occurring in a somewhat narrow time frame. In addition, rumours surrounding football player transfers are common and can be impactful (Caled & Silva, 2018). Therefore, the event windows of (1;-1), (3;-3), and (5;-5) will be used.

1.3. Definitions

Definitions of important phrases and words will be addressed throughout the different sections. However, two main expressions are very frequently used. **Top four/top ranked football clubs:** Definition based on data of the clubs' yearly revenue performance, provided by Deloitte's annual industry analysis, *The Deloitte Football Money League*. **Football:** A sport, which in some parts of the world is referred to as 'soccer'.

1.4. Disposition

This study is categorized into eight sections. In section two, relevant theories and previous literature of the research area of interest will be presented. Section three will provide the hypotheses based on the findings and discussions addressed in section two. Section four explains the methodology of choice, while section five will present our data being used in more depth. Section six will present the empirical findings based on the quantitatively assessed data. Furthermore, section seven will provide a conclusion followed by section eight in which suggestions for future research will be discussed.

2. Theoretical Framework and Literature Review

The following section will present an overview of previous theories and literature on the research area of interest. At first, to understand the economic effects of player purchases related to abnormal returns, the theory of *efficient markets* will be addressed. Followed by a section of *public information*, to grasp in what way the news of a new player signing may be interpreted from different investor perspectives. In the *literature* section, several studies regarding sports clubs and derived activities with effects on the share price will be presented, with the aim to provide an understanding of what has already been done, and what more can be done, in the relevant area of research. The literature section will also provide an overview of related definitions and activities to provide a basic understanding of how football transfers and related activities work.

2.1. Theoretical Framework

2.1.1. Efficient Markets

According to Eugene Fama (1970), an efficient market may be viewed as a market where the share prices are in direct correlation with all available information. The efficient market hypothesis also states that releasing new information to the market is the only time effects on share prices will occur. The level of *market efficiency* may be separated into three different brackets as per table 1. (Fama, 1970)

Table 1. Description of types of efficient markets

Weak form efficiency	The share price only reflects the information of an historical character. Nothing should be overvalued, and there are no opportunities for arbitrage earnings.
Semi-strong efficiency	Indicates that all publicly available information is used to evaluate a stock, both concerning the historical and newly provided information.
Strong-form efficiency	All available information, may it be public or private (e.g. insider trading), is considered in the evaluation of the stock.

In 1991, Fama returned to his research on the efficient market hypothesis and provided a more thorough description of the hypothesis. The *weak form* was renamed *Tests for return predictability*, as the factors of dividends and interests were incorporated into the share price. With semi-strong forms, he renamed it *event studies*, which is used to investigate the effect on a share price following an event. The strong *form* was renamed the *test for private information*. (Fama,

1991) In line with the assumption of Frenkel (1981), that all public information is considered in the share price expectation, we can expect an adjustment of the football clubs' share prices following the publication of new information that was not previously accounted for. (Andersson et al., 2008) Hence, a situation where the prices are semi-strong efficient. Moreover, regarding the football transfer market, rumours before an announcement of a new player ought to have a significant impact on the adjustment of the share price expectation. As this study solely investigates the effect on a short-term perspective, relevant share price fluctuations prior to the event window of (-5) may already have adjusted for the, potentially, not so unexpected announcement at (0).

2.1.2. Criticism of The Efficient Markets

Given, for example, the digitalization of the stock market and streams of information availability (Shukla, A. & Nerlekar, S. 2019), Fama's argument that traders can never win over the market has been proven incorrect many times, since the theory clearly states that the market price will always reflect the actual market value. Furthermore, Burton G. M., (2003) argued for a couple of different schools of thought, which questions the arguments proposed by Fama. One is *momentum investing*, an analysis that argues for specific price patterns to withstand time. The second school of thought is *behavioural finance*, which argues that the rational behaviour of investors is affected by psychology. For example, Shiller (1981) found indications that investors were not always acting rationally due to obvious and unexpected fluctuations in the share prices, something that the efficient market hypothesis does not take into consideration.

Furthermore, to account for Fama's theory and complementing critical findings, this study will adjust the event windows to look at the days leading up to the announcement, to attribute for potential price adjustments before the announcement. In addition, as Nofsinger (2001) argued, private investors react slower in evaluating news affecting the share price compared to institutional investors that react immediately. Hence, by also investigating the days following an announcement will allow for the incorporation of slow investor response, which will be further discussed in section 2.1.3.

2.1.3. Public Information

When conducting the event study, assuming Fama's theory of semi-strong form within the transfer market of the top-listed clubs, it is also important to reconcile in what way the news of an

announcement may affect the actions of the investors. Nofsinger (2001) addressed this question and argued for three different news characteristics where private and institutional investors act differently.

- *Good news*: when officially announced to the market, the share price will rise, where institutions will act quickly to buy shares. Private investors will also buy but act significantly slower compared to institutional investors.
- *Neutral news*: will not affect the share price as both institutional and private investors will act neutral
- *Bad news*: when released to the market, institutions will act quickly and sell while private investors will act slower but eventually also sell. The share price will fall due to the sell-off.

By implementing three different event windows, that will be further discussed in the methodology section, we will be able to account for both the faster institutional investors and the slower acting private investors, as we investigate the effect on the share price. Also, this study will be able to examine whether specific transfer characteristics may differ as either good, bad, or neutral news depending on what club sample it concerns. For example, concerning the top four ranked clubs compared to the sample of 15 clubs by Fotaki et al. (2007). This will also contribute to a deeper understanding regarding if the brand strength of the top clubs will contribute to different investor behaviour compared to a broader sample of clubs, when presented with the same characteristics of news.

2.2. Literature Review

2.2.1. Football and Market Performance

A limited number of sports clubs are currently listed on a stock exchange, for example, amongst 28 countries in the European Union, there are 36 active professional football leagues with approximately 950 professional football clubs. (European Leagues, 2020) Out of these, there are only 23 clubs publicly listed on a stock exchange. (STOXX Index, 2020) As can be concluded, only a small percentage of all clubs are publicly listed, and research on the interconnectedness between sporting events and the share price has, to our knowledge, been relatively scarce over the years. An overall description of previous and relevant studies on the correlation between sporting events and share price effects is presented in table 2.

Table 2. Description of previous studies investigating football actives and stock price effect

Renneboog and Vanbrabant (2000)	Conducted an event study to investigate how the performance of all the UK listed football clubs affected their respective share price. They concluded that winning matches affects the share price positively and vice versa following a draw or loss.
Sarac and Zeren (2013)	This study investigated three listed Turkish football clubs and how gameday performance affected their respective share price during the time period 2005-2012. They found empirical support of a correlation between the two factors, which was positive following a win and negative following a loss.
Stadtman (2006)	Studied Borussia Dortmund and the relationship between match performance and the effect on the share price. He also found a correlation between the two factors and concluded that the expectations of the supporters played a large role in explaining the derived effect on the share price.
Brown and Hartzell (2001)	Investigated the relationship between the basketball team Boston Celtics' performance in the league with the effects on the share price. The study found empirical support that the team's performance did correlate with the share price effect.
Zuber et al. (2005)	Analysed the stock behaviour of ten UK listed football clubs during the time period of 1997-2000. In contrary to the above-mentioned studies, did not find any correlation between the effect on abnormal returns and the performance in a game.
Fotaki et al. (2007)	The study researched, among other things, what effect player transfers had on the share price of 15 UK listed football clubs during the time frame of 1997-2004. The study found significant negative abnormal returns on the fourth day (-0.23%) and significant positive results (+0.17%) on the twelfth day following the announcement of a new player purchase. Overall, except day four, the study found indications of a generally modest positive trend following the announcements. However, those results were not statistically significant.

As can be interpreted from table 2, previous research addressing football clubs and share price effects have been conducted with the aim to find a correlation between matchday performance and what effect the results may have on the share price of the club. Zuber et al. (2005) found results contradicting the findings of Renneboog and Vanbrabant (2000), Sarac and Zeren (2013), Stadtmann (2006), and Brown and Hartzell (2001), which may be due to all the studies investigating a different sample of clubs and time periods. Besides, most studies investigated clubs derived from the same league, which incorporates both the top performing clubs as well as the low performing clubs, concerning both financial- and sports results. They did not take into account that the marketability of a top club like Manchester United FC may have a significant impact on investor expectations and behaviour. For example, if a newly signed player is perceived as overpriced or that a loss in a perceived 'easy-win' game for a top club, may affect investor behaviour differently compared to a smaller club. Moreover, we believe that the greater the brand strength of the club, the more probable it is that expectations will be more significantly impacting the share price development following a new event, which Stadtmann (2006) concluded, played a significant role in the effect on the share price.

Furthermore, as described in table 2, Fotaki et al. (2007) investigated 15 clubs publicly listed in the United Kingdom. As previously discussed, the difference between brand strength and investor expectations between a top club and a smaller club ought to induce dissimilarities in market behaviour. Nofsinger (2001) also found empirical support for the fact that news receiving greater media coverage will result in higher trading activity in the stock. Meaning that our delimitation of only investigating the top ranked clubs, which are generally given more extensive media coverage concerning football activities (Manoli, E., 2016), e.g. transfers, will ensure enough trading activity across the entire sample to create a sufficient effect on the share price. Taking the aforementioned factors into consideration, we argue that comparing a smaller sample of football clubs with a more equal resemblance in market value and sporting results, as presented in table 3, will provide a more precise understanding of how investors act following the transfer of a player to a top ranked football club.

Table 3. Club Characteristics

Table presents the teams' market value (MV) as of 2019-12-31 - comprised by total player value, and league-position. It also shows how many times the teams have finished as top five in the domestic league (DL) and played in European competitions (EU), between the seasons 2009/2010-2018/2019.

	MV (EURm)	DL	EU
Man Utd	646	7	9
BVB	614	8	9
Juventus	586	9	9
Roma	354	7	7

Source: transfermarkt.de, 2020

2.2.2. Investor Expectations

Investor expectations regarding football performance may differ from expectations concerning non-sports industries, especially concerning emotional fans investing in football clubs.

“Football fans are often regarded to act irrationally and one can not rule out that football fans also engage in stock market trading” (Andersson et al., 2008, p.394)

Edmans et al. (2007) investigated the effect on the stock market following different football game results and concluded that investing football fans were acting emotionally and, furthermore, argued that sports sentiment will affect the mood of some investors. Hence, not being able to rule out that football fans will also invest in their football clubs (Andersson et al. 2008), chances are that some investors will act irrationally following the announcement of a transfer that should be perceived as “bad news” as per the definition of Nofsinger (2001). Besides football fans investing in their beloved clubs, the shareholder structures for the four clubs also concern institutions holding significant stakes, and following Fama's (1970) argument, irrational investments ought to be balanced out by rational investments. For example, Borussia Dortmund has a free float of approximately 60%, the remaining 40% is held by institutions, e.g. Puma 5% and Evonik Industries almost 10%. (BvB, annual report, 2019) While Juventus FC has a free float of 47,5%. (Juventus FC, annual report, 2019) We further assume, in line with Nofsinger's (2001) findings, that institutional investors will act more rationally and quickly than private investors.

Furthermore, football clubs purchase players with the aim and expectation that it will help the team to achieve better sports related results. This expectation is transmitted over to fans and investors, and Fotaki et al. (2007) address this expectation as either being successful or not. This means that investors may be optimistic following a player purchase, which will have a positive effect on the share price. However, in some cases, the new players are not performing expectedly, which can lead to a pessimistic long-term development of the share price. Moreover, Fotaki et al. (2007) did conclude that the market, in general, does not believe that a high transfer fee will be a profitable investment. However, the study lacked in providing empirical support for this to hold in all situations. This is a factor that will be interesting to investigate whether it holds when only addressing the top listed clubs, although the long-term effect will not be examined in this study.

2.2.3. The Brand

Putranto (2019) argued that the effect on share prices is not always the result of financial factors, instead, aspects such as player- and club brand strength may play a significant role in influencing market reactions. As previously discussed, the top ranked European football clubs have in the past decade expanded their commercial operations, with strategies focused on expanding the existing fan bases to further develop a lucrative cash-cow business. (Bernstein, J., 2017) By creating a global brand presence, fan interest overseas will intensify, which should result in the increase of foremost commercial revenues, e.g. shirt sales, but also higher ticket sales and tv-licence royalties. (Deloitte, 2020)

When discussing the importance of a strong brand regarding football clubs, it is essential to first define the meaning of a *brand*. One classical definition provided by Martineau (1959) states that a brand is a combination of illustrations in the consumer's mind with psychological characteristics. Keeble (1991) further addresses that the brand becomes a 'brand' the moment an individual becomes associated with it. (Maurya, U. K., 2012) When addressing football clubs and their strategies to enhance brand strength, it becomes clear when viewing figure 1 in section 5.3, what effect expanding brand presence may have on their respective revenue streams. Besides, every year, *brandfinance.com* releases an analysis of the most valuable football club brands in the world, and out of all publicly listed football clubs, the respective rankings can be seen in table 4. (BrandFinance, 2019)

Table 4. Club overview

Table illustrates the position of the clubs on the rank of highest brand value. Column “Listed Clubs” concerns the ranking among all publicly listed clubs, and the column “All Clubs” illustrates the ranking among all professional clubs. As of 2019.

	Listed Clubs	All Clubs
Man Utd	1	2
BVB	2	11
Juventus	3	12
Roma	4	18

Source: Brand Finance, 2019

Moreover, building brand strength concerns the value of the brand for which the term *brand equity* is most commonly used. Keller (1993) defines *brand equity* as the difference between what a consumer is willing to pay for a branded product compared to the same product but without the brand. In addition, the study of Gladden et al. (2011) found empirical support regarding a positive correlation between brand equity and commercial revenue. The brand equity of a club may increase when acquiring the right top players, which affects the fan expectations and increases their willingness to purchase merchandise, e.g. with the new player's name on the shirt. A relevant example of this type of correlation is the transfer of Cristiano Ronaldo to Juventus FC in the summer of 2018. Although Ronaldo was signed at 33 years old, a relatively old age in football terms, and for a transfer fee of €117 million, his enormous brand strength contributed to Juventus FC increasing their market capitalization by 11% the day of the announcement. (Dawson, A. 2018). Counting in the rumours, which also had a significant impact on the share price and in combination with post-announcement investor behaviour, Juventus FC's market capitalization had increased by 127% two months after the official announcement. (Dawson, A., 2018. Putranto, 2019) An example that clearly demonstrates in what way the brand strength of either the player or the club may impact the market behaviour.

The delimitation of focusing on the top four publicly listed clubs makes it possible to investigate whether the positive correlation found by Gladden et al. (2001) also holds when analysing the correlation between football transfer expenditures and the different revenue streams.

3. Hypotheses

In the following section, the previously discussed literature and theories will be used as a base to form our hypotheses.

3.1. Abnormal Returns

The main research question of this thesis is constructed with the aim to investigate the effect on abnormal returns following player acquisitions. Firstly, it is relevant to address in what ways investors can make a profit to further be able to investigate the underlying investor psychology that takes place when investing in a top football club. The first alternative concerns capital growth, where an investor can experience a value increase of the stock which is being held. Simply put, the increase of value from the volume weighted average buy-in price, to when it is sold. The second alternative is by receiving dividends on one's shares. (Graham, B. 1949)

A share price is expected to increase over time, since investors expect excess returns and will invest in companies believed to increase their future cash flows, therefore, the benchmark for the *expected market value increase* will be derived from the MSCI European Index (MXEU). With the announcement of a new player purchase, the market will incorporate the newly obtained information by adjusting the share price. (Fama, 1970) By doing so, abnormal returns, i.e., the difference between expected growth and the actual growth, can either be positive, negative or not affected at all. (Nasdaq, 2020) If investors perceive the news as good, abnormal returns ought to be positive and vice versa if the news is perceived as bad. (Nofsinger, 2001) In addition, and as presented in section 2.2.1, Fotaki et al., (2007) did partially investigate this with football transfers. The only significant results, however, addressed day four (+4) with -0.23% and day twelve (+12) with +0.17% and was conducted on a fairly large sample of football clubs which differed significantly in sports- and financial performance. Other studies, as was also addressed in section 2.2.1, examined the effect matchday performance had on the share prices. For example, it was found by Renneboog & Vanbrabant (2000), that a win resulted in a positive effect on the share price and a loss or draw in a negative effect. In line with Nofsinger (2001), a win would inarguably be perceived as good news and a loss or draw, especially regarding a top performing club as Andersson et al. (2008) and Stadtmann (2006) investigated as bad news. These findings indicate that investors in football clubs do incorporate the news of football related activities, e.g. matchday results or transfer announcements, into the share price. It is therefore expected that when top clubs announce a new player to the public, media coverage

will spread the news rapidly and the market will react. In contrast to Fotaki et al.'s (2008) findings, we hypothesize that the brand strength of top clubs will create more positive expectations in the market, since these clubs have more earning capabilities than smaller clubs e.g. playing in European competitions, increasing commercial revenues, etc. (Deloitte, 2020) Despite the, in general, larger absolute price tag when joining a top club (Transfermarkt, 2020), investors' ought to perceive it as good news. This discussion translates into the study's first hypothesis, expecting positive abnormal returns following a player purchase announcement.

H1: *The effect on abnormal returns following a new player purchase to a top club is positive*

3.2. Transfer Fee Amount

According to Edman et al. (2007), sports sentiment will most likely affect the mood of some investors, which is why signings over a specific transfer fee will probably have more of an effect on the share price; due to the expectations regarding the profitability of higher transfer fees will either be significantly higher or lower than those with below average transfer fees. Our study will account for this by providing a benchmark fee of €20 million, constituting the mean transfer fee of our dataset (see table 11, section 6.2), to investigate the difference in the effect of a player purchase above or below €20 million.

Fotaki et al. (2007) did conclude that investors, in general, believe that the players with higher fees are not financially profitable. However, as this conclusion was drawn from investigating a broad sample of clubs and in a different time period, the factor of, for example, brand equity affecting investor expectations were not accounted for. We, therefore, hypothesize that the cumulative abnormal returns are higher following a larger transfer fee, and further that the CAR will be positively affected by a higher transfer fee.

H2: *The mean cumulative abnormal returns following a transfer fee above €20 million are higher compared to below €20 million*

H6: *The cumulative abnormal returns are positively affected by an increase in player transfer fees*

3.3. Offensive versus. Defensive Players

When examining different factors influencing the market behaviour following a player acquisition, it is of interest to investigate how the different types of field positions of the acquired players may contribute with contrasting investor expectations. From our dataset, we can conclude that the offensive player transfer fee *mean*, accounts for €21.20 million, and the defensive *mean* for €17.9 million. (see table 9, section 5.1) We have defined *Offensive players* as the combination of forwards and midfielders, while *defensive players* have been defined as goalkeepers and defenders. The mean transfer sums of the respective groups in our dataset are also in line with the *transfermarkt* list of most valuable players in the world, where out of the top 40 players, 36 belong to the offensive category and only four players to the defensive category. This is a common trend in the world of football, as the game is centred around winning matches, and offensive players have in general greater opportunities on producing obvious game-winning goals and assists. We, therefore, expect that the greater perceived value of purchasing offensive players will influence investors' expectations to act more optimistically when investing in a top football club.

H3: *Offensive players have a larger effect on abnormal returns compared to defensive players*

3.4. Fee Expenditures and Revenue Streams

The effect football player transfers have on the clubs' share prices cannot only be correlated to investor expectations derived from financial factors. (Putranto, 2019) As previously discussed, non-financial factors, e.g. brand equity, may also play an essential role in affecting investor expectations, and thus, the market reaction.

This study focuses on the top four listed football clubs, which are all among the top 20 clubs regarding total football clubs' brand value and further have the highest market value of the listed football clubs. In line with the findings of Gladden et al. (2011), who found empirical support for the correlation between brand equity and commercial revenues, we hypothesize that despite an enormous development of transfer fee expenditures in the past decade, there will still be a positive correlation to commercial revenue. This would partly be due to the fan expansion operations conducted by the top ranked clubs, to increase their commercial revenues streams by foremost merchandise sales, as discussed in section 1.

H4: *The development of transfer fee expenditures between 2009-2019 has a strong positive correlation to commercial revenues*

3.5. Financial Measurement

Besides the effect of non-financial elements on investor expectations and behaviour, financial measurements, e.g. return on equity, will also affect how investors act following the announcement of a new player purchase. Investors should investigate profitability ratios when evaluating whether or not to invest in a stock, since this will provide guidance to the intrinsic return of the company in question. (Rehki, D., 2016) Hence, we hypothesize that ROE is positively correlated to the yearly return of the share price of the respective clubs.

H5: *The yearly percentage return of the individual stock prices is positively correlated to ROE*

4. Methodology

This section introduces the quantitative methodology used in this study. Moreover, it details the procedure of the event study, correlation analysis, and regression, to provide a further understanding of the delimitations made.

4.1. Methodology Selection

This study focuses on how player purchases exert an effect on the underlying football clubs' share prices, and further, how investors act when investing in football clubs on the stock market. In order to answer our previously discussed hypotheses, and in coherence with previous literature on the area of interest, three quantitative methods will be used:

- An event study with inspiration from the framework of MacKinlay (1997)
- A correlation test through the use of the Spearman rank correlation test
- An OLS regression based on multiple variables

The event study is conducted on player transfers' effect on the share prices' abnormal returns of the selected football clubs. The choice of limiting the dataset to only address four clubs and 174 observations, is to provide as relevant results as possible regarding our overall research question. Moreover, the test of correlation will be used in two areas;

- The yearly ROE data variable and the yearly development of the share prices
- The yearly revenue streams, e.g. commercial, broadcast, and matchday, against the accumulated yearly transfer fee expenditures

4.2. Event Study

Event studies have been conducted in finance since the late 1960s when Fama et al. (1969) researched the use of similar event study methods, as are still widely accepted today. This method is used in order to examine specific events' effects on other parameters, and in our study, this will be the effect of transfer announcements on the underlying football clubs' abnormal stock returns. Our study will, as previously mentioned, be influenced by the MacKinlay's (1997) framework and as stated by Fama in 1980, event studies ought to be used when testing whether a market is semi-strong efficient following the introduction of new public information to the market. MacKinlay (1997) furthermore concludes that event studies can be conducted through the process of three necessary stages.

4.2.1. Stage One

MacKinlay (1997) argues for the importance of first and foremost deciding on the event windows for the period and the event of interest. The *event window* addresses the period of research for which a share's abnormal returns will be calculated. The *event of interest* in our study has been defined as the date of the purchasing club's official announcement of the player transfer. Moreover, due to the risk of rumours and other factors affecting the share price development, e.g. insider trading, event windows are used to analyse the effects on the share prices prior to, and after the announcement. Fotaki et al. (2007) suggested that the event window should be 20 days prior- and 20 days post the event of interest. However, in our case, this would create issues as the transfer windows are only open during the month of January and between the first of June and the first of September, which could create a large clustering effect. (FIFA, 2020) Based on these insights, this study will base the statistical analysis on three event windows:

- (-1;1): One day before the announcement and one day post
- (-3;3): Three days before the announcement and three days post
- (-5;5): Five days before the announcement and five days post

Moreover, there are some cases in the dataset where the event window, due to the day of the announcement, makes for the specific share price dates to be on a weekend or holiday. In those

cases, which are inevitable, the closest trading day has been used in those calculations. The *estimation window* of the event study refers to the selection and use of a benchmark for normal expected return, in order to calculate abnormal returns. We have chosen to use the MSCI European Index (MXEU), since all clubs operate in Europe.

4.2.2. Stage Two

The second stage concerns the *choice of sample*, where the specific transfers selected must be chosen under specific criteria, which are predetermined. The football transfer market is surrounded by many different characteristics, which is why predetermined criteria concerning transfers, will facilitate avoidance of biases in the data collected. The data selection process will be further addressed in section 5, while the criteria chosen were:

- Top five player purchases during the timeframe of 2009-2019, per season and club
- Only purchases derived from Manchester United FC, Juventus FC, Borussia Dortmund and AS Roma
- Event of interest derived from the official announcement of the purchasing club

By using the criteria mentioned above, a more narrow investigating approach was created to fit with our main research question.

4.2.3. Stage Three

The third and final step is to create an event study assessment, which in this study concerns the calculations of effect on the abnormal return of the share price. Expected return is necessary in order to compute the abnormal returns. There are different ways of doing this, with one model being the *Capital Asset Pricing Model*; however, in this study the market adjusted model will be used to calculate abnormal, which is the most frequently used model in statistics (Campbell & McKinlay, 1996).

The following formula is then used to calculate the abnormal returns (AR):

$$AR_{i,t} = R_{i,t} - R_{m,t} \quad (1)$$

The variables of the above formula are defined as per the following: AR = Abnormal return of each stock (i = football club) and each date (t) where t denotes the event window date in days, e.g. (-5 ;5). R = the percentage daily return of each stock at date t defined by:

$$R_{i,t} = \frac{P_{i,t}}{P_{i,t-1}} - 1 \quad (2)$$

In equation 1, R_m = the market return, which we have defined as the percentage return of the MSCI European Index.

Cumulative Abnormal Return (CAR), which accumulates turns of the abnormal returns of the single event windows, e.g. AR -1 and AR 1 will be calculated. This will make it possible to analyse the target share price of the event windows. CAR is calculated through:

$$CAR_{-t,t} = \sum_{-t}^t AR_{i,t} \quad (3)$$

The CAR represents the accumulated returns of the event windows that the shareholders receive above or below the market return, where $t = 0$ is the player transfer announcement date.

4.3. Correlation Test

Hypotheses 4 and 5 will be investigated by conducting a correlation test using the non-parametric Spearman rank correlation test, with the motivation to study the relationship between the variables attributable to the hypotheses. The Spearman rank-order test will be used instead of Pearson's correlation test as we do not know if our variables hold true to the assumptions needed in a Pearson correlation test, i.e., we do not know if the population is valid to assume normality and linearity. (Newbold et al., 2013) Moreover, we have a low number of observations as our $n < 20$.

4.4. OLS Regression

We will conduct an OLS regression model as we aim to examine the effect of different variables on the cumulative abnormal returns. In this study, we will use the independent variable *fee* and dummy variables for the type of position the player being bought is classified in. That being stated, there are, of course, many other variables that may affect the outcome of the CAR. The regression model is defined as per the following formula:

$$CAR = \alpha + \beta_2 \text{Player transfer fee} + \beta_3 \text{Forward} + \beta_4 \text{Midfielder} + \beta_5 \text{defender} + \beta_6 \text{Goalkeeper} + \varepsilon_t \quad (4)$$

The following variables are included in the regression model:

- **Fee**- an independent variable of the player transfer fee in € millions
- **Forward**- a dummy variable where 1 indicates a forward position player transfer and 0 any other position type transfer
- **Midfielder**- a dummy variable where 1 indicates a midfielder position player and 0 any other position type transfer
- **Defender**- a dummy variable where 1 indicates a defender position player and 0 any other position type transfer
- **Goalkeeper**- a dummy variable where 1 indicates a goalkeeper position player and 0 any other position type transfer

4.5. Multicollinearity

A correlation matrix, through the conduction of a Pearson correlation test, is presented in table 5, in order to test whether our selected variables are multicollinear or not.

Table 5. Correlation matrix

<i>Pearson correlations for independent variables and the CAR (-5;5)</i>						
	Fee	Forward	Midfielder	Defender	Goalkeeper	CAR (-5;5)
Fee	1.0000					
Forward	0.0642	1.0000				
Midfielder	0.0169	-0.4844	1.0000			
Defender	-0.0346	-0.4980	-0.4146	1.0000		
Goalkeeper	-0.1189	-0.1562	-0.1300	-0.1337	1.0000	
CAR (-5;5)	0.1403	0.1156	0.0131	-0.1034	-0.0551	1.0000

The results of the correlation matrix of the other event windows, i.e. CAR (-1;1) and CAR (-3;3), and CAR (-5;5) are almost identical which is the reason for only presenting the correlation matrix with the CAR (-5;5) in table 5. The tables, including CAR (-1;1) and CAR (-3;3), are presented as tables 6 and 7 respectively in the appendix. None of our variables in table 5 correlate larger than 0.5 or less than -0.5, which provide results that lead to the judgement of the variables *not* being significantly correlated.

5. Data

In the following section, a detailed presentation of the dataset used in this study will be presented.

5.1. Sample Selection of Football Clubs

Identifying listed clubs in Europe was conducted using Capital IQ and the Index STOXX Europe Football. We wanted to investigate clubs from the top European football leagues where the larger transfers occur, which are publicly listed. In order to find the right club size, the criteria of having a balance sheet of at least €300 million in total assets as per the end of 12-31-2019 were used, as well as being continuously ranked top 20 in the highest revenue the last decade. (Deloitte, 2010-2020) Moreover, with the partial aim of investigating the level of correlation of the increase in player transfer expenditures and the revenue composition, the clubs selected had to disclose this data. In our dataset, we ended up with four European football clubs based on the criteria mentioned above, which resulted in our analysis covering the following football clubs: Manchester United FC (Man Utd), Juventus FC, Borussia Dortmund (BVB), and AS Roma.

Table 8. Descriptive statistics

<i>Descriptive table of transfers and fees</i>				
	N	Mean fee (EURm)	Min fee (EURm)	Max fee (EURm)
Man Utd transfers	29	39.560	1.700	105.000
BVB transfers	46	12.640	0.225	30.500
Juventus transfers	52	22.410	0.300	117.000
Roma transfers	47	12.690	3.500	29.500
Total transfers	174	20.060	0.225	117.000

In table 9, offensive players are defined as forwards and midfielders, while defensive players are defined as goalkeepers and defenders. See further motivation and description to this clustering in section 3.3.

Table 9. Descriptive statistics

Frequency table of number of players classified as offensive and defensive players respectively.

	Man Utd	BVB	Juventus	Roma	Total
N	29	46	52	47	174
Frequency offensive	19	32	31	32	114
Frequency defensive	10	14	21	15	60
Mean fee offensive (EURm)	42.92	12.98	24.22	13.59	21.20
Mean fee defensive (EURm)	33.17	11.84	19.75	10.77	17.90
Min fee offensive (EURm)	5.50	0.35	2.45	3.50	0.35
Min fee defensive (EURm)	1.70	0.23	0.30	3.50	0.23
Max fee offensive (EURm)	105.00	30.00	117.00	29.00	117.00
Min fee defensive (EURm)	87.00	30.50	85.50	29.50	87.00

5.2. Selection of Player Transfer Data

In the professional football transfer market, a player can only change clubs during two time periods a year. The first is commonly known as the summer period, which stretches between the first of July to the first or second of September. The second period occurs during the winter between the first of January to the first of February. (FIFA, 2020)

Player transfers included in our dataset are the yearly top five player acquisitions per club and seldom have the clubs in our dataset acquired more than five players per season. Furthermore, in our study, transfers are defined as permanent acquisitions, and we have therefore not collected data on loan fees, even though these occasionally are included in the top five fee table. In those cases, they were excluded, as we only collected data on the top five “true” acquisitions. Albeit being a potential limitation of the data, this decision was made because only a small amount of these transfers occur on the top level and would not contribute with additional value when investigating our research question. The data has been collected manually using the website *transfermarkt.com* which gathers all historical player transfers of all European and professional football clubs. The dates of transfers have then been cross-checked with the official club websites to be certain that the dates of the official announcements were correct. (manutd.com, asroma.com, juventus.com, bvb.de)

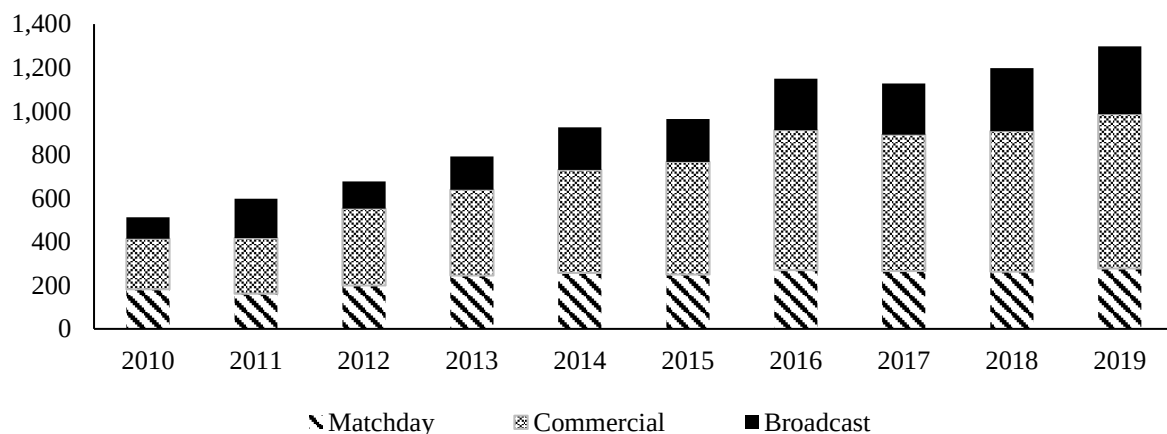
Since the Bosman Ruling in 1995, it is possible for a club to acquire a player for free. It may occur if the current player contract has expired and not been renewed. (Liew, J. 2015) There were a couple of cases in our data gathering where this type of transfer had occurred and been included in the top five transfers of the year. However, we have neglected these and only included actual fees larger than 0 in our study.

Moreover, the dates of the transfers are based on the day of the official announcement in which the information is made publicly known to all market players. In addition, we believe that player position types will have different effects on the abnormal returns and have therefore collected data on position types of each transfer from transfermarkt. (See discussion in section 3.3)

5.3. Selection of Revenue Streams

Every year Deloitte publishes an extensive report analysing the top 20 football clubs' financial performances during the prior season, the *Deloitte Football Money League*. This framework divides the clubs' revenue streams into three major brackets: *Commercial*, e.g. shirt- and merchandise sales, *Matchday*, e.g. ticket sales, as well as *Broadcast*, e.g. revenue from tv-licenses. The development of the different revenue streams regarding the four selected clubs can be viewed in figure 1

Figure 1. Revenue Development, by Revenue Type, EURm



Source: Deloitte, 2010-2020

As can be seen in figure 1, commercial revenue derived from foremost merchandise sales has had an impressive development in the last ten years together with broadcast revenues. These different revenue streams will be used when examining to what degree the increase of transfer

expenditures is correlated with the increase of these three separate revenue streams, in hypothesis 4 (H4).

5.4. Selection of Share Price Data

In order to gather the correct stock prices over the timeframe we have chosen to study, (2009-2019), Capital IQ has been used. Daily stock prices over the time period were downloaded. However, we have only used the share prices in our dataset that corresponds to our event windows $(-1;1)$, $(-3;3)$ and $(-5;5)$, as well as the event of interest (0), in which the announcement corresponds to the announcement of the player transfers. In order to be able to calculate the abnormal returns, the daily returns have been calculated, which have been defined as per equation (2).

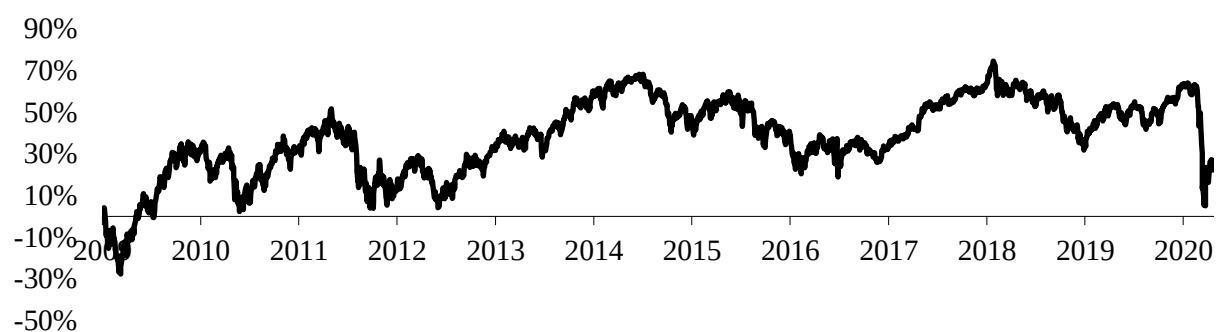
The price used to calculate the returns are the closing prices of each day. In the case of weekends, the last prior intraday has been used to calculate the daily return of the stocks. Furthermore, not all of our selected football clubs have been listed during the time period between 2009-2019, Manchester United FC was delisted from the London Stock Exchange in June 2005 and relisted on the New York Stock Exchange in 2012. (The Times, 2005; Financial Times, 2012) Therefore, we do not have the share price data from Manchester United FC for our entire time frame. This has been adjusted for, by only incorporating the transfers that can be derived to an active publicly trading activity. However, Manchester United FC is the largest football club as per their financial statements in 2019 of all the publicly listed clubs, which is why we have chosen to include them. (Annual report, Man U, 2019) Figure 2, 3, 4 and 5 in appendix illustrates the development of the respective share prices of our selected football clubs (indexed since their respective IPOs).

5.5. Selection of Stock Index

Using the market adjusted model to calculate abnormal returns, a relevant index of the selected football clubs was identified and used in the study. As the study researches European football clubs, the MSCI Europe Index (MXEU) has been downloaded from capital IQ and used to

define the AR (abnormal returns) and CAR (cumulative abnormal returns) parameters. The index comprises 446 constituents of large and medium-size companies from 15 countries in Europe and is used to benchmark returns since our clubs' sports operations occur across Europe. Although Manchester United FC's sports operations are connected to the United Kingdom, the club is listed on the New York Stock Exchange (NYSE). In line with their strong connection to the European market, the decision was made to include Manchester United FC, even though the index does not benchmark the US stock market. Figure 6 shows the historical development of the index since the beginning of 2009

Figure 6. MSCI Europe Index (MXEU) - Index daily percentage change



5.6. Criticism of Data

In our study, a number of delimitations have been made regarding the dataset, to satisfy the scope of our main question. As a consequence, there are some influential data points that are not taken into consideration in the analysis.

A limited number of the larger clubs are traded on a public market, which limits the available selection. The largest club in our dataset, Manchester United FC, was delisted from the London Stock Exchange (LSE) in 2005 and relisted again in 2012 on the New York Stock Exchange (NYSE), which means that there is no public share price data between 2009 and 2012 which is a limitation considering our chosen time frame. However, we did deem them relevant to use anyway, since it is the largest publicly traded football club available.

Another potential critique of our data is the fact that we do not look at all transfers, e.g. player loans, divestitures, as well as players sold and bought for free through the Bosman ruling, each

year. Although it would not add much absolute value in transfer fees, there is a possibility it would affect the individual stocks. A further problem with the transfer fee data is that some transfers are announced on the same day as other transfers or in very close proximity, which could affect the stock price in ways not examined in this study. This is also related to our decision of event windows, which are rather short; recall $(-5;5)$, $(-3;3)$, and $(-1;1)$. There may also circulate transfer rumours before our pre-announcement event windows as media coverage about potential transfers tends to emerge long before the official announcement. As such, it could lead to rumours affecting investor decisions and fans, leading to a potential early effect in share prices. Recall the discussion about Ronaldo in section 2.2.3.

Notably, we are aware that our dataset neglects other influential variables not being considered in this study due to the stated delimitations. However, our aim was to provide as precise results as possible, given our main research question.

6. Empirical Results

In the following chapter, the results of the event study with different tests will be presented. The section will be structured by going through the results attributable to the hypotheses in accordance with the order as presented in the hypothesis chapter.

6.1. Abnormal Returns

H1: *The effect on abnormal returns following a new player purchase to a top club is positive*

Table 10. t-test output table

A one sample t-test for each event window per club as presented in the table. Performed to test if the event windows differ significantly from zero. The upper value denotes the mean and the value in parentheses denotes the t-value

	Man Utd	BVB	Juventus	Roma	Total
AR (-5)	-0.2783% (-0.7205)	-0.3229% (-1.2292)	0.1747% (0.4667)	0.2409% (0.6788)	-0.0145% (-0.0830)
AR (-3)	0.3150% (0.7913)	-0.4787%* (-1.4923)	0.0451% (0.1730)	0.1505% (0.5555)	-0.0199% (-0.1311)
AR (-1)	-0.0383% (-0.1273)	0.2904% (1.1627)	-0.2407% (-0.9941)	-0.3064%* (-1.3826)	-0.0843% (-0.6717)
AR (0)	-0.2103% (-0.6157)	0.4015% (1.1038)	0.2393% (1.0189)	-0.2030% (-1.2127)	0.0878% (0.6283)
AR (1)	-0.1702% (-0.5534)	0.4308%** (1.8590)	0.1200% (0.4613)	0.1039% (0.5018)	0.1495% (1.2000)
AR (3)	-0.2208% (-0.7882)	0.0061%** (2.2859)	-0.024% (-0.0995)	0.0660% (0.2393)	0.1345% (1.0020)
AR (5)	0.6048%** (1.8662)	0.2601% (0.9335)	0.2437% (1.0204)	0.1493% (0.5491)	0.2827%** (2.0711)
CAR (-1, 1)	-0.2085% (-0.5118)	0.7213%** (2.2328)	-0.1207% (-0.2896)	-0.2026% (-0.7072)	0.0651% (0.3546)
CAR (-3, 3)	0.0942% (0.2268)	0.1288% (0.2921)	0.0212% (0.0560)	0.2165% (0.5269)	0.1146% (0.5536)
CAR (-5, 5)	0.3265% (0.6188)	-0.0629% (-0.2195)	0.4184% (0.9860)	0.3901% (0.8087)	0.2682% (1.2511)
N	29	46	52	47	174

* $p < 0.1$, ** $p < 0.05$

As per table 10 and regarding the total sample, we have found significant empirical support that five days post the announcement of a player acquisition, the abnormal returns will, on average, increase, thus having a positive effect on the abnormal returns by approximately 0.28% points. Overall, the market indicates a slight positively growing trend following the transfers to top clubs, furthermore, mitigating the negative effect of the decline prior to the player acquisition announcement. This does, however, need to be verified by future research, i.e., with the use of a larger sample (n), as this study was not able to find significant empirical support to accept this trend. However, if the trend were to hold, it might be indications that investor expectations

are high in the short-term perspective and that transfer announcements derived from the top clubs can be interpreted as *good news*. Addressing the growth of trend, it indicates slow but optimistic investor response, which in line with the findings of Nofsinger (2001) can be explained as private investors acting slower compared to institutional investors regarding both positive and negative news.

Comparing our findings with Fotaki et al. (2007), we can interpret greater positivity in our trend. In addition, Fotaki et al. (2007) only found significant empirical results on day four following the announcements, which were negative of -0.23%, clearly highlighting a difference in effect on abnormal returns when solely investigating a smaller sample of top clubs compared to a much broader and somewhat imbalanced dataset. All in all, our hypothesis (H1) is partially empirically supported at a significance level of 5%. However, we cannot fully accept it since only one out of seven event windows in the total dataset empirically supports the hypothesis.

Investigating in more detail on the individual club level, we find indications that there are discrepancies between foremost Manchester United FC and the other selected clubs. However, as we cannot find statistically significant results of this statement to hold true for each event window, we recommend future research to further investigate this. In addition, we want to reinforce that we did find statistical significance on a 5% level of positive abnormal returns for Manchester United FC, five days post-announcement, and positive abnormal results for BVB on day one and three post-announcement.

6.2. Transfer Fee Amount

H2: *The mean cumulative abnormal returns following a transfer fee above €20 million are higher compared to below €20 million*

In the following subsection, t-tests have been conducted to investigate if transfer fees larger than €20 million have a more significant impact on the CARs than transfer fees less than €20 million.

Table 11. t-test output table

A t-test is performed to analyse whether CARs are significantly different around their means between the fees larger than EURm 20 and less than EURm 20

Total dataset	Difference mean (%)	t-statistic
CAR >20 (-1;1) - CAR<20 (-1;1)	0.09356%*	0.2462
CAR >20 (-3;3) - CAR<20 (-3;3)	-0.03845%*	-0.0961
CAR >20 (-5;5) - CAR<20 (-5;5)	0.22394%**	0.4989

* $p < 0.5$, ** $p < 0.4$

Based on table 11, the data suggests that player transfer fees surpassing €20 million, impact the CARs more than transfer fees less than €20 million. However, this cannot be concluded as statistically significant as the P-values are too high, less than 0.5. Therefore, we do not find sufficient empirical support that fees larger than €20 million would have a more significant effect on the cumulative abnormal returns for both our event windows. If the indications would hold as statistically significant, it could be correlated with greater media coverage on higher transfer fees, as discussed in the literature section. We cannot accept the hypothesis (H2).

6.3. Offensive versus Defensive Players

H3: *Offensive players have a more positive effect on abnormal returns compared to defensive players*

Table 12. t-test output table

A t-test is performed to analyse whether the CARs per event window are significantly different between the position types defined as offensive- and defensive positions

Total dataset	Difference mean (%)	t-statistic
CAR offensive (-1;1) - CAR defensive (-1;1)	-0.02172%	-0.0572
CAR offensive (-3;3) - CAR defensive (-3;3)	-0.16738%	-0.3936
CAR offensive (-5;5) - CAR defensive (-5;5)	0.77002%*	1.7871

* $p < 0.05$

While we cannot conclude significant empirical support that offensive player positions have a larger impact on CAR during the event windows (-1;1) or (-3;3), we do find significant empirical support that there is a difference in means between the types on the CAR (-5;5) where offensive players have, on average, a larger effect on abnormal returns than defensive players by 0.77% points. In line with our hypothesis section, our findings support the expectation that the offensive players', in general, greater market value contribute to more positive investor behaviour. Hence, we can partially accept hypothesis 3 (H3) with regards to the CAR event window (-5;5) at a 5% significance level.

6.4. Fee Expenditures and Revenue Streams

H4: *The development of transfer fee expenditures between 2009-2019 has a positive correlation to commercial revenues*

Table 13. Spearman's rank correlation test output table

Spearman's rank correlation test to research which revenue types are correlated to transfer fee expenditures. Spearman's rho is presented

Total accumulated	Yearly transfer fee	Matchday revenue	Commercial revenue	Broadcast revenue
Yearly transfer fee	1.0000			
Matchday revenue	0.9273*	1.0000		
Commercial revenue	0.9758*	0.9394*	1.0000	
Broadcast revenue	0.9636*	0.8909*	0.9515*	1.0000
N	10	10	10	10

* $p < 0.01$, ** $p < 0.05$

When aggregating the selected clubs yearly transfer investments and respective revenue streams, we find very strong empirical support that all types of revenue streams presented are highly correlated with player transfer expenditures. All three revenue types have a correlation coefficient above 0.9, where commercial revenue is the most correlated with player transfer fees at the Spearman correlation coefficient of 0.9758. In line with the findings of Gladden et al. (2001), the strong correlation found in table 13 may be in correlation with the clubs' combined brand equity. Furthermore, it is plausible that the explanation can be further derived from positive commercial results following the clubs' aggressive marketing strategies to expand their global brand presence and increase fan bases.

In addition, to further address in what way a club's brand equity may contribute to increased revenues and greater investor expectation, we interpreted the individual clubs' correlation tests (see appendix). Man Utd has the strongest individual correlation between transfer fee expenditures and commercial revenues at ~ 0.84 , followed by BVB at ~ 0.79 , Juventus at ~ 0.71 , and AS Roma with ~ 0.46 . Recall table 4 section 2.2.3 regarding the brand value of the clubs, as of 2019, Man Utd had the second strongest football brand globally and AS Roma the 18 strongest. A large difference between the global brand value that seems to contribute with some explanatory material as to why the difference between the correlation of transfer fees and commercial revenues is much stronger for a strong brand as Man Utd compared to the relatively weaker brand of AS Roma. Given these findings, we can accept our hypothesis at a significance level of 1% (H4).

6.5. Financial Measurement

H5: *The yearly percentage return of the individual stock prices is positively correlated to ROE*

Table 18. Spearman's rank correlation test output table

<i>Spearman correlation test to research which revenue types are correlated to transfer fee expenditures. Spearman's rho is presented</i>		
	Spearman's rho	P-value
Manchester United	0.1667	0.6932
BVB	0.4182	0.2006
Juventus	0.5364*	0.0890*
Roma	-0.0636	0.8525

* $p < 0.1$

As per table 18, we find significant statistical support that Juventus FC's ROE is positively correlated to the yearly return of the share prices. Moreover, with the Spearman correlation coefficient being larger than 0.5, we find support that the correlation between the two variables of interest is high. The data does not find empirical support for the correlation for the other selected clubs. However, we find indications that ROE is positively correlated with the yearly share price return for Man Utd and BVB as well, albeit low. In Roma's case, it provides an almost zero correlation suggesting that investors do not consider ROE when investing in the club. However, we can only accept our hypothesis (H5) in the case of Juventus on a significance level of 10%.

6.6. Regression

H6: *The cumulative abnormal returns are positively affected by an increase in player transfer fees*

Table 19. Sample overview

<i>Descriptive table of the overall independent variables</i>					
Independent variables	Fee	Forward	Midfielder	Defender	Goalkeeper
Frequency	174	64	50	52	7
N	174			174	

Table 20. OLS regression output table

<i>OLS regression for each event window in the total sample. t-statistic in parentheses</i>			
	CAR (-1;1)	CAR (-3;3)	CAR (-5;5)
Constant	0.0063 (0.26)	-0.0143 (-0.52)	-0.0188 (-0.66)
Fee	-0.0001 (-1.02)	-0.00002 (-0.15)	0.0002* (1.69)
Forward	0.0007 (0.03)	0.0183 (0.66)	0.0216 (0.76)
Midfielder	-0.0094 (-0.39)	0.0112 (0.41)	0.0181 (0.64)
Defender	-0.0049 (-0.20)	0.0193 (0.70)	0.0134 (0.47)
Goalkeeper	0.0039 (0.15)	0.0002 (0.01)	0.0122 (0.40)
Adjusted R ²	0.0112	0.0023	0.0089
N	174	174	174

* $p < 0.1$

Table 20 represents the output of the multiple linear OLS regression. Since we wanted to investigate the marginal effect the different variables have on the independent variables of the respective CARs and not make predictions about future results, the adjusted R², which is very low in our regression, is not of much importance in this study.

As can be seen in the output table, we find empirical support at a significance level of 10%, that the independent variable fee is expected to have a positive effect on the mean of CAR (-5;5) as the fee grows larger, holding all the other independent variables constant. This suggests that the CAR (-5;5) will increase by 0.02% per every €1m increase in player transfer fee. Hence, we can accept the hypothesis 6 (H6) on a 10% significance level.

Table 21. Hypothesis overview

H1	The effect on abnormal returns following a new player purchase to a top club is positive	(Partially) supported
H2	The mean cumulative abnormal returns (CAR) following a transfer fee above €20m are higher compared to below €20m	Not supported
H3	Offensive players have a more positive effect on abnormal returns compared to defensive players	(Partially) supported
H4	The development of transfer fee expenditures between 2009-2019 has a positive correlation to commercial revenues	Supported
H5	The yearly percentage returns of the individual stock prices are positively correlated to ROE	Not supported
H6	The cumulative abnormal returns (CAR) are positively affected by an increase in player transfer fees	(Partially) supported

7. Conclusion

This thesis investigated the market behavior following an announcement of a new player acquisition from a top ranked club. In addition, specific characteristics, e.g. player position, player- and club brand-strength, were also examined to contribute with a deeper sense of understanding concerning what factors influence investor behavior and how sustainable the development of transfer fee expenditures have been. To our knowledge, limited research has investigated this type of interconnectedness, aside from the study of Fotaki et al. (2007), which partially investigated the factorial relationship between market reactions and transfer announcements. Within our delimited scope of research, we hypothesized that top clubs' player purchases will have a positive effect on abnormal returns, that an offensive player as well as higher transfer fees, will contribute to greater investor expectations.

Conducting an event study on a total of 174 transfers, derived from our four selected clubs during the time period of 2009-2019, we examined this relationship. Notably, we discovered significant empirical support for positive abnormal returns five days following the official announcements of $\sim 0.28\%$. As we compare our findings with the findings of Fotaki et al. (2007), we detect a clear difference in the respective observable trends. Fotaki et al. (2007) present a slightly positive trend following the announcements, with empirical support for four days (+4) of -0.23% and +12 days of 0.17% . In line with one of our hypotheses, the results differ when delimiting the scope to exclude significant imbalances between the sampled clubs, where we can provide observable indications of a more optimistically positive trend following transfer announcements conducted by the top ranked clubs. However, this can only be partially empirically supported.

Moreover, consistent with the discussion about investors perceiving offensive players as more likely to re-compensate their fee i.e. greater brand strength and opportunity to provide game-winning results, we find empirical support for offensive players providing on average 0.77% points higher cumulative abnormal returns compared to defensive players, five days following an announcement. In addition, and contrary to previous literature, our OLS regression provides empirical support that an additional unit in absolute transfer fees have a positive influence on the abnormal returns. An interrelation which indicates a positive investor response five days following a transfer of a more significant fee and could be explained as investors in general perceiving top-clubs' exceptional investments as *good news*. (Nofsinger, 2001) Investor optimism, which could be derived from the fact that the non-financial factors e.g. brand strength, acts as a significant role when affecting foremost, private investors. Because, further in line with Nofsinger's findings, and as described in section 2.1.3, when *good news* is presented to the market, institutions will act immediately while the private investors will act significantly slower. Assuming this situational relationship, and given significant high abnormal returns on five (+5) days, we can argue for indications of a large interest from private investors.

Furthermore, we find a strong correlation between the clubs' transfer expenditures and commercial revenues, indicating that the brand value of a club, functions as a significant catalyst in affecting both investor expectations and behavior. This relationship holds even stronger when comparing the highest ranked brand in our sample, Manchester United FC, with the

lowest ranked AS Roma, presenting a much higher correlation for Man Utd.

Concludingly, we find that our empirical data support the motivation of delimiting the scope of selected clubs, to minimize the imbalanced effect on investor behavior between top ranked- and low ranked clubs. We also find strong indications that it is essential to reconcile both financial and non-financial factors when addressing football clubs' performance on the stock market, which we hope helps contribute with further motivation on research into the area of interest.

8. Directions for Future Research

This study aimed to investigate whether there was an effect on the share price of the top four publicly listed football clubs, following the purchase of a new player. When conducting our study, we identified a number of different factors and topics that would have been interesting to investigate further.

Firstly, as discussed in the literature review section and to our knowledge, there has been limited research looking into the effect on a football club's share price following a player transfer. We, therefore, believe that some of our findings can approve for further research to create stronger empirical support. More specifically, this can be done by extending the time frame to instead look at the entirety of the 21st century, which would provide a larger dataset and possibly find more significant results. We also believe that incorporating additional dummy-variables regarding the brand status of a player e.g. social media followers, previous transfer fees, and the number of news articles published, would create an additional dimension of explanatory material concerning what specific type of characteristics affect the market behaviour the most.

Another interesting perspective for future research would be to conduct a similar study, but also analysing small- and medium sized publicly listed football clubs and then compare the different results, both on average and on a club level. As discussed earlier, we did find results contrasting the findings of Fotaki et al. (2007), which can be partially explained by the study's use of a larger sample of clubs regardless of size parameters. Studying a more narrow selection of football clubs of a smaller size than those studied in this thesis, would probably lead to different results, which would be interesting to compare and analyse. This could contribute to an additional dimension to the research.

Moreover, this study had a focus on the implicated effects on the abnormal returns of share prices, through selected factors and correlations of different variables regarding stock returns, player transfer fees, and commercial revenues, as is presented in the empirical results section (6). Furthermore, we would also recommend future research to complement a quantitative method with an investigation of the valuation methods of a set number of publicly listed football clubs comprised of different sizes on a detailed level. This could be conducted through the use of a qualitative study in order to examine if the player valuations are in line with the expected investor behaviour and if player brand strength is taken into consideration before a purchase from a club perspective.

Finally, this study was created based on the impressive growth in the last decade, concerning transfer expenditures and revenues among top football clubs. With the ongoing COVID-19 crisis, the football industry is one of many sectors that have been enormously affected, resulting in competitions not being completed, investors selling the football stocks (see figures 2-5 in appendix), setbacks in commercial operations, and football players having to accept a reduction in pay. (Holroyd, M., 2020; Goal.com, 2020) These are all significant consequences affecting the football industry and its financial development. Hence, it would be interesting to re-examine the market behaviour regarding football clubs' transfer expenditures in a couple of years time, to conclude whether the industry development between 2009-2019 survived through the corona crisis and if the market's optimistically belief in the top football club transfer investments continuous to hold.

Concludingly, we hope this thesis motivates future research to be conducted into the research area of interest.

9. References

- Andersson, P., Ayton, P., & Schmidt, C. (2008). Myths and Facts about Football: The Economics and Psychology of the World's Greatest Sport. *Cambridge Scholars Publishing*, 372-419.
- Annual report. (2019). Manchester United FC. Retrieved from <https://ir.manutd.com/~media/Files/M/Manutd-IR/documents/2019-mu-plc-form-20-f.pdf>
- Annual report. (2019). Juventus FC. Retrieved from <https://www.juventus.com/en/club/investor-relations/financial-reports/statements-and-reports/2018-19.php>
- Annual report. (2019). Borussia Dortmund. Retrieved from <https://aktie.bvb.de/eng/Publications/Quarterly-Financial-Reports>
- BBC Sport. (2020). "Spanish Super Cup - who, why and where?". Bbc.com. Retrieved 2020 April 5 from <https://www.bbc.com/sport/football/51013150>
- Bernstein, J. (2017). Awful weather, terrible pitches and angry managers... Why Premier League clubs tour the Far East on pre-season jaunts. *Dailymail.com*. Retrieved 2020 April 4 from <https://www.dailymail.co.uk/sport/football/article-4710310/Why-Premier-League-clubs-tour-Far-East-pre-season.html>
- Bodet, G., & Chavanet, N. (2010). Building Global Football Brand Equity: Lessons from the Chinese market. *Asia Pacific Journal of Marketing and Logistics*, 22(1), 55-66.
- Brand Finance. (2019). Football 50 2019: The Annual Report on the most Valuable and Strongest Brands. *Brandfinance.com*. Retrieved 2020 April 20 from <https://brand-finance.com/knowledge-centre/reports/brand-finance-football-50-2019/>
- Brown, G. W., and J. C. Hartzell. (2001). Market reaction to public information: The atypical case of the Boston Celtics. *Journal of Financial Economics*, 60(2-3), 333-370.
- Burton, G. Malkiel. (2003). The Efficient Market Hypothesis and Its Critics. *Journal of Economic Perspectives*, 17(1), 59-82.
- BVB Share. (2020). Shareholder data. *Aktive.bvb.de*. Retrieved April 1 2020 from <https://aktie.bvb.de/eng/BVB-Share/Shareholder-Structure>
- Caled, Danielle., & Silva, Mário. (2018). FTR-18: Collecting rumours on football transfer news. In proceedings of Workshop on Rumours and Deception in Social Media (RDSM). *ACM, Turin, Italy*, 1-5.
- Dawson, A. (2018). Shares in Juventus FC have doubled since it bought Cristiano Ronaldo, and it's probably only the beginning., *Businessinsider.com*. Retrieved 2020 April 15 from <https://www.businessinsider.com/juventus-fc-stock-has-doubled-in-the-cristiano-ronaldo-era-and-its-probably-only-the-beginning-2018-9?r=US&IR=T>
- Deloitte. (2000-2020). Football Money League. Issue 2000-2020 (except 02, 03). Retrieved 2020 March 19 from <https://www2.deloitte.com/uk/en/pages/sports-business-group/articles/deloitte-football-money-league.html>
- Edmans, A., Garcia, D., & Norli, Ö. (2007). Sports Sentiment and Stock Returns. *The Journal of Finance*, 62(4). 1967-1984.
- European Leagues, (2020). The Corporation. *Europeanleagues.com*. Retrieved 2020 April 12 from <https://europeanleagues.com/about/>

- Fama, E. F., Fisher, L., Jensen, C. J., Roll, R. (1969). The adjustment of stock prices to new information. *International economic review*, 10(1), 1-21.
- Fama, E. F. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance*, 25(2), 383-417.
- Fama, E. F. (1991). Efficient Capital Markets II. *The Journal of finance*. 46(5), 1575-1616.
- FIFA, (2020). Regulations: on the Status and Transfer of Players. Fifa.com. Retrieved 2020 April 15 from <https://resources.fifa.com/image/upload/regulations-on-the-status-and-transfer-of-players-june-2019.pdf?cloudid=ao68trzk4bbaezlipx9u>
- Fotaki, M., Markellos, R., and Mania, M., (2007). The Effect of Human Resource Turnover on Shareholder Wealth: Evidence from the UK Football Industry. *Athens university of Economics and Business*, 1-21.
- Frenkel, J. A. (1981). Flexible exchange rates, prices, and the role of “news”: Lessons from the 1970s. *Journal of Political Economy*, 89(4), 665-705.
- Gladden, J.M., Irwin, R.L., and Sutton, W.A. (2001). Managing North American Major Professional Sport Teams in the New Millennium: A Focus on Building Brand Equity. *Journal of Sport Management*, 15(4), 297-317.
- Goal. (2020). Which Premier League footballers have taken pay cuts in coronavirus crisis?. Goal.com. Retrieved 2020 May 2 from <https://www.goal.com/en/news/which-premier-league-footballers-have-taken-pay-cuts-in/truhwf12kvqt1316tog7xbyab>
- Graham, Benjamin. (1949). The intelligent Investor. *Revised edition, first Collins business Essentials* Edition 2006, p.25.
- Holroyd, M. (2020). Coronavirus: What could happen if the football season is cancelled?. Euronews.com. Retrieved 2020 May 7 from <https://www.euronews.com/2020/03/13/coronavirus-what-could-happen-if-the-football-season-was-cancelled>
- Keeble, G. (1991). Creativity and the Brand. In D. Cowley, ed. *Understanding brands by 10 people who do*. London: Kogan Page, edition 2, 167-182.
- Keller, K. L., (1993). Conceptualizing, measuring, and managing customer-based equity. *The Journal of Marketing*, 57(1), 1-22.
- KPMG, (2017). Football clubs and the Stock Exchange in 2016. Footballbenchmark.com. Retrieved 2020 April 10 from https://www.footballbenchmark.com/library/stock_exchange_football_clubs
- Liew, J. (2015). How the Bosman revolution changed football forever. Telegraph.com. Retrieved 2020 April 15 from <https://www.telegraph.co.uk/sport/football/competitions/premier-league/12047806/How-the-Bosman-revolution-changed-football-for-ever.html>
- The Times (2005). Man Utd Delists from LSE after 14 years. Thetimes.com. Retrieved 2020 April 20 from <https://www.thetimes.co.uk/article/man-utd-delists-from-lse-after-14-years-3nr79jnnfb3>
- Total Sportek. (2020). ‘25 World’s most Popular Sports’. Totalsportek.com. Retrieved 2020 April 15 from <https://www.totalsportek.com/most-popular-sports/>

- MacKinlay, A.C. (1997). Event Studies in Economics and Finance. *Journal of Economic Literature*, 35(1), 13-39.
- MacKinlay, A.C., & Campbell, J. (1996). The Econometrics of Financial Markets. *Macro Dynamics*, 2, 559-562.
- Manoli, E. (2016). Media Relations in English Football Clubs. *Contemporary Sport Marketing: Global Perspectives*, chapter 8, 1-24.
- Martineau, P. (1959). Sharper Focus for the Corporate Image. *Harvard Business Review*. 3(1), 49-58.
- Maurya, U. K. (2012). What is a Brand? A perspective on Brand Meaning. *European Journal of Business and Management*. 4(3). 124.
- Nasdaq, (2020). Glossary: Abnormal Returns. Nasdaq.com. Retrieved 2020 April 23
<https://www.nasdaq.com/glossary/a/abnormal-return>
- Newbold, P., Carlson, L. W., & Thorne, N.B. (2013). *Pearson Education Limited*. Edition 8, P.634.
- Nofsinger, J. R. (2001). The impact of public information on investors. *Journal of Banking and Finance*. 25(2), 383-417, 1339-1366.
- Peterson. L. R. (2002). Buy on the Rumor: Anticipatory Affect and investor Behaviour. *The Journal of Psychology and Financial Markets*, 3(4), 218-222.
- Poli, R., Ravani, L., and Besson, R. (2018). Financial analysis of the transfer market in the big-5 European leagues (2010-2019). *CIES Football Observatory Monthly Report*. Issue 47.
- Putranto, P. (2019). The effect of Cristiano Ronaldo's Recruitment on Football Club's Stock Prices in Italian League. *Journal of Economics and Sustainable Development*, 10(4), 165-167.
- Rehki, D. (2016). What is the importance of ROE for investors?. *Economictimes.com*, Retrieved 2020 May 1 from <https://economictimes.indiatimes.com/markets/stocks/news/what-is-the-importance-of-roe-for-investors/articleshow/51640483.cms>
- Renneboog, L., and P. Vanbrabant. (2000). Share price reactions to sporty performance of soccer clubs listed on the London stock exchange and the AIM Center for Economic Research. *Working Paper 2000-19*. Tilburg University.
- Saraç, M., and Zeren, F. (2013). The Effect of Soccer Performance on Stock Return: Empirical Evidence From "The Big Three Clubs" of Turkish Soccer League. *Journal of Applied Finance and Banking*, 3(5), 299.
- Shukla, A., & Nerlekar, S. (2019). Impact of Digitization Transformation on Financial Markets. *MET Management Retrospect*, 3(1).11-20. Available at
<http://dx.doi.org/10.2139/ssrn.3342126>
- Shiller, R. J. (1981). The use of volatility measures in assessing market efficiency. *The Journal of Finance*, 36.2, 291-304.
- Stadtmann, G. (2006). Frequent news and pure signals: The case of a publicly traded football clubs. *Scottish Journal of Political Economy*, 53(4), 485-504.
- STOXX Index, (2020). Stoxx.com. Retrieved from <https://www.stoxx.com/index-details?symbol=FCTP>

- Szymanski, S. (1998). Why is Manchester United So Successful?. *Business Strategy Review*, 9(4), 47-54.
- The European Business Review. (2019). How Football Clubs are Building Global Brand Equity. *Europeanbusinessreview.com*. Retrieved 2020 April 5 from <https://www.european-businessreview.com/how-football-clubs-are-building-global-brand-equity/>
- TransferMarkt. (2020). Transfer Records. *Transfermarkt.com*. Retrieved 2020 March 19 from <https://www.transfermarkt.com/statistik/transferrekorde>
- White, J. (2019). Asia pre-season tours: Barcelona, Manchester clubs and Juventus lead visits to China, Japan and Singapore. *South China Morning Post*. Retrieved 2020 April 5 from <https://www.scmp.com/sport/football/article/3008389/asia-pre-season-tours-barcelona-manchester-clubs-and-juventus-lead>
- Zuber, R.A., Patric, Y., Lamb, R.P. and John M, G. (2005). Investor-fans? An examination of the performance of publicly traded English Premier League Teams. *Applied Financial Economics*, 5(15), 305-313.

10. Appendix

Figure 2. Manchester United FC share price development

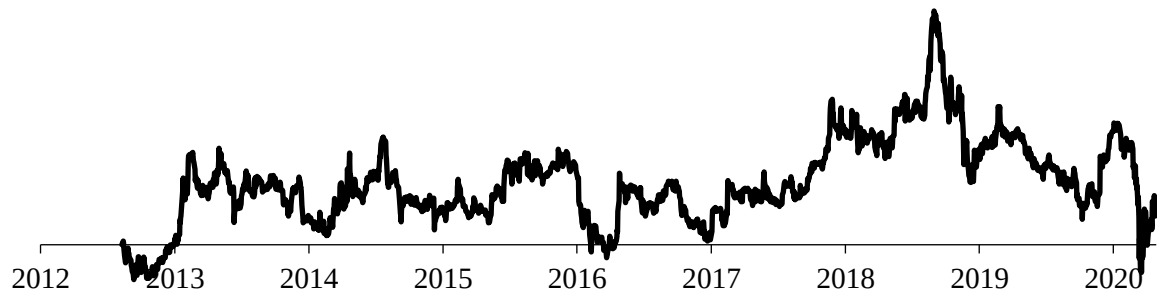


Figure 3. Borussia Dortmund share price development

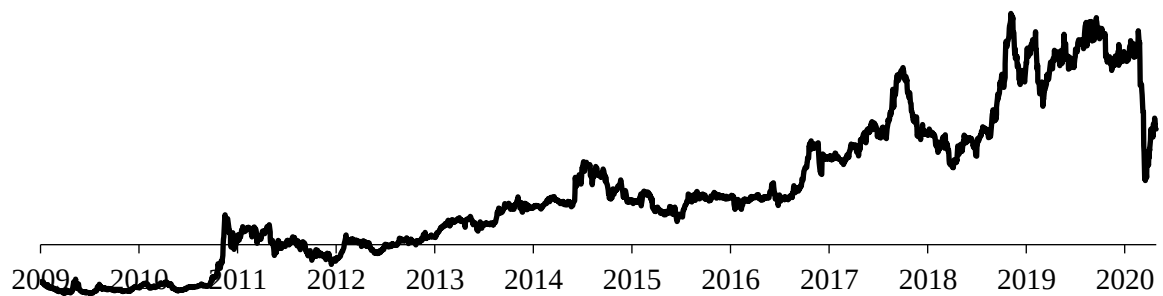


Figure 4. Juventus FC share price development

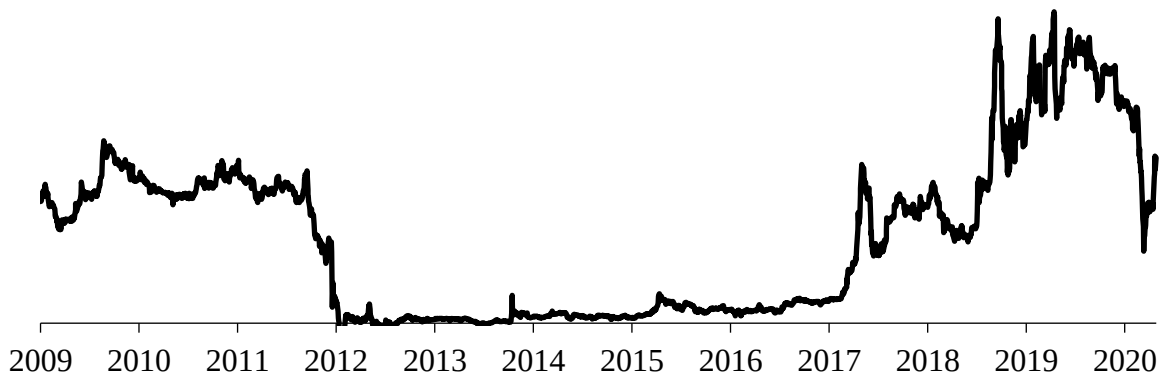


Figure 5. AS Roma share price development

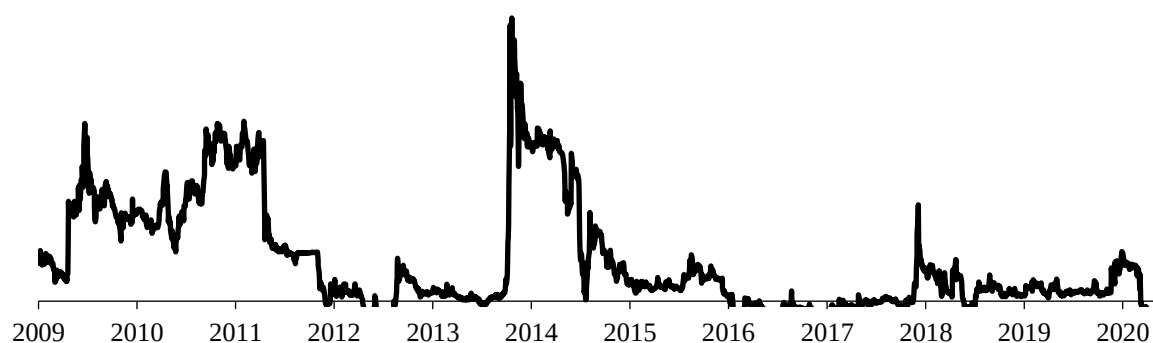


Table 6. Correlation matrix

<i>Pearson correlations for independent variables and the CAR (-1;1)</i>						
	Fee	Forward	Midfielder	Defender	Goalkeeper	CAR (-1;1)
Fee	1.0000					
Forward	0.0642	1.0000				
Midfielder	0.0169	-0.4844	1.0000			
Defender	-0.0346	-0.4980	-0.4146	1.0000		
Goalkeeper	-0.1189	-0.1562	-0.1300	-0.1337	1.0000	
CAR (-1;1)	-0.0801	0.1367	-0.1502	-0.0293	0.0742	1.0000

Table 7. Correlation matrix

<i>Pearson correlations for independent variables and the CAR (-3;3)</i>						
	Fee	Forward	Midfielder	Defender	Goalkeeper	CAR (-3;3)
Fee	1.0000					
Forward	0.0642	1.0000				
Midfielder	0.0169	-0.4844	1.0000			
Defender	-0.0346	-0.4980	-0.4146	1.0000		
Goalkeeper	-0.1189	-0.1562	-0.1300	-0.1337	1.0000	
CAR (-3;3)	0.0013	0.0704	-0.0106	0.0870	-0.1151	1.0000

Table 14. Spearman's rank correlation test output table

*Spearman correlation test to research which revenue types are correlated to transfer fee.
Spearman's rho is presented*

Manchester Utd	Yearly transfer fee	Matchday revenue	Commercial revenue	Broadcast revenue
Yearly transfer fee	1.0000			
Matchday revenue	0.1211	1.0000		
Commercial revenue	0.8424*	0.2000	1.0000	
Broadcast revenue	0.7818*	-0.1515	0.7939*	1.0000
N	10	10	10	10

* $p < 0.01$

Table 15. Spearman's rank correlation test output table

*Spearman correlation test to research which revenue types are correlated to transfer fee.
Spearman's rho is presented*

BVB	Yearly transfer fee	Matchday revenue	Commercial revenue	Broadcast revenue
Yearly transfer fee	1.0000			
Matchday revenue	0.8632*	1.0000		
Commercial revenue	0.7939	0.6748**	1.0000	
Broadcast revenue	0.6485**	0.4924	0.6485**	1.0000
N	10	10	10	10

* $p < 0.01$, ** $p < 0.05$

Table 16. Spearman's rank correlation test output table

*Spearman correlation test to research which revenue types are correlated to transfer fee.
Spearman's rho is presented*

Juventus	Yearly transfer fee	Matchday revenue	Commercial revenue	Broadcast revenue
Yearly transfer fee	1.0000			
Matchday revenue	0.6364*	1.0000		
Commercial revenue	0.7091**	0.8909**	1.0000	
Broadcast revenue	0.6121	0.9515*	0.8545*	1.0000
N	10	10	10	10

* $p < 0.01$, ** $p < 0.05$

Table 17. Spearman's rank correlation test output table

*Spearman correlation test to research which revenue types are correlated to transfer fee.
Spearman's rho is presented*

Roma	Yearly transfer fee	Matchday revenue	Commercial revenue	Broadcast revenue
Yearly transfer fee	1.0000			
Matchday revenue	0.7295**	1.0000		
Commercial revenue	0.4681	0.5823	1.0000	
Broadcast revenue	0.8146*	0.8902*	0.3018	1.0000
N	10	10	10	10

* $p < 0.01$, ** $p < 0.05$