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Master Thesis M.Sc. Economics and Business - Strategy Economics

Analyzing the timing and immediate effect of club takeovers in the European Top-5 nations

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Abstract

In this study, I investigate the timing and effects of club acquisitions by majority investors in European football. More specifically, I observe the relationship of their takeovers to team investments, sporting performance, and the sporting performance to wage expenditure ratio. The effects are estimated in the largest data sample to date, including a total of 215 clubs and 238 takeover events from the largest five European league structures. I find that private majority investors acquire clubs with significantly lower normalized wage expenditure, controlling for Club and Year Fixed Effects. Subsequently, the wage expenditure increases significantly by 5.5 percentage points. These effects are higher for foreign investors, compared to domestic investors by 16.1 percentage points. Furthermore, the takeovers occur at a significantly low degree of sporting competitiveness, measured by the Elo coefficient. During the takeover and one year after the takeover, the sporting competitiveness of the club decreases furthermore significantly. The overall decrease in sporting performance is driven by the activities of domestic investors. Consequently, the ratio between sporting performance and wage expenditure decreases. The interpretation of the findings is limited to a potential non-random treatment bias and a potential attrition bias in the sample.

Overview of Tables

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Overview of Abbreviations

GDP	Gross Domestic Product	SAD	Sociedad Anomina Deportiva
UCC	UEFA Club Competitions	pp	percentage points
CAGR	Compounded annual growth rate	PPG	Points per Game
UEFA	Union of European Football Associations	FFP	Financial Fair Play

1. Introduction

European club football is the largest football market in the largest sport globally and has a major cultural and economic influence (European Leagues, 2019; topendsports, 2008). The involvement and the effect of majority investors in European club football is a highly debated topic. There are different dominant views and regulations throughout football federations in Europe (Linklater LLP, n.d.). How these markets should be organized and regulated has thus major importance.

As investors in the football community professionalized, their impact on the market comparatively grew (Hagen & Nascimento Cunha, 2019). In 2012, clubs in private majority ownership accounted for approximately 75% of the revenues in European football, 80% of wage expenditure, and 90% of transfer expenditure paid (Rohde & Breuer, 2017). English football has increased its global attractiveness and market position through investor involvement. Germany on the other hand has decided to pursue a different path, generally disallowing clubs to be taken over by majority investors. Many supporters argue that a club consists of its members, the supporters (Peeters & Szymanski, 2014). The acquisition of a club by an individual contradicts that view.

Previous literature has analyzed the effects of investors on clubs mostly in theoretical papers (Rohde & Breuer, 2017). Furthermore, there are a few empirical papers, observing differences based on club ownership status (Wilson et al., 2013; Plumley et al., 2014; Rohde & Breuer, 2016). However, none of these studies sufficiently isolates the effect that directly results from the takeover in a data sample with strong statistical power. For example, Rohde and Breuer (2016) conclude their finding on the basis of 14 takeovers. To address this gap in the literature, this study uses panel data from 215 clubs over 14 years to distinguish ex-ante from ex-post takeover phenomena. It considers a total of 238 takeovers, the largest ownership dataset of clubs used to date.

This study uses three indicators to evaluate those effects. These are team investments, sporting performance, and a ratio for operating efficiency. Team investments are formulated as wage expenditure, sporting performance is measured as points per game and the Elo coefficient of the club, and efficiency is measured as the ratio of sporting performance to wage expenditure. The models use a time indicator around the takeover event which considers the season before, the season during, and the season after the takeover. This dependent variable aims to draw empirical conclusions about the timing (*before the takeover*) and the effect (*during and after the takeover).* Furthermore, all models controlled for Club and Year-Fixed Effects to compare the coefficients of the team to their comparable levels.

The study finds that clubs tend to be subject to a takeover when they have a relatively low wage expenditure. During the takeover, the wage expenditure increases significantly by 5.5 percentage

points, for which the wage difference after the takeover is no longer significantly lower. The increase in wage expenditure is likely a result to achieve a social buy-in, in which a majority owner aims to mitigate their opposition. Furthermore, the takeover occurs at a significantly low level of sporting performance, when measured in Elo rating. The sporting performance decreases furthermore within the two following seasons, in which it becomes negatively significant for both sporting measurements. Because of the increase in wage expenditure and the decrease in sporting performance, the ratio between sporting performance to wage expenditure decreases temporarily. The effects are furthermore driven by the activity of foreign investors. Compared to domestic takeovers, foreign investors increase the wage expenditure significantly by 16.1 percentage points and increase the points per game by 13.3 percentage points. The findings are mostly statistically robust, however, may be subject to a non-random treatment bias since the takeovers do not occur randomly. Furthermore, the sample may be subject to an upward attrition bias.

The remainder of the study is structured as follows. Chapter 2 focuses on analyzing previous literature and aims to uncover the motives and intentions of investors in a market-specific context. Chapter 3 describes the methodological approach for the empirical part of this study and formulates the variables and data included. Chapter 4 presents the results of the empirical part and elaborates on the findings. Chapter 5 presents the limitations of the findings, and Chapter 6 draws a conclusion about the findings.

2. Literature Review

2.1. Economics of European Club Football

2.1.1. Economic theory of European Club Football

From an economic perspective, professional football teams compete by applying strategies that maximize the return of available assets and individuals directly or indirectly involved in the game, such as players, staff, and club infrastructure. As club football allows for player mobility, the clubs compete in attracting the best playing talent to generate the highest playing performance (Dobson & Goddard, 2011). Hereby, they aim to attract the most fans, which then generate the highest revenue. Therefore, football clubs compete in business terms against each other (Garcia-del-Barrio & Szymanski, 2009). Since the clubs generate a significant part of their revenue from their fans, the football club industry is generally classified as an entertainment product (Szymanski, 2010).

European club football[1] is the largest football market globally, featuring more professional leagues and clubs than anywhere else on earth, and a total of 40% of all professional football players (Peeters & Szymanski, 2014; European Leagues, 2019). European football clubs aim to maximize the value that they create for their fans, as they essentially collect funds from their fans and redistribute them as welfare-generating products (Garcia-del-Barrio & Szymanski, 2009; Madden, 2012). Fan welfare is generated by the satisfaction of the fans resulting from strong performances on the pitch, such as winning games against other teams (Garcia-del-Barrio & Szymanski, 2009).

Therefore, clubs face a maximization problem, as they essentially face trade-off decisions between the prices they charge, such as through stadium tickets and merchandise, in relation to the inherent surplus of welfare they generate through their investments (Madden, 2012; Szymanski, 2017). Additionally, they may generate profits through their activities (Weimar, 2019).

Squad selection and planning are one of the most crucial activities for football clubs to maximize their performance. Consequently, the activities in the transfer market resemble direct asset decisions taken by a club (Beiderbeck et al., 2021). The two main strategies to invest funds for better sporting outcomes are the acquisition of new players in the transfer market and enhancing club infrastructure (Beiderbeck et al., 2021). Acquiring players leads to more immediate results in terms of sporting performance, but tends to underlie a higher variance, therefore being the strategy with a higher risk (Beiderbeck et al., 2021).

Generally, clubs are motivated to conduct player transfers to improve the output and efficiency of their players to increase the probability of winning matches, which subsequently results in higher fan satisfaction, higher revenue, and higher club valuation (Madden, 2012; Rohde & Breuer, 2016). Therefore, all clubs are expected to conduct activities on the transfer market, if they expect positive returns from their investments (Garcia-del-Barrio & Szymanski, 2009). As these decisions are mostly conducted before and during the start of a season, they are subject to the assumptions, expectations, and risk tolerances of managing individuals.

Following investment and divestment decisions, football clubs compete against each other in the market. The European club competition is structured as a pyramid, with national competitions at the base of the pyramid and the UEFA Club Competitions (hereafter: *UCC)*, on top (Bundesliga, 2020). Each professional club of the 55 national associations, excluding Liechtenstein, participates in their national league system (Bundesliga, 2020). In these competitions, European football clubs generate most of their revenue from national broadcasting revenue, individual club commercial

[1] European club football is hereafter defined as the national and continental competition of professional football clubs that are based in member nations of the European football association, UEFA.

income, and matchday income (European Leagues, 2019). Matchday income used to be the main source of income but has significantly decreased in importance relative to broadcasting and commercial income, as a result of emerging distribution channels (European Leagues, 2019). Therefore, clubs are less dependent on their local crowds but can attract fans globally. This has increased the economic potential of European club football and led to increasing globalization of the sport.

When reaching certain performance criteria, such as winning the league, the club may qualify for UCC in the consequent season. How this performance criterion is formulated exactly depends on the number of national spots available, and how these spots are distributed (Bundesliga, 2020). UCC competitions are highly attractive for clubs since they increase their global recognition, matchday income, commercial income, and broadcasting income (European Leagues, 2019).

Better-performing leagues receive more spots than smaller leagues (Bundesliga, 2020). As football clubs are unlikely to relocate, their nationality may thus influence their success probability. Furthermore, the UCC revenues can contribute to a serial correlation of sporting success, due to higher investment possibilities, fostering positive externalities on other revenue streams (Franck, 2010). Therefore, clubs with high market power or capital accumulation are expected to achieve relatively higher returns on their investments, as a result of their existing market power and capital intensity, compared to other actors in the market. This is also described as the Matthew effect, which is commonly observed in sports markets (Franck & Lang, 2014; Weimar, 2019; Yegorov et al., 2022). The distribution of UCC revenue is concentrated on a fraction of clubs in Europe and has thus partly contributed to a growing divergence of club growth (European Leagues, 2019; UEFA, 2015).

2.1.2. Economic development of European Club football

Today, football is the most popular sport with an estimated 3.5 billion fans globally (European Leagues, 2019; topendsports, 2008). As the largest football market globally, European club football plays a significant role in the development of football to date (European Leagues, 2019). However, a decrease in overall competitiveness is observable, resulting from divergent club revenues and growth (García-Cebrián & Espitia-Escuer, 2016). Especially the Top-5 leagues, consisting of England, France, Italy, Germany, and Spain have created a strong gap to their pursuers.

Winning 16 out of 17 competitions in the Champions Leagues between 2002 and 2019, and 12 of 17 titles in the Europe League[2], the Top-5 leagues have dominated Europe's continental club competitions (transfermarkt 2022a; transfermarkt 2022b). Consequently, clubs of the Top-5

[2] The predecessor of the Europe League before 2009, named "UEFA Cup", has been considered in this analysis.

leagues have witnessed strong recent revenue growth since the beginning of the 21st century. These clubs increased their operative revenue by a yearly compounded annual growth rate (hereafter *CAGR*) of 7.74% between the fiscal year of 2008 to 2019 (European Leagues, 2019). The growth is significantly larger compared to clubs of smaller league clusters, which averaged 3-5% CAGR (European Leagues, 2019).

This consolidation is expected to persist in the future, as these leagues have a structural competitive advantage in receiving more qualification spots in UCC competitions (Peeters & Szymanski, 2014). Furthermore, clubs from smaller leagues are likely to be structurally disadvantaged in their ability to generate significant revenue out of sporting success or sell players for considerable sums: Since these clubs have fewer opportunities to prove their competitiveness against the best, their players' valuation tend to be lower (Hoey et al., 2021; Peeters, 2011). As a result, 27 of the 32 most-valued football clubs in 2019 played in one of the Top-5 leagues (KPMG, 2019).

To address cash injections from owners to climb up the competitive ladder, the UEFA introduced the break-even requirement of the Financial Fairplay regulation in the season 2013/14. The financial fair play aims to address increasing investor activity and financial market risk. It restricts the direct investments of a club in sporting activities to its sporting-related income (Peeters & Szymanski, 2014). The implementation of the regulation has faced criticism for likely cementing the position of incumbent top teams since they are more likely to maintain and increase their leadership (Peeters & Szymanski, 2014). Consequently, clubs in the Top-5 leagues are highly likely to maintain their status as attractive investments for investors.

The market growth correlates to a general price increase in the market. The transfer sums of players and wages have grown to an all-time high during the 21st century, which led to higher operative and investment costs for football clubs (European Leagues, 2019). This resulted in higher market entrance costs, which attracted more wealthy and professionalized investors, compared to the previous owners in the 20th century (Hagen & Nascimento Cunha, 2019).

To conclude, the Top-5 leagues have been highly competitive in terms of sporting- and financial performance during the 21st century and won most of the UCC competitions. Teams from the Top-5 leagues maintain a structural competitive advantage, which classifies them as highly attractive investments. As the market entrance costs for investors increased, the individuals buying clubs were more professionalized and possessed higher funds.

2.2. Private Majority Investors in European Club Football

2.2.1. Ownership structures of European football clubs

Since club governance represents the voting rights behind a club, ownership has major implications on operational, tactical, and strategical decisions and underlying organizational objectives. There are three main distinctions between the ownership structures of European football clubs, considered in the existing literature: fan ownership, publicly traded clubs, and private ownership (Hagen & Nascimento Cunha, 2019; Franck, 2010). In the following, private ownership will be further separated by majority[3] and non-majority ownership.

The fan ownership model is a non-profit organization structure, that democratically elects representatives that take over management functions, without being personally liable (Franck, 2010). The residual rights, meaning the right to decide regarding investments, are heavily limited and non-transferrable as the club consists of its members, which normally have one vote per member (Franck, 2010). Furthermore, residual claims, also the right to profit of the organization, are nonexistent, due to the non-profit orientation of the organization (Franck, 2010). Therefore, financial investors are limited in generating profits.

Publicly traded clubs normally consist of a strongly dispersed ownership structure of stockholders. These stockholders have the right to elect directors, vote on the corporate charter of the club, or can vote on organic changes (Franck, 2010). However, their ability to influence the operative business is limited, since they hold a relatively small share, and transfer their participation rights in operating decisions to representatives, such as board members (Franck, 2010). Therefore, they are not the holders of the residual rights of control in the public corporation, as long as they are not a majority stockholder (Franck, 2010). However, stockholders hold residual claims and have the right to receive dividends on their investments.

Generally, privately owned clubs have a similar governance structure to publicly listed clubs, however, they tend to have a lower ownership dispersion, due to their limited ability to trade shares (Franck, 2010; Rohde & Breuer, 2016). This increases their access to residual rights as there is lower anonymity within the group of investors (Franck, 2010). Furthermore, due to different governance structures compared to public firms, the investors have more information access rights and can influence operational decisions to a higher degree. This increases control over the governance, especially for majority-owned clubs, which effectively hold residual rights, due to their majority of voting power (Franck, 2010). The investors hold the residual claims and can profit from their

[3] Private majority ownership is hereby defined as the exclusive possession of at least 50% of the voting rights of the controlling entity of one football club by a private or institutional entity

investment (Franck, 2010). Therefore, private investors have the highest participation rights in the club, of the three ownership structures. On the other hand, since there is a higher ownership concentration and lower anonymity within the investor community, they are subject to higher public exposure. Thus, their actions are publicly discussed and linked to the sporting performance of the club (Franck, 2010). This especially holds for majority owners, which are highly exposed to local communities as the connection of their actions to the performance of the club (Franck, 2010).

To conclude, clubs in fan ownership have a non-profit orientation and do not consolidate rights to efficiently manage an asset. As a result, these clubs do not qualify as attractive opportunities, rather investors in the football market are more likely to acquire an equity stake in a privately owned club. As shareholders in a privately owned club, they are eligible to financially profit from their investment gains and receive dividends from their investment. Moreover, if they acquire a majority stake in a club, the investors are actively able to manage the club in alignment with their overall investment strategy. Generally, they are likely to maximize their profits to generate a return on their investment. However, they are subject to public discussion in the assessment of their managerial capabilities.

2.2.2. Entrepreneurial activities of majority club owners

Private majority-club owners of clubs aim to maximize their return as active investors in entrepreneurial activities, including *"*creating value by exploiting some form of change – either shifting resources or, more directly, improving productivity" (Bull & Whittam, 2020). This also holds for the immediate time after the acquisition, as they can minimize their transaction costs and welfare loss from externalities (Rohde & Breuer, 2016). Therefore, the early entrepreneurial activities of new private majority club owners mark the introduction of their objectives and strategy into the club governance to employ strategic capital in their assets for long-term value creation (Bull & Whittam, 2020).

As a result of the acquisition, the optimality conditions, meaning the Pareto efficient behavior of the club, may have changed. Therefore, the club may have a higher or lower level of optimal risk, depending on the owners' effect on bailout probability and overall ownership concentration (Franck & Lang, 2014; Rohde & Breuer, 2016). For example, the optimal risk of the club is formulated by the bailout probability of the owner, which may significantly change with a new owner (Franck & Lang, 2014). Moreover, investment motivation could have a significant influence on the bailout probability of the owner. If the new investors have a strong willingness to pay for social and political acceptance or anticipate spillovers to other investments, they may strictly be interested in increasing the sporting performance, which results in a higher bail-out probability

(Franck, 2010; Franck & Lang, 2014). The investors are expected to account for a possible shift in risk optimality and adjust to the ex-post Pareto-efficient level, under consideration of their future expectations.

Since football is an entertainment product, the investors are subject to public exposure during and following the acquisition (Franck, 2010). Therefore, they are expected to consider social and political capital during their entrepreneurial activities to minimize opposition and "buy-in" to social structures (Franck, 2010; Bull & Whittam, 2020). This is especially expected during the early entrepreneurial execution, to lock in fans and politicians positively, mitigating current and future opposition. This social and political capital is mostly generated from strong sporting performance (Bull & Whittam, 2020).

To conclude, following the acquisition of a majority owner of a private club, optimal risk, governance objectives, and strategy may significantly shift. During the early entrepreneurial activities, majority-owner are expected to account for their social buy-in to local communities and politics and have a strong motivation to generate high value within a short period of time to mitigate opposition.

2.3. The early effects of majority investors on clubs

Since the beginning of the 21st century, football has grown into one of the largest entertainment products globally, and created, due to major technological progress in the commercialization of the sport, high value for football fans worldwide. This development has increased investment returns and market entrance costs (Hagen & Nascimento Cunha, 2019). As new investors had to cope with higher market entrance costs, they are likely to have high financial funds, which increases, on the other hand, the optimal risk for the club (Rohde & Breuer, 2017; Franck & Lang, 2014).

When investors acquire a club, they immediately introduce systemic changes and new objectives into the club and engage in entrepreneurial activities to maximize the return on their investment (Bull & Whittam, 2020). Furthermore, regardless of their investment strategy, they are expected to trade profits for value generation at the beginning of the investment cycle to mitigate public opposition, conducting a "social buy-in" (Franck, 2010; Bull & Whittam, 2020). Finally, the investment motivation of these new investors is expected to be high in the European Top-5 leagues, due to structural competitive advantage, strong market growth, and the introduction of the Financial Fairplay regulation especially favor the ones on top of the competitive pyramid (Yegorov et al., 2022; Peeters & Szymanski, 2014; Peeters, 2011; KPMG, 2019). For this reason, clubs in the Top-5 leagues will likely maintain their dominant status in European football.

So far, most literature about the financial and sporting impact of private investors in football has been theoretical. Rohde and Breuer (2017) analyzed existing literature and found no previous

scientific work that analyzes the financial impact of private investors on football clubs. However, some researchers, such as Wilson et al. (2013) and Plumley et al. (2014), analyzed the relationship between ownership structure and sporting performance. First, these studies lacked statistical robustness and included at most 200 observations. Second, due to limited data availability, their methodology was unable to address whether these observations resulted from ex-ante, or ex-post observations. This methodologic weakness was addressed by Rohde and Breuer (2016), who analyzed the Top-30 European clubs over a 10-year period, in terms of their financial performance, sporting performance, and team investments. However, the explanatory power of their findings is limited, as their dataset only considered a total of fourteen takeover events.

Therefore, to my knowledge, there is no literature available that uses a sufficiently sized dataset to draw conclusions about the effect of club owners on the sporting- and financial performance of football clubs. This study aims to address this gap and uses the largest dataset of ownership-, financial-, and sporting performance data to establish empirical conclusions about the timing (*before the takeover*) and effect (*after the takeover*) of club acquisitions.

2.3.1. Takeover and Team Investments

While the football market is becoming increasingly professional and investors are expected to maximize the value of their investments, the social tie between investors and clubs is expected to become less important. Furthermore, the choice in which club to invest is expected to become less random, while more emphasis will be put on measurable parameters (Bull & Whittam, 2020). Therefore, investors are expected to choose investments, in which they identify a high upside potential. This is likely to be the case when the club performs at a relatively low level. Namely, when a club is a relative underperformer, the investment costs are also lower while the upside gains of investments provide higher marginal benefits.

Furthermore, the implementation of Financial Fairplay has restricted the possibility of investors increasing expenditure, since they may be penalized for the surplus in expenditure when qualifying for UCC competitions. As the investors are still expected to seek a sufficient number of available resources to conduct their entrepreneurial resources, investors are expected to take-over clubs at a comparably low level of wage expenditure, which decreases the amount of working capital, that has been attributed to assets by the previous governance structure.

H1a: Clubs that were acquired by new majority owners are expected to have significantly lower team investments than in seasons in which they were not acquired.

Secondly, the investors are expected to conduct entrepreneurial activities immediately after their takeover, to mitigate public opposition (Franck, 2010; Bull & Whittam, 2020). Since player acquisition represents a direct opportunity to immediately improve sporting performance, the investors are expected to create significant parts of their activities in this field (Beiderbeck et al., 2021). Therefore, they are expected to significantly increase the investments in team expenditure within the first season after acquiring a club. This expectation is partially in line with Rohde and Breuer (2016), Wilson et al. (2013), and Plumley et al. (2014) who found that clubs being owned by a majority investor, tend to have higher team investments in particular.

H1b: Clubs are expected to significantly increase their team investments in the season being acquired.

2.3.2. Takeover and Sporting Performance

Due to the hypothesized low wage expenditure of the clubs, and as a result of the correlation between wage expenditure and sporting success, the sporting performance of the clubs that are acquired is expected to be low as well. Parker and Stuart (1997) argue that football brands have encompassed values and that switching costs are comparatively high for supporters. Thus, clubs, performing at a relatively low level are expected to maintain a high commercial potential.

H2a: Clubs that were acquired by a new majority owner are expected to perform at a significantly lower level in the national league than in seasons in which they were not acquired.
H2c: Clubs that were acquired by a new majority owner are expected to have a significantly lower sporting performance than in seasons in which they were not acquired.

If this assumption holds, clubs performing at a comparatively low level could realize high investment returns, due to the low acquisition price and high revenue potential. Therefore, this study expects that clubs that were acquired by a new majority owner have a lower sporting performance, compared to seasons in which they were not acquired. Since sporting performance is dependent on different dimensions, such as own competitiveness and league competitiveness, it will be measured in two different variables.

Wilson et al. (2013) found that in the British Premier League, clubs owned by a foreign majority investor tended to perform better in the league. Therefore, the clubs are expected significantly increase their sporting performance in a short period of time, as a reaction to the new governance objectives and entrepreneurial activities.

H2b: Clubs are expected to significantly increase their national league performance in the season being acquired.
H2d: Clubs are expected to significantly increase their sporting performance in the season being acquired.

2.3.3. Takeover and Operating Efficiency

Since coping with high market entrance costs, the new investors likely possess more liquidity and are more professionalized (Hagen & Nascimento Cunha, 2019). Therefore, they are expected to identify highly efficient takeovers that have high upside potential to realize returns on their investment. Especially as the introduction of the financial fair play, which generally limits expenditure to income, it has become more challenging to temporarily invest strongly in a better team, since this would generate high losses. This has fossilized the existing market structure (Peeters & Szymanski, 2014). However, teams with a relatively low wage expenditure, compared to their sporting performance, are relatively unaffected by this regulation. Therefore, the investment possibilities for clubs with relatively low wage expenditure, compared to their sporting performance, are higher. For this reason, I expect that clubs have a significantly higher efficiency between those terms in seasons they become a takeover target, compared to seasons, in which they are not.

H3a: Clubs that were acquired by a new majority owner are expected to have a significantly higher operating efficiency in terms of team investments to national league performance than in seasons in which they were not acquired.
H3b: Clubs that were acquired by a new majority owner are expected to have a significantly higher operating efficiency in terms of team investments to sporting performance than in seasons in which they were not acquired.

2.3.4. Takeover and Investor Origin

For several reasons, previous literature emphasizes the effect of foreign investors (Rohde & Breuer, 2016; Bull & Whittam, 2020; Wilson et al. 2013). First, the initial cultural and social distance between owners and clubs is expected to be higher for foreign owners, compared to domestic owners (Bull & Whittam, 2020). Therefore, the entrepreneurial buy-in may be higher for foreign owners, since they face a higher degree of political and social skepticism, as a result of their weaker ties to the club (Bull & Whittam, 2020). Second, they are more likely to anticipate spillovers to other businesses and investments (Bull & Whittam, 2020). For this reason, they could be more motivated to increase the sporting performance of the club and not emphasize generating short-term investment returns with the club (Franck, 2010). These theories are in line with existing

empirical literature, which found a statically lower degree of financial performance, and a higher degree of sporting performance, for clubs in foreign ownership (Wilson et al., 2013; Plumley et al., 2014). Furthermore, Rohde and Breuer (2016) found that the wage in foreign ownership had a higher wage expenditure of 21%, compared to clubs that were not. Therefore, the hypothesized effects are expected to be significantly stronger for foreign investors, compared to domestic investors.

H4a: The increase in team investments is expected to be significantly higher for takeovers of foreign investors than for takeovers of domestic investors.
H4b: The increase in national team performance is expected to be significantly higher for takeovers of foreign investors than for takeovers of domestic investors.
H4c: The increase in sporting performance is expected to be significantly higher for takeovers of foreign investors than for takeovers of domestic investors.

3. Methodology

3.1. Data

3.1.1. Data Collection

The empirical analysis of this research uses three different data sources. The main dataset was provided by the Erasmus Centre for Applied Sports Economy and consists of game- and season-level data of European football clubs. The dataset includes variables on game- and season-level for financial performance and national sporting results of European football clubs from Belgium, England, France, Germany, the Netherlands, Italy, Portugal, and Spain between 1994 and 2018. The financial data originates from the audited financial statements of the clubs and has been collected from the respective national firm registers. Foreign currencies have been converted to Euros based on the exchange rate of the 30th of June in each financial year (Hoey et al., 2020). The dataset has been used in previous research, such as by Hoey et al. (2020), Peeters and Szymanski (2014), and Peeters and van Ours (2022). The dataset was unbalanced, meaning that some data for some clubs in certain seasons were not included. It includes most observations for the first and second divisions in England, Italy, and France, and for the first division in Spain and Germany. Thus, clubs were not included in the data when they got relegated to the second or third division, depending on their country. Furthermore, the financial data was subject to country-wide gaps, due to data non-availability. I tried to collect the remainder of the data using Orbis, transfermarkt, and national registers for audited financial statements. Despite limited success in acquiring the missing

data, I managed to add 44 more observations. Foreign currencies have been converted as in Hoey et al. (2020).

Data about investor acquisitions have been manually collected from Orbis. Orbis is a data portal of Bureau van Dijk, an analytics company of the rating agency Moody's. It aggregates company information for close to 400 million private and public companies from over 170 separate data providers (Orbis, n.d.). First, I investigated the company entity of each club. As some clubs formed separate firms for their merchandising, ticketing, or infrastructure maintenance, I focused on the companies that were responsible for organizing professional football activities. I collected the information about stakeholder changes from the *shareholder history* tab in Orbis. A stock acquisition was identified as a majority acquisition when it resulted in an aggregate of more than 50% of direct total ownership post-acquisition. If there was no takeover activity at this firm, I investigated clubs' holding companies. Since some holding companies were founded during the period of observation, the clubs had shareholder activities for both the footballing unit and the holding. Thus, depending on the timing, frequency, and controlling entities of these two companies, I then considered takeovers of either one or both companies in the data. In rare cases, where I could not find any shareholder activity in Orbis, I reassured my findings by searching for press reports about investor activity. For clubs that filed for bankruptcy during my panel, I investigated whether the company was present during playing professional football, as most insolvency proceedings led to relegation.

As some of the owners transferred ownership from one company to another, for example from a company registered in the UK to a company registered in the Marshall Islands, I investigated the controlling entities of each company. If the ownership transfer concluded with no change of the actual controlling identity behind the company, the acquisitions have been omitted, therefore representing no takeover event in the data. Moreover, due to missing information in Orbis, the controlling identity of a shell company could not be identified in some cases. If this was the case, available press information, public relations statements, and club history summaries were consulted to identify if the transfer represented an actual majority ownership change. Finally, I separated takeovers by origin, distinguishing domestic and foreign investors as of the nationality in Orbis. More specifically, if the takeover was conducted by a controlling entity of a private person, their nationality, as of Orbis, was used. However, if the takeover was conducted by a firm, the origin of the firm's ultimate global owner was chosen, which in some cases is a person and sometimes a holding company. This approach follows how I identified stock acquisitions as ownership changes. An overview of the manual matching from club to firm entity can be found in Table 12 of the Appendix. The takeover data is strongly balanced and includes a total of 215 clubs over a period

of 14 years. To my knowledge, it is the largest set of takeover data in football, used in research to date.

Finally, information about the total sporting performance was collected from the open-data platform clubelo.com. The website ranks teams from 1950 to 2022 based on the expected and actual outcome on the game level, therefore also accounting for the performance distance between the teams (Schiefler, n.d.). Thus, winning against a stronger opponent will result in higher Elo points, than winning against a weaker opponent and may thus be more unbiased than one-dimensional rankings. The Elo coefficient and Elo rank of the six hundred strongest clubs in Europe for each year during the observation was acquired and merged. Clubelo.com has been referenced and used as a source in comparable research, such as by Csató (2022) and Geurkink et al. (2021).

3.1.2. Data Compilation

This study focuses on the Top-5 nations in Europe. Therefore, it includes observations from clubs in fan ownership, publicly listed clubs, and privately owned clubs from Spain, Italy, France, Germany, and England.

First, I removed observations before the season 2004/05. I decided to use this season as the beginning of the panel since I observed strong data gaps before and was aware of the heavily limited data collection possibilities. Despite investigating a multitude of different sources, such as the national registers, Orbis, and club websites, and finally reaching out to club and league officials to add more financial data, I could not acquire significantly more data. Furthermore, Orbis' accuracy in identifying ownership changes decreased for takeovers before that season, as the stakeholder information for southern European countries became less reliable. Next, I removed all clubs from the sample with less than 3 out of 14 possible observations from the original finance and national league performance sample, since I expected these clubs to add relatively low explanatory power and high workload to investigate their takeovers. The cut-off value of 3 observations was chosen as a result of a panel-data analysis, in consideration of achieving a reliable data sample size. A similar approach has been taken by Ruta et al. (2020).

To consolidate the data samples, I matched the club names, representing the time-invariant unique identifiers, automatically in Excel for all data sources. Moreover, I assigned the remainder of the entities manually. In addition, I used the season-end years to identify the period of the observation, when merging the datasets together. First, I tried to achieve a final dataset with balanced data for a set number of clubs during a set amount of observation period. However, after careful consideration, I decided to proceed with an unbalanced dataset, due to the high number of

missing observations which would have more than halved the sample size. For this reason, the number of observations included per regression varies and depends on the balance of the respective variables. The takeover sample was fully balanced, which implies that there are no missing observations.

Less observations were available for the sporting performance dataset with Elo coefficients. The lowest level of panel consistency came from the main data sample, in which the financial data had even lesser observations. Furthermore, regressions that include lagged variables to estimate the change from one season to another are expected to have even fewer observations, since these depend on two waves to be representative.

A total of 41 clubs filing for administration between 2004/05 and 2017/18 were identified. I decided to include clubs that have been dissolved, went into administration, or filed for bankruptcy in my research. This is because these events are likely to be a result of excessive risk-taking, for which representatives and owners of the club should be accountable. Furthermore, as the clubs directly compete against each other, the decisions of clubs that become insolvent at a later Season may influence the behavior of other clubs in the sample. Since the competitive behavior of these clubs is therefore non-random and endogenous, removing them could introduce a selection bias in my sample. However, as the dropout of the panel is therefore potentially non-random, tests for an attrition bias will be addressed in the econometric part of the research. Additionally, some clubs were involved and penalized for criminal misconduct and financial misconduct, as a result of systematic or individual wrongdoing of officials. As it is generally unknown, if these misconducts were known to the existing and/or new majority owners, they are expected to be accounted for by the owners. The direct involvement of club presidents and managers in these criminal actions, as it for example occurred at CFC Genoa, supports the rationale that these effects may be rather endogenous than exogenous, since the individuals are employed and indirectly governed by the club owner (*Genoa Demoted for Match-fixing*, 2005). Therefore, I undertook no actions to investigate and identify the penalization of clubs in my sample.

Generally, all clubs in private ownership are expected to be structurally able to be acquired by investors (Linklaters LLP, n.d.; Hamil et al., 2010). Moreover, all publicly listed clubs except for the German club Borussia Dortmund have been identified with a takeover of at least one majority owner before or during the period of observation. The list of publicly listed clubs with a majority investor includes Manchester United, Juventus Turin, AS Roma, S.S. Lazio, and Tottenham Hotspur. Clubs in fan ownership cannot get acquired by majority investors and serve as control observations in this sample to increase the statistical power of the models. Except for TSG Hoffenheim, Leverkusen, and Wolfsburg, this is the case for all other remaining German clubs,

due to the 50+1 regulation. The 50+1 rule does not allow external investors to systematically gain control over the clubs (Linklaters LLP, n.d.). Furthermore, I identified four Spanish clubs that maintained to be in fan ownership. As in Garcia-del-Barrio & Szymanski (2009), most clubs in Spain transformed into a Sociedad Anomina Deportiva (*SAD*). The SAD is a special form of a limited liability corporation, which is structurally able to trade its shares on the private market. However, some clubs, namely Real Madrid, FC Barcelona, Athletic de Bilbao, and CA Osasuna, continued to organize in a fan-owned structure, which strongly protects against the takeover of external investors. Comparable to most German clubs, I decided to keep their observations as references. I preferred this approach since I especially cannot assume that majority investors strictly maximize profits but may also just as clubs in fan ownership maximize value. In the end, my research includes observations on 215 clubs for 14 periods with a total of 238 takeovers, resulting in a total of 3,010 observations.

3.2. Variables

3.2.1. Independent Variables

The main independent variable for H1 is direct team expenditure. Total direct team expenditure consists of investments in new assets, such as transfer expenditure, and ongoing costs, such as wage expenditure. As in Pavlovic et al. (2014), transfer expenditure has been subject to different accounting methods during the period of observation. Furthermore, some clubs agreed on loan deals with buy clauses, to postpone capital outflow to a later stage, such as the acquisition of Kylian Mbappé by Paris Saint Germain (Gaillard, 2017). As Szymanski (2010) assumes a linear relationship between the total transfer expenditure and wages, the measurement of the *total personnel expenses including taxes and social security contributions* of club j in season *t*, is likely to represent the total direct team investments to a reliable degree with less fluctuation due to accounting influence. To address a strong skewness of the variable, and a systematic increase in wage expenditure throughout the sample, I normalized the variable into a logarithm. Therefore, aiming to uncover the absolute effects on wage, the independent variable for H1a is: $\log(wage)_{j,t} = \ln(1 + wage_{j,t})$.

Secondly, due to possible heterogeneity in club size, the relative effect on wages is being investigated for H1b and H4a. For this, I use the variable *wage change*, calculating the relative increase in personnel expenditure, compared to the previous fiscal year: $wage\_change_{j,t} = \frac{wage_{j,t}}{wage_{j,t-1}} - 1$. The first effects of wage change are being measured in the second season of observation, since they rely on the reference value of the season prior.

For H2a, H2b, and H4b, the main independent variable, indicating national sporting performance, is represented by the change in average points per game achieved in the national

league, in which post-point deductions for financial or criminal misconduct have been included. The use of average points per game is in line with Rohde and Breuer (2016), and in contrast to other reference research, which used the total sum of points per season (Plumley et al., 2014), or the rank achieved at the end of the season (Leach & Szymanski, 2015). In comparison to total points achieved, the use of average points per game accounts for variation in season length between countries and divisions. Second, using rank explains the outcome of a season, but not necessarily the performance delivered. Namely, the rank is dependent on the other clubs' performances, and also, the rank does not account for performance distances between clubs. For H2a, the absolute change in national sporting performance is therefore described as $ppg_{j\,t} = \frac{Total\ Season\ Points_{j,t}}{Total\ Season\ Games_{j,t}}$. Furthermore, this effect will be investigated in relative terms in H2b and H4b. For this, the change of PPG from *t-1* to *t* is used, calculated as: $ppg\_change_{j,t} = (\frac{Total\ Season\ Points_{j,t}}{Total\ Season\ Games_{j,t}} / \frac{Total\ Season\ Points_{j,t-1}}{Total\ Season\ Games_{j,t-1}}) - 1$.

For H2c and H2d and H4c, the Club Elo coefficient will be considered, measuring the total sporting performance. The Elo rankings that have been acquired modify the standard Elo system by taking home advantage, goal difference, and inter-league adjustments into account, and have been identified as suitable by comparable research to identify the total sporting performance of a football club (Csató, 2022; Geurkink et al., 2021). To identify absolute effects, the dependent variable for H2c will be the Elo coefficient of club *j* in season *t*: $elo_{j,t}$. For H2d and H4c, the relative effects will be explained in the percentual change in the Elo coefficient of club *j* from season *t-1* to *t*: $elo\_change_{j,t} = \frac{elo_{\,j,t}}{elo_{j,t-1}} - 1$.

Moreover, the third set of regression models aims to uncover the efficiency of personnel expenditure, compared to the outcome of sporting performance. However, as wage expenditure is not fixed at the beginning of the season but is likely influenced by certain performance-related requirements and bonuses, controlling for any of the variables as a dependent variable could introduce systematic bias to the regression models. Therefore, due to a likely simultaneity bias between sporting performance and wage expenditure, relative terms describing the ratio from wage expenditure to sporting performance have been formed. Furthermore, as the distribution of *wage* was not normal, both factors in the term have been normalized. The aim of this normalization is to account for a potential non-linearity in the efficiency, as a result of the competitive position of a club. The variable for H3a is thus formulated as the efficiency relationship between wage spent to wage points achieved: $points\_wage_{j,t} = \frac{\ln(1+points)_{\,j,t}}{\ln(1+wage)_{j,t}}$. H3b emphasizes the relationship between wage spending to Elo rating: $elo\_wage_{j,t} = \frac{\ln(1+Elo)_{\,j,t}}{\ln(1+wage)_{j,t}}$.

3.2.2. Explanatory Variables

The explanatory variable for the first three sets of hypotheses is the categorical variable $change_{j\,t}$ for club *j* in season *t*. Value *1* serves as a baseline comparison of the state of the club before the takeover, therefore being of interest for Hypotheses H1a, H2a, H2c, H3a, and H3b. It is assigned to *1* for seasons if a takeover occurred in a consecutive season earlier than the 31st of August. Furthermore, it is assigned to 1 in seasons where a takeover occurred during mid-season. Due to the restricted investment opportunities in the winter transfer window, it is therefore assumed that the entrepreneurial activities of new owners are non-significant when the takeover occurred after the closure of the summer transfer window (Bull & Whittam, 2020; Karlsen, 2022). To simplify, I will refer to the period before the takeover or as T-1 hereafter. The variable is assigned to *2* seasons with entrepreneurial activities of new owners, therefore one season after *change = 1*. In these seasons, new owners have the first opportunity to actively influence significant investment decisions. Therefore, they are accountable for the player and asset decisions. This period is of interest for H1b, H2b, and H2d. I will refer to this period as the during takeover or as *Takeover* in figures and tables. Finally, since the effect of investment decisions on sporting performance may be subject to a time lag, the variable is assigned to *3* for the following season, also referred to as the season after the takeover or as T+1. This may be the case if a club qualifies for UCC competitions in the season *change = 2*. To compare these values to observations without a takeover event, the *change* variable is *0* otherwise. The variable does not differentiate the ownership concentration of the majority investor. Therefore, I assumed, that the behavior of an investor that controls at least half of the shares does not significantly differ from an investor, who controls 100% of the club.

The fourth set of hypotheses uses two explanatory variables to identify the strength of the effects based on investor origin. First, the dummy $inv\_take_{j,t}$ is *1* for a club with entrepreneurial activities of new owners, of club *j* in season *t*, and 0 otherwise. Therefore, *inv_take* = 1 when *change = 2*. Furthermore, the variable $take\_type_{j,t}$ is *1* for clubs in seasons with entrepreneurial activities of foreign owners, 2 for clubs in seasons with entrepreneurial activities of domestic owners, and 0 otherwise. This approach aims to identify the heterogeneity between foreign inventors to domestic investors.

3.2.3. Control Variables

The set of main control variables aims to address cofounding effects within the panel observations. These control variables ($X_{j,c,t}$) are time-variant and differ on club *j* and season *t* level and include two binary indicators if a club has been promoted or relegated to another division of

the national league system, as in line with Ruta et. al (2020). Therefore, $prom_{j,t}$ equals *1* if club *j* has been promoted after season *t-1* and *0* otherwise. Consequently, $rel_{j,t}$ equals 1 if club *j* has been relegated after season *t-1*, and 0 otherwise. These two variables aim to address the time lag of wage expenditure, due to contractual obligations. Also, I aim to isolate outliers that strongly changed their sporting performance from one year to another, due to playing in another division. Additionally, the dummy variable $div\_num_{j,t}$ is a categorical variable for the division that club *j* plays in season *t*. This variable aims to address structural differences between the divisions, for example a distinction in the wage expenditure to points per game ratio. Furthermore, due to the hypothesized Matthew effects, growth is expected to be stronger for the first division. Therefore, the variable aims to isolate the effects depending on the division affiliation.

Finally, the variable $b2b\_takeover_{j,t}$ was defined as *1* for clubs that were subject to multiple majority ownership takeovers within three years. I opted for three years since this is the series length of my explanatory variable. Implementing this variable aims to isolate a potential overlap of the entrepreneurial activities of the respective majority owners. These back-to-back takeovers occurred ten times in the sample, and all other observations were assigned a value of *0*.

3.3. Econometric Approach

This study aims to investigate potential effects with linear panel data regression models. The dataset consists of unbalanced panel data, observing 215 units for a total of 14 periods, of which 13 will be considered in the regressions with growth variables as these variables included lagged data. The underlying assumptions for the linear regression model are linearity of parameters, random sampling, no high collinearity between the coefficients, and the zero conditional mean assumption, for systematically unbiased estimates. Reset tests have been conducted for all regression models, which indicated that in all models, except for H2a, the null hypothesis of missing important non-linearities is not rejected at a 5% significance level. Since I also use another variable to measure sporting performance, my concern about missing important non-linearities is limited.

The introduction of the financial fair play regulation for European football clubs may have limited the ability of investors to increase the operative expenditure starting from the season 2013/14. Furthermore, the sample is subject to overall consistent year-on-year growth. To account for the time-variant heterogeneity, fixed effects are implemented on a yearly level (μ_t). Furthermore, to address time-invariant club heterogeneity, fixed effects estimators are implemented on the Club level (μ_j). Therefore, the takeover is expected to represent an exogenous event, that creates sufficient change to generate significant effects, compared to the club average and year average during observation. Using Fixed Effects is in line with the approaches of Rohde

and Breuer (2016) and Garcia-del-Barrio and Szymanski (2009). Moreover, the standard errors of all hypotheses were clustered at the club level. This decision was further supported by rejecting the null hypothesis of constant variance of a Breusch-Pagan test for normal error terms on a 1% significance level for some of the models.

A selection bias is relatively unlikely since every club that has played for more than three years in the first or second division of the Top 5 leagues during the period of observation, is included. However, panel data can be subject to attrition biases of individuals dropping out of the sample. In this sample, this may result from teams being relegated to lower divisions, or teams discontinuing their operations. To account for an attrition bias, I tested for the statistical significance of a *next_wave* dummy for all regressions. The value of the dummy is *1* if the explanatory variable is present in the next year, and *0* if it is not. Due to being time-variant, the *next_wave* dummy is suitable for regression models that control for Fixed Effects. I investigated the magnitude and significance of the dummy for all hypotheses, *(i)* only controlling for team and year Fixed Effects and *(ii)* including them in the final regression models. For all models, the dummy is positive and significant on a 10% level. This means that the sample is likely subject to attrition bias as it only considers clubs that maintained a position in the top divisions. Next, I re-ran the regressions for a sub-sample excluding the teams that filed for bankruptcy to explore if they strengthened the bias. Since I was unable to find significant differences in the magnitude and significance level, I expect that the potential attrition bias is due to methodological weaknesses and sample limitation and not due to including clubs filing for administration. Despite including takeovers that occurred at a lower level of competitiveness in the takeover datasets, these takeovers will only be considered in the models if they include data for the independent variables. Especially for the wage and PPG variables, this is not always the case. Of the initial 238 takeovers, 72 are missing wage data, 67 are missing information on points per game, and 50 are missing information on the Elo coefficient during *change =2*. There are fewer cases with missing data for the periods of *change=1* and *change=3*.

Finally, considering the error term for each regression ($\varepsilon_{j\,t}$), the hypotheses are formulated as follows:

$$\log(wage)_{j,t} = \alpha_0 + ß_1\, change_{j,t} + ß_2\, X_{j,t} + \mu_j + \mu_t + \varepsilon_{j,t} \quad \text{(H1a)}$$

$$wage\_change_{j,t} = \alpha_0 + ß_1\, change_{j,t} + ß_2\, X_{j,t} + \mu_j + \mu_t + \varepsilon_{j,t} \quad \text{(H1b)}$$

$$ppg_{j,t} = \alpha_0 + ß_1\, change_{j,t} + ß_2\, X_{j,t} + \mu_j + \mu_t + \varepsilon_{j,t} \quad \text{(H2a)}$$

$$ppg\_change_{j,t} = \alpha_0 + ß_1\, change_{j,t} + ß_2\, X_{j,t} + \mu_j + \mu_t + \varepsilon_{j,t} \quad \text{(H2b)}$$

$$elo_{j,t} = \alpha_0 + ß_1\, change_{j,t} + ß_2\, X_{j,t} + \mu_j + \mu_t + \varepsilon_{j,t} \quad \text{(H2c)}$$

$$elo\_change_{j,t} = \alpha_0 + ß_1\, change_{j,t} + ß_2\, X_{j,t} + \mu_j + \mu_t + \varepsilon_{j,t} \quad \text{(H2d)}$$

$$points\_wage_{j,t} = \alpha_0 + ß_1\, change_{j,t} + ß_2\, X_{j,t} + \mu_j + \mu_t + \varepsilon_{j,t} \quad \text{(H3a)}$$

$$elo\_wage_{j,t} = \alpha_0 + ß_1\, change_{j\,t} + ß_2\, X_{j\,t} + \mu_j + \mu_t + \varepsilon_{j\,t} \quad \text{(H3b)}$$

$$wage\_change_{j,t} = \alpha_0 + ß_1\, inv\_take_{j,t} + ß_2\, Take\_Type_{j,t} + ß_3\, X_{j,t} + \mu_j + \mu_t + \varepsilon_{j,t} \quad \text{(H4a)}$$

$$ppg\_change_{j,t} = \alpha_0 + ß_1\, inv\_take_{j,t} + ß_2\, Take\_Type_{j,t} + ß_3\, X_{j,t} + \mu_j + \mu_t + \varepsilon_{j,t} \quad \text{(H4b)}$$

$$elo\_change_{j,t} = \alpha_0 + ß_1\, inv\_take_{j,t} + ß_2\, Take\_Type_{j,t} + ß_3\, X_{j,t} + \mu_j + \mu_t + \varepsilon_{j,t} \quad \text{(H4c)}$$

4. Empirical Results

4.1. Descriptive Statistics

Table 1 shows the descriptive statistics of the main variable of interest. The dataset includes a total of 215 clubs for 14 seasons between 2004/05 and 2017/18. Therefore, the final dataset considers a total of 3,010 observations. English clubs account for 756 observations (25%), 683 (23%) from France clubs, 885 (29%) from Italy, 294 (10%) from Germany, and 392 (13%) from Spain. This is a result of limited data availability and acquisition challenges in Spain and Germany. Furthermore, these clubs played in 1,301 cases (58%) in their national first division, 898 (40%) in the second division, and 24 (1%) in the third division. There is a total of 787 observations without information on the division.

7% of the club-season observations were subject to relegation and 12% to promotion However, this comparison could also be biased, as clubs dropping to non-considered leagues in the main data sample are not marked with relegation, while they are marked when being promoted back into the panel.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Investor Takeover	3,010	0.08	0.27	0	1
Change	3,010	0.44	0.91	0	3
Foreign Takeover	3,010	0.02	0.14	0	1
Norm (Wage)	2,089	17.06	1.02	14.62	20.09
Wage *Change in %*	1,809	11 %	31 %	-76 %	248 %
Points per Game	2,223	1.39	0.38	0.29	2.68
Points per Game *change in %*	1,938	3 %	37 %	-84 %	385 %
Elo Coefficient	2,421	1,594.19	146.37	1,251	2,089
Elo Coefficient *Change in %*	2,165	-0 %	3 %	-11 %	11 %
Norm (Wage)/*Norm* (Points)	2,089	0.23	0.02	0.14	0.28
Norm (Wage) / *Norm* (Elo)	2,045	0.43	0.02	0.38	0.50
B2B Takeover	3,010	0.00	0.06	0	1
Relegation	2,227	0.07	0.25	0	1
Promotion	2,227	0.12	0.33	0	1
Division	2,223	1.43	0.52	1	3

8% of the observations have been subject to a majority investor takeover, representing 238 investor takeover events of interest. 69 of these takeovers occurred in England, 39 in France, 91 in Italy, and 38 in Spain. One German takeover, more specifically the acquisition of TSG 1899 Hoffenheim by Dietmar Hopp, is furthermore considered in the dataset. In total, 153 of the 215 clubs have been subject to a majority investor takeover during the period of observation (71%). The teams with the most identified takeovers are Hellas Verona and RDC Mallorca with 5 takeovers each. Five additional clubs were subject to four takeovers, and 10 additional clubs got three new owners. Addressing time-variant heterogeneity, Figure 4 indicates the takeover activity per year throughout the dataset. It suggests that takeover activity was relatively consistent during the period of observation, as presented by the columns. However, there is a significant decrease for the season 2012/13, which is one year before the introduction of the break-even requirement in the Financial Fairplay regulation. This could indicate that investors in the European football market faced uncertainty and thus decided to halt their activities until facing higher certainty of market developments. A complete list of the takeovers identified is included in Table 12 in the Appendix.

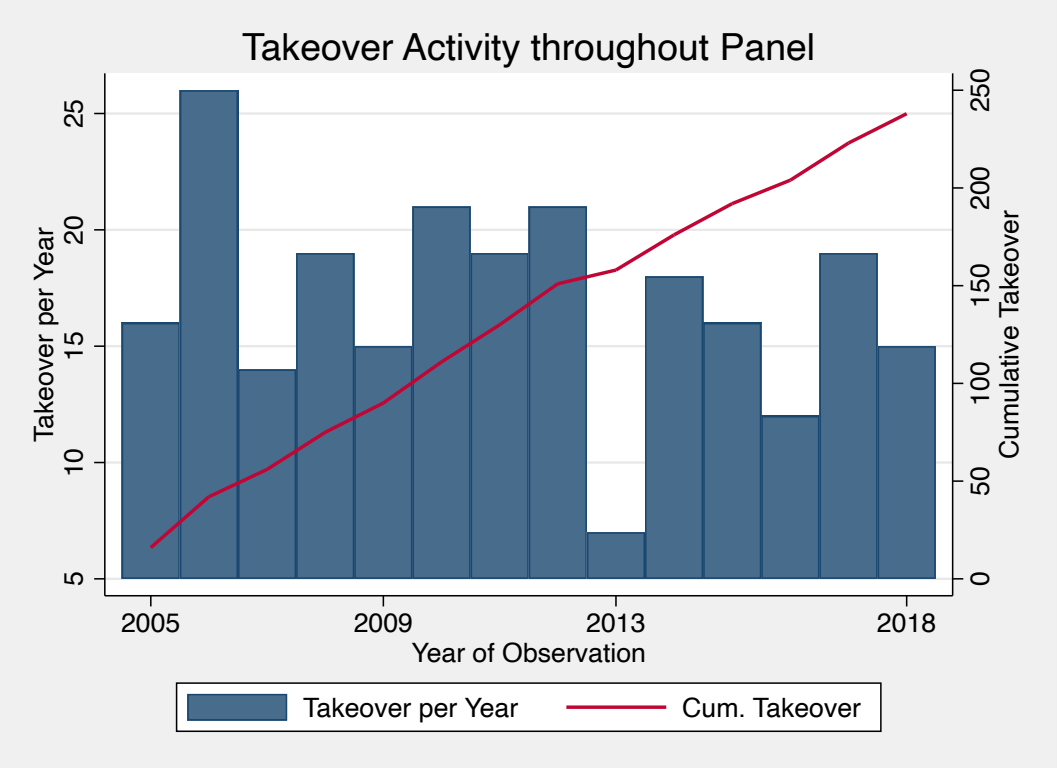

Figure 1: Takeover Activity Throughout Panel

There is a total of 2,089 observations of wage expenditure, representing the lowest data density compared to the other explanatory variables (69%). The normalized wage expenditure ranges between 14.62 and 20.09 units. The non-normalized wage expenditure per season is dispersed between €2.2 million and €556.0 million, with an average value of €44.0 million Furthermore, there are even fewer observations available for the yearly wage change (60%). The mean increase in wages of 11% per season indicates strong economic growth during the period of observations for the clubs observed, confirming the observations in previous literature. Cesena increased the yearly wage by the sample maximum of +248% season on season in 2010/11, after promoting to Serie A. However, this is not a strong outlier, as Carpi also increased their wage by +216% after promotion in 2015/16, 1 year following a takeover from a domestic investor. On the other hand, Catania decreased their wage expenditure by 76% following relegation to the third division in 2015 / 16. Figure 1 indicates the median wage expenditure of takeover targets (*change = 1*) to observations that were not involved in takeover activities during the season (*change = 0*). The figure suggests that relative to the reference observations, the median wage expenditure of takeover targets was higher before the introduction of the Financial Fairplay. Therefore, teams with relatively higher team expenditures were more often involved in takeovers. Most notably, this also changed one year before the introduction of Financial Fairplay in the season 2012/13 where the median team expenditure of takeover targets strongly dropped within one season. However, this gap

decreased starting from the season 2015/16, after which the median team expenditure was only marginally lower than the median of the reference observations.

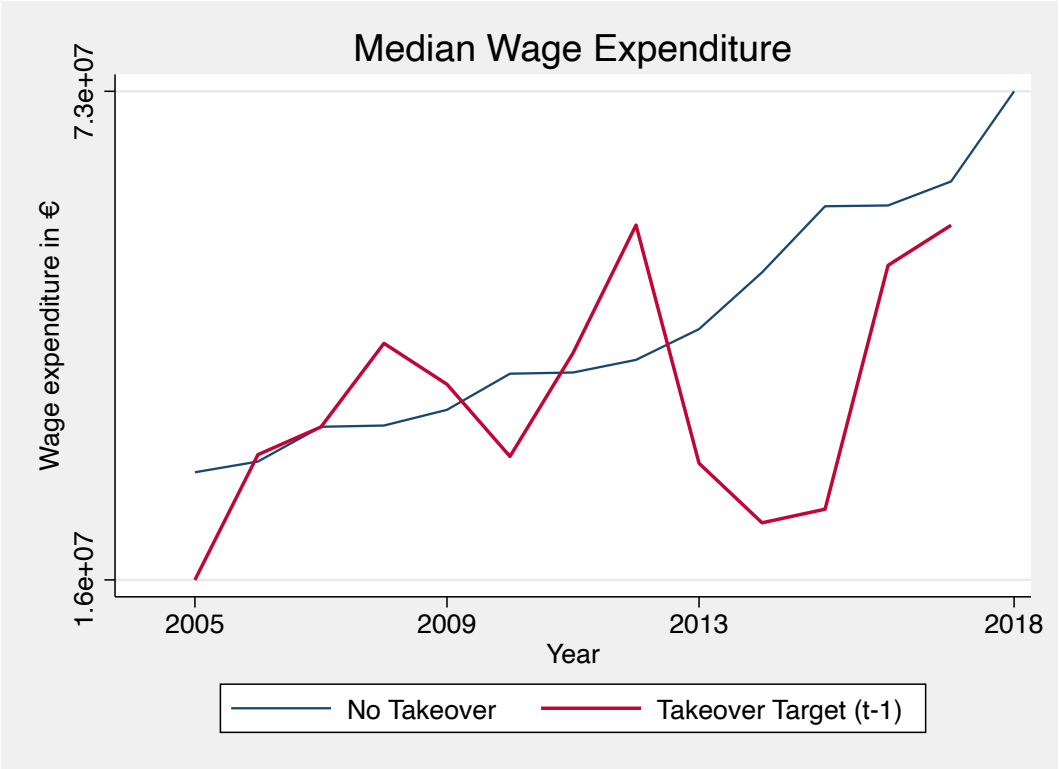

Figure 2: Wage expenditure of Takeover Targets

There are a total of 2,223 observations for points per game (74%) and 1,938 observations of year-on-year change of points per game (64%). During the observation period, the clubs scored on average 1.39 points per game. This appears representative, considering that the clubs can achieve 3 points in case of a win, 1 in case of a draw, and 0 in case of a loss. Furthermore, the clubs have positively increased the points per game on average by 3% per year. Compared to the national sporting performance, there is more data available on the Elo coefficients, representing the competitiveness of the clubs. There is a total of 2,421 observations with Elo coefficient (80%) and 2,165 observations with a yearly change of the Elo coefficient (72%). The average club has an Elo coefficient of 1,594; the values range between 1,251 for Juve Stabia in 2013/14 and 2,809 for Real Madrid in 2011/12. In contrast to the points per game measure, the negative average of the yearly Elo coefficient change indicates that, at least temporarily, a share of the clubs performed worse than in the seasons prior.

Figure 3 indicates heterogeneity in the competitive strength of takeover targets throughout the panel. In contrast to Figure 2, which observed a decrease in wage expenditure in anticipation of the Financial Fair-Play regulation, the competitive strength of these clubs was relatively higher than

in the seasons before and after. This likely suggests that in the period of relatively low takeovers before the Financial Fair-Play regulation, some teams with low wage expenditure but highly competitive performance were subject to takeover. The overall panel indicates that, on average, the median of a team being subject to takeover is lower, than the market average. This observation was especially strong in the season 2008/09, which could be correlated to the occurrence of a financial crisis in the US and Europe. The takeover of the most competitive team, as measured by Elo rating, was Liverpool in 2007/08 with an Elo coefficient of 1,961. Being ranked amongst the three most competitive teams in Europe that season, the club was subject to a takeover by a foreign investor. On the other hand, the takeover of the least competitive team in the data sample was Perugia in 2013/14, with an Elo coefficient of 1,325 (479th-best European football club).

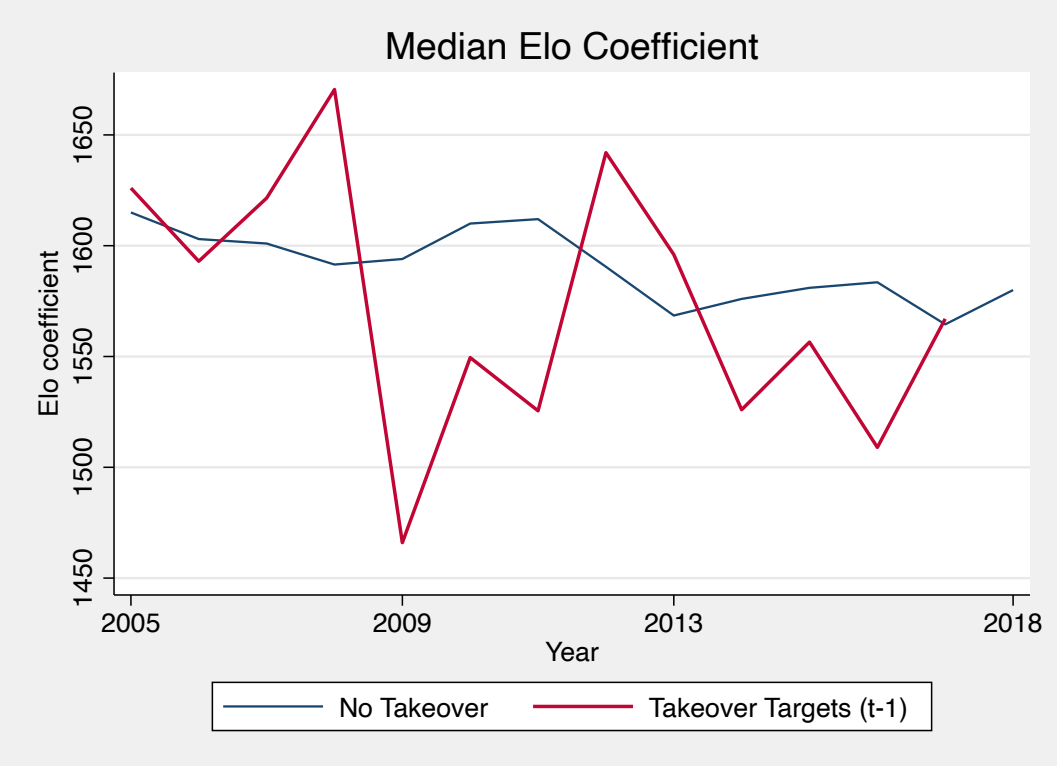

Figure 3: Elo Coefficient of Takeover Targets

Finally, correlation statistics of the variables of interest can be found in Table 13 in the Appendix. The correlation coefficients are interpreted as in Taylor (1990). I found a high correlation ($r > .67$) between two variables included in one model on one occasion. The division number is highly correlated to the Elo coefficient. To identify whether this collinearity may inflate the results, a variance inflation factor was established for all models, which concluded no mean variance inflation higher than 1.8. No variable introduced has a variance inflation higher than 5. Interpreting these results as in O'Brien (2007), multicollinearity concerns are therefore limited.

Moreover, observing a high correlation between the Elo rating and wage variables supports the methodological approach of this research, as controlling for sporting indicators in regressions running on financial indicators, or vice versa may introduce systematic bias in the models.

4.2. Regression Results

In the following section, the results of the regression models are presented and interpreted in terms of their sign, significance, and magnitude. Table 2 presents the results of the first set of hypotheses, estimating the effect of an investor takeover on team spending. The first model has a total of 2,089 observations and the second 1,809, due to controlling for data from the previous year. Therefore, the first estimation for H1b occurs in season *t=2*. Controlling for the division and divisional changes, club and year fixed effects, the wage expenditure in the first season before an investor takeover is on average 0.0071 units lower, ceteris paribus. This effect is statistically significant at a 5% significance level.

Table 2: Regression Results of H1

VARIABLES	(H1a) *Norm* (Wage)	(H1b) *Change of* Wage (%)
T-1	-0.071**	0.002
	(0.028)	(0.026)
Takeover	-0.051*	0.055*
	(0.027)	(0.031)
T+1	-0.027	0.023
	(0.027)	(0.030)
B2B Takeover	-0.032	-0.107
	(0.068)	(0.082)
Relegation	0.378***	-0.275***
	(0.033)	(0.026)
Promotion	-0.151***	0.547***
	(0.019)	(0.045)
Second Division	-0.899***	-0.098***
	(0.037)	(0.025)
Third Division	-1.646***	-0.041
	(0.093)	(0.074)
Observations	2,089	1,809
R-squared	0.677	0.378
Club FE	YES	YES
Year FE	YES	YES
Number of Clubs	206	204

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

When controlling for the division, relegation has a positive and significant effect at a 1% significance level, and promotion has a negative and significant effect at a 1% significance level. This is likely since relegated teams spend more on wage expenditure than their league competitors that still have contractual obligations from the previous seasons. The opposite is the case for promoted teams, which likely have closed contracts on the base of the lower league level, resulting in less systematic wage expenditure. Consequently, observations in the second and third divisions have a lower normalized wage expenditure, relative to the first division. Figure 4 visualizes the coefficients of the explanatory variable for the first set of Hypotheses. It indicates that with increasing involvement of the new investor, the wage increases, and the level of wage expenditure becomes non-significant.

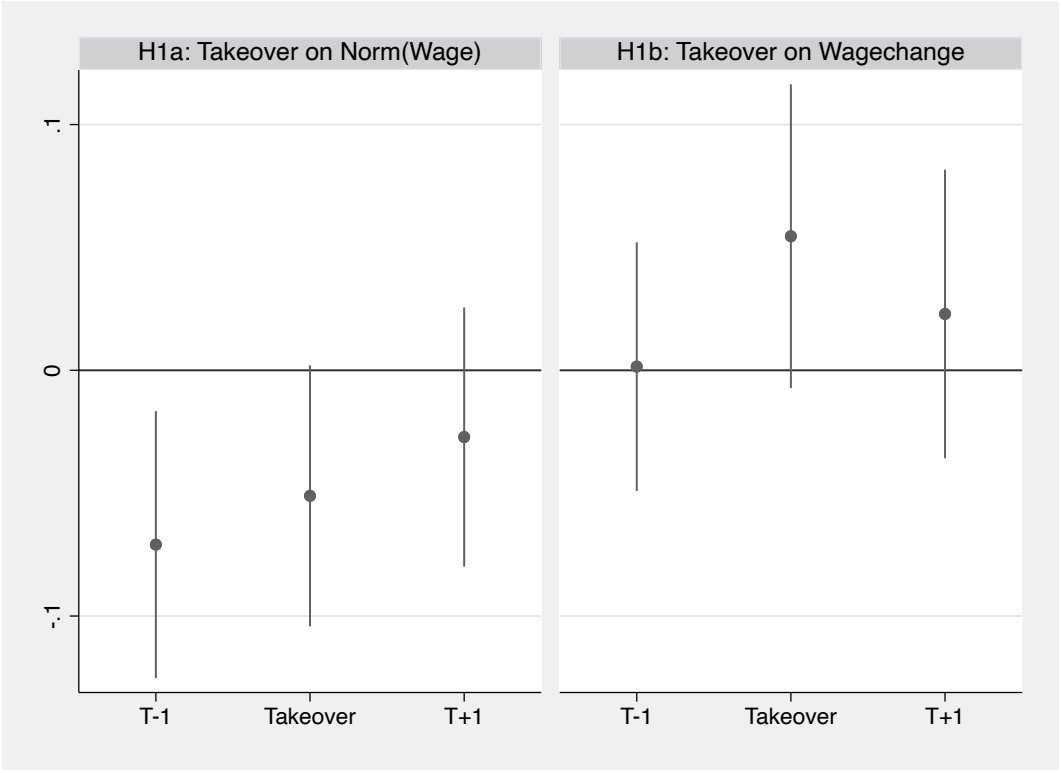

Figure 4: Coefficient Plot for H1

Furthermore, the second column of Table 2 shows the regression results for H1b. The second row indicates the coefficient of interest, namely the wage change in the first season with entrepreneurial activities. Controlling for division and division changes, year and team fixed effects, the wage expenditure during a season with a majority investor takeover increases by 5.5 percentage points, ceteris paribus. This effect is statistically significant at a 10% significance level. Moreover, relegation and promotion affect the change of wage spending in a negative and positive manner, respectively, both on a 1% significance level. Therefore, the wage decreases by 27.5 percentage

points after being relegated and it increases by 54.7 percentage points after being promoted. The negative and statistically significant coefficient for the second division indicates that the wage growth is stronger for the first league than for the second league during the period of observations. This supports observing the Matthew effect in the sample. Figure 4 indicates that the wage increase is strongest for the first season of entrepreneurial activities of new owners and decreases in the season after the takeover to non-significant levels. To conclude, my models find support that investors take over clubs at a low point of wage expenditure for the club level and consequently increase wage spending significantly. Thus, I confirm H1a on a 5 percent and H1b on a 10 percent significance level.

Table 3: Regression Results of H2

VARIABLES	(H2a) PPG	(H2b) *Change of* PPG (%)	(H2c) Elo Coefficient	(H2d) *Change of* Elo Coefficient (%)
T-1	-0.027	-0.019	-9.456*	-0.004
	(0.025)	(0.023)	(5.263)	(0.003)
Takeover	-0.071***	-0.031	-13.492**	-0.006*
	(0.027)	(0.022)	(5.782)	(0.003)
T+1	-0.053*	0.048	-13.910**	-0.003
	(0.028)	(0.032)	(5.724)	(0.003)
B2B Takeover	0.015	0.134	11.888	0.008
	(0.100)	(0.133)	(18.620)	(0.022)
Relegation	0.090***	0.871***	39.174***	-0.024***
	(0.032)	(0.055)	(6.142)	(0.004)
Promotion	-0.015	-0.350***	-20.172***	0.026***
	(0.017)	(0.020)	(3.516)	(0.003)
Second Division	0.387***	0.143***	-117.047***	0.017***
	(0.029)	(0.022)	(6.282)	(0.003)
Third Division	0.690***	0.039	-231.441***	0.024***
	(0.075)	(0.072)	(18.987)	(0.009)
Observations	2,223	1,938	2,169	2,008
R-squared	0.217	0.525	0.322	0.086
Club FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Number of Clubs	214	214	211	211

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 3 presents the findings for the second set of hypotheses. H2a includes 2,223 and H2b includes 1,938 time-unit observations. Controlling for division and division changes, year and team fixed effects, seasons before an investor takeover achieve comparatively 0.027 points per game less, ceteris paribus. This effect is not statistically significant on a 10% significance level. However, the second and third rows indicate that the points per game are statistically significantly lower for the

season during and the season after the takeover, with 0.071 and 0.053 points per game less, ceteris paribus. This suggests that the points per game relatively decrease during and after, but not before, the investor takeover.

The second row in the second column in Table 3 indicates the results for hypothesis H2b. The points per game relatively decrease by 3.1 percentage points in the season during the investor takeover. This effect is, however, not statistically significant on a 10% significance level. Figure 5 visually plots the coefficients of the two hypotheses. The change of points per game increases in the season after the takeover. However, the coefficient is not statistically significant from 0 on a 10% significance level. Therefore, my models do not find support for H2a and H2b on a 10% significance level and I reject the hypotheses.

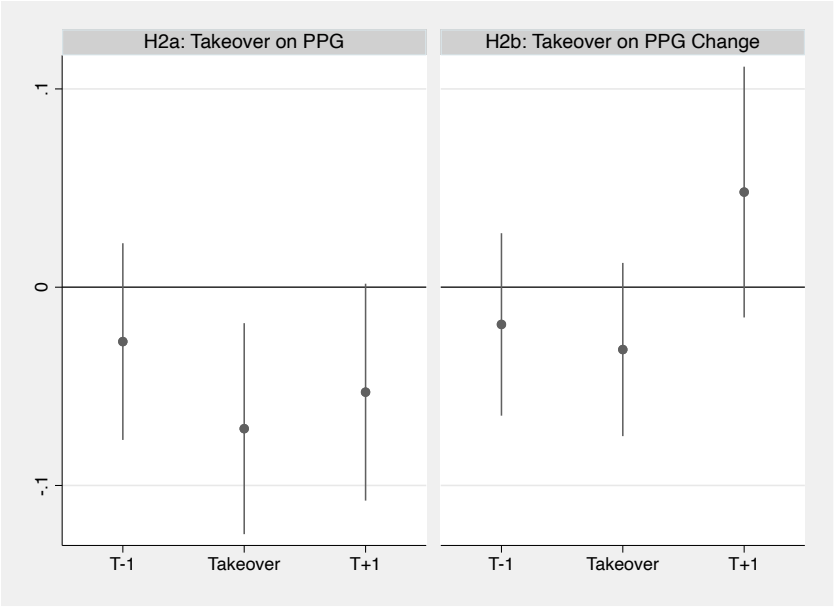

Figure 5: Coefficient Plot for H2a & H2b

H2c and H2d estimate the effect on the Elo rating as a measure of total sporting performance. H2c includes a total of 2,169 and H2d a total of 2,008 observations. As in the first row, the third column implies that controlling for division and division changes, and year and team fixed effects, the Elo coefficient of a team in the season before a majority takeover is 9.45 points lower, ceteris paribus. This is statistically significant at a 10% significance level. Furthermore, the Elo coefficient is 13.5 and 13.9 points lower in the season during and the season after the takeover. In these periods, the competitiveness is statistically significantly lower on a 5 percent significance level. Figure 6 visually confirms that the decrease is consistent from the season before the takeover to the season after the takeover. As of the figure, investors acquire clubs at a significantly low level of competitiveness, but further relatively decrease it during and after the takeover. Therefore, a

statistically significant decrease in competitiveness after the takeover can be observed for both sporting performance measures. The second row of the fourth column of Table 3 indicates that this decrease is statistically significant for the first season of entrepreneurial activities on a 10% significance level. Hereby, the Elo coefficient decreases by 0.6 percentage points in the first season. Figure 7 confirms these observations visually. Furthermore, I observe that the decline in competitiveness shrinks in T+1, one season after the takeover. Thus, the downward trend halts in the first season after the takeover. This may indicate that entrepreneurial activities underlie a time lag to improve the sporting performance of the club.

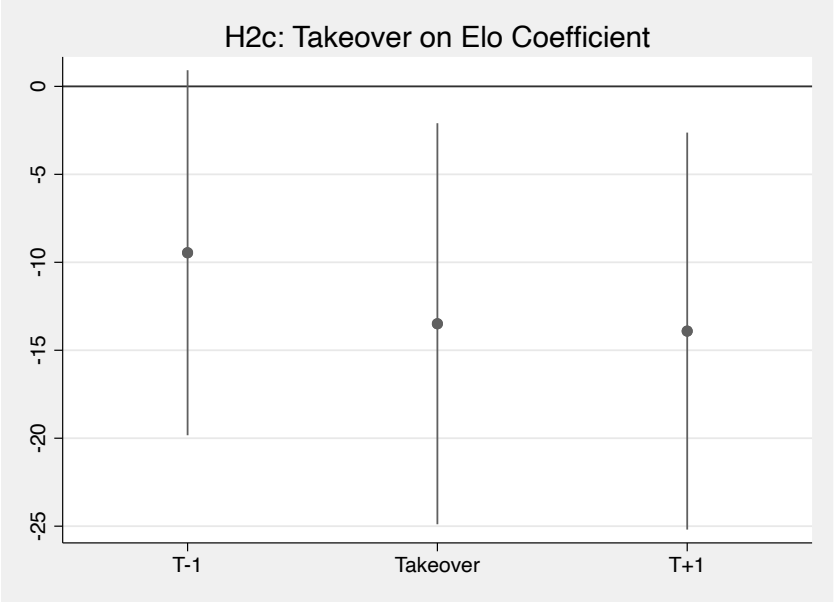

Figure 6: Coefficient Plot for H2c

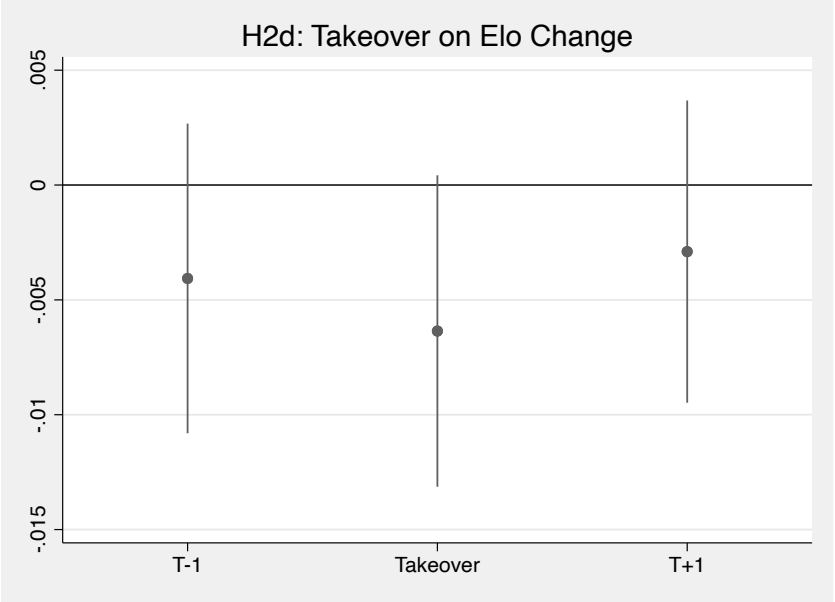

Figure 7: Coefficient Plot for H2d

The models suggest that teams are being taken over at a statistically significant lower levels of sporting performance on a 10% significance level when using the Elo coefficient as a measure. This is not statically significant on a 10% significance level when using national sporting performance as the explanatory variable. Furthermore, my models did not indicate that the sporting performance significantly improved during the takeover. In fact, they suggest that the sporting performance is significantly lower in the season during, and the season after the takeover on a 5% significance level. This decrease itself is statistically significant in the first season of entrepreneurial activities on a 10% significance level. Therefore, I find evidence to reject H2a, H2b, and H2d, and to confirm H2c.

Table 4: Regression Results of H3

VARIABLES	(H3a) *Norm* PPG / *Norm* Wage	(H3b) *Norm* Elo / *Norm* Wage
T-1	-0.000	0.001**
	(0.001)	(0.001)
Takeover	-0.002*	0.001
	(0.001)	(0.001)
T+1	-0.002	0.000
	(0.001)	(0.001)
B2B Takeover	0.000	0.000
	(0.005)	(0.002)
Relegation	-0.002*	-0.009***
	(0.001)	(0.001)
Promotion	0.000	0.003***
	(0.001)	(0.000)
Second Division	0.035***	0.019***
	(0.001)	(0.001)
Third Division	0.058***	0.033***
	(0.003)	(0.002)
Observations	2,089	2,045
R-squared	0.510	0.693
Club FE	YES	YES
Year FE	YES	YES
Number of Clubs	206	203

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 4 indicates the results of the third set of hypotheses, observing the operating efficiency between sporting performance and wage expenditure. The first model using points per game includes 2,089 observations, and the second model with the Elo coefficient as a performance measure includes 2,045 observations. Since sporting performance is the numerator of the term, higher efficiency is represented by positive, and lower efficiency by negative coefficients. As of the first column, there is no significant difference for the season before the takeover when using the

points per game measure. However, the number of normalized points per normalized wage expenditure is 0.002 units lower in the season during the takeover, when controlling for division and division changes, year, and team fixed effects. This effect is statistically significant at a 10% significance level and is likely a result of the increase in wage expenditure and the stagnancy in sporting performance.

The first row in the second column of Table 4 furthermore presents the regression results for H3b. Controlling for division, division changes, year, and team fixed effects, the ratio between normalized Elo rating and normalized wage expenditure is 0.001 units higher in the season before the takeover, ceteris paribus. This effect is statistically significant on a 5% significance level.

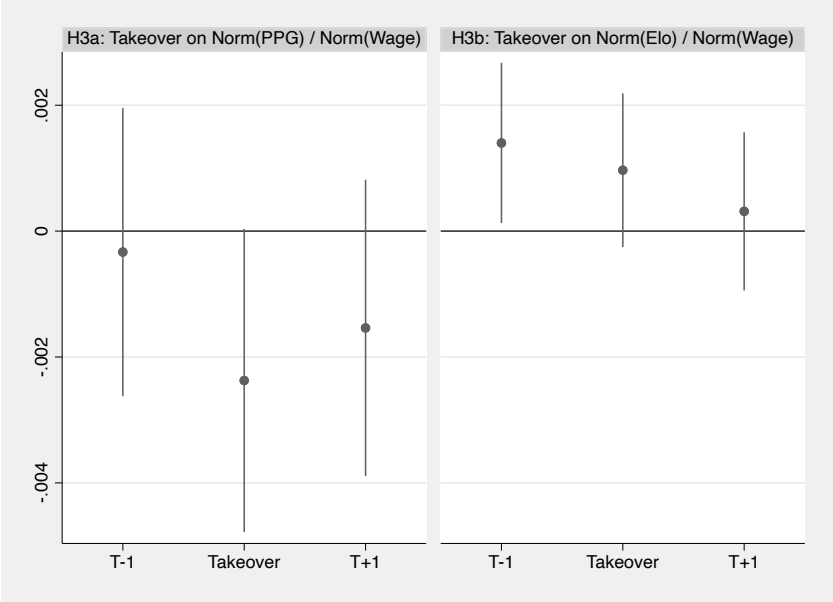

Figure 8: Coefficient Plot for H3a + H4b

Figure 8 presents the findings visually, suggesting a consistent decrease in the Wage to Elo ratio throughout the takeover event. On the other hand, using the points per game measure does not suggest a consistent trend. Therefore, I conclude that clubs with a higher performance-to-wage expenditure ratio, controlling for fixed effects, qualify as subject to takeover when using the Elo measurement. Both measurements indicate, at least temporarily, a decrease in efficiency, because of increasing wage expenditure and stagnant or decreasing sporting performance. Therefore, I reject H3a and confirm H3b.

Last, Table 5 presents the last set of hypotheses, differentiating the growth variables by investor origin. All hypotheses have the same number of observations, as their predecessors in H1 and H2. The first column presents the findings for H4a. Controlling for division, division changes, team and year fixed effects, the wage change in seasons with a takeover of a foreign investor is 15.7

percentage points higher, ceteris paribus. This effect is statistically significant on a 5% significance level. Compared to foreign takeovers, clubs with domestic takeovers have a lower growth of wage expenditure by 16.1 percentage points, ceteris paribus. This difference is statistically significant on a 5 percent significance level. Therefore, the findings suggest that there are strong differences between the groups in terms of investment willingness in team quality after the takeover. Furthermore, as Domestic Takeovers are not positive statically different from *0*, it is likely that the observed effects in H1b are driven by the activities of foreign investors exclusively. The second column indicates that the change of points per game in a season with a takeover from a foreign investor does not significantly differ from observations without a takeover event. However, the points per game in a season during a domestic investor takeover decreased by 13.3 percentage points, compared to foreign takeovers. This effect is statistically significant on the 1% significance level. This indicates that the decrease in sporting competitiveness in *H2b* and *H2d* during the takeover is strongly driven by domestic investors. The last set of hypotheses does not find any significant effects involving the change in Elo rating. Thus, I find evidence to support H4a, and H4b, but reject H4c.

Table 5: Regression Results of H4

VARIABLES	(H4a) *Change of* Wage (%)	(H4b) *Change of* PPG (%)	(H4c) *Change of* Elo Coefficient (%)
Takeover	0.157**	0.053	0.000
	(0.062)	(0.045)	(0.006)
Domestic Takeover	-0.161**	-0.133***	-0.008
	(0.068)	(0.051)	(0.007)
B2B Takeover	-0.114	0.125	0.007
	(0.084)	(0.133)	(0.023)
Relegation	-0.276***	0.870***	-0.024***
	(0.026)	(0.055)	(0.004)
Promotion	0.546***	-0.349***	0.026***
	(0.045)	(0.020)	(0.003)
Second Division	-0.103***	0.140***	0.016***
	(0.025)	(0.022)	(0.003)
Third Division	-0.049	0.038	0.024***
	(0.073)	(0.073)	(0.009)
Observations	1,809	1,938	2,008
R-squared	0.383	0.526	0.086
Club FE	YES	YES	YES
Year FE	YES	YES	YES
Number of Clubs	204	214	211

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

To conclude, this study finds evidence that clubs with comparatively low wage expenditure are subject to takeover (*H1a*). In the following, these clubs significantly increase their wage expenditure to achieve better sporting performance (*H1b*). However, the wage increase is mostly a result of the activities from foreign investors (*H4a*). While competing on a comparatively weak level for their standards, as measured with the Elo coefficient (*H2c*), there are no observable effects that these clubs significantly increase their sporting performance in the short run, following the takeover (*H2b*). In fact, their competitiveness is likely to decrease (*H2a, H2c, H2d*). This sporting decrease is a result of the activities of domestic investors (*H4b*). However, there are no significant differences between the investor groups when using the Elo coefficient (*H4c*).

Finally, the efficiency ratio between the competitiveness (measured in Elo coefficient) to wage expenditure is significantly higher for club levels prior to takeover (*H3b*). This effect is not statistically significant when using a wage-to-points ratio (*H3a*). As a reaction to the takeover, both measures decrease in the season during the takeover (*H3a*, *H3b*).

4.3. Discussion

Observing a wage increase during the takeover confirms the findings of Rohde and Breuer (2016), who found that clubs belonging to foreign investors had 21 percent higher team investments, compared to other clubs from the Top-30 clubs, that have not. Furthermore, the findings support their observation of a short-term positive impact of a takeover on team investments. I find a significant wage increase of 5.5 percentage points in the first year of entrepreneurial activities of new owners. However, when separating foreign from domestic investors, the coefficient for foreign investors strongly increases to 15.7 percentage points wage. Therefore, I can confirm their findings in regression models with more than ten times their sample size. Furthermore, I find significantly lower wage increases for domestic investors, compared to foreign ones. Therefore, the coefficient of 15.7 percentage points wage increase for majority investors is comparatively lower in this research, however, the negative significant dummies for the second league have shown that growth is stronger on the top of the pyramid. This may explain why the findings of Rohde and Breuer (2016) indicate a stronger effect, as they observed the Top-30 clubs in Europe.

Furthermore, this study addresses two limitations of the previous research, as identified by the authors: the statistical robustness of the observed effects during the implementation of regulatory changes, such as financial fair play, and the external validity of the results in a larger dataset. First, the observed effects on wage increase remain statistically significant throughout the analysis using a larger dataset, in which the FFP regulation has been conducted. This is in line with Acero et al.

(2017) who found that the effects of ownership concentration on financial performance remained significant throughout the implementation of the FFP regulation. Secondly, the coefficients of wage increase remain significant for a dataset, consisting of more than ten times the amount observations in regressions, compared to their research.

Therefore, entering majority investors had, on average, a stronger investment motivation than existing owners, clubs in minority ownership, and fan-owned clubs, when controlling for Fixed Effects. Generally, this indicates that new investors are willing to trade parts significant of their profits for value generation, here represented by the increase in wage expenditure (Franck, 2010). However, there are confounding effects, which could further influence the effect. First, the new set of owners may be interested in conducting a social buy-in, as in Bull and Whittam (2020). Therefore, they aim to manage social and political opposition through an increase in investment to increase the level of fan satisfaction. Second, the new owners may increase the bailout probability of the club, due to their higher wealth, higher interest, strategic agendas, or interest in spill-overs to other businesses. This would increase the optimal level of investment risk as of Frank and Lang (2014). Third, a part of the takeovers is a result of block-building strategies, in which the new owners consolidated the shares of different previous investors. By aligning the residual rights within the governance, they could be interested to increase investments systematically, due to minimal transaction costs (Rohde & Breuer, 2016). Furthermore, there has been a negative relationship between ownership concentration and financial performance at football clubs observed (Acero et al., 2017).

However, this significant increase in expenditure becomes non-significant in the first year after the takeover. Therefore, investors invest strongly in the year during their takeover but do not maintain to do so in the year after. This could either be because of a higher baseline variable as the wage expenditure has been increased in the year before. However, Bernile and Lyandres (2011) analyzed investor sentiment, based on the stock movement of publicly listed clubs following UCC matches. They found that markets' reaction to football games is asymmetric, while wins resulted in a near-zero return, losses were associated with negative postgame returns. If private majority investors are subject to a similar bias, their investment motivation could also significantly decrease in the second season, resulting from cognitive losses during the first season. Since the data is unlikely to deliver statistically robust results for longer observation periods around the point of investment, due to the occurrence of multiple investment events, this study does not observe how the *wage change* effects develop in later stages of the investment cycle. Further research could address the behavior of investors during longer observation periods around the takeover events to estimate the mid-term and long-term effects.

To conclude, most of the private majority investors increase the wage spending in the year during the takeover. However, this is a temporary effect that decreases in the year after. I, therefore, interpret that the results suggest the presence of early entrepreneurial activities and that the investors invest significantly more in the assets on the pitch during the first year, compared to the years after, which is in line with Bull and Whittam (2020).

The second set of hypotheses suggested that sporting performance decreases during entrepreneurial activities and that teams were taken over at a relatively low level of sporting performance. This contrasts, at least in the short term, with Plumley et al. (2017), who found that foreign majority ownership increased the relative sporting performance, compared to other teams. However, as of *H4b,* there is strong heterogeneity between foreign and domestic investors when using the points per game measure. There are no significant differences between the two groups when using the Elo coefficient as of *H4c*. Therefore, the decrease in sporting performance may be driven by domestic investors. This aligns with observations from the third set of hypotheses, in which clubs decreased their ratio between normalized wage expenditure to normalized sporting performance throughout the first years of the investment cycle.

These observations can be explained by different factors. First, clubs have pre-takeover a low level of wage expenditure, and a strong efficiency between the wage expenditure and their competitive outcome, as indicated by the positive and significant coefficient pre-takeover. Therefore, increasing this measure while increasing investments (as measured in wage expenditure) is unlikely. The clubs are likely not randomly selected and the reason for their takeover remains unknown. Further research could address the circumstances in which a club is taken over. For instance, the relatively low sporting performance may be a result of the financial distress of the previous owner, or a result of low investments to increase profit figures. Second, asset shifting in early entrepreneurial activities may relatively inefficient, due to low knowledge of the assets available and their interdependency. Thus, knowledge of the output, risk, and interdependencies of assets is required to conduct an investment strategy to generate the highest risk-adjusted return, in terms of sporting performance.

Third, the knowledge of managing football clubs is likely industry-specific since there are only a few comparable industries. As argued, the football industry essentially generates entertainment for its fans and thus contrasts with firms that generate material products or services. This would partly contrast with Hagen and Nascimento Cunha (2019), who argued that the new set of investors is often more professionalized and is therefore expected to have a higher investment outcome. If the set of capabilities required for the asset orchestration in football clubs is found to be industry-specific, then the degree of professionalization may have, at least in the observation of the early

entrepreneurial activities, a smaller effect than hypothesized. This is due to the non-specific knowledge of the orchestration of football clubs, as many investors acquired their capital in other industries. This information and capabilities may progressively develop throughout the later stages of the investment life cycle. Further implications of the club- and investor heterogeneity will be discussed in the limitation section.

Fourth, although squad planning is expected to create a more immediate impact on the pitch, these investments may still underlie a strong time lag in terms of creating performances on the pitch. If the investors, for example, invested relatively more money in the acquisition of young players, it takes a relatively long period for them to mature in experience and generate performance. As in Rohde and Breuer (2017), most valuable young players with less than 23 years of age played at clubs of a private majority investor. Last, the decrease in efficiency may be intended, as the coefficient for both hypotheses of the third set in the year after the investment is not statistically different from zero. However, it is unknown if the coefficient further decreases in the following seasons. As in Franck and Lang (2014), the optimal level of risk is determined by the bailout optimality of the owner. If the new owners, as hypothesized, introduce a higher bailout probability, a higher ratio of investments to sporting outcomes may be efficient.

4.4. Robustness Checks

The robustness checks aim to address concerns about my sample, season matching of the explanatory variable, and the use of control variables. First, I have decided to include clubs in my research that filed for bankruptcy during the period of observation, since I have not found significant differences in the findings for a potential attrition bias between the two samples. However, filing for bankruptcy is a non-randomized event, which could bias my results including mismanagement. To account for this circumstance, Table 6 presents the regression findings for a sample excluding clubs filing for insolvency. The regressions include 41 clubs less, compared to the main sample. The results indicate that there is no significant difference for the normalized wage at takeover, change of Elo rating, and the normalized wage to normalized PPG and normalized Elo ratios.

However, most notably, the wage change in the first season with entrepreneurial activities becomes non-significant for domestic and foreign investors combined. This could indicate that a fraction of clubs filing for bankruptcy at a later stage takes a higher financial risk in terms of wage expenditure increase. In terms of sporting performance, the Elo coefficient before takeover becomes non-statistically significant on a 10% significance level. This suggests that clubs before the takeover are performing on a relatively low level. However, the points per game measure, as of

H2a becomes negatively statistically significant on a 10% significance level in T+1, and the decrease of points per game, compared to the season before, becomes negatively statistically significant on a 10% level. In this case, the decrease in points per game and the Elo coefficient both indicate a negative trend throughout the takeover process. This supports the observation that sporting performance decreases immediately after a takeover. Furthermore, this indicates that some takeovers of the club filing for bankruptcies occurred at a significantly low level of sporting performance, potentially in an effort to save the club.

Table 6: H1-H3 without Clubs filing for Bankruptcy

	H1a *Norm.* Wage	H1b % Wage	H2a PPG	H2b % PPG	H2c Elo	H2d % Elo	H3a *Norm.* Wage/ N*orm.* PPG	H3b *Norm.* Wage / *Norm.* Elo
Previous Results T-1	**-0.07 **** (0.03)	0.00 (0.03)	-0.03 (0.03)	-0.02 (0.02)	**-9.45 *** (5.26)	-0.00 (0.00)	-0.00 (0.00)	**0.00*** (0.00)
Takeover	**-0.05 *** (0.03)	**0.06*** (0.03)	**-0.07***** (0.03)	-0.03 (0.02)	**-13.49**** (5.78)	**-0.01 *** (0.00)	**-0.00*** (0.00)	0.00 (0.00)
T+1	-0.02 (0.03)	0.02 (0.03)	**-0.05 *** (0.03)	0.05 (0.03)	**-13.91**** (5.72)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
New Results T+1	**-0.07 **** (0.03)	0.01 (0.03)	-0.02 (0.03)	-0.01 (0.02)	- 8.60 (6.58)	-0.00 (0.00)	-0.00 (0.00)	**0.00**** (0.00)
Takeover	**-0.06 *** (0.03)	0.05 (0.03)	**-0.09***** (0.03)	**-0.04*** (0.02)	**-14.89**** (6.59)	**-0.01 **** (0.00)	**-0.00**** (0.00)	0.00 (0.00)
T+1	-0.01 (0.03)	0.02 (0.03)	-0.04 (0.03)	0.05 (0.04)	**-10.69*** (6.35)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)

Table 7: H4 without Clubs filing for Bankruptcy

	H4a % Wage	H4b % PPG	H4b % Elo
Previous Results	**0.15 ****	0.05	0.00
Foreign Takeover	(0.06)	(0.04)	(0.01)
Domestic Takeover, relative to Foreign	**-0.16**** (0.07)	**-0.13 ***** (0.05)	-0.01 (0.01)
New Results	**0.16 ****	0.06	0.00
Foreign Takeover	(0.07)	(0.05)	(0.01)
Domestic Takeover, relative to Foreign	**-0.17**** (0.07)	**-0.16 ***** (0.05)	**-0.02**** (0.01)

Furthermore, Table 7 presents the results for the fourth set of hypotheses. The findings are robust with the main models and suggest a slightly higher magnitude of the effects. Furthermore, the coefficient for H4b indicates that without bankruptcies the Elo coefficient of domestic investors decreases, relative to foreign investors. This observation aligns with hypothesis *4b* that the sporting performance is stronger for foreign investors during the takeover. To conclude, the findings are overall robust with the main findings and do not suggest that including bankrupt clubs strongly biased the results.

Secondly, the increase in sporting performance may also be subject to methodological weaknesses: this study assumes that the first entrepreneurial activities are conducted in the summer transfer window of the consecutive year. However, the recent acquisition of Newcastle FC indicates, there is a chance that new majority owners conduct significant squad decisions in the winter transfer window to potentially save the club from relegation. For this reason, the investor takeover variable was reprogrammed, assigning it to the year of the season end, if the month of the takeover was in January, and to the year of the season beginning, if the investment occurred after the 31st of January.

Table 8: H1-H3 with Winter Activities

	H1a *Norm.* Wage	H1b % Wage	H2a PPG	H2b % PPG	H2c Elo	H2d % Elo	H3a *Norm.* Wage/ *Norm.* PPG	H3b *Norm.* Wage / *Norm.* Elo
Previous Results T-1	**-0.07 **** (0.03)	0.00 (0.03)	-0.03 (0.03)	-0.02 (0.02)	**-9.45 *** (5.26)	-0.00 (0.00)	-0.00 (0.00)	**0.00*** (0.00)
Takeover	**-0.05 *** (0.03)	**0.06*** (0.03)	**-0.07***** (0.03)	-0.03 (0.02)	**-13.49**** (5.78)	**-0.01 *** (0.00)	**-0.00*** (0.00)	0.00 (0.00)
T+1	-0.02 (0.03)	0.02 (0.03)	**-0.05 *** (0.03)	0.05 (0.03)	**-13.91**** (5.72)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
New Results T+1	**-0.06 **** (0.03)	0.01 (0.03)	**-0.05**** (0.03)	**-0.04*** (0.02)	**- 10.33*** (5.60)	**-0.01*** (0.00)	-0.00 (0.00)	**0.00**** (0.00)
Takeover	-0.04 (0.03)	**0.06**** (0.03)	-0.04 (0.03)	0.02 (0.03)	**-9.00*** (5.24)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
T+1	-0.02 (0.03)	**0.06*** (0.03)	0.00 (0.03)	-0.00 (0.03)	**-3.51*** (6.57)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)

Table 8 presents the results of the first set of hypotheses. The findings for *H1a* and *H1b* maintain statistically robust. The wage expenditure before the takeover continues to be significantly

lower but becomes non-significant for the season during the takeover. Furthermore, the wage change in the season of the takeover maintains significantly higher by six percentage points. Additionally, the wage change in the season after the takeover also becomes statistically significant on a 10 percent significance level. The findings for the sporting performance suggest a decrease before the takeover, instead of during the takeover. Therefore, the Elo rating and points per game significantly decrease in the season before the takeover. The increase in sporting performance during and after the takeover is however not statistically positive. Thus, I confirm H2a and H2c, but continue to reject H2b and H2d on a 10 percent significance level. Finally, the third set of hypotheses does not indicate any major change.

Table 9: H4 with Winter Activities

	H4a % Wage	H4b % PPG	H4b % Elo
Previous Results	**0.15 ****	0.05	0.00
Foreign Takeover	(0.06)	(0.04)	(0.01)
Domestic Takeover, relative to Foreign	**-0.16****	**-0.13 *****	-0.01
	(0.07)	(0.05)	(0.01)
New Results	0.11	0.02	-0.00
Foreign Takeover	(0.49)	(0.04)	(0.01)
Domestic Takeover, relative to Foreign	-0.08	0.02	0.00
	(0.06)	(0.06)	(0.01)

As of Table 9, the wage change becomes insignificant, due to higher variance. This is in contrast to my main findings and previous literature. Therefore, I interpret that my initial approach is likely suitable since including winter activities leads to higher variance within the groups and contrasts with the observation and theories of previous literature. All in all, concerns about the assignment of takeovers to certain seasons are therefore limited.

Last, my methodological approach to control for club fixed effects and a continuous division binary isolate between league differences, but not within league differences. If a club plays at the lower half of a first division most of the time, the division number variable and the club fixed effect will approximate those values. However, if the club drops to the second league for a season, where the division coefficient turns into to, the overall approximation may suggest that the club plays stronger. Thus, especially for the sporting performance indicators, controlling for the division may bias the results. For this reason, Table 10 and Table 11 indicate the results of the explanatory variables of the regressions without controlling for the division number. Table 10 indicates that all coefficients for H1a become negative statically significant, supporting the hypothesis. Furthermore,

the coefficient for the wage increase of all investors becomes non-significant. The PPG measure is now likely biased, due to not controlling for the division anymore. However, the PPG coefficient during the takeover maintains a negatively significant. There are no significant differences for H2b and H2c. The ratio for all years in H3b becomes positively significant on a 10 percent level, supporting the hypothesis that the teams are relatively efficient, which qualifies them as a takeover target.

Table 10: H1-H3 without controlling for Division

	H1a *Norm.* Wage	H1b % Wage	H2a PPG	H2b % PPG	H2c Elo	H2d % Elo	H3a *Norm.* Wage/ N*orm.* PPG	H3b *Norm.* Wage / *Norm.* Elo
Previous Results T-1	**-0.07 **** (0.03)	0.00 (0.03)	-0.03 (0.03)	-0.02 (0.02)	**-9.45 *** (5.26)	-0.00 (0.00)	-0.00 (0.00)	**0.00*** (0.00)
Takeover	**-0.05 *** (0.03)	**0.05*** (0.03)	**-0.07***** (0.03)	-0.03 (0.02)	**-13.49**** (5.78)	**-0.01 *** (0.00)	**-0.00*** (0.00)	0.00 (0.00)
T+1	-0.02 (0.03)	0.02 (0.03)	**-0.05 *** (0.03)	0.05 (0.03)	**-13.91**** (5.72)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
New Results T+1	**-0.10 **** (0.04)	-0.00 (0.03)	-0.02 (0.03)	-0.01 (0.02)	**- 14.4**** (6.83)	-0.00 (0.00)	0.00 (0.00)	**0.00**** (0.00)
Takeover	**-0.09**** (0.04)	0.05 (0.03)	**-0.06*** (0.03)	-0.03 (0.02)	**-18.9***** (7.10)	-0.01 (0.00)	-0.00 (0.00)	**0.00*** (0.00)
T+1	**-0.08**** (0.04)	0.02 (0.03)	-0.03 (0.03)	0.05 (0.03)	**-21.7***** (7.7)	-0.00 (0.00)	0.00 (0.00)	**0.00*** (0.00)

Table 11: H4 without controlling for Division

	H4a % Wage	H4b % PPG	H4b % Elo
Previous Results	**0.15 ****	0.05	0.00
Foreign Takeover	(0.06)	(0.04)	(0.01)
Domestic Takeover, relative to Foreign	**-0.16**** (0.07)	**-0.13 ***** (0.05)	-0.01 (0.01)
Incl. Winter Activities	**0.15****	0.07	0.00
Foreign Takeover	(0.07)	(0.05)	(0.01)
Domestic Takeover, relative to Foreign	**-0.15**** (0.07)	**-0.15***** (0.05)	-0.00 (0.01)

Table 11 presents the results for the fourth hypothesis. There are no significant differences in the coefficients, compared to my main results. Therefore, I conclude that controlling for the division of the club does not systematically bias my results. However, without controlling for the division, the coefficients for the change in sporting performance during the takeover are not negatively significant anymore. Thus, the observed negative change in sporting performance in *H2d* may be a result of the promotion of a few teams, biasing the results.

5. Limitations

The presented findings are subject to several limitations, including potential biases, methodology weaknesses, and statistical assumptions.

First, I do not expect the takeover to be a randomized event. Therefore, the results may underlie a non-random treatment bias. If there is a non-random treatment bias present, the found effects may be subject to selection bias since the treatment is not equally applied to all clubs. Furthermore, there may be confounding factors that affect the outcome of my study. This could be the case if the takeover is occurring at clubs with certain structural commonalities. Then these structural commonalities, also confounding factors, could influence my results. I have tried to address possible biases and factors in terms of wage expenditure, competitive position, and activity throughout the panel in the descriptive section and the robustness checks. However, I cannot exclude the possibility that this study underlies a bias, due to non-random treatment. Furthermore, this effect may be strengthened by methodological weaknesses. I included all takeovers of clubs, regardless of their current and past division. However, these takeovers will only be considered in the regression models if data for the other variables are sufficiently available. As mentioned, the data for financial and sporting performance was unbalanced and further research could concentrate on extending the dataset. I added the Elo coefficient as an additional measurement, which is available for the Top-600 clubs in Europe, to increase the data heterogeneity in the models for sporting performance. However, some regression models do not consider certain takeovers due to a lack of data.

Second, the sample is not fully representative of the European football market since only clubs are active in one of the Top-5 leagues and attrition is present. To investigate if my sample therefore may underlie an attrition bias, I implemented next-wave dummies. These concluded for all models, that units maintaining present in the next wave of the sample, were significantly better in financial and sporting performance. This is reasonable since top clubs are less likely to be relegated. However, it may lead to an upward attrition bias of the effects, as the clubs being relegated and the clubs filing for insolvency drop out. This holds especially since clubs that did not remain 3/14

seasons in the highest leagues are dropped in my research. I tried to address this circumstance with the implementation of Fixed Effects on the club and on a yearly level. This approach aims to isolate structural biases that are observable throughout units and waves. However, including less competitive clubs would likely have increased the unbiased explanatory power of the models.

Third, fan satisfaction is not a one-dimensional variable explained by better sporting performance, but consists of a multitude of factors, as investigated by Sarstedt et al. (2014). They found that factors such as the quality of the stadium, and entertainment in the stadium all significantly impact fan satisfaction. While club management and the team also have a significant effect on fan satisfaction, they may be part of a multi-dimensional strategy to create value. This implies, that there are other factors to satisfy the local opposition and that a wage increase is not the sole driver of higher fan satisfaction. Parker and Stuart (1997) argue furthermore that football brands have encompassed values. Since brand switching costs are high for football fans, investors need to pursue a strategy that fits the clubs' values in order to mitigate public opposition (Parker & Stuart, 1997; Bull & Whittam, 2020). Thus, for some majority investors, investing in the team may have adverse effects on fan satisfaction, if the club is known for its youth development. Therefore, further research could include other variables, such as tangible assets, activities in youth development, and commercial revenue, to investigate the effect of takeovers in other dimensions. Moreover, the wage variable itself may omit additional compensation schemes, such as the transferring of commercialization rights to players.

Fourth, the explanatory ratios in the third set of hypotheses underlie the assumption that the relationship between normalized wage expenditure and normalized sporting performance is linear. If this assumption does not hold, due to the requirement of linear parameters in linear regression models, the estimates are systematically biased. The distribution the ratios are normal. Furthermore, a Ramsey test rejected the null hypothesis of missing important non-linearities in the model. Therefore, I expected that the concern is limited, however, I cannot fully confirm this assumption.

Fifth, my findings may be biased by activities in certain countries, as the data and the number of takeovers is not evenly distributed. I spent a reasonable time of my research trying to increase the sample size, however, adding new data was often more challenging than expected. Since the wage expenditure is only included in the financial closing and not very often publicly discussed, I had to rely on financial statements to complete existing- and add new observations. However, especially for the years before 2008, data collection was challenging, as the national registers in Spain, France, Germany, and Italy have not digitized documents from the early 2000s. As the availability of old financial closings from England was more accessible, fully balanced observations from England are more present.

Sixth, the development of sporting performance can be influenced by exogenous events. Injuries may, for example, significantly decrease sporting performance and bias the results. Therefore, all observed effects may underlie exogenous effects that cannot be controlled or changed by the new investors. My interpretation of the sporting performance and wage-to-sporting performance ratio is therefore subject to the assumption that these events are random. Future research could concentrate on isolating this effect, for example controlling for the period of injury times the market value of the player. This could improve the interpretability of the entrepreneurial effects in terms of their decision quality and overall efficiency impact.

Seventh, the fiscal year of financial clubs is generally aligned with the Seasons, however, professional clubs do not have homogenous year-ends (KPMG, 2022). I did not undertake an effort to control for divergent reporting periods. Therefore, the matching for some clubs between financial performance and sporting performance may be imprecise, as certain months of the year are not correctly assigned. This potentially may also include the transfer periods, in which I expect additional expenses, such as signing bonuses.

Last, the robustness of my investor takeover variable and takeover date is unknown. This is for several reasons. First, majority takeovers may result from block-building strategies, that effectively introduce the investors' agenda fluently into the club, such as Stan Kroenke did at Arsenal. Furthermore, less-known individuals may collaborate as an investor consortium, like the Agnelli family at Juventus. Thus, a club may efficiently belong to majority ownership, while it is not identified as such. Also, individuals may acquire clubs with colluding interests, such as the City Group, which acquired FC Girona to mainly develop their own talents. The phenomenon of multi-club ownership has gradually increased during the period of observation. Additionally, I tried to differentiate between within-investor ownership changes and ownership changes that concluded in a shift of the controlling entity. However, this was challenging, as often an investigation of offshore companies was required. Sometimes, I, therefore, had to rely on press articles to identify if an actual takeover occurred. The reliability of these sources varies. Finally, I relied on the date of the takeover noted in Orbis. However, it is likely that investors were able to conduct entrepreneurial activities before that date. Moreover, not every transaction was a simple purchase of shares. For example, the Glacier family acquired the majority of shares at Manchester United with the redemption of a debt-equity swap. While redemption of the debt, resulting in the acquisition of stocks, is noted as the acquisition date, it is likely that the family was able to act as the majority shareholder before that date.

6. Conclusion

In this study, I investigated the effects of a majority investor takeover at European football clubs in the Top-5 nations with the largest dataset of investor takeovers to date. Furthermore, I differentiated between the timing and the effects of the takeover to isolate the ex-ante from ex-post phenomena. My sample included a total of 238 takeover events with data from 215 clubs in the largest five European leagues between 2004/05 and 2018/19. I found significant empirical evidence for the entrepreneurial activities of private majority investors in the first season after the takeover.

Using wage expenditure as a measurement to determine team investments, I investigated that clubs with significantly low wage expenditure pre-takeover attract investors when controlling for club and year fixed effects and selected exogenous sporting variables. These clubs performed at relatively significantly lower competitiveness when using the Elo coefficient. However, no significant effect was found, when using the points per game measure to identify effects related to the performance in the national league. Finally, the efficiency between the normalized Elo coefficients to normalized wage expenditure was significantly higher pre-investment. This could indicate that these teams are more efficient in terms of their operating efficiency, compared to the other clubs, qualifying them as takeover targets to conduct investments and entrepreneurial activities, to maximize the return on investment in terms of profits and value.

Following the takeover, private majority investors are conducting entrepreneurial activities that aim to improve the sporting performance of the club, mitigate local opposition, and improve the output of available players. Therefore, the wage expenditure increases significantly by 5.5 percentage points, likely as a direct result of the newly introduced objectives of the owner. This effect is even stronger for foreign majority investors, which increase the wage expenditure in the first season after the takeover by 15.7 percentage points. On the other hand, the wage increase of domestic investors on was 16.1 percentage points lower, compared to foreign investors. Therefore, it is likely that the observed effects are significantly influenced by the activities of foreign investors. The heterogeneity between foreign and domestic investors is likely a result of higher social and cultural distance from the club. Since foreign investors face higher opposition, their required social buy-in is expected to be higher. Moreover, they are more likely to focus on spill-overs to other businesses, which could increase their motivation to invest. The wage increase is lower in the season after the takeover than in the season during the takeover. This may be a result of cognitive losses from the investors in the first season, as investors in public markets significantly overestimate the percentage of winning.

The clubs, subject to takeover, performed at a significantly low level of sporting performance pre-takeover, using the Elo coefficient. However, during and following the takeover, the effect maintains significantly negative and increases in magnitude. Furthermore, starting from the season during the takeover, the sporting performance of points per game is significantly negative. Therefore, I find no evidence that suggests that sporting performance increases after the takeover. This may be due to a lack of available information to the owner, and industry specificity of the knowledge in entrepreneurial activities. Similarly, to heterogeneity in the wage change, I find that there is no significant decrease for foreign investors. However, compared to foreign investors, domestic investors decrease the points per game in the first season by 13.3 percentage points. The initially positive and significant coefficient of the operative efficiency decreases to non-significant levels. This is likely a result of the observable investment activities in the first and second year after the investment, which does not lead to a positive outcome on the sporting performance side. When using the points per game to wage expenditure ratio, the coefficient is negatively significant for the season during the takeover. Therefore, the decrease in efficiency may be especially observable in the first season of entrepreneurial activities.

This study contributes to the existing literature by observing the theoretically hypothesized effects, in a relatively robust data sample. To my knowledge, it is the first research that uses panel data for a relatively representative dataset to differentiate investor takeover effects before and after. However, the research was heavily restricted by data scarcity to elaborate on further and more advanced topics. Future research could concentrate on extending the methodology of this research and focus on creating insights about the influence of takeover events on other variables, such as infrastructure and commercial development. Furthermore, the interpretation of my findings is limited to a potential non-random treatment bias and a potential attrition bias in my sample. Future research could focus on addressing these concerns more efficiently. Finally, the observations of these effects could be extended for periods longer than one year before until one year after the takeover, to approximate more accurately long-term behavior.

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Appendix

Table 12: Teams and Takeovers in Dataset

Name in Stata	Name in Orbis	Take 1	Take 2	Take 3	Take 4	Take 5	Take 6
Ajaccio	GFA ATHLETISME GAZELEC FOOTBALL CLUB AJACCIO ATHLETISME						
Ajaccio G	ATHLETIC CLUB AJACCIEN ACA FOOTBALL						
Albinoleffe	U.C. ALBINOLEFFE S.R.L.	01.12.06					
Almeria	UNION DEPORTIVA ALMERIA, SA D	01.05.06	01.09.19				
Amiens	AMIENS SPORTING CLUB FOOTBALL	01.10.18					
Arezzo	UNION TEAM CHIMERA AREZZO SOCIETA' SPORTIVA DILETTANTISTICA A RES PONSABILITA' LIMITATA						
Arsenal	THE ARSENAL FOOTBALL CLUB PUBLIC LIMITED COMPANY	01.04.11					
Aston Villa	ASTON VILLA FC LIMITED	01.08.06	01.05.16	01.07.18			
Atalanta	ATALANTA BERGAMASCA CALCIO S.P.A.	01.12.05	01.02.11				
Athletic Bilbao							
Atletico Madrid	CLUB ATLETICO DE MADRID SAD	01.12.03					
Augsburg							
Auxerre	ASSOCIATION DE LA JEUNESSE AUXERROISE	01.08.16					
Barcelona							
Barnsley	BARNSLEY FOOTBALL CLUB LIMITED	01.12.05	01.12.08				
Bayern Munich							
Bielefeld							
Birmingham City	BIRMINGHAM CITY FOOTBALL CLUB PLC	01.03.04	01.12.17	01.01.21			
Blackburn Rovers	THE BLACKBURN ROVERS FOOTBALL AND ATHLETIC LIMITED	01.09.15					
Blackpool	BLACKPOOL FOOTBALL CLUB HOLDINGS LTD	01.03.13	01.05.20				
Bochum							
Bologna	BOLOGNA FOOTBALL CLUB 1909 - S.P.A., IN FORMA ABBREVIATA BFC S.P .A.	01.06.10	01.10.14				
Bordeaux	FOOTBALL CLUB DES GIRONDINS DE BORDEAUX	01.01.15	01.02.19				
Boulogne	UNION SPORTIVE DES MUNICIPAUX DE BOULOGNE-SUR-MER						

Bourg Peronnas	FOOTBALL BOURG EN BRESSE PERONNAS 01					
Bournemouth	AFC BOURNEMOUTH LIMITED	01.01.12				
Bremen						
Brentford	BRENTFORD FC LIMITED	01.01.02	01.01.06	01.10.12		
Brescia	BRESCIA CALCIO S.P.A.	01.10.06	01.10.09	01.02.15		
Brest	STADE BRESTOIS 29	01.01.18				
Brighton & Hove Albion	BRIGHTON & HOVE ALBION HOLDINGS LIMITED	01.08.08				
Bristol City	BRISTOL CITY HOLDINGS LIMITED					
Burnley	BURNLEY FC HOLDINGS LIMITED	01.12.12	01.09.21			
Caen	STADE MALHERBE CAEN CALVADOS BAS NORMAND	01.09.20				
Cagliari	CAGLIARI CALCIO S.P.A.	01.10.07	01.06.13	01.12.15		
Cardiff City	CARDIFF CITY FOOTBALL CLUB (HOLDINGS) LIMITED	01.10.17				
Catania	CALCIO CATANIA S.P.A.	01.10.06	01.05.21			
Celta de Vigo	REAL CLUB CELTA DE VIGO SAD	01.02.15				
Charlton Athletic	CHARLTON ATHLETIC FOOTBALL COMPANY LIMITED	01.01.14	01.09.20			
Chelsea	CHELSEA FC PLC	01.08.03				
Chievo	CHIEVO VERONA FOOTBALL & FENCING SRL	01.12.05				
Cittadella	A.S. CITTADELLA S.R.L.	01.12.05				
Clermont	CLERMONT FOOT 63					
Cottbus						
Coventry City	Coventry City Football Club	01.07.07				
Creteil	US CRETEIL LUSITANOS FOOT	01.06.11	01.03.18			
Deportivo Alaves	DEPORTIVO ALAVES, S.A.D.	01.08.04	01.07.07	01.02.10	01.05.18	01.10.21
Deportivo La Coruna	REAL CLUB DEPORTIVO DE LA CORUNA, SAD	01.12.20				
Derby County	THE DERBY COUNTY FOOTBALL CLUB LIMITED	01.12.05	01.01.07	01.11.16		
Dijon	DIJON FOOTBALL COTE D'OR					
Doncaster Rovers	DONCASTER ROVERS LIMITED	01.03.04	01.03.10			
Dortmund						
Eibar	SOCIEDAD DEPORTIVA EIBAR, SA D					
Empoli	EMPOLI F.B.C. - S.P.A.	01.10.06				
Espanyol	REIAL CLUB DEPORTIU ESPANYOL DE BARCELONA S.A.D.	01.11.15				
Everton	EVERTON FOOTBALL CLUB COMPANY, LIMITED	01.08.18				

Evian TG	EVIAN THONON GAILLARD FOOTBALL CLUB	01.11.10					
Fiorentina	ACF FIORENTINA S.R.L.	01.12.05	01.08.19				
Frankfurt							
Freiburg							
Frosinone	FROSINONE CALCIO S.R.L.	01.03.09	01.06.18				
Fulham	FULHAM FOOTBALL LEISURE LIMITED	01.07.08	01.07.13				
Genoa	GENOA CRICKET AND FOOTBALL CLUB S.P.A.	01.06.08	01.04.10				
Getafe	GETAFE CLUB DE FUTBOL SAD	01.03.05					
Granada	GRANADA CLUB DE FUTBOL SAD	01.10.13	01.05.16				
Grenoble	GRENOBLE FOOT 38	01.03.07	01.02.10				
Grosseto	FOOTBALL CLUB GROSSETO SOCIETA' SPORTIVA DILETTANTISTICA A RESPON SABILITA' LIMITATA IN FORMA ABBREVIATA F.C. GROSSETO S.S.D. A R.L.						
Gueugnon	FOOTBALL CLUB GUEUGNONNAIS SA						
Guingamp	EN AVANT DE GUINGAMP						
Hamburg							
Hannover							
Hellas Verona	HELLAS VERONA FOOTBALL CLUB S.P.A.	01.10.06	01.02.09	01.10.12	01.10.15	01.08.16	01.11.17
Hertha							
Hoffenheim		01.02.15					
Huddersfield Town	THE HUDDERSFIELD TOWN ASSOCIATION FOOTBALL CLUB LIMITED	01.06.05	01.07.10	01.07.19			
Hull City	HULL CITY TIGERS LIMITED	01.07.06	01.06.07	01.08.10	01.08.11		
Internazionale	F.C. INTERNAZIONALE MILANO S.P.A.	01.10.10	01.10.13	01.06.18			
Ipswich Town	IPSWICH TOWN FOOTBALL CLUB COMPANY LIMITED	01.10.10					
Juve Stabia	S.S. JUVE STABIA S.R.L.	01.12.09	01.12.12	01.04.15			
Juventus	JUVENTUS FOOTBALL CLUB SPA	01.12.03	01.06.10				
Koln							
Las Palmas	CLUB UNION DEPORTIVA LAS PALMAS, SA D						
Latina	U.S. LATINA CALCIO S.R.L.	01.06.09	01.08.12	01.12.16			
Laval	SASP STADE LAVALLOIS MAYENNE F C						
Lazio	SOCIETA SPORTIVA LAZIO SPA	01.01.07					

Le Havre	HAVRE ATHLETIC CLUB FOOTBALL ASSOCIATION	01.08.14	01.09.19			
Le Mans	LEMANS FC	01.12.17				
Lecce	UNIONE SPORTIVA LECCE S.P.A.	01.11.04	01.06.10	01.11.15		
Leicester City	LEICESTER CITY FOOTBALL CLUB LIMITED	01.09.07	01.08.10	01.09.12		
Lens	RACING CLUB DE LENS	01.08.03	01.01.09	01.07.11	01.07.13	01.05.16
Levante	LEVANTE UNION DEPORTIVA SOCIEDAD ANONIMA DEPORTIVA	01.03.05	01.07.08	01.01.13		
Leverkusen						
Lille	LOSC LILLE	01.09.07	01.01.17			
Liverpool	THE LIVERPOOL FOOTBALL CLUB AND ATHLETIC GROUNDS LIMITED	01.03.07	01.10.10			
Livorno	ASSOCIAZIONE SPORTIVA LIVORNO CALCIO S.R.L. IN LIQUIDAZIONE	01.12.06	01.04.11	01.08.15		
Lorient	FC LORIENT BRETAGNE SUD					
Lyon	OLYMPIQUE LYONNAIS GROUPE	01.04.05				
Mainz						
Malaga	MALAGA CLUB DE FUTBOL, SOCIEDAD ANONIMA DEPORTIVA	01.03.04	01.08.06	01.03.11		
Mallorca	REAL CLUB DEPORTIVO MALLORCA SAD	01.03.08	01.10.10	01.01.15	01.01.16	01.05.18
Manchester City	MANCHESTER CITY FOOTBALL CLUB LIMITED	01.06.07	01.08.08			
Manchester United	MANCHESTER UNITED FOOTBALL CLUB LIMITED	01.07.06				
Mantova	ASSOCIAZIONE CALCIO MANTOVA S.R.L. IN SIGLA A.C. MANTOVA S.R.L. IN LIQUIDAZIONE	01.03.09				
Marseille	OLYMPIQUE DE MARSEILLE	01.02.07				
Metz	FC METZ					
Middlesbrough	MIDDLESBROUGH FOOTBALL & ATHLETIC COMPANY HOLDINGS LIMITED					
Milan	ASSOCIAZIONE CALCIO MILAN S.P.A. O IN FORMA ABBREVIATA A.C. MILAN S.P.A.	01.05.17				
Millwall	MILLWALL HOLDINGS LIMITED	01.06.06	01.10.12			
Monaco	AS MONACO FOOTBALL CLUB SA	01.09.17				
Monchengladbach						

Montpellier	MONTPELLIER HERAULT SPORT CLUB S	01.12.06		
Nancy	S.A.S.P. NANCY LORRAINE	01.01.08		
Nantes	FC NANTES	01.09.07		
Newcastle United	NEWCASTLE UNITED LIMITED	01.05.08		
Nice	SASP OLYMPIQUE GYMNASE CLUB NICE COTE AZ	01.04.07	01.06.16	01.08.19
Nimes	NIMES OLYMPIQUE	01.04.10	01.11.18	
Niort	CHAMOIS NIORTAIS FOOTBALL CLUB			
Norwich City	NORWICH CITY FOOTBALL CLUB PLC	01.10.19		
Nottingham Forest	NOTTINGHAM FOREST FOOTBALL CLUB LIMITED	01.10.19		
Novara	NOVARA CALCIO SOCIETA' A RESPONSABILITA' LIMITATA	01.04.09	01.12.19	
Nurnberg				
Orleans	UNION SPORTIVE ORLEANS LOIRET FOOTBALL			
Osasuna	CLUB ATLETICO OSASUNA			
Padova	CALCIO PADOVA S.P.A.	01.07.15	01.07.17	01.11.19
Paris Saint Germain	PARIS SAINT GERMAIN FOOTBALL	01.07.04	01.06.11	
Perugia	ASSOCIAZIONE CALCISTICA PERUGIA CALCIO S.R.L.	01.04.13	01.12.15	
Peterborough United	PETERBOROUGH UNITED FOOTBALL CLUB LIMITED	01.10.03	01.07.08	
Piacenza	PIACENZA CALCIO 1919 - SOCIETA' A RESPONSABILITA' LIMITATA ENUNCIABILE ANCHE PIACENZA CALCIO 1919 - S.R.L.	01.09.13	01.05.17	01.06.20
Pisa	PISA SPORTING CLUB SOCIETA' A RESPONSABILITA' LIMITATA	01.02.11	01.09.15	01.01.17
Plymouth Argyle	PLYMOUTH ARGYLE FOOTBALL CLUB LIMITED	01.10.12		
Portsmouth	PORTSMOUTH FOOTBALL CLUB	19.07.06	10.04.13	01.08.17
Preston North End	PRESTON NORTH END LIMITED	01.06.10		
Pro Vercelli	F.C. PRO VERCELLI 1892 S.R.L	01.02.11	01.07.20	
Queens Park Rangers	QPR HOLDINGS LIMITED	01.08.07	18.08.11	
Racing Santander	REAL RACING CLUB DE SANTANDER, SAD	01.03.05	01.11.11	01.11.18

Rayo Vallecano	RAYO VALLECANO DE MADRID, SAD	01.03.04	01.05.11	
Reading	READING F.C. LIMITED	01.07.07		
Real Madrid				
Real Sociedad	REAL SOCIEDAD DE FUTBOL SAD			
Real Valladolid	REAL VALLADOLID CLUB DE FUTBOL SA D	01.09.11	01.08.14	01.11.18
Real Zaragoza	REAL ZARAGOZA SAD	01.08.06	01.07.14	
Recreativo Huelva	REAL CLUB RECREATIVO DE HUELVA SAD	01.02.05	01.02.15	01.05.18
Reims	SASP STADE DE REIMS			
Rennes	STADE RENNAIS FOOTBALL CLUB	01.12.10		
Rimini	RIMINI CALCIO FOOTBALL CLUB S.R.L. IN LIQUIDAZIONE	01.02.02		
Roma	A.S. ROMA SPA	16.04.11	01.08.20	
Rotherham United	ROTHERHAM UNITED FOOTBALL CLUB (RUFC) LIMITED	01.04.09		
Saint Etienne	SASP AS SAINT ETIENNE	01.10.03		
Salernitana	U.S. SALERNITANA 1919 - SOCIETA' A RESPONSABILITA' LIMITATA	01.12.11		
Sampdoria	UNIONE CALCIO SAMPDORIA - SOCIETA' PER AZIONI	01.12.06		
Sassuolo	UNIONE SPORTIVA SASSUOLO CALCIO S.R.L. ABBREVIABILE IN: U.S. SASSUOLO CALCIO S.R.L.	01.12.08		
Schalke				
Scunthorpe United	SCUNTHORPE UNITED FOOTBALL CLUB LIMITED	01.07.14		
Sevilla	SEVILLA FUTBOL CLUB SOCIEDAD DEPORTIVA SAD	01.03.08		
Sheffield United	THE SHEFFIELD UNITED FOOTBALL CLUB LIMITED	01.06.13		
Sheffield Wednesday	SHEFFIELD WEDNESDAY PLC	01.06.13		
Sochaux	FOOTBALL CLUB SOCHAUX-MONTBELIARD SA	01.03.05	01.07.15	
Southampton	SOUTHAMPTON FOOTBALL CLUB LIMITED	01.07.09	01.08.17	
Spezia	SPEZIA CALCIO 1906 S.R.L. IN LIQUIDAZIONE	01.06.06	01.03.09	01.05.11
Sporting Gijon	REAL SPORTING DE GIJON, SA D			
Stoke City	STOKE CITY HOLDINGS LIMITED	01.01.07		
Strasbourg	RACING CLUB DE STRASBOURG ALSACE	01.07.16		
Stuttgart				

Sunderland	SUNDERLAND A F C	01.08.06	21.05.18	24.12.20
Swansea City	SWANSEA CITY ASSOCIATION FOOTBALL CLUB LIMITED(THE)	01.07.16		
Ternana	TERNANA CALCIO S.P.A.	01.12.09	01.11.17	
Torino	TORINO FOOTBALL CLUB S.P.A. O, IN FORMA ABBREVIATA, TORINO F.C. S.P.A.	01.04.07	01.12.08	
Tottenham Hotspur	TOTTENHAM HOTSPUR LIMITED	01.01.04		
Toulouse	TOULOUSE FOOTBALL CLUB	01.02.14	01.07.20	
Tours	TOURS F C			
Trapani	TRAPANI CALCIO S.R.L.	01.05.11	01.06.19	
Triestina	UNIONE SPORTIVA TRIESTINA CALCIO S.P.A.	01.11.10		
Troyes	ESPERANCE SPORTIVE TROYES AUBE CHAMPAGNE	13.06.09	03.09.20	
Udinese	UDINESE CALCIO - SPA	01.11.05		
Valencia	VALENCIA CLUB DE FUTBOL SOCIEDAD ANONIMA DEPORTIVA	01.12.08	01.09.11	01.10.14
Vannes	VANNES OLYMPIQUE CLUB	01.01.10		
Varese	SOCIETA' SPORTIVA DILETTANTISTICA VARESE CALCIO S.R.L.	01.07.04	01.05.17	01.06.18
Villarreal	VILLARREAL CLUB DE FUTBOL, SOCIEDAD ANONIMA DEPORTIVA	01.03.04		
Virtus Entella	VIRTUS ENTELLA SRL	01.11.11	01.09.17	
Virtus Lanciano	S.S. VIRTUS LANCIANO 1924 S.R.L. - IN LIQUIDAZIONE	01.03.09		
Watford	WATFORD ASSOCIATION FOOTBALL CLUB LIMITED(THE)	01.06.12		
West Bromwich Albion	WEST BROMWICH ALBION HOLDINGS LIMITED	01.05.13	01.05.21	
West Ham United	WEST HAM UNITED LIMITED	01.04.08	01.07.13	
Wigan Athletic	WIGAN ATHLETIC A.F.C. LIMITED	01.05.12		
Wolfsburg				
Wolverhampton Wanderers	WOLVERHAMPTON WANDERERS FOOTBALL CLUB (1986) LIMITED	01.05.12		
Angers	ANGERS SCO	01.05.06	01.08.14	
Arles	ATHLETIC CLUB ARLESIEN			
Avellino	S.S.C. AVELLINO S.R.L. - SOCIETA' SPORTIVA DILETTANTISTICA SENZA FINI DI LUCRO, IN LIQUIDAZIONE			
Pescara	PESCARA CALCIO S.P.A.	01.10.08		

Trevino	TREVISO FOOTBALL CLUB 1993 S.R.L. - IN SIGLA F.B.C. IN LIQUIDAZIONE	01.12.06		
Ancona	A.C. ANCONA S.R.L.	01.11.09		
Ascoli	ASCOLI CALCIO 1898 F.C. S.P.A.	01.11.06		
Bari	SOCIETA' SPORTIVA CALCIO BARI S.P.A.	20.05.14		
Bastia	SA SPORTING CLUB DE BASTIA			
Bolton Wanderers	BURNDEN LEISURE LIMITED	01.12.03	01.06.14	01.06.16
Carpi	ASSOCIAZIONE CALCIO CARPI			
Cesena	A.C. CESENA S.P.A.	01.10.10	01.07.13	
Chateauroux	LA BERRICHONNE FOOTBALL			
Crotone	F.C.CROTONE S.R.L	01.03.08	01.11.12	
Crystal Palace	CPFC LIMITED	01.08.10	01.05.16	
Istres	FOOTBALL CLUB ISTRES OUEST PROVENCE	01.02.13		
Leeds United	LEEDS UNITED FOOTBALL CLUB LIMITED	01.04.14	01.01.17	
Messina	ASSOCIAZIONI CALCIO RIUNITE MESSINA A.C.R. MESSINA SOCIETA' SPORTIVA DILETTANTISTICA A RESPONSABILITA' LIMITATA	01.07.17		
Modena	MODENA FOOTBALL CLUB - S.R.L.	01.12.05	01.04.11	01.05.14
Napoli	SOCIETA' SPORTIVA CALCIO NAPOLI S.P.A. O IN BREVE S.S.C. NAPOLI S.P.A. OPPURE SSC NAPOLI S.P.A.	01.06.05		
Palermo	not found on orbis. U.S. PALERMO SPA (SOCIETA' CALCISTICA)	01.06.02	22.11.18	
Parma	PARMA FOOTBALL CLUB SPA OPPURE IN FORMA ABBREVIATA PARMA F.C. S.P.A. IN FALLIMENTO	01.01.07		
Real Betis	REAL BETIS BALOMPIE, SOCIEDAD ANONIMA DEPORTIVA	01.03.05	01.05.18	
Reggina	REGGINA 1914 S.R.L.	01.03.16		
Sedan	CLUB SPORTIF SEDAN ARDENNES SA	01.11.06		
Siena	ACN SIENA 1904 - SRL			
Treviso	TREVISO FOOTBALL CLUB 1993 S.R.L. - IN SIGLA F.B.C. IN LIQUIDAZIONE	01.12.06		
Valenciennes	VAFC-VALENCIENNES SPORT DEVELOPPEMENT	01.08.06		
Vicenza	Vicenza Calcio	01.10.09	01.06.06	

Table 13: Correlation Statistics

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) inv_take	1.000														
(2) change	0.493	1.000													
(3) take_type	0.555	0.274	1.000												
(4) norm_wage	-0.040	-0.047	0.050	1.000											
(5) wagechange	0.027	0.028	0.026	0.110	1.000										
(6) ppg	-0.058	-0.061	0.029	0.386	-0.037	1.000									
(7) ppg_change	-0.037	0.019	0.044	-0.036	-0.274	0.507	1.000								
(8) elo	-0.052	-0.071	-0.002	0.811	0.118	0.545	0.025	1.000							
(9) elo_change	-0.037	-0.029	0.010	0.082	0.291	0.473	0.366	0.284	1.000						
(10) norm_wage_poi~s	-0.015	-0.003	0.004	-0.483	-0.148	0.577	0.532	-0.240	0.366	1.000					
(11) norm_wage_elo	0.034	0.036	-0.062	-0.986	-0.106	-0.306	0.048	-0.709	-0.026	0.527	1.000				
(12) b2b_takeover_1	0.229	0.113	0.148	-0.006	-0.021	-0.005	0.027	-0.008	-0.018	-0.005	0.003	1.000			
(13) rel	-0.020	0.007	0.013	-0.109	-0.322	0.157	0.664	-0.155	-0.132	0.259	0.086	0.016	1.000		
(14) prom	0.000	0.019	-0.031	-0.020	0.540	-0.234	-0.336	-0.067	0.097	-0.234	-0.000	-0.019	-0.074	1.000	
(15) div_num	0.028	0.045	0.031	-0.663	-0.249	0.061	0.320	-0.713	-0.055	0.702	0.620	-0.001	0.365	-0.184	1.000