Scoring Profits?

The Impact of Private Equity Investments on Soccer Clubs*

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Abstract

The interplay between private equity (PE) ownership and performance outcomes in soccer clubs raises fundamental questions about the nature of these organizations: Are soccer clubs profit-maximizing entities akin to traditional firms, or do they embody characteristics of non-profit organizations, prioritizing community and social outcomes? This paper contributes to the debate by investigating how PE investments impact financial value and social value, particularly whether financial outcomes come at the expense of team dynamics and team performance. Analyzing 96 male teams (28 PE and 68 non-PE) and 67 female teams (15 PE and 52 non-PE) (in addition to their players) across the five major European leagues as of the 2023-2024 season, the study uses a staggered difference-in-differences methodology and detailed datasets on club financials, player salaries, player and match performance metrics, and management changes. The findings suggest that while PE investments may have successfully boosted commercial and matchday revenue, on-field individual soccer player performance declines as well as team match performance. This discrepancy highlights a trade-off where off-field gains haven't translated into on-field success. I argue that individual player and match performance suffers because of team dynamics changes. I document that degree centrality, betweenness centrality, and closeness centrality among players decline following the PE deal, which has a direct impact on home and away match performance.

Keywords: PE-soccer investments, strategic shift, financial and on-field performance, team dynamics changes, player networks
JEL Codes: G23, L21, L25, L83

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I. Introduction

According to a recent analysis by a PitchBook senior reporter, over 20% and nearly 30% of the European football clubs in the main leagues are backed by private equity investors from the United States [26]. The clubs included in the study were decided based on the 96 teams in the five main male's European leagues (and on the 67 teams in the five main female's European leagues): Premier League (Super League) (England), La Liga (Liga F) (Spain), Bundesliga (Frauen-Bundesliga) (Germany), Serie A (Serie A Women) (Italy), and Ligue 1 (Feminine Division I) (France) as of the 2023-2024 season. Beginning with 2019, this specific sport has seen a rise in not only private equity financing, but involvement primarily by firms and funds located in the United States. The football industry has seen a boom in private wealth investment – private debt, venture capital funds, and private equity funds – which has led to the rising demand in foreign, predominantly U.S., participation in this growing industry. This increase in private wealth investments is a result of a rise in popularity for soccer in the US, as well as an expansion in funds created in devotion to sports. In response to this trend, this paper analyzes the financial and performance-related impacts of private equity ownership on European football clubs, aiming to provide insights into how these investments are reshaping the industry.

The European football market, a multibillion-dollar industry, presents high exit multiples and has consistently outperformed traditional public indices in terms of growth [10]. In 2022, over six billion dollars were invested in the industry, comprising both majority and minority stakes, which created a substantial pool of capital for clubs to leverage. As European football clubs expanded, they sought out larger markets for investment, finding that their local markets were insufficient in comparison to the scale of the U.S. market. U.S. private equity firms, experienced in sports investment and management through their involvement in leagues like the MLB, MLS, NBA, and NHL, quickly emerged as crucial investors [35]. These firms not only provided much-needed funding but also offered strategic partnerships and management expertise, leveraging their familiarity with the intersection of professional sports and financial investing. The appeal of European football to U.S. investors lies in the sport's growing global popularity and its distinct structure, particularly the promotion and relegation system, which contrasts sharply with the franchise model used in American sports. This dynamic, combined with the absence of a franchise cap, offers investors the potential for significant growth as teams ascend to higher leagues and enhance their valuations. The U.S. market, with its deeper investment pools, provides clubs with

more than just capital—U.S. investors also bring a wealth of sports management knowledge and a keen understanding of how to maximize returns in a sports business environment. U.S. PE firms are motivated by the possibility of immense returns, particularly given that the sports industry has demonstrated a potential for up to a 1,057% return over a 20-year period, which far exceeds the performance of more conventional public markets [10] [34]. Consequently, U.S. firms see their investments in European football as not only a financial venture, but also an opportunity to capitalize on the sport's expanding international reach.

This paper provides an in-depth analysis of the effects of U.S. private equity (PE) investments on European football clubs, with a focus on both financial and performance outcomes. By studying 96 male teams and 67 female teams across the five major European leagues – Premier League (Super League), La Liga (Liga F), Bundesliga (Frauen-Bundesliga), Serie A (Serie A Women), and Ligue 1 (Feminine Division I) – the paper employs a staggered difference-in-differences methodology to assess the changes brought by PE ownership. The findings reveal that PE-backed clubs experience considerable financial growth, including significant increases in commercial revenue, sponsorship deals, and player salaries, particularly for male teams. However, this financial growth is accompanied by declines in on-field performance, especially in away games and more so in female teams, where key performance metrics such as goals, points per game, and overall possession diminish post-investment. Additionally, the study highlights significant organizational restructuring, with frequent changes in management, chairmanship, and squad composition, indicating the disruptive impact of PE takeovers on team dynamics. Despite the financial improvements, the evidence suggests that the athletic success of clubs often deteriorates, particularly due to destabilized team structures and heightened performance pressure. Ultimately, the paper presents a comprehensive picture of how U.S. PE investments reshape European football clubs, driving financial gains at the expense of competitive performance, and underscoring the complex trade-offs between profit maximization and sporting success.

This paper contributes to the private equity literature by providing an alternative approach to private equity analysis and investment within a growing sports industry. Consistent with other literature, sport-designated private equity funds seek to increase firm value through the enhancement of financial and operational efficiency [8]. Within the football industry, investors seek to increase firm value and earn a profit through sponsorships, team performance, consumer attraction, and social network revenues (streaming, advertising, and merchandise). Ultimately, PE

firms seek three main goals during an investment or buyout: high growth multiples, leading innovation, and expanding their branch and investment geographically [8]. This paper analyzes changes in financials pre-investment and post-investment to determine PE's impact on these European football clubs as it pertains to the three main goals mentioned above. I document that relative to non-PE clubs, PE clubs experience increases in revenues, including matchdays' and commercials' revenues. This finding is consistent with prior literature, which documents that in comparison to non-PE funds and companies, there are performance improvements that are much larger under PE ownership, especially since PE seek shorter time frames to maximize their profits [19].

Within the sports industry, performance is dependent on league standings, tournament performance, and season performance. In contrast to other industries, PE funds in sports cannot directly impact player performance, but instead, seek to adjust managerial and operational efficiency. In most studies, PE firms tend to out-manage firms controlled privately, publicly, by the government, and by a family [2]. I document immediate chairman, management, and squad changes (from one year before to one year after the PE investment) which points to be consistent with prior studies. I also argue that these team changes, despite also increases in male players' salaries) impact both individual male and female players' performance (individual female players' performance suffers more) and team match performance (away match performance suffers more) through changes in team dynamics.

This paper also contributes to the growing literature in sports economics and sports investments by analyzing club-level changes due to private equity ownership inspired by the rise in private funds within sports. Analyzing the specific funds, making the most recent investments in the football clubs, most of which are sport-specific funds. This is beneficial from a financial and operational efficiency standpoint since firms that have a higher specialization within a specific industry improve specific inefficiencies more effectively [15]. Sports, primarily European football for the purposes of this paper, have seen a large growth due to urbanization, emerging economies, and new methods of networking and viewership [29]. Over the years, we have seen a rise in club valuation which has driven the demand for PE investment. Furthermore, this attraction to European football from PE investors is correlated with two main reasons [30].

First, success in sport and team performance significantly leads to a positive impact on revenues. As team performance increases between seasons, they are able not only to bring in more

viewers and consumers but are able to increase sponsorships and increase prices from a consumer's perspective. Whether this is from relegation or attending a season-end tournament, football performance directly impacts funds and revenues. Second, the success of the sport is strongly correlated with team investments. As more money is poured into the industry, teams can provide more to viewers and consumers. According to multiple studies, clubs owned by foreign private investors perform better **[30] [31]**. Although I don't find that attendance increases from pre- to post-PE investment, I do document that commercial and matchday revenues increase. I would infer that matchday revenues, given that there are few changes in attendance, increase because of increases in ticket prices, membership programs, merchandise, and food and beverage sales. I would also infer those commercial revenues, given that there are few changes in sponsorship deals, increase because of broadcasting and media rights (as in higher broadcasting fees and/or exclusive content – behind-the-scenes footage, exclusive videos, documentaries, and so on) and brand value and marketability (strong brand image and star players who attract fans and media attention).

I also examine the channel through which on-field performance decreases following PE investments. I determine that player interconnectedness and player dynamics are negatively affected from before-to-after the PE investment, and that spills over into home and away match performance. PE investments lead to a decrease in degree centrality, betweenness centrality, and closeness centrality for clubs that have received PE investments, potentially reflecting changes in team dynamics and player interconnectedness. Non-PE clubs show lower degree centrality, betweenness centrality, and closeness centrality overall, but the focus of the plot is on the changes within PE clubs pre- and post-investment. This suggests that the structural changes introduced by PE investments might lead to a less tightly interconnected network, with players being less central within the team's overall structure. After determining that team dynamics changes occur from before the time of the private equity investment to after the private equity investment, I determine the impact of centrality measures on home and away match performance. Overall, the results suggest a negative impact of centrality measures on away match performance and a more aggressive game play during home matches.

Based on the analysis of private equity (PE) investments in European football, the paper reveals significant insights into their multifaceted impact. While PE investments are highly effective in enhancing financial outcomes (consistent with the profit-maximizing objectives of PE firms), I show this comes at the expense of on-field performance, which is a key social value for fans,

players, and the broader football community. The shift toward profit-driven priorities can alienate fans and stakeholders who value on-field success and team loyalty over financial metrics.

The remainder of the paper is organized as follows. **Section II** introduces a literature review. **Section III** discusses the datasets utilized in the analysis, the matching technique of the various datasets, the main factors used for analysis and the sample's summary statistics. **Section IV** documents the results of the tests with specific industry analysis. **Section V** concludes and emphasizes the implications of the paper's results.

II. Literature Review and Hypotheses Development

The paper contributes to two main strands of literature – (1) impact of private equity investments on companies and (2) labor market dynamics in sports. Private equity (PE) investments have been shown to significantly enhance the operational and financial performance of companies. Research published top finance journals highlights that PE firms improve corporate governance, reduce agency costs, and implement strategic realignments to focus on core business strengths. PE firms create value through operational engineering and strategic oversight, resulting in substantial performance improvements **[24]**. Additionally, a survey of PE investors managing over $750 billion in assets revealed that they primarily focus on increasing growth rather than just reducing costs, suggesting a proactive approach to value creation **[16]**. Furthermore, studies indicate that companies under PE ownership often experience better profit margins and reduced operational costs due to the active management strategies and stringent cost controls implemented by PE firms **[17] [21]**.

Research by Harris, Jenkinson, and Kaplan (2012) demonstrated that U.S. buyout funds outperformed public markets by 20% to 27% over the life of the fund, reflecting the substantial value PE firms can add **[18]**. Additionally, studies by Lerner et al. (2019) found that PE buyouts could have varied effects on target firms and their workers, depending on deal type and market conditions **[27]**. The performance persistence of PE funds, as documented by Kaplan and Schoar (2005), further supports the long-term benefits of PE investments **[25]**. Moreover, the research by Davis et al. (2014) on the impact of PE on jobs and productivity highlights that PE ownership can lead to significant productivity improvements in target firms **[7]**.

PE ownership introduces significant strategic and managerial shifts in both companies and sports clubs. PE firms often bring in new management and focus on maximizing revenue streams,

such as broadcasting rights and merchandise sales. This approach can lead to a period of adjustment and short-term performance issues, but the long-term benefits include improved financial health and operational efficiency. A bibliometric review of venture capital and PE research highlights that PE firms tend to focus on enhancing financial and operational efficiencies through specialized management practices and strategic realignments [15]. My paper contributes to the private equity literature by showing that PE investments often boost commercial revenues and sponsorship deals. However, this financial success does not always translate into immediate on-field performance improvements.

Penn and Berridge (2019) offers a comprehensive analysis of competitive balance within the English Premier League (EPL). This study focuses on the disparities between clubs in terms of financial resources and player salaries and how these factors contribute to competitive balance – or the lack thereof – in the league. The concept of competitive balance is central to sports economics as it affects both the sporting outcomes and the overall appeal of the league to fans. The study by Penn and Berridge evaluates how economic disparities between clubs, particularly in terms of the ability to afford high wages for star players, create an uneven playing field. Financially powerful clubs, such as Manchester City, Manchester United, and Chelsea, dominate the league, leading to a concentration of success among a few clubs.

Fort and Quirk (1992, 1995) delve into the effects of wage dispersion within teams and its impact on overall team performance [11] [12]**.** Their study and book explore how wage disparities can influence team cohesion and success, particularly in leagues with revenue-sharing agreements. This research is crucial for understanding the balance between competitive equity and financial efficiency within sports leagues. Additionally, Franck and Nüesch (2011) examine how wage dispersion affects team outcomes in European soccer, finding that greater wage inequality within teams can lead to diminished performance, highlighting the importance of equitable pay structures in team sports [14].

Another significant study in sports economics involving MLB baseball players is "The Peculiar Economics of Professional Sports" by Walter C. Neale published in 1964. This foundational paper discusses unique aspects of professional sports leagues, such as the "Louis-Schmelling paradox," which emphasizes the interdependence of competitors, and the "league standing effect," focusing on the competitive balance within leagues [28]. Rottenberg's paper "The Baseball Players' Labor Market" introduced the idea that the reserve clause, which bound players to their teams

indefinitely, shifted wealth from players to team owners. Rottenberg argued that the clause had little effect on the distribution of talent among teams, as players would naturally end up in markets that could best exploit their abilities [32]. Kahn's research examined the effects of free agency and long-term contracts on player compensation. He found that free agency significantly increased player salaries and provided a more equitable distribution of player talent across teams [23]. My paper contributes to the sports economics literature by showing that despite increases in soccer player salaries after private equity investments, team-level on-field performance doesn't improve in the short term most likely due to team dynamics changes.

I also contribute to the literature on social networks within companies. Social networks within companies have garnered significant attention in finance research due to their profound impact on various aspects of corporate behavior and performance. Some of the topics this strand literature explores are the following – influence on decision-making and performance, corporate governance, and organizational culture and employee behavior. Social networks within companies facilitate the diffusion of information, which can lead to better-informed decision-making processes. In a study by Cohen et al. (2010), the authors examine how social ties among executives and directors influence corporate investment decisions [6]. They find that firms with more interconnected boards are better at acquiring and utilizing valuable information, leading to improved investment efficiency and firm performance. Another study by Engelberg, Gao, and Parsons (2012) investigates peer effects in corporate decision-making [9]. The research highlights how social connections among CEOs of different firms can lead to similarities in corporate policies and strategies. These peer effects are especially pronounced in areas such as executive compensation, capital structure, and strategic investments.

Social networks within the board of directors play a crucial role in shaping corporate governance. A paper by Hwang and Kim (2009) examines how the social ties among board members affect firm outcomes [21]. The study finds that firms with highly interconnected boards tend to exhibit better governance practices and lower levels of managerial opportunism, ultimately leading to higher firm value. Activist investors also leverage social networks to exert influence on corporate governance. Brav et al. (2021) explore how activist hedge funds use their social ties to gather support and coordinate actions during proxy fights [3]. The research shows that social networks enable activists to be more effective in pushing for governance changes and enhancing shareholder value.

Research by Bandiera, Barankay, and Rasul (2009) delves into how social networks within firms impact employee performance [1]. The study finds that employees who are more centrally positioned within their company's social network tend to exhibit higher levels of productivity. This centrality provides better access to information and resources, fostering a more collaborative and efficient work environment. Social networks within companies also facilitate knowledge sharing and innovation. A study by Cai, Li, and Park (2016) examines the role of internal networks in promoting knowledge transfer among employees [5]. The findings suggest that firms with stronger internal networks are more adept at leveraging their collective knowledge, leading to higher rates of innovation and competitive advantage. Although my paper is not directly tied to within-company decision-making and performance and corporate governance, it is related to within-company organizational culture and employee behavior. I argue that individual players' and match performance suffers because of team dynamics changes. To show these team dynamics changes, I build a players' network based upon appearances and co-appearances in home and away games and find correlation with home and away game performance.

The interplay between private equity (PE) ownership and performance outcomes in sports clubs raises fundamental questions about the nature of these organizations: Are soccer clubs profit-maximizing entities akin to traditional firms, or do they embody characteristics of non-profit organizations, prioritizing community and social outcomes? Soccer clubs occupy a unique space between non-profit and for-profit organizational models, blending elements of both. Traditionally, many soccer clubs have operated with community-oriented missions, prioritizing the social and cultural values of the sport which aligns with non-profit characteristics. Some examples of such soccer clubs include Real Madrid and Barcelona, which are member-owned entities. However, as the commercial appeal of soccer has grown, many clubs have increasingly adopted practices of for-profit institutions. They aim to maximize revenue streams through ticket sales, sponsorships, broadcasting rights, and merchandise. This transformation reflects a broader shift toward profit-maximization goals, particularly in clubs backed by private equity investors or other financial stakeholders seeking high returns on their investments. Some of the clubs that fit into this space include Manchester United and Chelsea. This paper contributes to the debate by investigating how PE investments impact financial and on-field performance, particularly whether efficiency gains come at the expense of team dynamics and team performance. I develop the following two hypotheses:

I. **H1:** PE ownership increases financial efficiency and player salaries but does not necessarily enhance individual or team performance.

II. **H2:** PE ownership results in significant managerial and squad turnover, affecting team cohesion and network metrics, such as player centrality.

By formulating these hypotheses, the paper provides a framework to interpret the nuanced and sometimes ambiguous results of PE investments in sports.

III. Private Equity in European Football: Investment Patterns and Strategies

A systematic review of institutional investment across major European football clubs reveals distinct patterns in ownership strategy, investor origin, and regional concentration. Private equity firms, high-net-worth individuals, sovereign wealth funds (SWFs), and hybrid corporate structures have increasingly targeted football clubs as high-upside, brand-driven assets capable of delivering long-term returns through commercial expansion, media rights, and internationalization strategies.

In England, a mature and commercially dynamic football ecosystem, clubs like Bournemouth, Chelsea, Manchester United, and Newcastle United have drawn multi-layered investor structures combining PE and HNW capital. For instance, Chelsea represents a particularly fragmented ownership model involving Clearlake Capital, Todd Boehly, and other minority stakeholders such as Ares Management—with investment stakes spanning from majority control to passive minority positions. Newcastle United's acquisition by Saudi Arabia's PIF, alongside PCP Capital and the Reuben Brothers, represents a contrasting model: a consolidated strategic majority play, combining sovereign influence with private capital expertise. These variations in stake size reflect different strategic ambitions—ranging from full-scale sporting control to financial exposure without operational accountability.

In Italy and France, there has been a clear trend toward majority buyouts driven by PE funds with longer time horizons. Clubs such as AC Milan (RedBird Capital Partners), Atalanta (Bain Capital, Arctos), Olympique Lyonnais (Eagle Football Holdings), and Toulouse (RedBird) now sit under outright or controlling PE ownership, often following underperformance, governance crises, or post-COVID valuation resets. These majority stakes allow for more aggressive restructuring, youth development pipelines, and monetization of commercial rights—especially in mid-market clubs where turnaround potential is higher and the barrier to entry is lower than in the Premier League.

Conversely, in Spain and Germany, the predominant investor footprint is still one of minority holdings, exemplified by firms like Ares Management (Atlético Madrid), 777 Partners (Sevilla), and MSP Sports Capital (Augsburg). These investments are often regulatory-constrained or guided by legacy ownership traditions that resist outright control. As such, investors tend to act as financial backers rather than operational stewards, opting for gradual equity appreciation and soft influence via board representation.

Across regions, a general trend emerges: private firms entering with majority stakes tend to be more operationally involved, aiming for active value creation through capital discipline, brand optimization, and talent pipelines. Minority investors, particularly those from the U.S. PE ecosystem like Arctos Sports Partners, Silver Lake, and Core Sports Capital, are more likely to treat clubs as portfolio assets—leveraging sports as an uncorrelated alternative investment class without seeking transformational influence.

These investment archetypes also mirror the intentions and histories of the firms involved. For example, 777 Partnersand RedBird Capital Partners, both among the most active investors in football, have consistently favored control positions across multiple clubs, suggesting a long-term strategy of vertical integration and cross-club synergy. Meanwhile, firms like Ares Management and Silver Lake, which frequently take minority stakes, appear more aligned with low-touch, return-driven capital allocation within broader sports, media, and entertainment portfolios.

The increasing financialization of football, as evidenced by the proliferation of PE and SWF-backed transactions across both top-tier and historically mid-table clubs, has fundamentally reshaped the governance and fiscal orientation of the game. Investment strategy—particularly the distinction between control and non-control stakes—not only determines the investor's operational influence but also shapes downstream decisions in cash allocation, player recruitment, and infrastructural investment.

IV. Data and Methodology

For my final dataset, I use hand-collected public information and information from Footy Stats on PE clubs and non-PE clubs in the Premier League (Super League) (England), La Liga (Liga F) (Spain), Bundesliga (Frauen-Bundesliga) (Germany), Serie A (Serie A Women) (Italy), and Ligue 1 (Féminine Division 1) (France). I identify the clubs that private equity has invested in based on Preqin data, PitchBook public reports, and other various public information. I identify 28 private

equity deals from 1998 to 2023 with one deal occurring in 1998, one deal occurring in 2005, one deal occurring in 2006, one deal occurring in 2017, one deal occurring in 2018, four deals occurring in 2019, three deals occurring in 2020, six deals occurring in 2021, seven deals occurring in 2022, and three deals occurring in 2023. The Premier League (Super League) and the Ligue 1 (Féminine Division 1) are the two leagues in which private equity invests the most, while the Bundesliga is the league in which private equity invests the least. The 28 private equity deals represent 28.86% of the clubs in my sample of male clubs and 36.67% of female clubs. The male clubs' sample includes 28 private equity clubs and 68 non-private-equity clubs, and the female clubs' sample includes 15 private equity clubs and 52 non-private-equity clubs. The first three clubs that private equity has invested in are Stade Rennais in 1998, Manchester United in 2005, and Paris Saint-Germain in 2006. I also gather information on the private equity parent companies that have invested in the football clubs in the sample. For instance, Cannae Holdings, Inc. invests in Bournemouth on 12/2022. The majority of the deals in the sample are buyout and growth capital deals, even though there are co-investment deals in the sample. In addition to identifying the month and the year that private equity invests in football clubs, I also identify the season in which the investment takes place.

To determine PE's impact on football clubs, I identify the season before and after the investment takes place. For instance, for Liverpool, the PE investment takes place on 02/2021 which is during the club's 2020-2021 season. Therefore, I gather information for the club for the 2019-2020 season (the season before) and all seasons before going back to the 2013-2014 season and for the 2021-2022 season (the season after) and all seasons up to the 2023-2024 season. The information I gather relates to clubs' performance (including both individual player performance, such as goals, assists, yellow and red cards, etc., and team home and away match performance, such as the goal count, corner count, yellow and red cards, etc.), squad and management (chairman changes, management changes, and squad), and sponsors (shirt sponsor changes, front sponsor changes, and total sponsor changes). I also use the Capology dataset within Dewey data to gather information on raw and adjusted gross and net salaries and financials (revenue, EBIT, total revenue per player, matchdays' revenue, broadcasts' revenue, commercials' revenue, player trading revenue, and player trading net results (revenues minus costs from player trading)). For the salaries and financials information, if the PE deal takes place in 2021 (as is the case with Liverpool), I get the salary and financial information reported as of the end of 2020 (the year before the PE

investment) and all years before going back to the end of 2014 and as of the end of 2022 (the year after the PE investment), including in this case, two years after – 2023 and 2024. I have missing financial and salary information for some clubs as I don't have information on financials for 1998, 2005, and 2006 (the three clubs mentioned above).

For the methodology in my paper, I am using a staggered difference-in-differences model since PE investments occurred in different years across different leagues and countries from 1998 to 2023 across England, France, Germany, Italy, and Spain. I use this identification strategy to assess the long-run effect of private equity investments on individual players' performance and team match performance, players' salaries, and clubs' financials. I also use a staggered difference-in-differences model to examine the short-run effect of private equity investments on chairman, management, and squad changes. The main treatment period is the time-period that football clubs receive PE investments, and the main treatment cohort is the PE club-level. I believe the methodology meets the exogeneity assumption since PE investments are randomly implemented over time and not related to variables for the outcomes of interest or related to the outcome of interest itself. I also double check if the parallel trends assumption holds (in revenues and salaries tests – only salaries are displayed in Figure A1). Although the treatment group (PE clubs) starts to increase in salaries before treatment (the control group (non-PE clubs) starts to increase in salaries before treatment similarly to the treatment group (PE clubs)), a clear divergence occurs after treatment with the treatment group experiencing a sharp increase in salaries relative to the control group (non-PE clubs). Table A5 shows the results of a parallel trends regression for various salary categories. The coefficient on 1.pe#c.years_since_treat tests whether the treatment group (PE-backed clubs) has a different pre-trend compared to the control group (non-PE clubs). The coefficient on 0b.pe#co.years_since_treat is 0 because it represents the control group and base category in that case. Since this interaction term is not statistically significant ($p > 0.05$), we fail to reject the null hypothesis that pre-trends are parallel. Additionally, I believe that there are no contemporaneous country-level trends that are correlated with PE investments and the outcomes of interest at the same time. I also meet the staggered treatment adoption assumption.

I have chosen a staggered difference-in-differences model as the identification strategy to assess the impact of PE ownership in treated clubs relative to control clubs. The DiD model allows us to determine causal effects by comparing changes in outcomes over time between treatment and control groups and to isolate the effect of PE ownership on three different dimensions –

managerial, financial, and individual players' and teams' match performance. The first equation below shows the two-way fixed effects staggered difference-in-differences model at the club level. The outcomes I examine are based upon management, chairman, and squad changes. The second equation below shows the two-way fixed effects staggered difference-in-differences analysis at the player level. The outcomes examined in this case are individual players' salaries (including raw net and gross salaries and adjusted net and gross salaries) and individual players' performance (including appearances, goals, assists, yellow and red cards, etc.). The third equation below shows the two-way fixed effects staggered difference-in-differences analysis at the match level. The outcomes examined in this case are various performance dimensions (including goal and corner count, yellow and red cards, fouls, possession, etc.) for the home and away teams for each match played in all seasons from the 2015-2016 to the 2023-2024 season. The models also include club-level financial controls. Incorporating financial controls into the DiD model refines the understanding of the relationship between PE ownership and performance. The inclusion of these controls ensures that observed changes in individual and team performance are not driven by underlying financial disparities between PE-backed and non-PE-backed clubs. I also include league and season fixed effects. League fixed effects account for unobservable, time-invariant characteristics unique to each league that could influence club performance or financial metrics, while season fixed effects control for unobservable, time-varying factors that affect all clubs within a season. The main effects (*PE_club* and *Post*) are absorbed by the fixed effects, which is standard practice in TWFE models, while β_3 captures the treatment effect in all three regression models.

(1) $$Management/Chairman/Squad\_Changes_{ct} = \alpha + \beta_1 PE\_club_c + \beta_2 Post_t + \beta_3 (PE\_club_c \times Post_t) + X_{ct}\,\gamma + \lambda_c + \delta_t + \varepsilon_{ct,}$$

where:

Y_{ct}: The outcome variable for club c at time t (management, chairman, and squad changes).

α: The intercept term.

PE_club_c: A binary variable indicating whether club c received PE investment (1 if yes, 0 if no).

$Post_t$: A binary variable indicating the post-investment period (1 if post-investment, 0 if pre-investment).

$PE\_club_c \times Post_t$: The interaction term between PE investment and post-investment period, capturing the differential effect of PE investment.

X_{ct}: A vector of control variables at the club level (financials).

γ: The coefficients for the control variables.

λ_c: League fixed effects.

δ_t: Season fixed effects.

ε_{ct}: The error term.

(2) $$Performance/Salary_{it} = \alpha + \beta_1 PE\_club_i + \beta_2 Post_t + \beta_3 (PE\_club_i \times Post_t) + X_{it}\gamma + \lambda_i + \delta_t + \varepsilon_{it},$$

where:

β_1: Captures the difference in match performance and salaries between PE-club players and non-PE club players before the investment.

β_2: Captures the time trend affecting all clubs.

β_3: Captures the effect of PE investment on performance/salary post-investment (the coefficient of interest).

X_{it}: A vector of control variables at the individual level (players' age and salaries (salaries for male players only in player-performance model only)) and at the club level (financials).

γ: The coefficients for the control variables.

λ_i: League fixed effects.

δ_t: Season fixed effects.

ε_{it}: The error term.

If $\beta_3 > 0$, it indicates a positive effect of PE investment on player performance/salaries.

(3) $$Performance_{mt} = \alpha + \beta_1 PE\_club_m + \beta_2 Post_t + \beta_3 (PE\_club_m \times Post_t) + X_{mt}\gamma + \lambda_m + \delta_t + \varepsilon_{mt},$$

where:

β_1: Captures the difference in performance at the match level between PE clubs and non-PE clubs before the investment.

β_2: Captures the time trend affecting all clubs.

β_3: Captures the effect of PE investment on club-level match performance post-investment (the coefficient of interest).

X_{mt}: A vector of control variables at the club level (financials).

γ: The coefficients for the control variables.

λ_m: League fixed effects.

δ_t: Season fixed effects.

ε_{mt}: The error term.

If $\beta_3 > 0$, it indicates a positive effect of PE investment on match home/away performance.

V. Results

[Insert Table 1 here]

[Insert Figure 1 here]

Table 1 presents the summary statistics for both the private equity funded clubs and the non-private equity clubs. Panel A shows the performance statistics for individual male players in the PE sample and those in the non-PE sample. I can observe that most statistics are identical, but still PE players score more goals, have more assists, have more clean sheets on average. PE players also have lower attacker, midfielder, and defender ranks in their leagues. Panel B shows the performance statistics for individual female players in the PE sample and those in the non-PE sample. PE female players have more assists, goals, and clean sheets, for example. Like the PE individual male players, female players also have lower attacker, midfielder, and defender ranks in their leagues across all years available for those players including those in the pre-PE sample. Panel C presents statistics on male matches. One can see that attendance is higher when the home team is a PE team than when the home team is a non-PE team. Possession for the home PE team is higher, but for the away PE team is lower. Home PE shots-on-target are higher than those for non-PE teams, while away PE shots-on-target are lower than those for non-PE teams. Panel D shows female match statistics. Attendance for home PE female teams is higher than home non-PE female teams, like that of PE male teams. A statistic, which might point to the low female soccer players' performance, is their low home and away possession numbers in comparison to non-PE teams. Panel E shows statistics of PE- and non-PE players' salaries. Both raw and adjusted gross and net salaries are higher for PE teams. Panel F shows the 28 PE-backed clubs and the 68 non-PE-backed clubs with classifications of revenue generation and financial ratios. Revenue numbers are identical, while ratios, such as sales to assets and equity to assets, are lower. Figure 1 presents the country distribution of private equity deals. France and England are with nine, Italy is with five, Spain is with four, and Germany is with one.

[Insert Table 2 here]

The analyses can be divided into three main analyses – male and female player and match performance, team and sponsorship changes, salaries and financial performance. Table 2 presents a two-way fixed effects staggered difference-in-differences model for the impact of private equity on individual male players' performance. When measuring male players' performance, I also consider the position of each player in the team – defender, midfielder, forward, or goalkeeper – since the dataset reflects this information. The table reports results of 15 performance indicators – overall appearances (1), goals (2), assists (3), penalty goals (4), penalty misses (5), clean sheets (6), conceded (7), yellow cards (8), red cards (9), minutes per match (10), minutes per card (11), minutes per assist (12), rank in league of top attackers (13), rank in league of top midfielders (14), and rank in league of top defenders (15). In comparison to non-PE soccer players' control sample, PE soccer players see a statistically significant decline in their match appearances (1) and a decline in their rank of defenders (15). To provide some economic intuition, a PE investment reduces male player appearances by 1.389 matches per season. This reduction is 6.77% of the pre-treatment mean, which indicates a relatively small impact, at just 0.124 standard deviations, suggesting a modest economic effect. This may indicate that after PE investment, clubs rotate or rest players more frequently, possibly due to changes in management strategy, increased squad depth, or performance-related decisions. They also see a statistically significant decline in conceded goals (7), yellow cards (8), rank midfielders (14), rank defenders (15) and a statistically significant increase in clean sheets (6). As one can see, male soccer players' performance declines based upon some, but not all, metrics. This could signify a change in teams' strategy and within-team player changes (which I later document in Table 6).

[Insert Table 3 here]

Table 3 presents another staggered difference-in-differences model for the impact of private equity on male home and away team games. The table reports results of 19 team match performance metrics – home points per game (1), home goals (2), home corners (3), home yellow cards (4), home red cards (5), home shots on target (6), home shots off target (7), home fouls (8), home possession (9), home attendance (10), away points per game (11), away goals (12), away corners (13), away yellow cards (14), away red cards (15), away shots on target (16), away shots off target (17), away fouls (18), and away possession (19). Although there isn't much statistical significance for home match performance, home shots off target increase after PE investments.

For away game performance, I find that performance declines for the following metrics – away goals (12), away corners (13), away shots on target (16), away shots off target (17), and away possession (19). Away yellow cards (14) increase statistically significantly as well, also pointing to a deterioration in away game performance. For example, becoming a PE-owned club results in a decrease in away goals for male teams. A PE investment reduces away goals by 0.186 goals per match. This accounts for approximately 18% of the pre-treatment mean and represents a moderate economic impact, equivalent to 0.17 of variability. This suggests that clubs under PE ownership might struggle with away games, possibly due to changes in team dynamics, tactics, or travel-related factors.

[Insert Table 4 here]

Table 4 presents a two-way fixed effects staggered difference-in-differences model for the impact of private equity on individual female players' performance. When measuring female players' performance, I also consider the position of each player in the team – defender, midfielder, forward, or goalkeeper – since the dataset reflects this information. The table reports results of 14 performance indicators (since I have insufficient information for penalty misses) – overall appearances (1), goals (2), assists (3), penalty goals (4), clean sheets (5), conceded (6), yellow cards (7), red cards (8), minutes per match (9), minutes per card (10), minutes per assist (11), rank in league of top attackers (12), rank in league of top midfielders (13), and rank in league of top defenders (14). Appearances (1), yellow cards (7), red cards (8), minutes per card (10), rank attackers (12), rank midfielders (13), and rank defenders (14) statistically decline in comparison to the non-PE sample from pre-to-post the private equity investment. A PE investment worsens attacker rankings by 15.51 places, where a lower rank indicates poorer performance. This decline in attacker ranking represents a 21.85% worsening relative to the mean rank with an effect size of 0.20 standard deviations, indicating a moderate economic impact. This finding implies a drop in the quality or performance of attacking players. This could result from changes in recruitment policies, wage distribution, or strategic decisions that deprioritize high-performing attackers. Still, yellow and red cards (8) decline in comparison to the non-PE sample. This signifies a more pronounced decline in female players' on-field performance, but less aggressive game play, than that of male players' on-field performance. I believe this finding can be multifaceted. It could be related to resource allocation and prioritization of male teams in comparison to female teams and inequality in support wherein more support is provided to male athletes than to female athletes. At

the same time, it could be attributed to changing team dynamics following private equity investments or certain psychological factors that are unique to females, such as high expectations and scrutiny they encounter.

[Insert Table 5 here]

Table 5 presents another two-way fixed effects staggered difference-in-differences model for the impact of private equity on home and away team games. The table reports results of 19 team match performance metrics – home points per game (1), home goals (2), home corners (3), home yellow cards (4), home red cards (5), home shots on target (6), home shots off target (7), home fouls (8), home possession (9), home attendance (10), away points per game (11), away goals (12), away corners (13), away yellow cards (14), away red cards (15), away shots on target (16), away shots off target (17), away fouls (18), and away possession (19). Like what I find in the male sample, I also don't find much statistical significance in the home game performance of female teams. The only result to point out is an increase in home shots off target (7). When it comes to away game performance, I document that away goals (12), away corners (13), away shots on target (16), and away possession (19) statistically fall in comparison to the non-PE sample. For female teams, this decline is even more dramatic than for male teams. For example, a PE investment reduces away goals by 0.813 goals per match. This represents a substantial reduction of approximately 87% of the pre-treatment mean and corresponds to 0.68 of variability, indicating a strong economic impact. This highlights a much greater disruption in female teams' away performance compared to male teams. This may indicate deeper issues such as tactical inflexibility, squad changes, or loss of key players after PE investment. I document that both away male and female performance declines. I would attribute this to a disruption in team cohesion and dynamics, whose lack thereof can be challenging in away game environments, where soccer players might face public hostility, or unfavorable training conditions and accommodations. Another possibility is changing tactics whose impact is observed in away games more than in home games. With a changed team and squad (as I document in the following table), a new tactical approach and strategy by management might take time to implement effectively. During this adjustment period, away game performance suffers significantly as game conditions are less controlled. I will employ a player network analysis relating players' appearances and co-appearances to determine players' interactions in both home and away games. Changed team dynamics could be an explanation for this finding.

[Insert Table 6 here]

Table 6 reports the results of the impact of private equity on male teams' squad changes (1), management changes (2), and chairman changes (3). All three coefficients point to immediate changes in the squad, management, and chairman from one year before the private equity investment to the one year after. I attribute this finding to the need for strategic realignment and possible cultural change. These changes, however, I believe, have a negative impact on male players' individual performance and team game performance. A football manager's primary purpose is to manage the team's players and any manager changes, thus, have an adverse effect on team performance. Although the involvement of private equity should not have a direct impact on the sport performance elements of the clubs, I do document and believe those declines in performance come from management and squad changes.

[Insert Table 7 here]

[Insert Figure 2 here]

Using the same methodology that has been used in the previous tables, in Table 7, I document the impact of private equity on players' salaries – raw net player salaries (1), raw gross player salaries (2), adjusted net player salaries (3), and adjusted gross player salaries (4). I take the natural logarithm of the respective salary categories. Controlling for financials and including additional fixed effects, such as player-league fixed effects and player-group fixed effects, I find that relative to non-PE sample salaries, PE sample salaries (all four categories) increase statistically significantly. Raw net player salaries increase by $156,041 per player. This means PE ownership leads to a 10.4% increase in salaries relative to the mean salary. However, the effect size is relatively small at 0.062 standard deviations. Raw gross player salaries increase by $302,585 per player. This means PE ownership leads to an 11.08% increase in raw gross player salaries relative to the mean salary. However, the effect size is relatively small at 0.0667 standard deviations. Adjusted net player salaries increase by $166,367 per player. This means PE ownership leads to a 10.3% increase in salaries relative to the mean salary. However, the effect size is relatively small at 0.0625 standard deviations. PE ownership leads to a $320,537 increase in adjusted gross player salaries per player, representing a 10.90% rise relative to the mean salary and 0.067 standard deviations, indicating a modest economic impact. This indicates that PE-backed clubs are increasing player compensation, although the economic effect is rather modest, potentially as a strategy to attract and retain talent. Figure 2 provides plots of time-to-event coefficients with 95%

confidence intervals of raw net players' salaries and adjusted net players' salaries from an event study analysis of dynamic treatment effects over time. As one can see, comparing treated vs. non-treated soccer teams from before the private equity deal to after the private equity deal yields statistically significantly increasing salaries over time. In addition, before year 0, the estimates are close to 0 and statistically different from 0 from the null hypothesis which means that likely parallel trends hold, while after year 0, there are significant positive effects post-treatment with the impact peaking in years 3 and 4 and then slightly declining. Increases in salaries could point to private equity's way to align their interests with strategic goals of improving performance and winning home and away games. One possible way, though unobservable, is to introduce performance-based contracts with higher salaries and bonuses to achieve specific performance targets.

[Insert Table 8 here]

In Table 8, using the same methodology as in previous tables, I examine private equity's impact on revenue (1), EBIT (2), and total revenue per player (3) in comparison to a non-PE soccer sample. I take the natural logarithm of the respective dependent variables in this table. Revenues increases statistically significantly while controlling for various other financials, such as ROA, Sales to Assets, Cash to Assets, Debt to Assets, and Equity to Assets and including season and league fixed effects to account for unobservable heterogeneity across years and country-leagues. Total Revenue sees a 41.20% rise relative to the mean revenue. The effect size is 1.95 standard deviations, indicating a very large economic impact. Immediate increases in revenue highlight private equity's aggressive focus on financial oversight, in particular revenue generation, which in this case is at the expense of teams' on-field performance.

[Insert Table 9 here]

In Table 9, using the same methodology as in previous tables, I examine private equity's impact on matchdays' revenue (1), broadcasts' revenue (2), commercials' revenue (3), player trading revenue (4), and player trading net results (meaning player trading revenue minus any player trading expenses incurred) (5). I take the natural logarithm of the various revenue categories. Matchdays' revenue and commercials' revenue increase statistically significantly, while player trading revenue decreases. PE ownership results in a 102.73% rise in matchdays' revenue relative to the mean and 3.26 standard deviations, indicating an extremely large economic impact. This highlights PE firms' ability to transform matchday operations into a major revenue driver, possibly through improved ticketing strategies, stadium operations, or fan engagement initiatives. PE

ownership results in a 35.78% rise in commercial revenue relative to the mean and 1.20 standard deviations, indicating a significant economic effect. This implies that PE-backed clubs are successfully leveraging their brand to generate additional income from sponsorships, merchandise sales, and other commercial ventures. The results on total revenue in Table 8 mostly come from matchdays' revenue and commercials' revenue. Although I don't find that attendance increases from pre-to-post-PE investment, I document that commercial and matchday revenues increase. I would infer that matchday revenues, given that there are few changes in attendance, increase because of increases in ticket prices, membership programs, merchandise, and food and beverage sales. I would also infer those commercial revenues, given that there are few changes in sponsorship deals, increase because of broadcasting and media rights (as in higher broadcasting fees and/or exclusive content – behind-the-scenes footage, exclusive videos, documentaries, and so on) and brand value and marketability (strong brand image and star players who attract fans and media attention). Player trading revenues, however, as well as net player trading results decline from pre- to post-PE investment. For example, PE ownership increases player trading revenue by approximately 7.52 units. This represents a 120% rise relative to the mean player trading revenue. The effect size is 0.91 standard deviations, indicating a large economic impact. The reasons behind this could be multifaceted and I don't have information to prove where the finding comes from, but I believe it could be from two sources – either from overvaluation of the player transfers' market and a following correction or new management's low buyer bargaining power, leading to less favorable transfer deals.

Understanding the network of players within a soccer team is crucial for several reasons. The interaction and coordination between players significantly influence team performance. Player co-appearances in matches reflect these interactions as teammates develop chemistry and understanding through shared playing time. Measuring degree centrality (frequency of interactions), closeness centrality (efficiency of interactions), and betweenness centrality (role of bridge players) relies on mapping these co-appearances to quantify players' roles within the team network. In addition, I have already demonstrated that PE investments bring squad, management, and chairman changes. Player appearances highlight how these changes affect core players' positions in the network and continuity and consistency in team dynamics. By linking co-appearance data to network metrics, I can assess how well-connected the team remains and correlate it with performance outcomes in home and away games.

As mentioned above, I determine degree centrality, closeness centrality, and betweenness centrality. Degree centrality helps to identify players who frequently interact with many others, indicating their involvement in the play and potential influence on the game. Closeness centrality measures how quickly a player can interact with all others in the team, providing insights into which players are best positioned to facilitate play and distribute the ball effectively. Betweenness centrality highlights players who act as bridges within the team, controlling the flow of the game and connecting different sub-groups. These players are critical for maintaining team cohesion and ensuring smooth transitions during play.

In this final section of the paper, I determine how players' connections change from pre-to-post-PE investments. I take the following steps to do that. First, I collect data on player appearances and co-appearances for each player each month from before to after the PE investment. Therefore, I keep the monthly individual player appearances from before the investment occurs to after the investment occurs. Second, I organize the data in a way that can be used to create an adjacency matrix. Third, I create an edge list which is a table that lists pairs of connected nodes (players) along with the weight of their connection (e.g., the number of co-appearances). Fourth, I convert the edge list into an adjacency matrix, where rows and columns represent players, and the cell values represent the number of co-appearances. Fifth, I calculate the network metrics – degree centrality, closeness centrality, and betweenness centrality. Sixth, I interpret the centrality measures to understand the roles of different players in the team and then determine how centrality measures have changed for the PE and non-PE clubs. I also determine the impact of those centrality measures on on-field performance following the PE deal. Below are the three centrality measures I have used and the simple OLS regression model under equation (4) I have used for the impact on on-field performance.

Degree Centrality

The degree centrality of a player *i* is given by:

$$DC_i = \sum_j A_{ij},$$

where DC_i is the degree centrality of player *i*, and A_{ij} represents the co-appearance between player *i* and player *j*.

Closeness Centrality

The closeness centrality of a player *i* is given by:

$$CC_i = \frac{N-1}{\sum_j d(i,j)},$$

where CC_i is the closeness centrality of player *i*, *N* is the total number of players, and *d(i,j)* is the shortest path distance between player *i* and player *j*.

Betweenness Centrality

The betweenness centrality of a player *i* is given by:

$$BC_i = \sum_{s \neq i \neq t} \frac{\sigma_{st}(i)}{\sigma_{st}},$$

where BC_i is the betweenness centrality of player *i*, σ_{st} is the total number of shortest paths from player *s* to player *t*, and $\sigma_{st}(i)$ is the number of those shortest paths that pass through player *i*.

$$\textbf{(4)}\ Y_i = \beta_0 + \beta_1 DC_i + \beta_2 CC_i + \beta_3 BC_i + \varepsilon_i,$$

where:

Y_i is the performance metric for player i (e.g., goals, assists).

β_0 is the intercept term.

β_1 is the coefficient for degree centrality.

β_2 is the coefficient for closeness centrality.

β_3 is the coefficient for betweenness centrality.

ε_i is the error term.

[Insert Figure 3 here]

Figure 3 maps out the network of relationships among men's soccer clubs (based on players' appearances and co-appearances in home and away matches), highlighting how interconnected these clubs are through various forms of co-appearance, and providing a visual tool for analyzing patterns and clusters within the sport. The density (0.8762) indicates a high level of connectivity among the clubs, suggesting that the network is tightly knit with many clubs having interactions with each other. The average clustering coefficient (0.8998) reflects the tendency of clubs to form tight clusters. A high clustering coefficient suggests that if club A is connected to both clubs B and C, then there is a high likelihood that B and C are also connected. This clustering could imply regional leagues, common participation in tournaments, or shared player history.

[Insert Figure 4 here]

Figure 4 provides a network graph which serves as a visual and quantitative analysis of the relationships among women's soccer clubs based on co-appearance data. It helps to identify which clubs are central in the network and how clubs are grouped into communities, offering insights into the structure and dynamics of interactions within women's soccer. The density value indicates the overall connectivity of the graph. A density of 0.6552 suggests a moderately high level of connectivity, implying that there are significant interactions among the clubs. However, it's not as densely connected as a fully connected network, which would have a density of 1. The average

clustering coefficient statistic measures the degree to which nodes in the network tend to cluster together. An average clustering coefficient of 0.7293 is quite high, suggesting that clubs not only interact, but also tend to form tightly knit communities. For example, if Club A interacts with Clubs B and C, there is a high likelihood that Clubs B and C will also interact directly with each other. Both Figures 3 and 4 map out the connectedness between male and female soccer players, respectively. The higher density for male clubs reflects that male soccer players have a more integrated or active system of leagues and competitions among male clubs. It could also suggest a greater financial or logistical capability for hosting or engaging in more frequent competitions and exchanges. In addition, the higher clustering coefficient for male clubs likely reflects a higher degree of local networking and collaboration within subsets of clubs. It could be indicative of regional leagues where clubs have frequent and recurring interactions, or it might reflect a cultural or strategic emphasis on building strong inter-club relationships within certain groups or communities.

[Insert Figure 5 here]

In Figure 5, I display boxplots that show the distribution of degree centrality, betweenness centrality, and closeness centrality among male soccer players before (post=0) and after (post=1) PE investments. The median degree centrality is higher for clubs with PE investment compared to those without PE investment in the pre-period. The interquartile range (IQR) is wider, indicating more variability in degree centrality among clubs with PE investment. The median degree centrality decreases slightly for clubs with PE investment compared to the pre-investment period. The variability also decreases, as shown by the narrower IQR. Although clubs with PE investments show higher degree centrality before the investment compared to non-PE clubs, they see a noticeable decrease in degree centrality after the investment, suggesting that the player network becomes less interconnected post-investment. The median betweenness centrality is higher for clubs with PE investment compared to those without before the actual investment. The interquartile range is wider, indicating more variability in betweenness centrality among clubs with PE investment. The median betweenness centrality decreases significantly for clubs with PE investment compared to the pre-investment period. The variability also decreases, as shown by the narrower IQR. Although clubs with PE investments show higher betweenness centrality before the PE investment compared to non-PE clubs, they see a noticeable decrease in betweenness centrality

after the investment, suggesting that the player network becomes less dependent on central intermediaries post-investment.

I make similar findings when it comes to closeness centrality. The median closeness centrality is higher for clubs with PE investment compared to those without before the actual PE investment. The interquartile range is wider, indicating more variability in closeness centrality among clubs with PE investment. The median closeness centrality decreases slightly for clubs with PE investment compared to the pre-investment period. The variability also decreases, as shown by the narrower IQR. Although clubs with PE investors have higher closeness centrality before the PE investment, they experience a noticeable decrease in closeness centrality after the investment, suggesting that the player network becomes less interconnected post-investment. The figure indicates that PE investments lead to a decrease in degree centrality, betweenness centrality, and closeness centrality for clubs that have received PE investments, potentially reflecting changes in team dynamics and player interconnectedness. Non-PE clubs show lower degree centrality, betweenness centrality, and closeness centrality overall, but the focus of the plot is on the changes within PE clubs pre- and post-investment. This suggests that the structural changes introduced by PE investments might lead to a less tightly interconnected network, with players being less central within the team's overall structure.

[Insert Figure 6 here]

In Figure 6, I display boxplots that show the distribution of degree centrality, betweenness centrality, and closeness centrality among female soccer players before (post=0) and after (post=1) PE investments. For teams that received PE investment, the degree centrality decreased after the investment. This suggests that the structural roles and connections among female players may have become less concentrated or influential after the PE investment. This could be due to changes in team dynamics, strategies, or player roles induced by new management practices or structural changes. This might have a few implications. The reduction in degree centrality among female players post-PE investment might imply a shift towards a more evenly distributed play style, where the influence is less centralized among a few players. This could be a result of strategic changes brought on by the new management under PE ownership. Across both periods (before and after PE investment), the median betweenness centrality is very low. This indicates that, generally, no individual player has significantly high control over the flow of the game by being a frequent intermediary in the shortest paths between other players. For teams that received PE investment,

betweenness centrality has decreased even further after the investment. This suggests that the influence of individual players as intermediaries in the network has diminished. It could imply that the role of pivotal players in facilitating connections between other players has reduced, possibly due to a more distributed or collective playing strategy.

I also display boxplots that show the distribution of closeness centrality among female soccer players before (post=0) and after (post=1) PE investments. Across both periods (before and after PE investment), the median closeness centrality is relatively stable, indicating that the average "closeness" of players within the team network remains unchanged. This suggests that the ability of players to reach other players efficiently within the network has not drastically changed due to PE investment. Teams without PE investment also show stable median closeness centrality, but the changes in variability are less pronounced compared to PE-invested teams. This highlights the impact of PE investment on promoting a more standardized network structure within the team. Overall, the results in Figure 6 point to private equity investments indeed having an impact on female team dynamics. Both degree centrality and betweenness centrality decrease following PE investments, while closeness centrality remains stable before and after PE investments. Overall, from the analyses of Figures 5 and 6, I document that degree, closeness, and betweenness centrality decrease (considering male teams) and that degree and betweenness centrality decrease (considering female teams) following PE investments signifying changes in players' interconnectedness.

[Insert Table 10 here]

Table 10 shows the results of an OLS regression for the impact of degree centrality, betweenness centrality, and closeness centrality on male home and away match performance. Home corners and home possession decrease with any increases in centrality measures, while home yellow cards and red cards increase with any increases in centrality measures. Home points per game are positively related to centrality measures, while home shots off target are negatively related to centrality measures. Away points per game and possession are negatively related to centrality measures. Overall, the results suggest a negative impact of centrality measures on away match performance and a more aggressive game play during home matches. This indicates that disrupted team dynamics (lower cohesion or excessive reliance on key players) are especially problematic in less controlled away environments.

[Insert Table 11 here]

Table 11 shows the results of an OLS regression for the impact of degree centrality, betweenness centrality, and closeness centrality on female home and away match performance. The results suggest that away female match performance is more adversely affected than home match performance. Higher degree centrality and closeness centrality are associated with fewer away shots on target and less away team possession. The findings imply that PE-induced changes (squad rotations and reliance on specific players) weaken team chemistry, particularly in away games where external pressures like travel and hostile crowds might affect team vulnerabilities. The results for home match performance are more mixed and additional analyses are needed to dive deeper into the results.

VI. Conclusion

Based on the analysis of private equity (PE) investments in European football, the paper reveals significant insights into their multifaceted impact. While PE investments are highly effective in enhancing financial outcomes (consistent with the profit-maximizing objectives of PE firms), I show this comes at the expense of on-field performance, which is a key social value for fans, players, and the broader football community. The shift toward profit-driven priorities can alienate fans and stakeholders who value on-field success and team loyalty over financial metrics. To be more specific, this paper focuses on male and female teams across major European leagues and evaluates financials, player salaries, performance metrics, and team dynamics. The results indicate that while PE investments have led to increased commercial success, this has not been mirrored by on-field performance, which has notably declined, especially among female players and during away games for both genders. These findings suggest that the influx of PE funds initiates a transition phase for clubs, marked by substantial changes in leadership, management, and team composition.

I also examine the channel through which on-field performance decreases following PE investments. I determine that player interconnectedness and player dynamics are negatively affected from before-to-after the PE investment, and that spills over into home and away match performance. PE investments lead to a decrease in degree centrality, betweenness centrality, and closeness centrality for male clubs and a decrease in degree centrality and betweenness centrality in female clubs that have received PE investments, potentially reflecting changes in team dynamics and player interconnectedness. I further examine the impact of centrality measures on male and

female home and away match performance. I determine that male home and away match performance is negatively related to centrality measures after the PE investment and that following PE investments, male players engage in more aggressive tactics. I also determine that female away match performance is negatively related to centrality measures after the PE investments, while results with female home match performance are mixed.

This study adds to the body of knowledge in sports economics, shedding light on the complex relationship between financial investment and athletic performance, and highlights the challenges clubs face in converting financial gains into on-field success. As for how these trends might impact European soccer, the growing influence of private equity could reshape the game in several ways. In the long term, while PE investments could bring more visibility and revenue to European soccer, the trade-off could be a decline in the quality of competition and a shift away from the community and fan-centered approach that has traditionally defined European clubs. This might alienate fans, particularly in leagues where success on the pitch has historically taken precedence over commercial gains.

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Table 1: Summary Statistics

Table 1 presents the summary statistics for male and female soccer players for those in private equity (PE)-funded clubs, male and female match performance for private equity (PE)-funded clubs, male players' salaries for players of private equity (PE)-funded clubs, and soccer teams' financials for private equity (PE)-funded. Panel A presents male players' performance statistics for main sample. Panel B presents female players' statistics for main sample. Panel C presents male match performance statistics for main sample. Panel D presents female match performance statistics for main sample. Panel E presents male players' salaries for main sample. Panel F presents soccer teams' financials for the main sample.

Panel A. Male Players' Performance Statistics for Treatment Sample

Stats	N	Mean	SD	p25	p50	p75
appearances	3948	20.53571	11.15424	11	22	30
goals	2124	3.991055	4.586574	1	2	5
assists	2072	2.900097	2.503915	1	2	4
penalty_goals	327	2.330275	1.857112	1	2	3
penalty_misses	155	1.219355	0.487119	1	1	1
clean_sheets	3599	7.104196	4.301580	4	7	10
conceded	3691	19.36684	13.04532	8	18	28
yellow_cards	3014	3.695421	2.577211	2	3	5
red_cards	450	1.117778	0.355541	1	1	1
min/match	3010	627.5674	542.7409	288	454	764
min/card	2072	952.1602	724.6896	432	704	1235.5
min/assist	4456	442.7460	685.3688	0	0	650.5
rank_attackers	4456	155.3175	143.0566	-1	134	276
rank_midfielders	4456	152.1364	141.4037	-1	125	274
rank_defenders	4456	23.30206	45.88824	-1	-1	26

Panel B. Female Players' Performance Statistics for Treatment Sample

Stats	N	Mean	SD	p25	p50	p75
appearances	1674	13.33811	7.372208	7	14	19
goals	847	3.936246	3.883431	1	3	5
assists	634	2.716088	2.171515	1	2	4
penalty_goals	110	1.636364	1.064242	1	1	2
penalty_misses	43	1.139535	0.350605	1	1	1
clean_sheets	1558	6.288832	3.977621	3	6	9
conceded	1494	11.14123	9.321065	4	9	17
yellow_cards	794	1.998741	1.302340	1	2	3
red_cards	61	1.049180	0.218039	1	1	1
min/match	1667	63.15117	24.38986	47	70	84
min/card	794	774.9887	508.7625	384	630	1103
min/assist	634	655.5789	495.3998	286	488	900
rank_attackers	1818	70.96535	77.60640	-1	45	123
rank_midfielders	1818	70.61221	78.54804	-1	42	123
rank_defenders	1818	6.775028	18.10480	-1	-1	4

Panel C. Male Match Performance Statistics for Treatment Sample

Stats	N	Mean	SD	p25	p50	p75
attendance	3057	21830.96	21947.38	0	18856	39335
home_ppg	3057	1.824426	0.502243	1.37	1.84	2.16
away_ppg	3057	1.171573	0.500485	0.79	1.11	1.47
home_goals	3057	1.743867	1.406842	1	2	2
away_goals	3057	1.046124	1.080905	0	1	2
home_corner	3057	5.815833	3.174223	4	5	8
away_corner	3057	4.123324	2.616432	2	4	6
home_yellow_cards	3057	1.690546	1.287940	1	2	2
away_yellow_cards	3057	2.044488	1.371927	1	2	3
home_red_cards	3057	0.061171	0.308879	0	0	0
away_red_cards	3057	0.094537	0.357089	0	0	0
home_shots_on_target	3057	6.016356	2.879290	4	6	8
away_shots_off_target	3057	4.376840	2.328115	3	4	6
home_shots_on_target	3057	7.764802	4.248494	5	7	10
away_shots_off_target	3057	5.710500	3.346816	3	5	8
away_fouls	3057	11.73340	4.312245	9	12	14
home_possession	3057	53.14589	12.71209	46	54	62
away_possession	3057	45.48086	12.28561	38	45	53

Panel D. Female Match Performance Statistics for Treatment Sample

Stats	N	Mean	SD	p25	p50	p75
attendance	764	685.6571	2712.129	0	0	509
home_ppg	764	2.076270	0.673654	1.59	2.15	2.64
away_ppg	764	1.278861	0.720017	0.73	1.18	1.81
home_goals	764	2.339005	2.023841	1	2	4
away_goals	764	0.930628	1.201421	0	1	2
home_corner	764	3.836387	4.227252	-1	4	7
away_corner	764	2.189791	3.039168	-1	2	4
home_yellow_cards	764	0.633508	1.143322	0	1	1
away_yellow_cards	764	0.892670	1.327795	0	1	2
home_red_cards	764	-0.15183	0.449825	0	0	0
away_red_cards	764	-0.14921	0.453600	0	0	0
home_shots_on_target	764	4.774869	4.903162	-1	5	8
away_shots_on_target	764	2.760471	3.543988	-1	3	5
home_shots_on_target	764	4.628272	5.252276	-1	4	8
away_shots_on_target	764	2.804974	3.730421	-1	2	5
away_fouls	764	1.812827	4.714974	-1	-1	5
home_possession	764	36.62565	27.34319	-1	48.5	58
away_possession	764	30.66492	23.50367	-1	39	50

Panel E. Male Players' Salaries for Treatment Sample

Stats	N	Mean	SD	p25	p50	p75
player_age	6728	24.79162	4.80631	21	24	28
salary_gross_usd	6728	2729592	4540083	248140	1165177	3609803
salary_net_usd	6728	1500390	2521798	129464	636532	1981605
adjusted_salary_gross_usd	6728	2940701	4803437	268040	1252351	3895773
adjusted_salary_net_usd	6728	1615242	2661138	142811	669774	2136158

Panel F. Soccer Teams' Financials for Treatment Sample

Stats	N	Mean	SD	p25	p50	p75
Revenue	173	18.19531	3.843982	18.23542	18.97987	19.76181
EBIT	173	4.581895	7.432869	0	0	15.23814
Revenue/Player	173	6.266262	8.255699	0	0	16.82357
Matchdays Revenue	173	15.06883	4.748878	15.24548	16.20711	17.71141
Broadcasting Revenue	173	17.30752	4.136813	17.50236	18.42645	18.79187
Commercial Revenue	173	15.78877	4.718086	15.88679	16.71286	18.20224
Player Trading Revenue	173	6.266262	8.255699	0	0	16.82357
Net Player Trading Revenue	173	14.19216	6.342754	15.26266	16.8391	17.62760
ROA	173	-0.05775	0.160831	-0.14001	-0.01879	0.031018
Sales/Assets	173	0.688688	0.376997	0.450203	0.654257	0.849741
Cash/Assets	173	0.105180	0.114702	0.016000	0.067926	0.152509
Debt/Assets	173	0.728251	0.519624	0.373736	0.698263	0.906674
Equity/Assets	173	0.231060	0.499713	0.053932	0.241099	0.577731

Table 2: Impact of PE on Male Players' On-Field Performance

Table 2 investigates the impact of private equity on various performance metrics for male soccer players using a two-way fixed effects model in a staggered difference-in-differences framework. The table includes 15 columns, each representing a different dependent variable. Column (1) shows the impact on match appearances, Column (2) captures goals scored, and Column (3) reflects assists, Column (4) – penalty goals, Column (5) – penalty misses, Column (6) – clean sheets, Column (7) – conceded, Column (8) – yellow cards, Column (9) – red cards, Column (10) – min/match, Column (11) – min/card, Column (12) – min/assist, Column (13) – rank attackers, Column (14) – rank midfielders, Column (15) – rank defenders. The observations for each statistic are based upon players' position in the club – forward, midfielder, defender, and goalkeeper. Controls include player age and salaries, and club financials, while fixed effects for league and season account for any unobserved heterogeneity. Standard errors are clustered at the club level to ensure robustness. Significance levels are indicated as *p < 0.1, **p < 0.05, ***p < 0.01.

	Appearances	**Goals**	**Assists**	**Penalty Goals**	**Penalty Misses**	**Clean Sheets**	**Conceded**	**Yellow Cards**	**Red Cards**	**Min/ Match**	**Min/ Card**	**Min/ Assist**	**Rank Attackers**	**Rank Midfielders**	**Rank Defenders**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**
twfe_treatment = 1	**-1.389****	-0.306	-0.239	-0.340	-0.0140	**1.077*****	**-3.879*****	**0.323****	**0.196****	**-2.358****	10.30	28.53	-4.364	**-13.77****	**-9.088*****
	(0.540)	(0.335)	(0.178)	(0.416)	(0.223)	**(0.224)**	**(0.701)**	**(0.150)**	**(0.0821)**	**(0.995)**	(26.16)	(44.74)	(6.019)	**(6.258)**	**(1.908)**
Player Age	-0.0666	0.422**	0.215	0.0701	-0.251	0.0368	-0.544	-0.0755	-0.0118	-0.291	0.894	-14.97	-0.209	0.0449	-0.204
	(0.399)	(0.206)	(0.132)	(0.282)	(0.168)	(0.152)	(0.553)	(0.108)	(0.0650)	(0.750)	(20.09)	(37.67)	(4.660)	(4.934)	(1.495)
ROA	-0.844	0.571	0.270	0.885	-0.140	0.245	-2.377**	-0.175	-0.210	0.477	97.91**	-21.69	-13.61	-6.972	-8.585***
	(0.857)	(0.401)	(0.243)	(0.655)	(0.312)	(0.326)	(1.189)	(0.235)	(0.128)	(1.519)	(38.34)	(76.16)	(9.560)	(10.36)	(3.133)
Sales/Assets	1.721***	0.419**	0.174	-0.434	0.0443	-0.0824	3.825***	0.181*	0.0341	3.479***	37.76*	97.45**	16.08***	21.61***	7.322***
	(0.415)	(0.191)	(0.109)	(0.410)	(0.219)	(0.134)	(0.611)	(0.0977)	(0.0350)	(0.723)	(19.39)	(39.09)	(4.225)	(4.704)	(1.513)
Cash/Assets	3.035**	0.554	0.369	0.234	0.207	1.660***	0.774	-0.397	-0.0737	4.653**	132.3*	-112.3	-8.501	5.664	-7.358
	(1.280)	(0.631)	(0.402)	(0.980)	(0.503)	(0.459)	(1.783)	(0.346)	(0.208)	(2.363)	(67.90)	(126.3)	(14.72)	(15.59)	(4.636)
Debt/Assets	-1.552*	-1.243**	-0.142	-0.361	-0.344	0.400	-2.287*	-0.254	-0.357	-5.531***	34.81	-95.39	-28.00***	-27.58***	-9.096***
	(0.935)	(0.578)	(0.265)	(0.804)	(0.334)	(0.309)	(1.316)	(0.260)	(0.250)	(1.681)	(47.13)	(79.43)	(9.338)	(10.64)	(2.863)
Equity/Assets	-0.250	-0.587	0.240	-0.509	-0.508*	0.676**	-1.912	-0.206	-0.289	-4.049**	42.57	-171.5**	-25.48***	-27.06***	-8.618***
	(0.911)	(0.546)	(0.260)	(0.825)	(0.285)	(0.295)	(1.288)	(0.254)	(0.260)	(1.618)	(45.80)	(78.12)	(9.277)	(10.49)	(2.790)
Constant	22.10**	-4.659	-1.933	0.905	7.370*	5.738*	32.46***	5.974**	1.703	73.34***	515.4	1,382*	169.2*	157.9	33.52
	(8.796)	(4.546)	(2.910)	(6.417)	(3.912)	(3.354)	(12.23)	(2.409)	(1.529)	(16.53)	(445.9)	(831.4)	(100.9)	(106.8)	(32.24)
Observations	11,724	6,062	5,870	974	489	10,509	11,043	9,047	1,452	11,683	9,027	5,870	13,242	13,253	13,265
Number of players	4,090	2,413	2,418	500	332	3,613	3,812	3,277	1,080	4,061	3,264	2,417	4,808	4,808	4,809
R-squared	0.013	0.016	0.011	0.039	0.052	0.034	0.021	0.006	0.055	0.025	0.010	0.006	0.011	0.013	0.012
Season FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
League FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

Table 3: Impact of PE on Male Match On-Field Performance

Table 3 evaluates the effects of private equity on male soccer teams' home and away match performance across 19 columns using a two-way fixed effects model in a staggered difference-in-differences framework. Column (1) analyzes home points per game, Column (2) evaluates home goals scored, and Column (3) covers home corners, Column (4) – home yellow cards, Column (5) – home red cards, Column (6) – home shots on target, Column (7) – home shots off target, Column (8) – home fouls, Column (9) – home possession, Column (10) – home attendance, Column (11) – away points per game, Column (12) away goals scored, Column (13) – away corners, Column (14) – away yellow cards, Column (15) – away red cards, Column (16) – away shots on target, Column (17) – away shots off target, Column (18) – away fouls, Column (19) – away possession. The model controls for club financials and includes league and season fixed effects to account for unobserved league-specific and season-specific variations. The number of observations reflects the total number of home and away matches played during the study period. Standard errors are clustered by team. Significance levels are indicated as *p < 0.1, **p < 0.05, ***p < 0.01.

	Home PPG	**Home Goals**	**Home Corners**	**Home Yellow Cards**	**Home Red Cards**	**Home Shots on Target**	**Home Shots off Target**	**Home Fouls**	**Home Possession**	**Home Attendance**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
twfe_treatment = 1	0.00445	-0.0787	0.218	-0.0762	0.00717	-0.0169	**0.531***	-0.169	1.091	-0.258
	(0.0638)	(0.100)	(0.199)	(0.106)	(0.0163)	(0.211)	**(0.295)**	(0.326)	(0.932)	(0.197)
ROA	0.0754	0.116	-0.0647	-0.311*	0.0231	0.0425	0.174	-1.140***	-0.697	-0.0137
	(0.105)	(0.152)	(0.318)	(0.177)	(0.0286)	(0.306)	(0.407)	(0.417)	(1.520)	(0.113)
Sales/Assets	0.120**	-0.0124	-0.339**	0.0465	-0.0166	-0.0731	-0.388**	0.186	-0.0906	0.0853*
	(0.0510)	(0.0732)	(0.156)	(0.0692)	(0.0145)	(0.161)	(0.192)	(0.220)	(0.805)	(0.0485)
Cash/Assets	0.235*	0.634***	0.239	-0.174	-0.0707	-0.210	0.689	-0.404	3.972*	0.121
	(0.139)	(0.224)	(0.602)	(0.229)	(0.0477)	(0.434)	(0.685)	(0.718)	(2.108)	(0.100)
Debt/Assets	-0.145	-0.0278	0.638*	-0.113	0.0217	0.236	0.323	0.581	-0.186	-0.195*
	(0.114)	(0.218)	(0.359)	(0.155)	(0.0341)	(0.401)	(0.602)	(0.627)	(1.669)	(0.0997)
Equity/Assets	-0.0614	0.0957	1.113***	-0.164	-0.00857	0.463	0.550	0.197	1.600	-0.228***
	(0.0870)	(0.206)	(0.324)	(0.136)	(0.0290)	(0.380)	(0.570)	(0.591)	(1.557)	(0.0865)
Constant	0.0754	1.294***	3.317	2.108***	0.0195	4.779***	8.168***	11.40***	45.30***	10.35***
	(0.105)	(0.180)	(2.269)	(0.568)	(0.0306)	(1.484)	(2.754)	(0.909)	(5.308)	(0.0780)
Observations	8,854	8,854	8,854	8,854	8,854	8,854	8,854	8,854	8,854	5,817
Number of home teams	96	96	96	96	96	96	96	96	96	96
R-squared	0.207	0.151	0.179	0.181	0.218	0.199	0.275	0.232	0.318	0.532
Season FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
League FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

(*Table 3 continued*)	**Away PPG**	**Away Goals**	**Away Corners**	**Away Yellow Cards**	**Away Red Cards**	**Away Shots on Target**	**Away Shots off Target**	**Away Fouls**	**Away Possession**
	(11)	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**	**(17)**	**(18)**	**(19)**
twfe_treatment = 1	-0.0135	**-0.186****	**-0.652*****	**0.191****	0.00294	**-0.652*****	**-1.244*****	-0.108	**-6.538*****
	(0.0219)	**(0.0823)**	**(0.179)**	**(0.0956)**	(0.0248)	**(0.157)**	**(0.217)**	(0.278)	**(0.823)**
ROA	0.0860	-0.00865	0.141	-0.298*	-0.0393	0.403	-0.0563	-0.748	2.125
	(0.115)	(0.142)	(0.352)	(0.164)	(0.0513)	(0.296)	(0.394)	(0.692)	(1.682)
Sales/Assets	0.00131	-0.100	-0.0205	0.00593	0.0104	-0.0721	0.267	-0.512*	1.287*
	(0.0481)	(0.0798)	(0.169)	(0.0740)	(0.0240)	(0.166)	(0.197)	(0.272)	(0.721)
Cash/Assets	0.304**	0.435*	-0.233	0.0359	0.0367	0.556	-0.898	-0.944	1.607
	(0.127)	(0.231)	(0.486)	(0.268)	(0.0571)	(0.507)	(0.630)	(0.875)	(2.214)
Debt/Assets	0.0986	0.291*	0.109	0.180	-0.0372	0.0803	-0.160	0.0943	-3.501
	(0.133)	(0.162)	(0.408)	(0.185)	(0.0619)	(0.411)	(0.448)	(0.760)	(2.377)
Equity/Assets	0.190*	0.362**	0.299	0.271	-0.0285	0.350	0.264	0.496	-2.948
	(0.111)	(0.138)	(0.353)	(0.167)	(0.0560)	(0.353)	(0.368)	(0.623)	(2.217)
Constant	1.100***	1.611	3.048***	0.492	0.0821	5.778***	7.163**	7.992***	54.14***
	(0.125)	(1.400)	(0.755)	(0.461)	(0.0604)	(0.539)	(3.542)	(0.609)	(5.237)
Observations	7,722	7,722	7,722	7,722	7,722	7,722	7,722	7,722	7,722
Number of home teams	96	96	96	96	96	96	96	96	96
R-squared	0.190	0.166	0.187	0.203	0.222	0.213	0.300	0.245	0.314
Season FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
League FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

Table 4: Impact of PE on Female Players' On-Field Performance

Table 2 investigates the impact of private equity on various performance metrics for female soccer players using a two-way fixed effects model in a staggered difference-in-differences framework (following Table 2). Column (1) shows the impact on match appearances, Column (2) captures goals scored, and Column (3) reflects assists, Column (4) – penalty goals, Column (5) – penalty misses, Column (6) – clean sheets, Column (7) – conceded, Column (8) – yellow cards, Column (9) – red cards, Column (10) – min/match, Column (11) – min/card, Column (12) – min/assist, Column (13) – rank attackers, Column (14) – rank midfielders, Column (15) – rank defenders. The observations for each statistic are based upon players' position in the club – forward, midfielder, defender, and goalkeeper. The model controls for individual player characteristics, such as age, as well as club-level financials. Fixed effects are applied for league and season to control for unobserved heterogeneity, with standard errors clustered at the club level. Significance levels are indicated as *p < 0.1, **p < 0.05, ***p < 0.01.

	Appearances	**Goals**	**Assists**	**Penalty Goals**	**Clean Sheets**	**Conceded**	**Yellow Cards**	**Red Cards**	**Min/ Match**	**Min/ Card**	**Min/ Assist**	**Rank Attackers**	**Rank Midfielders**	**Rank Defenders**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**
twfe_treatment = 1	**-0.953***	-0.427	-0.265	-0.00911	0.382	0.344	**-3.813*****	**-0.344***	**0.183***	**-4.760*****	68.58	**-15.51*****	**-18.05*****	**-1.856***
	(0.520)	(0.389)	(0.308)	(0.674)	(0.268)	(0.265)	**(0.934)**	**(0.185)**	**(0.110)**	**(1.779)**	(57.96)	**(4.828)**	**(5.599)**	**(1.038)**
Player Age	-0.267	-0.0871	-0.198	-0.136	-0.245	-0.292*	0.211	-0.0390	0.497***	-0.274	20.08	-10.89***	-4.457	0.136
	(0.270)	(0.247)	(0.275)	(0.309)	(0.166)	(0.169)	(0.450)	(0.100)	(0.141)	(0.936)	(36.92)	(3.153)	(3.416)	(0.651)
ROA	0.274	-1.536**	-0.566	-1.057	-1.305**	-1.362**	0.463	-0.748**	0.214	-3.661	245.5**	-4.826	10.78	-0.399
	(0.937)	(0.772)	(0.816)	(1.386)	(0.549)	(0.548)	(1.571)	(0.322)	(0.355)	(2.729)	(112.1)	(9.966)	(11.89)	(2.042)
Sales/Assets	1.118	0.0469	-0.879	1.223	-1.316***	-1.404***	5.768***	0.363	-0.00872	4.553**	60.71	-3.270	11.55	5.783***
	(0.728)	(0.532)	(0.603)	(1.265)	(0.366)	(0.365)	(1.464)	(0.259)	(0.403)	(2.207)	(79.01)	(7.467)	(8.427)	(1.814)
Cash/Assets	-2.184	-0.751	0.268	-1.822	-1.252	-1.195	-0.0923	0.577	4.974***	-2.095	-62.56	-3.329	-23.18	-4.793
	(1.696)	(1.383)	(1.153)	(1.603)	(0.851)	(0.854)	(2.898)	(0.628)	(1.083)	(4.875)	(191.9)	(19.20)	(21.01)	(3.971)
Debt/Assets	1.991*	0.425	0.385	-0.274	0.165	0.367	1.982	-0.217	0.0150	2.613	4.722	17.46	16.25	-0.695
	(1.194)	(0.750)	(0.769)	(1.677)	(0.592)	(0.587)	(1.804)	(0.433)	(0.0916)	(3.453)	(136.6)	(13.78)	(13.70)	(2.857)
Equity/Assets	2.256**	0.676	0.166	0.922	-0.714	-0.501	4.780***	-0.194	-	5.698*	-14.02	18.35	26.95**	2.388
	(1.132)	(0.633)	(0.650)	(1.253)	(0.544)	(0.543)	(1.665)	(0.382)		(3.315)	(123.5)	(12.91)	(12.36)	(2.747)
Constant	15.71**	4.538	7.778	4.125	11.48**	12.57***	1.692	2.462	-13.58***	63.52**	224.7	322.7***	150.1*	-0.664
	(7.143)	(6.903)	(7.457)	(8.924)	(4.539)	(4.628)	(12.31)	(2.752)	(4.106)	(25.58)	(1,024)	(84.59)	(91.18)	(17.46)
Observations	4,411	2,100	1,403	273	3,947	3,948	4,014	2,242	175	4,396	2,235	4,849	4,851	4,850
Number of players	1,863	988	744	174	1,631	1,632	1,693	1,144	156	1,853	1,141	2,106	2,104	2,105
R-squared	0.197	0.038	0.037	0.176	0.133	0.133	0.107	0.039	0.854	0.024	0.045	0.059	0.047	0.036
Season FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
League FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

Table 5: Impact of PE on Female Match On-Field Performance

Table 5 examines the impact of private equity on female soccer teams' home and away match performance using a two-way fixed effects model in a staggered difference-in-differences framework. Column (1) analyzes home points per game, Column (2) evaluates home goals scored, and Column (3) covers home corners, Column (4) – home yellow cards, Column (5) – home red cards, Column (6) – home shots on target, Column (7) – home shots off target, Column (8) – home fouls, Column (9) – home possession, Column (10) – home attendance, Column (11) – away points per game, Column (12) away goals scored, Column (13) – away corners, Column (14) – away yellow cards, Column (15) – away red cards, Column (16) – away shots on target, Column (17) – away shots off target, Column (18) – away fouls, Column (19) – away possession. The model controls for club financials, incorporating both season and league fixed effects to account for unobserved variations across seasons and leagues. Standard errors clustered at the team level. Significance levels are indicated as *p < 0.1, **p < 0.05, ***p < 0.01.

	Home PPG	**Home Goals**	**Home Corners**	**Home Yellow Cards**	**Home Red Cards**	**Home Shots on Target**	**Home Shots off Target**	**Home Fouls**	**Home Possession**	**Home Attendance**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
twfe_treatment = 1	0.130	-0.0876	0.0391	0.0511	-0.0263	0.244	**1.365***	0.453	3.323	0.0299
	(0.171)	(0.294)	(0.531)	(0.202)	(0.0549)	(0.448)	**(0.702)**	(0.570)	(3.564)	(0.113)
ROA	-0.101	-0.909	-1.342	0.117	-0.0472	-2.300*	-2.259	2.826*	-5.176	0.0615
	(0.276)	(0.594)	(1.357)	(0.276)	(0.0937)	(1.228)	(1.594)	(1.602)	(6.242)	(0.469)
Sales/Assets	-0.409*	-0.186	0.917	-0.0685	-0.0759	-0.143	0.431	0.737	0.587	-0.380
	(0.228)	(0.347)	(0.745)	(0.260)	(0.0769)	(0.965)	(0.958)	(1.011)	(3.929)	(0.233)
Cash/Assets	-0.0321	0.541	1.869	0.120	-0.196	1.815	2.864	-0.536	17.69	0.312
	(0.528)	(0.731)	(2.124)	(0.693)	(0.166)	(2.166)	(2.889)	(2.350)	(14.07)	(0.543)
Debt/Assets	0.248	0.179	-3.144***	0.406	0.0553	-3.940***	-5.223***	-0.420	-15.46**	-0.221
	(0.431)	(0.651)	(1.152)	(0.376)	(0.126)	(1.391)	(1.593)	(1.547)	(6.497)	(0.371)
Equity/Assets	-0.214	0.0848	-2.737***	0.0253	0.102	-1.813*	-2.994**	-1.916	-9.372*	0.182
	(0.225)	(0.426)	(0.816)	(0.285)	(0.100)	(1.014)	(1.122)	(1.493)	(5.320)	(0.260)
Constant	1.572***	0.469	3.499*	-0.629	-0.600	5.015**	5.161**	-2.770	28.97**	6.701***
	(0.253)	(0.422)	(1.832)	(1.056)	(0.389)	(1.960)	(2.344)	(3.237)	(14.32)	(0.214)
Observations	2,544	2,544	2,544	2,544	2,544	2,544	2,544	2,544	2,544	1,106
Number of home teams	67	67	67	67	67	67	67	67	67	67
R-squared	0.378	0.324	0.425	0.371	0.433	0.425	0.382	0.412	0.534	0.347
Season FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
League FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

(*Table 5 continued*)	**Away PPG**	**Away Goals**	**Away Corners**	**Away Yellow Cards**	**Away Red Cards**	**Away Shots on Target**	**Away Shots off Target**	**Away Fouls**	**Away Possession**
	(11)	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**	**(17)**	**(18)**	**(19)**
twfe_treatment = 1	0.0521	**-0.813*** **	**-1.669*** **	-0.179	-0.00571	**-1.796*** **	-0.852	0.108	**-9.424*** **
	(0.0746)	**(0.277)**	**(0.588)**	(0.494)	(0.0343)	**(0.476)**	(0.814)	(0.752)	**(3.157)**
ROA	0.209	-0.830	-1.850	-0.744	0.113	-2.329	-2.776*	1.029	-14.44
	(0.188)	(0.664)	(1.804)	(0.524)	(0.164)	(1.743)	(1.512)	(2.038)	(10.20)
Sales/Assets	-0.0275	0.208	0.0104	-0.703*	-0.00337	0.226	-0.117	-0.841	-0.122
	(0.293)	(0.482)	(0.867)	(0.391)	(0.145)	(1.051)	(1.449)	(1.352)	(6.578)
Cash/Assets	-0.523	0.265	-1.031	1.650**	0.480**	-0.344	-2.457	-0.455	-4.024
	(0.443)	(1.108)	(1.954)	(0.757)	(0.219)	(2.860)	(3.524)	(4.072)	(14.46)
Debt/Assets	-0.145	0.380	-0.891	1.153*	0.370*	0.290	0.287	0.990	-3.043
	(0.412)	(1.091)	(1.706)	(0.636)	(0.189)	(2.450)	(2.093)	(3.538)	(10.00)
Equity/Assets	-0.378	-0.415	-0.0430	1.736***	0.339*	-0.173	1.149	1.792	5.627
	(0.266)	(1.006)	(1.405)	(0.509)	(0.171)	(2.381)	(1.816)	(2.972)	(9.943)
Constant	1.733***	1.783*	6.253***	0.706	-0.325**	5.990***	4.995**	1.233	63.21***
	(0.244)	(0.891)	(1.261)	(0.700)	(0.149)	(1.946)	(2.337)	(2.971)	(9.137)
Observations	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217	1,217
Number of home teams	67	67	67	67	67	67	67	67	67
R-squared	0.475	0.499	0.568	0.565	0.599	0.589	0.515	0.560	0.657
Season FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
League FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

Table 6: Impact of PE on Squad Changes (2), Management Changes (2), and Chairman Changes (3) – Male Teams

Table 6 assesses the organizational impact of private equity by evaluating changes in squad, management, and chairman personnel using a two-way fixed effects model in staggered difference-in-differences framework. The columns represent squad changes (Column (1)), management changes (Column (2)), and chairman changes (Column (3)), respectively. Controls include return on assets (ROA), sales-to-assets ratio, cash-to-assets ratio, debt-to-assets ratio, and equity-to-assets ratio, along with fixed effects for both seasons and leagues. The model captures the dynamic changes in these key positions before and after private equity investments, with observations reflecting the total number of clubs analyzed. Standard errors are clustered at the club level. Significance levels are indicated as *p < 0.1, **p < 0.05, ***p < 0.01.

	Squad Changes (1)	**Management Changes (2)**	**Chairman Changes (3)**
twfe_treatment = 1	**2.642****	**0.179***	**0.246*****
	(1.236)	**(0.103)**	**(0.0936)**
ROA	0.521	0.203	0.891
	(0.395)	(0.769)	(0.564)
Sales/Assets	-0.767	-0.750**	-0.445*
	(1.856)	(0.333)	(0.235)
Cash/Assets	3.215	1.004	0.848
	(5.089)	(1.114)	(0.931)
Debt/Assets	5.552**	1.553***	0.767**
	(2.634)	(0.513)	(0.353)
Equity/Assets	-4.913*	0.527	-0.395
	(2.927)	(0.359)	(0.241)
Constant	29.13***	-0.00923	0.0275
	(1.022)	(0.164)	(0.0958)
Observations	288	192	192
Number of clubs	96	96	96
R-squared	0.105	0.155	0.174
Season FEs	Yes	Yes	Yes
League FEs	Yes	Yes	Yes

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

Table 7: Impact of PE on Raw Net Player Salaries (1), Raw Gross Player Salaries (2), Adjusted Net Player Salaries (3), and Adjusted Gross Player Salaries (4) – Male Teams

Table 7 evaluates the impact of private equity on player salaries, both raw and adjusted for various categories, using a two-way fixed effects model in a staggered difference-in-differences framework. The columns represent raw net player salaries, raw gross player salaries, adjusted net player salaries, and adjusted gross player salaries. I take the natural logarithm (ln) of Raw Net Player Salaries (1), Raw Gross Player Salaries (2), Adjusted Net Player Salaries (3), and Adjusted Gross Player Salaries (4). Financial controls include return on assets, sales-to-assets ratio, and other player-level financial metrics. The model incorporates fixed effects for seasons, leagues, and player groups to control for constant factors across seasons and leagues. The number of observations corresponds to the total number of players analyzed in the dataset. Standard errors are clustered at the player level. Significance levels are indicated as *p < 0.1, **p < 0.05, ***p < 0.01.

	Raw Net Player Salaries (1)	**Raw Gross Player Salaries (2)**	**Adjusted Net Player Salaries (3)**	**Adjusted Gross Player Salaries (4)**
twfe_treatment = 1	**0.104*** **	**0.111*** **	**0.103*** **	**0.109*** **
	(0.0370)	**(0.0369)**	**(0.0370)**	**(0.0370)**
Constant	11.88**	12.55***	12.06***	12.73***
	(0.596)	(0.584)	(0.596)	(0.584)
Financial Controls	Yes	Yes	Yes	Yes
Observations	18,196	18,196	18,196	18,196
Number of players	6,670	6,670	6,670	6,670
R-squared	0.283	0.274	0.244	0.236
Season FEs	Yes	Yes	Yes	Yes
League FEs	Yes	Yes	Yes	Yes
Player-League FEs	Yes	Yes	Yes	Yes
Player-Group FEs	Yes	Yes	Yes	Yes

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

Table 8: Impact of PE on Revenue (1), EBIT (2), and Total Revenue per Player (3) – Male Teams

Table 8 assesses the financial performance of clubs from before to after private equity investment, focusing on total revenue (Column (1)), EBIT (Column (2)), and revenue per player (Column (3)) using a two-way fixed effects model in a staggered difference-in-differences framework. I take the natural logarithm (ln) of Revenue (1), EBIT (2), and Revenue per Player (3). Controls include return on assets, sales-to-assets ratio, cash-to-assets ratio, debt-to-assets ratio, and equity-to-assets ratio. The model incorporates fixed effects for both seasons and leagues to control for unobserved heterogeneity across regions and time. Observations correspond to the number of clubs included in the analysis. Standard errors are clustered by club, and the significance levels are reported as *p < 0.1, **p < 0.05, ***p < 0.01.

	Revenue	**EBIT**	**Revenue Per Player**
	(1)	**(2)**	**(3)**
twfe_treatment = 1	**0.412****	-0.160	-0.503
	(0.203)	(0.990)	(0.540)
ROA	-0.0634	19.42***	0.452
	(0.268)	(2.273)	(0.531)
Sales/Assets	-0.161	0.187	0.936*
	(0.322)	(0.954)	(0.555)
Cash/Assets	1.258**	5.321	-0.260
	(0.631)	(3.248)	(1.402)
Debt/Assets	11.28***	6.934***	4.455
	(3.364)	(2.247)	(2.805)
Equity/Assets	10.72***	8.613***	3.187
	(3.524)	(2.253)	(2.661)
Constant	7.323**	-1.551	1.222
	(3.419)	(1.712)	(2.604)
Observations	683	683	683
Number of clubs	96	96	96
R-squared	0.597	0.363	0.098
Season FEs	Yes	Yes	Yes
League FEs	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 9: Impact of PE on Matchdays' Revenue (1), Broadcasts' Revenue (2), Commercials' Revenue (3), Player Trading Revenue (4), and Player Trading Net Results (5) – Male Teams

Table 9 breaks down the revenue effects of private equity on different revenue streams from before to after PE investment, such as matchday revenue (Column (1)), broadcasting revenue (Column (2)), commercial revenue (Column (3)), player trading revenue (Column (4)), and player trading net results (Column (5)) using a two-way fixed effects model in a staggered difference-in-differences framework. I take the natural logarithm (ln) of Matchdays' Revenue (1), Broadcasts' Revenue (2), Commercials' Revenue (3), Player Trading Revenue (4), and Player Trading Net Results (4). Controls are the same as in previous tables, including return on assets, sales-to-assets ratio, and other financial controls, with fixed effects for season and league applied to account for unobserved heterogeneity. The number of observations reflects the total number of revenue entries available for analysis. Standard errors are clustered by club. Significance levels are indicated as *p < 0.1, **p < 0.05, ***p < 0.01.

	Matchdays' Revenue (1)	**Broadcasts' Revenue (2)**	**Commercials' Revenue (3)**	**Player Trading Revenue (4)**	**Player Trading Net Results (5)**
twfe_treatment = 1	**1.028****	1.055	**0.358***	**-1.200***	**-1.685***
	(0.425)	(0.656)	**(0.210)**	**(0.684)**	**(0.966)**
ROA	0.110	-0.152	-0.249	0.441	3.695**
	(0.653)	(0.287)	(0.275)	(0.523)	(1.454)
Sales/Assets	-0.609	-0.123	-0.0351	0.950*	0.144
	(0.371)	(0.326)	(0.311)	(0.555)	(0.830)
Cash/Assets	1.008	0.337	0.537	-0.288	-3.396*
	(1.242)	(0.981)	(0.608)	(1.401)	(1.776)
Debt/Assets	11.27***	10.64***	9.830***	4.388	3.728
	(2.887)	(3.263)	(3.077)	(2.793)	(2.271)
Equity/Assets	10.76***	10.25***	9.294***	3.130	3.104
	(3.019)	(3.413)	(3.213)	(2.651)	(2.279)
Constant	4.693	6.152*	5.331*	1.193	7.586***
	(2.905)	(3.319)	(3.125)	(2.599)	(2.081)
Observations	683	683	683	683	683
Number of clubs	96	96	96	96	96
R-squared	0.497	0.467	0.536	0.102	0.102
Season FEs	Yes	Yes	Yes	Yes	Yes
League FEs	Yes	Yes	Yes	Yes	Yes

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

Table 10: Impact of Centrality Measures on Post-PE Male's On-Field Match Performance

Table 10 examines the relationship between network centrality measures (degree, betweenness, and closeness centrality) and various match performance outcomes for male soccer teams using an OLS model. The table includes multiple columns that represent different match outcomes: Column (1) shows points per game, Column (2) focuses on home goals, Column (3) – home corners, Column (4) – home yellow cards, Column (5)) – home red cards, Column (6)) – home shots on target, Column (7) – home shots off target, Column (8) – home fouls, Column (9) – home possession, Column (10) – away points per game, Column (11) – away goals, Column (12) – away corners, Column (13) – away yellow cards, Column (14) – away red cards, Column (15) – away shots on target, Column (16) – away shots off target, Column (17) – away fouls, Column (18) – away possession. The model includes fixed effects for clubs and seasons to account for unobserved heterogeneity across time and teams. The number of observations represents the total number of matches analyzed. Standard errors are clustered by team. Significance levels are indicated as *p < 0.1, **p < 0.05, ***p < 0.01.

	Home PPG	**Home Goals**	**Home Corners**	**Home Yellow Cards**	**Home Red Cards**	**Home Shots on Target**	**Home Shots off Target**	**Home Fouls**	**Home Possession**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Constant	9.2093	36.7483	**55.0689****	**-42.8316****	3.0439	35.1138	-43.9683	-33.5708	**331.973*****
	(7.838)	(27.471)	**(27.772)**	**(17.307)**	(3.6)	(41.086)	(48.027)	(68.695)	**(125.462)**
Degree Centrality	3.9393	21.5904	**30.9761***	**-33.2978*****	2.682	19.2416	-33.9141	-29.2744	**170.8596****
	(4.632)	(16.233)	**(16.411)**	**(10.227)**	(2.127)	(24.278)	(28.38)	(40.593)	**(74.138)**
Betweenness Centrality	**1475.4904*****	1491.7998	2883.965	448.4307	**-509.1336****	-240.6406	**-8522.9355*****	-3452.5681	**20790****
	(534.194)	(1872.243)	(1892.745)	(1179.526)	**(245.335)**	(2800.132)	**(3273.213)**	(4681.787)	**(8550.643)**
Closeness Centrality	-15.0403	-70.4924	**-100.7976***	**91.0714*****	-6.1903	-58.9961	106.1537	91.8265	**-562.1261****
	(15.779)	(55.3)	**(55.906)**	**(34.84)**	(7.246)	(82.708)	(96.681)	(138.286)	**(252.561)**
Observations	403	403	403	403	403	403	403	403	403
Number of players	7,008	7,008	7,008	7,008	7,008	7,008	7,008	7,008	7,008
R-squared	0.067	0.005	0.021	0.136	0.049	0.004	0.141	0.011	0.053

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

(*Table 11 continued*)	**Away PPG**	**Away Goals**	**Away Corners**	**Away Yellow Cards**	**Away Red Cards**	**Away Shots on Target**	**Away Shots off Target**	**Away Fouls**	**Away Possession**
	(10)	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**	**(17)**	**(18)**
Constant	-10.3218	-5.2146	-20.5049	-9.2878	5.5057	-27.7885	-41.1542	83.5763	**-231.973***
	(6.851)	(12.98)	(39.106)	(20.863)	(4.857)	(34.343)	(49.649)	(77.314)	**(125.462)**
Degree Centrality	-6.0274	-1.7166	-16.8577	-11.279	3.5205	-21.9141	-33.1613	56.8352	**-170.8596****
	(4.048)	(7.67)	(23.108)	(12.329)	(2.87)	(20.294)	(29.339)	(45.686)	**(74.138)**
Betweenness Centrality	**-1162.2366****	-1068.0794	-3219.3174	1431.6508	-75.6371	-574.3285	-3783.7079	-1384.9653	**-2.08E+04****
	(466.915)	(884.626)	(2665.188)	(1421.91)	(331.046)	(2340.565)	(3383.765)	(5269.17)	**(8550.643)**
Closeness Centrality	**22.7906***	11.6997	49.2846	23.9502	-10.9906	65.1846	96.3911	-146.8648	**562.1261****
	(13.791)	(26.129)	(78.722)	(41.999)	(9.778)	(69.133)	(99.946)	(155.636)	**(252.561)**
Observations	403	403	403	403	403	403	403	403	403
Number of players	7,008	7,008	7,008	7,008	7,008	7,008	7,008	7,008	7,008
R-squared	0.016	0.008	0.044	0.027	0.007	0.002	0.048	0.036	0.046

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

Table 11: Impact of Centrality Measures on Post-PE Female's On-Field Match Performance

Table 11 examines the relationship between network centrality measures (degree, betweenness, and closeness centrality) and various match performance outcomes for female soccer teams using an OLS model. The table includes multiple columns that represent different match outcomes: Column (1) shows points per game, Column (2) focuses on home goals, Column (3) – home corners, Column (4) – home yellow cards, Column (5)) – home red cards, Column (6)) – home shots on target, Column (7) – home shots off target, Column (8) – home fouls, Column (9) – home possession, Column (10) – away points per game, Column (11) – away goals, Column (12) – away corners, Column (13) – away yellow cards, Column (14) – away red cards, Column (15) – away shots on target, Column (16) – away shots off target, Column (17) – away fouls, Column (18) – away possession. The model includes fixed effects for clubs and seasons to account for unobserved heterogeneity across time and teams. The number of observations represents the total number of matches analyzed. Standard errors are clustered by team. Significance levels are indicated as *p < 0.1, **p < 0.05, ***p < 0.01.

	Home PPG	**Home Goals**	**Home Corners**	**Home Yellow Cards**	**Home Red Cards**	**Home Shots on Target**	**Home Shots off Target**	**Home Fouls**	**Home Possession**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Constant	**1.9274*** **	**2.1269*** **	**5.0736*** **	**1.1814*** **	**-0.032*** **	**6.5123*** **	**6.094*** **	**2.0329*** **	**49.8281*** **
	(0.011)	**(0.045)**	**(0.088)**	**(0.029)**	**(0.009)**	**(0.096)**	**(0.107)**	**(0.122)**	**(0.493)**
Degree Centrality	**0.9986*** **	**1.9267*** **	**-2.2618***	**-0.7361***	-0.0607	0.8225	-1.134	**-5.4704*** **	**-10.5261** **
	(0.119)	**(0.486)**	**(0.952)**	**(0.314)**	(0.1)	(1.036)	(1.156)	**(1.322)**	**(5.322)**
Betweenness Centrality	**-38.2802** **	-65.9673	159.7834	24.8364	-11.5953	-23.4648	156.7653	**240.51***	261.0393
	(12.392)	(50.615)	(99.172)	(32.687)	(10.458)	(107.918)	(120.397)	**(137.686)**	(554.49)
Closeness Centrality	**0.1621*** **	-0.014	**1.1268** **	-0.1833	-0.0411	-0.3658	0.1586	**3.949*** **	**3.7053** **
	(0.04)	(0.165)	**(0.324)**	(0.107)	(0.034)	(0.353)	(0.393)	**(0.45)**	**(1.811)**
Observations	335	335	335	335	335	335	335	335	335
Number of players	5,063	5,063	5,063	5,063	5,063	5,063	5,063	5,063	5,063
R-squared	0.063	0.008	0.002	0.007	0.003	0.001	0.001	0.012	0.053

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

(*Table 12 continued*)	**Away PPG**	**Away Goals**	**Away Corners**	**Away Yellow Cards**	**Away Red Cards**	**Away Shots on Target**	**Away Shots off Target**	**Away Fouls**	**Away Possession**
	(10)	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**	**(16)**	**(17)**	**(18)**
Constant	**1.2347*** **	**1.0044*** **	**3.6077*** **	**1.3226*** **	**-0.0329*** **	**4.8065*** **	**4.6315*** **	**2.0888*** **	**43.4388*** **
	(0.016)	**(0.028)**	**(0.069)**	**(0.031)**	**(0.009)**	**(0.077)**	**(0.082)**	**(0.125)**	**(0.412)**
Degree Centrality	-0.0814	**-0.8936*** **	**-2.6812*** **	-0.5164	0.0034	**-2.086** **	**-3.7739*** **	**-4.5567*** **	**-12.6411*** **
	(0.174)	**(0.303)**	**(0.749)**	(0.333)	(0.099)	**(0.834)**	**(0.888)**	**(1.347)**	**(4.447)**
Betweenness Centrality	19.7778	**78.222** **	104.845	-6.5997	-15.1701	98.0918	**312.5947*** **	69.3864	208.9053
	(18.079)	**(31.613)**	(78.03)	(34.678)	(10.314)	(86.855)	**(92.525)**	(140.382)	(463.307)
Closeness Centrality	0.0793	-0.0451	-0.2806	-0.1267	-0.0438	**-1.3272*** **	**-0.5412***	**4.0206*** **	**-6.0902*** **
	(0.059)	(0.103)	(0.255)	(0.113)	(0.034)	**(0.284)**	**(0.302)**	**(0.459)**	**(1.513)**
Observations	335	335	335	335	335	335	335	335	335
Number of players	5,063	5,063	5,063	5,063	5,063	5,063	5,063	5,063	5,063
R-squared	0.001	0.004	0.010	0.004	0.002	0.019	0.012	0.013	0.020

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

Figure 1: PE Deals by Country

Figure 1 shows the distribution of private equity deals across several European countries, highlighting the number of PE deals made in the soccer industry. It visually represents that France and England each have the highest number of deals (nine each), followed by Italy with five, Spain with four, and Germany with one. The figure emphasizes the geographical focus of PE investments within European soccer clubs.

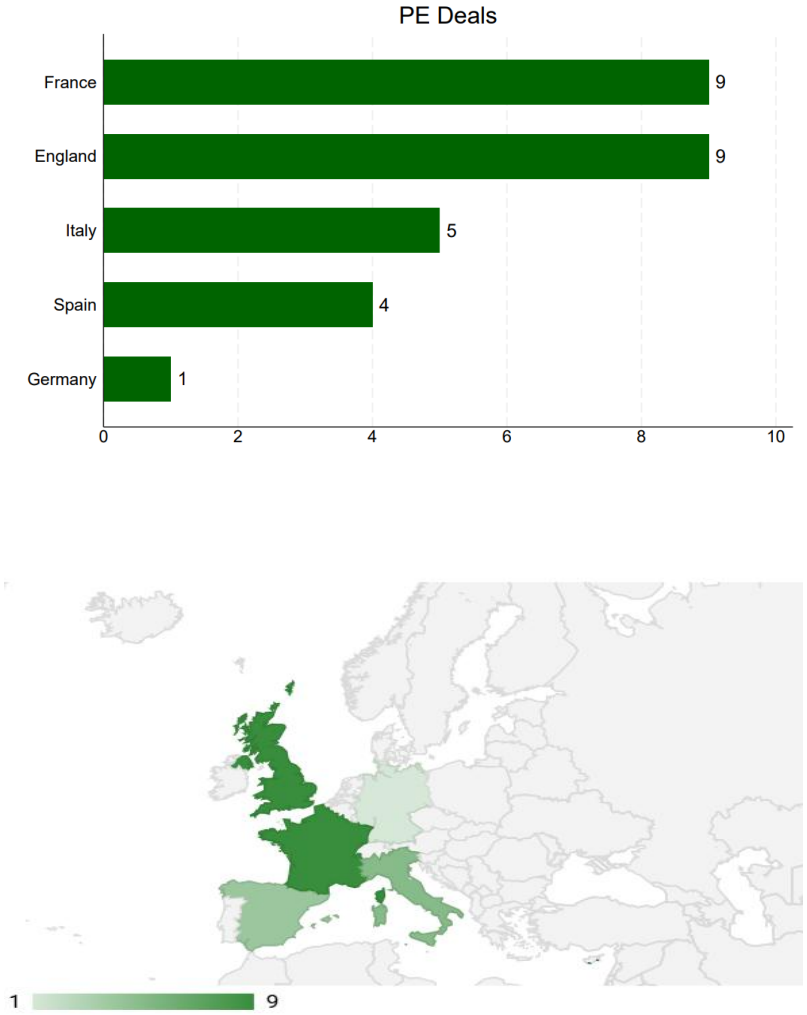
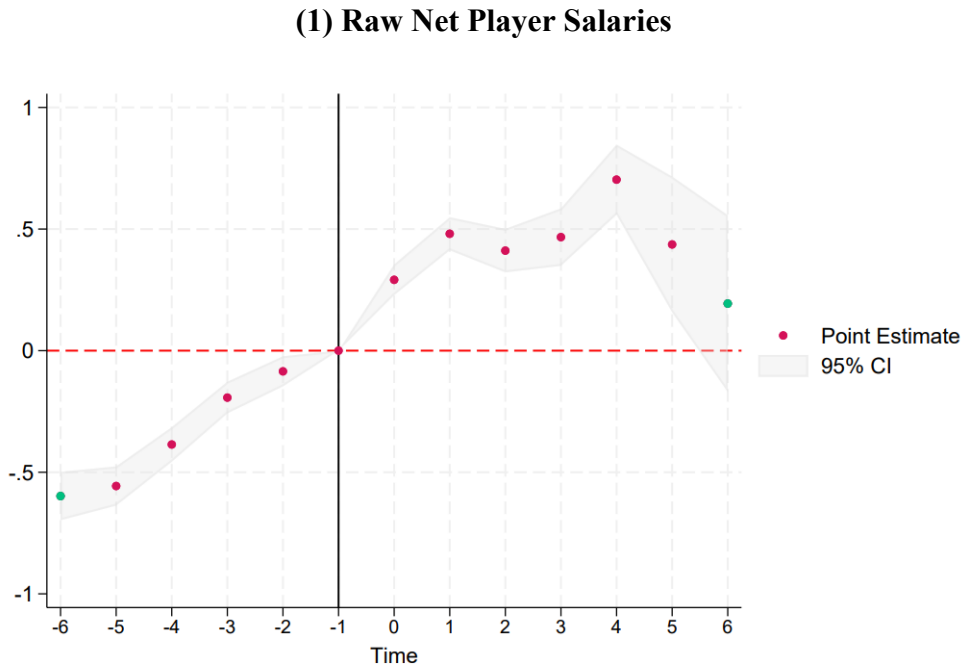


Figure 2: Dynamic Treatment Effects of Raw Net Player Salaries (1) and Adjusted Net Player Salaries (2) around PE Investments

Figure 2 presents two sets of time-to-event coefficients (from an event study analysis of dynamic treatment effects over time) with 95% confidence intervals, focusing on raw net player salaries (Panel 1) and adjusted net player salaries (Panel 2). It visually compares the treated (PE-invested) soccer teams with non-treated teams across the timeline of the private equity investment. The figure shows the trend of increasing salaries over time for both raw and adjusted net salaries, indicating the impact of PE investments on player compensation. The widening confidence intervals toward the post-investment period suggest greater variability in salary adjustments as PE investments take effect.



(2) Adjusted Net Player Salaries

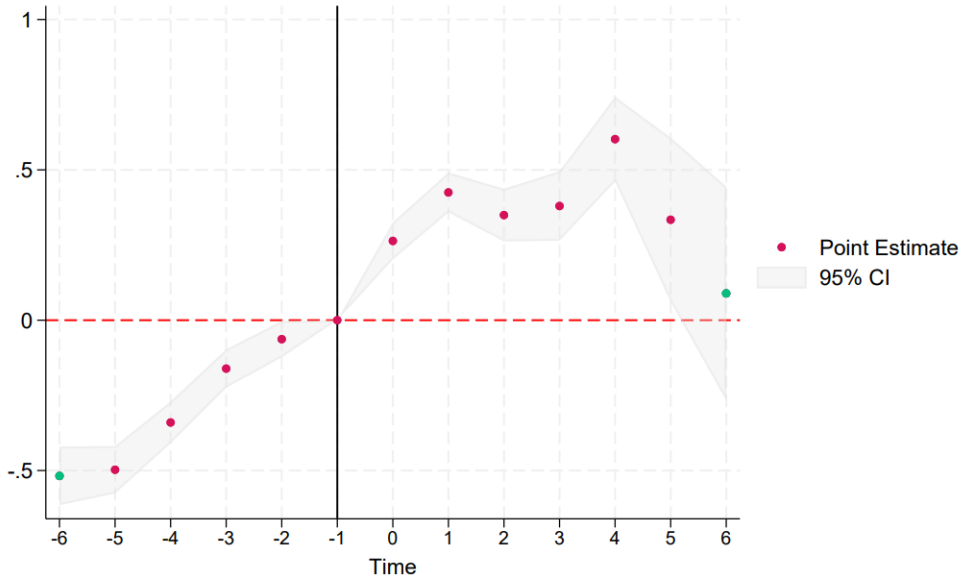


Figure 3: Network Graph of Men's Soccer Club Co-Appearances

This figure maps out the relationships between men's soccer clubs based on co-appearance data, indicating how interconnected these clubs are within the network. It highlights clusters of clubs that are more frequently connected and shows the central roles played by certain clubs. The high network density suggests strong interactions among clubs, with many clubs being involved in frequent exchanges and appearances.

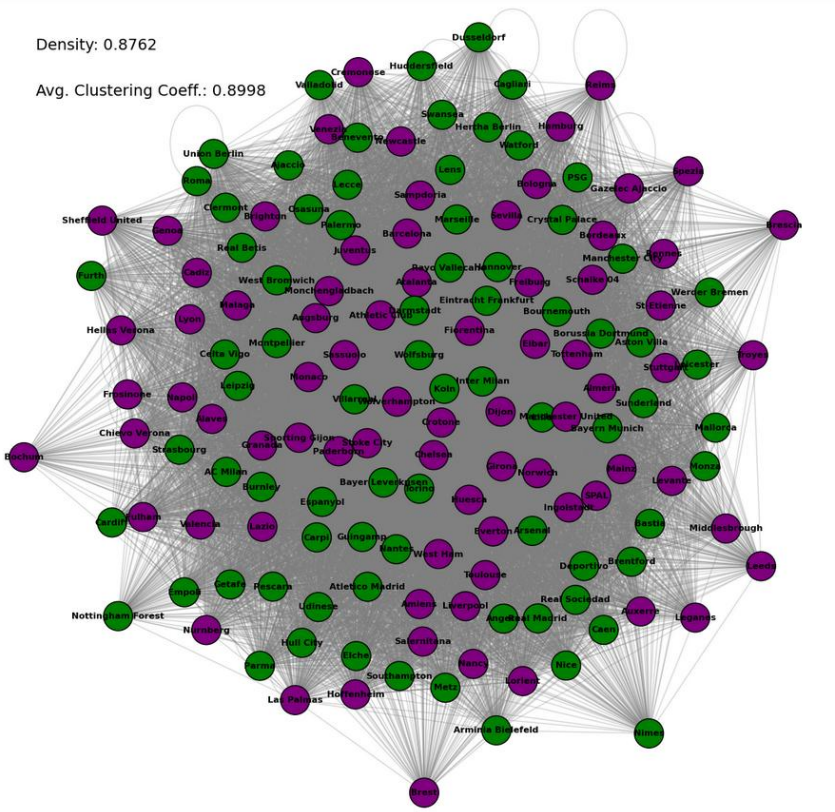


Figure 4: Network Graph of Women's Soccer Club Co-Appearances

Similar to Figure 3, Figure 4 presents a network graph for women's soccer clubs, based on co-appearance data. The density of the network, while lower than that of the men's clubs, indicates significant interactions and clustering within the women's soccer teams. The clustering coefficient reflects the tendency of clubs to form tight-knit communities, where connected clubs are likely to share interactions with one another.

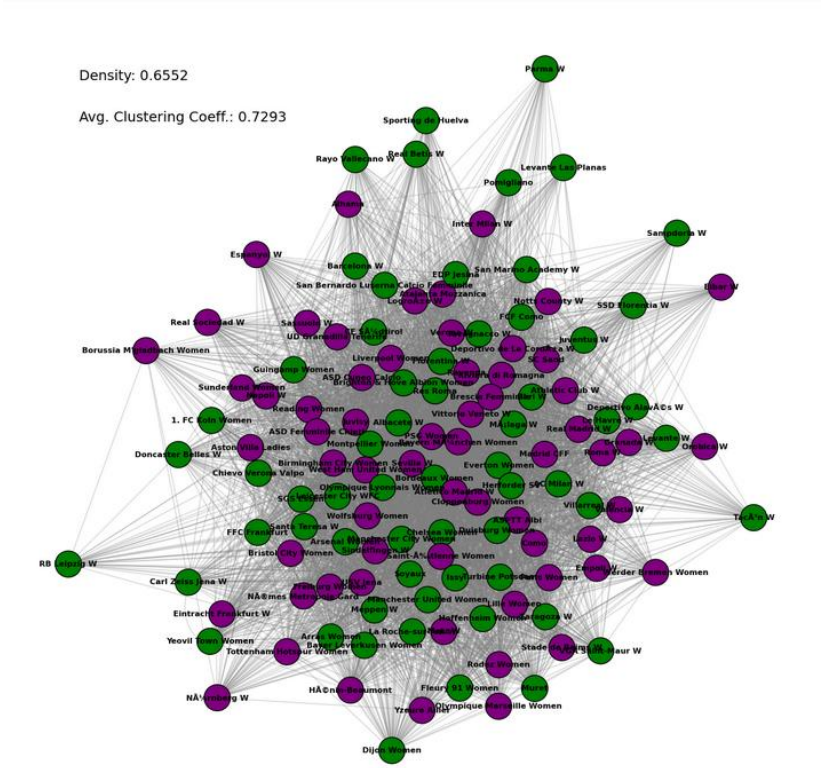
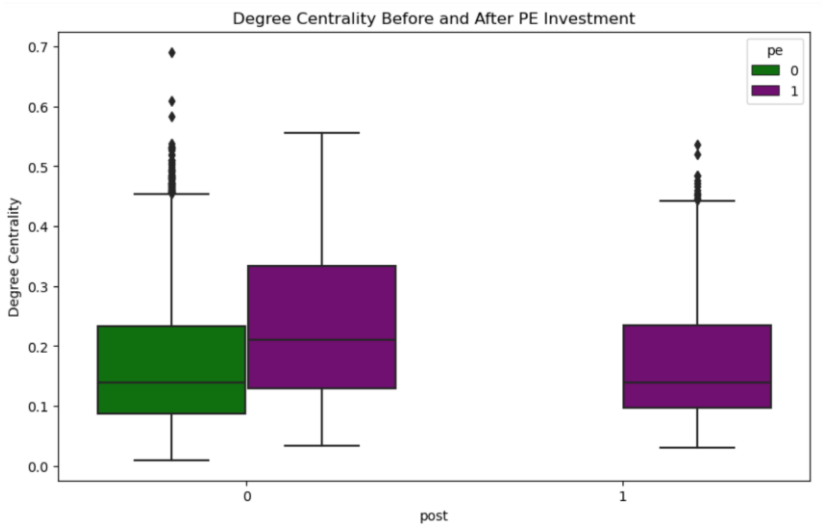


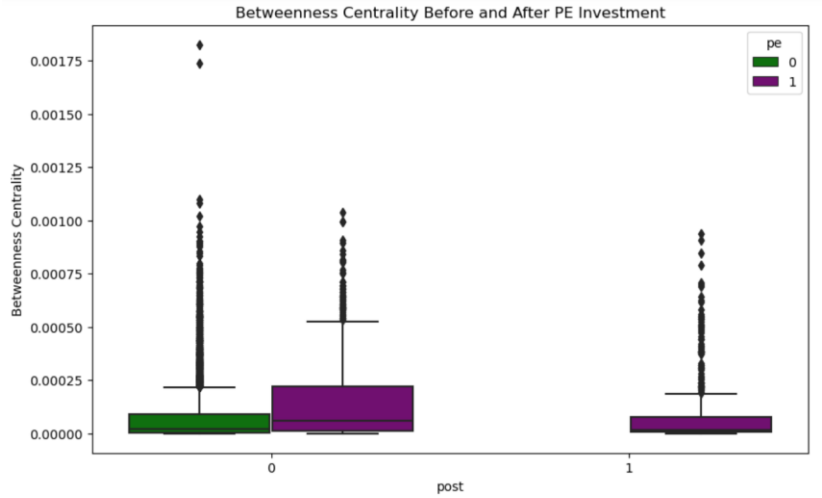
Figure 5: Box Plots of Impact of PE Investments on Network Centrality Measures in Male Soccer Teams

Figure 5 displays box plots illustrating the distribution of three centrality measures—degree centrality, betweenness centrality, and closeness centrality—among male soccer teams before and after PE investments. The plots show that PE clubs have higher levels of centrality before the investment compared to non-PE clubs, but these measures decline post-investment. The reduced interconnectivity post-investment suggests that the player network becomes less cohesive after PE takes over.

(1) Degree Centrality



(2) Betweenness Centrality



(3) Closeness Centrality

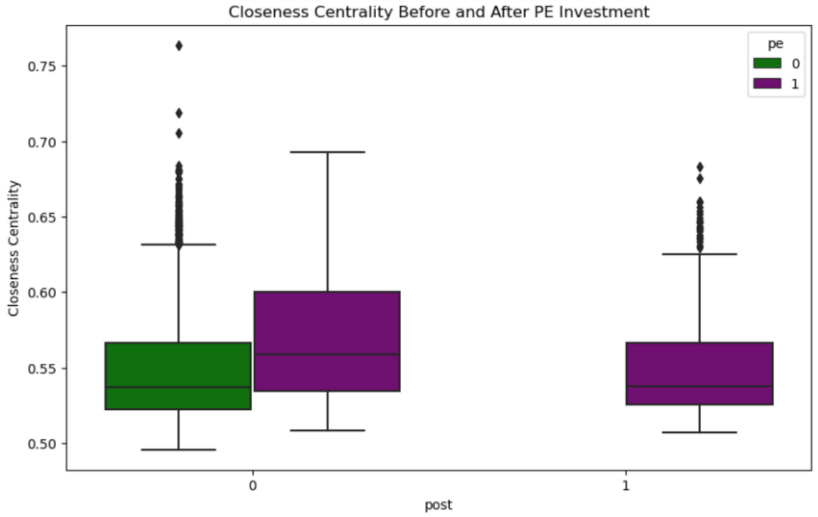
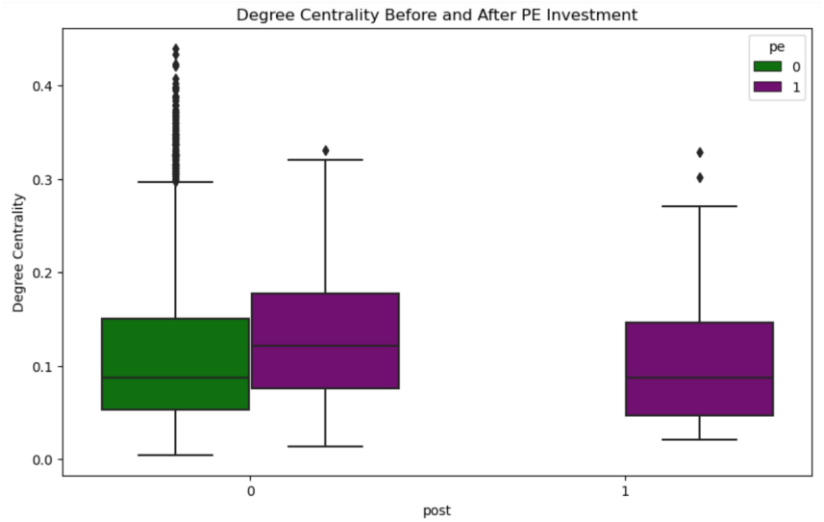


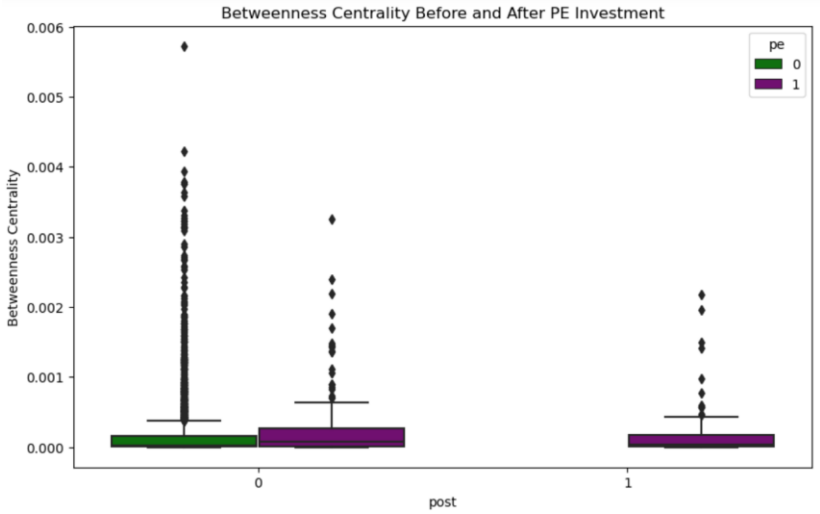
Figure 6: Box Plots of Impact of PE Investments on Network Centrality Measures in Female Soccer Teams

Similar to Figure 5, Figure 6 shows the distribution of degree centrality, betweenness centrality, and closeness centrality among female soccer teams, both before and after PE investments. It reveals that while PE clubs initially have higher centrality measures, these measures decline following the investment, reflecting a disruption in the cohesiveness of the player networks post-PE investment.

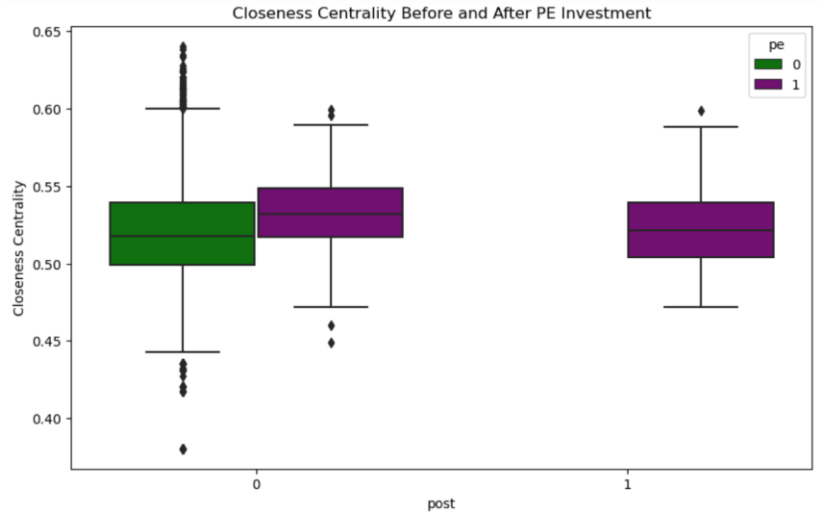
(1) Degree Centrality



(2) Betweenness Centrality



(3) Closeness Centrality



Online Appendix

for

Scoring Profits?
The Impact of Private Equity Investments on Soccer Clubs

By Kristina Lalova

Table A1: Summary Statistics

Table A1 presents the summary statistics for male and female soccer players for those in non-PE-funded clubs, male and female match performance for non-PE-funded clubs, male players' salaries for players of non-PE-funded clubs, and soccer teams' financials for non-PE-funded clubs. Panel A presents male players' performance statistics for control sample. Panel B presents female players' statistics for control sample. Panel C presents male match performance statistics for control sample. Panel D presents female match performance statistics for control sample. Panel E presents male players' salaries for control sample. Panel F presents soccer teams' financials for control sample.

Panel A. Male Players' Performance Statistics for Control Sample

Stats	N	Mean	SD	p25	p50	p75
appearances	11081	20.45366	11.07236	11	22	30
goals	5630	3.711901	4.038074	1	2	5
assists	5449	2.664893	2.204575	1	2	3
penalty_goals	937	2.160085	1.677525	1	1	3
penalty_misses	489	1.202454	0.481113	1	1	1
clean_sheets	9893	5.786718	3.619431	3	5	8
conceded	10510	22.11189	14.71474	10	21	33
yellow_cards	8670	3.943829	2.769985	2	3	5
red_cards	1435	1.114286	0.355527	1	1	1
min/match	11035	63.02900	23.38456	47	69	83
min/card	8656	572.8518	522.4194	264	404	677
min/assist	5449	990.7122	732.0481	454	759	1314
rank_attackers	12392	161.3171	143.3091	-1	144	286
rank_midfielders	12392	162.6981	144.4090	-1	145	288.5
rank_defenders	12392	30.56851	54.69539	-1	-1	48

Panel B. Female Players' Performance Statistics for Control Sample

Stats	N	Mean	SD	p25	p50	p75
appearances	3550	13.97408	8.086731	7	14	20
goals	1637	3.478925	3.643875	1	2	4
assists	1132	2.542403	2.269033	1	2	3
penalty_goals	212	1.693396	1.095165	1	1	2
penalty_misses	76	1.065789	0.249561	1	1	1
clean_sheets	3105	5.055395	3.683713	2	4	7
conceded	3252	16.57319	12.83319	6	14	25
yellow_cards	1880	2.292553	1.858069	1	2	3
red_cards	145	1.041379	0.232016	1	1	1
min/match	3540	62.01949	24.97993	45	68	84
min/card	1879	734.3427	512.7629	357	572	984
min/assist	1132	777.5786	543.8431	347	624	1112
rank_attackers	3894	84.92322	84.79268	-1	66	151
rank_midfielders	3894	84.92347	84.11920	-1	67	148
rank_defenders	3894	11.31305	24.85563	-1	-1	9

Panel C. Male Match Performance Statistics for Control Sample

Stats	N	Mean	SD	p25	p50	p75
attendance	8066	19074.78	19948.89	0	15490.5	30826
home_ppg	8066	1.551756	0.466565	1.24	1.53	1.84
away_ppg	8066	1.173703	0.495829	0.79	1.11	1.47
home_goals	8066	1.508059	1.279045	1	1	2
away_goals	8066	1.242499	1.180523	0	1	2
home_corner	8066	5.322341	2.927729	3	5	7
away_corner	8066	4.476692	2.626634	3	4	6
home_yellow_cards	8066	1.894743	1.333792	1	2	3
away_yellow_cards	8066	2.115795	1.375359	1	2	3
home_red_cards	8066	0.090131	0.326828	0	0	0
away_red_cards	8066	0.105257	0.342783	0	0	0
home_shots_	8066	5.463799	2.618640	4	5	7
away_shots_	8066	4.762088	2.446614	3	5	6
home_shots_	8066	7.217828	3.858313	4	7	9
away_shots_	8066	6.106248	3.561451	4	6	8
away_fouls	8066	12.57439	4.317899	10	12	15
home_possession	8066	50.51240	11.39415	43	51	58
away_possession	8066	48.65274	11.32523	42	49	56

Panel D. Female Match Performance Statistics for Control Sample

Stats	N	Mean	SD	p25	p50	p75
attendance	1902	432.7366	1889.847	0	0	400
home_ppg	1902	1.634826	0.724314	1.09	1.63	2.27
away_ppg	1902	1.286435	0.741820	0.73	1.18	1.82
home_goals	1902	1.852787	1.955687	0	1	3
away_goals	1902	1.348055	1.558535	0	1	2
home_corner	1902	3.549422	3.855958	0	3	6
away_corner	1902	3.032072	3.538549	0	3	5
home_yellow_cards	1902	0.860673	1.248688	0	1	2
away_yellow_cards	1902	1.002629	1.322525	0	1	2
home_red_cards	1902	-0.11987	0.439183	0	0	0
away_red_cards	1902	-0.11514	0.441045	0	0	0
home_shots_on_target	1902	4.741325	4.761030	0	5	8
away_shots_on_target	1902	3.758149	3.982388	0	4	6
home_shots_off_target	1902	4.289169	4.688114	0	4	7
away_shots_off_target	1902	3.503155	4.007192	0	3	6
away_fouls	1902	0.760252	4.249125	-1	-1	-1
home_possession	1902	37.36540	24.69595	-1	48	54
away_possession	1902	35.44532	23.61476	-1	45	52

Panel E. Male Players' Salaries for Control Sample

Stats	N	Mean	SD	p25	p50	p75
player_age	20054	24.94116	4.694308	21	25	28
salary_gross_usd	20054	1532308	2866007	194196	701264	1801709
salary_net_usd	20054	817630.5	1460550	107887	377604	970981
adjusted_salary_gross_usd	20054	1658756	3105630	204985	773561	1952883
adjusted_salary_net_usd	20054	884352.2	1579764	107887	411428	1048839

Panel F. Soccer Teams' Financials for Control Sample

Stats	N	Mean	SD	p25	p50	p75
Revenue	510	18.19031	2.299725	17.92701	18.49646	18.86121
EBIT	510	4.802131	7.317731	0	0	14.41469
Revenue/Player	510	7.106644	8.199032	0	0	16.49334
Matchdays Revenue	510	14.01904	5.044739	14.62689	15.51072	16.50241
Broadcasting Revenue	510	16.11845	5.255673	17.02357	17.73178	18.35677
Commercial Revenue	510	14.73743	4.928650	15.36122	15.98989	16.86554
Player Tr Revenue	510	7.106644	8.199032	0	0	16.49334
Net Player Tr Revenue	510	12.08173	7.102362	0	15.70262	16.84201
ROA	510	-0.02998	0.189452	-0.08472	0	0.046470
Sales/Assets	510	0.881016	0.511492	0.565628	0.797928	1.082123
Cash/Assets	510	0.110100	0.122929	0.016513	0.068138	0.159713
Debt/Assets	510	0.622659	0.417974	0.338232	0.584413	0.817358
Equity/Assets	510	0.351812	0.409574	0.166353	0.391001	0.637234

Table A2: Summary Stats for Centrality Measures for Male and Female Soccer Players, Respectively

Table A2 provides the summary statistics for centrality measures – degree centrality, betweenness centrality, and closeness centrality – before and after PE investment for both male and female soccer players. The table is split into four groups: PE-funded clubs before and after investment and non-PE-funded clubs before and after the same period. The columns show the mean and standard deviation for each of the centrality measures across the different groups. The table allows for a comparison of how player network positions change over time, particularly in response to PE investment.

	Degree Centrality		**Betweenness Centrality**		**Closeness Centrality**	
	mean	sd	mean	sd	mean	sd
pe_post					pe_post	
0 0	0.172689	0.108897	0.000083	0.000143	0.549304	0.035200
1 0	0.232633	0.118872	0.000141	0.000178	0.568462	0.039682
1	0.180325	0.116993	0.000096	0.000167	0.551952	0.038187

	Degree Centrality		**Betweenness Centrality**		**Closeness Centrality**	
	mean	sd	mean	sd	mean	sd
pe_post					pe_post	
0 0	0.111342	0.077149	0.000182	0.000419	0.520089	0.032886
1 0	0.128704	0.066000	0.000228	0.000415	0.531919	0.023367
1	0.104880	0.069112	0.000178	0.000356	0.522146	0.026290

Table A3: Impact of PE on Main League Change (1), Main League Position (2), and Champion's League Qualification (3)

Table A3 examines the impact of PE investment on three key league performance outcomes: league change (whether the club moved up or down in their league), league position (final standing in the league), and qualification for the Champion's League using a two-way fixed effects model in a difference-in-differences framework. Each column represents one of these outcomes. The staggered difference-in-differences model controls for various financial metrics and includes fixed effects for season and league. Standard errors are clustered by team. Significance levels are indicated as *p < 0.1, **p < 0.05, ***p < 0.01.

	Main League/ Or Not (1)	Main League Position (2)	Champion's League Qualify/Or Not (3)
twfe_treatment = 1	-0.0362	1.316	-0.0239
	(0.0772)	(1.205)	(0.0720)
ROA	0.0239	0.782*	-0.0585*
	(0.0382)	(0.458)	(0.0347)
Sales/Assets	0.0511	-1.237	0.288*
	(0.195)	(2.325)	(0.157)
Cash/Assets	-0.628*	-14.49***	0.403
	(0.322)	(3.851)	(0.367)
Debt/Assets	0.398*	8.201***	-0.290
	(0.202)	(2.894)	(0.215)
Equity/Assets	0.351**	5.096**	-0.169
	(0.164)	(2.247)	(0.157)
Constant	0.678***	4.883*	0.407***
	(0.167)	(2.698)	(0.153)
Observations	288	288	288
Number of clubs	96	96	96
R-squared	0.152	0.109	0.133
Season FEs	Yes	Yes	Yes
League FEs	Yes	Yes	Yes

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

Table A4: Impact of PE on Shirt Sponsor (1), Front Sponsor (2), and Total Sponsor Changes (3)

Table A4 explores the effect of private equity on sponsorship changes, including shirt sponsors, front sponsors, and total sponsor changes using a two-way fixed effects model in a staggered difference-in-differences framework. The columns represent changes in each sponsorship category – shirt sponsor changes (Column (1)), front sponsor changes (Column (2)), and total sponsor changes (Column (3)). Controls for ROA, sales-to-assets ratio, cash-to-assets ratio, debt-to-assets ratio, and equity-to-assets ratio are included. Season and league fixed effects are applied to control for unobserved heterogeneity across regions and time. The model uses standard errors clustered at the club level, with the number of observations corresponding to the clubs evaluated for sponsorship changes pre- and post-PE investment. Significance levels are indicated as *p < 0.1, **p < 0.05, ***p < 0.01.

	Shirt Sponsor Changes (1)	**Front Sponsor Changes (2)**	**Total Sponsor Changes (3)**
twfe_treatment = 1	0.0905	-0.0465	0.0440
	(0.0571)	(0.0498)	(0.0774)
ROA	0.00174	-0.257	-0.255
	(0.144)	(0.343)	(0.362)
Sales/Assets	-0.218	-0.0988	-0.317
	(0.168)	(0.141)	(0.191)
Cash/Assets	0.165	0.248	0.413
	(0.493)	(0.506)	(0.720)
Debt/Assets	0.0455	-0.0852	-0.0397
	(0.158)	(0.172)	(0.249)
Equity/Assets	0.0692	0.217	0.286
	(0.128)	(0.251)	(0.233)
Constant	0.410***	0.465***	0.875***
	(0.0624)	(0.0562)	(0.0857)
Observations	192	192	192
Number of clubs	96	96	96
R-squared	0.050	0.108	0.079
Season FEs	Yes	Yes	Yes
League FEs	Yes	Yes	Yes

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

Table A5: Regression Test for Parallel Trends Assumption

This table reports estimates from a pre-treatment trend regression. Model (1) reports pre-treatment trend regression results for Gross Salaries; Model (2) reports pre-treatment trend regression results for Net Salaries; Model (3) reports pre-treatment trend regression results for Adjusted Gross Salaries (3); Model (4) reports pre-treatment trend regression results for Adjusted Net Salaries. The coefficient on 1.pe#c.years_since_treat tests whether the treatment group (PE-backed clubs) has a different pre-trend compared to the control group (non-PE clubs). The coefficient on 0b.pe#co.years_since_treat is 0 because it represents the control group and base category in that case. Since this interaction term is not statistically significant ($p > 0.05$), we fail to reject the null hypothesis that pre-trends are parallel. Significance levels are indicated as *p < 0.1, **p < 0.05, ***p < 0.01.

	Gross Salaries (1)	**Net Salaries (2)**	**Adjusted Gross Salaries (3)**	**Adjusted Net Salaries (4)**
years_since_treat	0.0897	0.0891	0.0729	0.0722
	(0.0754)	(0.0720)	(0.0761)	(0.0727)
pe = 1	0.459	0.474	0.453	0.469
	(0.328)	(0.313)	(0.331)	(0.316)
0b.pe#co.years_since_treat	0	0	0	0
	(0)	(0)	(0)	(0)
1.pe#c.years_since_treat	-0.0759	-0.0699	-0.0810	-0.0751
	(0.151)	(0.145)	(0.153)	(0.146)
Constant	10.80***	10.29***	10.87***	10.36***
	(0.162)	(0.155)	(0.164)	(0.156)
Observations	10,902	10,902	10,902	10,902
R-squared	0.002	0.003	0.002	0.003

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A6: Dynamic Effect of PE on Revenue Streams

Table A6 shows the estimated dynamic effect of PE on different revenue streams (similar to Table 8 and Table 9). I take the natural logarithm (ln) of Revenue (1), Matchdays' Revenue (2), Broadcasts' Revenue (3), Commercials' Revenue (4), Player Trading Revenue (5), and Player Trading Net Results (6). We run the regression allowing for leads and lags of the PE investment year with the exception of the reference year (t-1). Controls are the same as in previous tables, including return on assets, sales-to-assets ratio, and other financial controls, with fixed effects for season and league applied to account for unobserved heterogeneity. The number of observations reflects the total number of revenue entries available for analysis. Standard errors are clustered by club. Significance levels are indicated as *p < 0.1, **p < 0.05, ***p < 0.01.

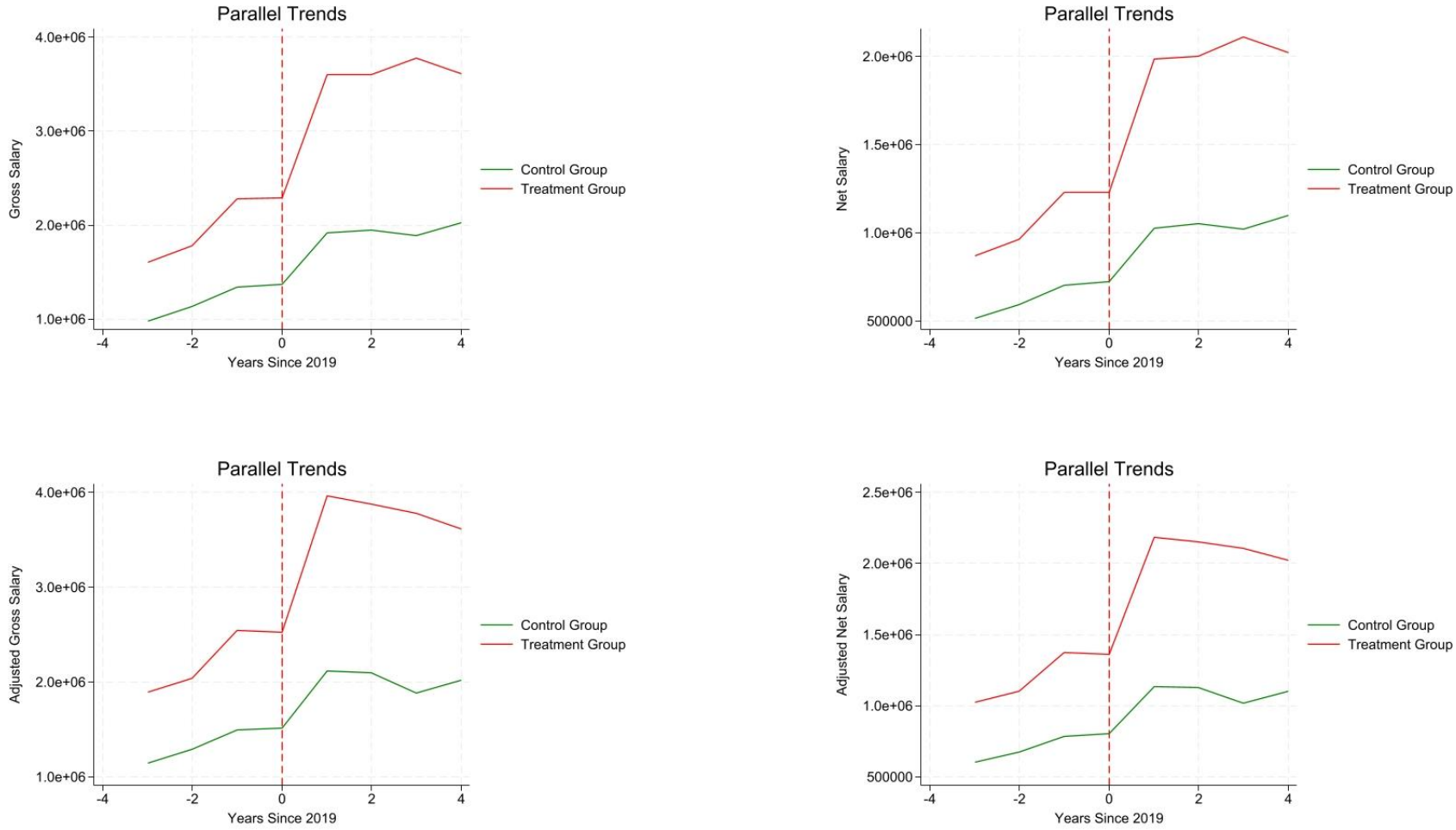
	Revenue (1)	**Matchdays' Revenue (2)**	**Broadcasts' Revenue (3)**	**Commercial Revenue (4)**	**Player Trading Revenue (5)**	**Player Trading Net Results (6)**
t-4	0.244	0.582**	0.200	-0.0369	-0.505	1.204
	(0.229)	(0.272)	(0.241)	(0.322)	(0.672)	(1.719)
t-3	0.336	0.591*	-0.268	0.0496	-1.077	1.247
	(0.259)	(0.307)	(0.602)	(0.362)	(0.811)	(1.617)
t-2	0.399	0.789**	0.693	0.0548	-0.468	1.690
	(0.287)	(0.351)	(0.468)	(0.375)	(0.889)	(1.757)
t=0	**0.659***	**1.123****	**1.113***	0.276	**-1.609***	-0.598
	(0.391)	**(0.505)**	**(0.577)**	(0.477)	**(0.967)**	(1.709)
t+1	**0.804***	**1.772*****	**1.262***	0.309	-0.817	-0.0191
	(0.434)	**(0.645)**	**(0.700)**	(0.542)	(1.302)	(1.566)
t+2	**1.036***	2.627	**1.822***	0.536	-0.350	0.403
	(0.526)	(1.794)	**(0.975)**	(0.616)	(1.683)	(1.792)
t+3	**1.213****	**3.152*****	**1.273****	0.684	-1.584	0.981
	(0.596)	**(1.037)**	**(0.636)**	(0.686)	(1.359)	(1.904)
t+4	0.981	**1.879****	**1.433****	0.350	-1.700	0.542
	(0.618)	**(0.805)**	**(0.713)**	(0.781)	(1.485)	(1.976)
Constant	7.282**	4.591	6.102*	5.324*	1.250	7.361***
	(3.420)	(2.892)	(3.328)	(3.136)	(2.621)	(2.109)
Observations	683	683	683	683	683	683
Number of clubs	96	96	96	96	96	96
R-squared	0.599	0.503	0.474	0.535	0.106	0.113
Season and League FEs	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Figure A1: Parallel Trends

Figure A1 examines pre-treatment trends to assess whether the control and treatment groups follow similar trajectories before PE investment. If trends are parallel before Year 0, the difference-in-differences (DiD) model is valid. A significant divergence before treatment would indicate a violation of the parallel trends assumption. The treatment group (PE clubs) signifies the red line, while the control group (non-PE clubs) signifies the green line. Pre-treatment trends are shown for Gross Salary, Net Salary, Adjusted Gross Salary, and Adjusted Net Salary, respectively.



Variable	Definition
Appearances	Male/Female player appearances per league season – applies to all positions within a soccer team.
Goals	Male/Female player goals per league season – applies to forward and midfielder.
Assists	Male/Female player assists per league season – applies to forward and midfielder.
Penalty Goals	Male/Female player penalty goals per league season – applies to forward and midfielder.
Penalty Misses	Male/Female player penalty misses per league season – applies to forward and midfielder.
Clean Sheets	Male/Female player clean sheets per league season (a player giving up zero goals in a game) – applies to defender and goalkeeper.
Conceded	Male/Female player conceded goals per league season (fail to stop an opposing team from scoring a goal) – applies to defender and goalkeeper.
Yellow Cards	Male/Female player yellow cards per league season – applies to all positions.
Red Cards	Male/Female player red cards per league season – applies to all positions.
Min/Match	Male/Female player minutes/match per league season – applies to all positions.
Min/Card	Male/Female player minutes/card per league season – applies to all positions.
Min/Assist	Male/Female player minutes/assist per league season – applies to all positions.
Rank Attackers	Male/Female player rank of attackers in the league during that respective season – applies to forward and midfielder.
Rank Midfielders	Male/Female player rank of midfielders in the league during that respective season – applies to midfielder.
Rank Defenders	Male/Female player rank of defenders in the league during that respective season – applies to defender.
Home PPG	Male/Female home match points.
Home Goals	Male/Female home match goals.
Home Corners	Male/Female home match corners.
Home Yellow Cards	Male/Female home match yellow cards.
Home Red Cards	Male/Female home match red cards.
Home Shots on Target	Male/Female home match shots on target.
Home Shots off Target	Male/Female home match shots/off target.
Home Fouls	Male/Female home match fouls.

Home Possession	Male/Female home match possession.
Home Attendance	Male/Female home match attendance.
Away PPG	Male/Female away match points per game.
Away Goals	Male/Female away match goals.
Away Corners	Male/Female away match corners.
Away Yellow Cards	Male/Female away match yellow cards.
Away Red Cards	Male/Female away match red cards.
Away Shots on Target	Male/Female away match shots on target.
Away Shots off Target	Male/Female away match shots off target.
Away Fouls	Male/Female away match fouls.
Away Possession	Male/Female away match possession.
Squad Changes	Male team squad changes from t-1 to t+1 around the PE investment.
Management Changes	Male team management changes from t-1 to t+1 around the PE investment.
Chairman Changes	Male team chairman changes from t-1 to t+1 around the PE investment.
Shirt Sponsor Changes	Male team shirt sponsor changes from t-1 to t+1 around the PE investment.
Front Sponsor Changes	Male team front sponsor changes from t-1 to t+1 around the PE investment.
Total Sponsor Changes	Male team total sponsor changes (shirt sponsor and front sponsor changes) from t-1 to t+1 around the PE investment.
Raw Net Player Salaries	Male team raw net player salaries (after deductions).
Raw Gross Player Salaries	Male team raw gross player salaries (before deductions).
Adjusted Net Player Salaries	Male team adjusted net player salaries (after deductions).
Adjusted Gross Player Salaries	Male team adjusted gross player salaries (before deductions).
Revenue	Male/Female club revenue per fiscal year.
EBIT	Male/Female club EBIT (earnings before interest and taxes) per fiscal year.
Revenue per Player	Male/Female club revenue per player (revenue per player per fiscal year).
Matchdays' Revenue	Male/Female club revenue from matchdays per fiscal year.

Broadcasts' Revenue	Male/Female club revenue from broadcasts per fiscal year.
Commercials' Revenue	Male/Female club revenue from commercials per fiscal year.
Player Trading Revenue	Male/Female club revenue from player trading per fiscal year.
Player Trading Net Results	Male/Female club player trading net results (revenue minus costs from player trading).
Degree Centrality	How frequently a player appears in the same match as other players, indicating their level of participation and interaction in the team.
Betweenness Centrality	How often a player acts as a bridge between different subgroups of players in various matches, representing their strategic role in connecting teammates.
Closeness Centrality	How quickly a player can connect to all other players in the network of appearances, indicating their central position in terms of influence and collaboration on the field.
ROA	Male/Female club ROA (return on assets – net income divided by total assets) in the year before the investment.
Sales/Assets	Male/Female asset turnover ratio in the year before the investment.
Cash/Assets	Male/Female cash-to-assets ratio in the year before the investment.
Debt/Assets	Male/Female debt-to-assets ratio in the year before the investment.
Equity/Assets	Male/Female equity-to-assets ratio in the year before the investment.
Player Age	Male/Female player age.
Salary Adjusted Gross	Male player adjusted gross salaries in the year before the investment.
Salary Adjusted Net	Male player adjusted net salaries in the year before the investment.
Main League/Or Not	Male club main league change from t-1 to t+1 around the PE investment.
Main League Position	Male club main league position from t-1 to t+1 around the

	PE investment.
Champion's League Qualify/Or Not	Male club Champion's League qualification or not from t-1 to t+1 around the PE investment.