A valuation of football companies between tangible and intangible values: A preliminary study[*]

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Abstract

This study delves into the dynamic world Football Club Valuations, an area rich in economic and cultural significance. It addresses the complex issue of which factors most profoundly influence the enterprise value of a football club.

Central to the hypothesis is the notion that a club's infrastructural investments, player salaries, and on-field successes are determining factors in its financial value. To test this, and the other hypotheses of the study, the research employs a rigorous quantitative approach, utilizing multiple linear regression analysis, to investigate the factors influencing the enterprise value of European football clubs. Examining data from 28 prominent clubs between 2018 and 2023, our research focuses on infrastructural investments, player salaries, team value, and on-field performance.

The results of this study are revealing, demonstrating a clear correlation between the hypothesized factors and club valuations, with infrastructural investments and player salaries emerging as key determinants of club valuation. The integration of a

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polynomial transformation for team value captures its complex, non-linear relationship with enterprise value. The model provides nuanced insights for football club stakeholders and managements.

What distinguishes this work is its pioneering integration of financial acumen with a deep understanding of the unique cultural and economic landscape of football and reveals, how the dynamics of investment in infrastructure and player salaries, along with success in international competitions, significantly and complexly influence the corporate value in the football sector, offering a new framework for analyzing enterprise value in football.

Keywords: enterprise value, football club valuations, financial variables, infrastructural investments, player salaries.

Sommario

Questo studio si addentra nel dinamico mondo delle valutazioni dei club di calcio, un'area ricca di significato economico e culturale. Affronta la complessa questione di quali fattori influenzano più profondamente il valore d'impresa di un club di calcio. Fondamentale è l'ipotesi che gli investimenti infrastrutturali di un club, gli stipendi dei giocatori e i successi sul campo siano fattori determinanti per il suo valore finanziario. Per verificare questa e le altre ipotesi dello studio, la ricerca impiega un approccio quantitativo rigoroso, utilizzando l'analisi di regressione lineare multipla, per indagare i fattori che influenzano l'enterprise value dei club calcistici europei. Esaminando i dati di 28 club importanti tra il 2018 e il 2023, la nostra ricerca si concentra sugli investimenti infrastrutturali, sugli stipendi dei giocatori, sul valore della squadra e sulle prestazioni sul campo.

I risultati di questo studio sono rivelatori e dimostrano una chiara correlazione tra i fattori ipotizzati e le valutazioni dei club, con gli investimenti infrastrutturali e gli stipendi dei giocatori che emergono come determinanti chiave della valutazione dei club. L'integrazione di una trasformazione polinomiale per il valore della squadra coglie la sua relazione complessa e non lineare con il valore d'impresa. Il modello fornisce approfondimenti sfumati per gli stakeholder e i dirigenti delle società calcistiche. Ciò che distingue questo lavoro è la sua pionieristica integrazione di acume finanziario con una profonda comprensione del paesaggio culturale ed economico unico del calcio.

Parole chiave: valore dell'impresa, valutazione dei club calcistici, variabili finanziarie, investimenti infrastrutturali, salari e stipendi.

1. Introduction

The football industry, with its vast global reach and intricate economic dynamics, represents a fascinating field of investigation for academic research in sports management (Bridgewater, 2010; McLeod *et al.*, 2021).

This extends to aspects of corporate governance (Michie & Oughton, 2005; Hamil *et al.*, 2004), leadership (Crust *et al.*, 2006), supply chain (Memari *et al.*, 2021), and financial economic nature (Nicoliello & Zampatti, 2016). This interest also encompasses the study of the socio-cultural impact of sports (Giulianotti, 1999), sports marketing strategies, and fan loyalty (Bauer *et al.*, 2008), as well as the influence of new technologies on sports operations (Ratten & Ratten, 2011). Furthermore, there is a growing focus on sustainability and ethics in football, as highlighted by research on corporate social responsibility in the industry (Paramio-Salcines *et al.*, 2013) and financial fair play (Szymanski, 2014). To fully understand these dynamics, it is necessary to adopt a multidisciplinary approach that combines sports management with sociology, economics, and law, providing a holistic view useful for navigating and influencing current and future trends in global football. Considering the economic and financial aspects, particularly in light of the Financial Fair Play (FFP) regulations established by UEFA, it is important to analyze the impact of these rules on European and Italian football, aiming to promote responsible and sustainable financial management of clubs. These regulations aim to limit excessive spending, and their influence is evident when examining cases of some Italian clubs. In 2019, for example, Inter was sanctioned under FFP due to significant losses. In response, the club had to sell prominent players, such as Romelu Lukaku, who moved to Chelsea, in an attempt to rebalance its finances in line with UEFA's established norms. Juventus faced the need to adjust its expenses during the COVID-19 pandemic, adopting a more cautious strategy to comply with FFP criteria. These situations demonstrate how the Financial Fair Play (FFP) can influence the financial and strategic decisions of clubs, albeit not without criticism. Some observers raise doubts about the actual fairness of the FFP rules, suggesting that they may favor established clubs with greater resources, potentially to the detriment of less capitalized ones (Calcio e Finanza, 2023; Pecunya, 2022). An emblematic case of positive adaptation to FFP is represented by AC Milan, which has recently improved its economic situation through player sales and the restructuring of its debt, thereby aligning itself with FFP parameters and strengthening its financial stability. In this context, the vital role of the media and governance bodies in monitoring the financial situation of clubs and promoting public awareness is clearly evident. However, there are lingering concerns about these entities' ability to

ensure competitive balance. The crisis unleashed by the COVID-19 pandemic has highlighted the fragility of football's financial structures, emphasizing the need for ongoing dialogue and policy review to ensure sustainability and fairness in the European football landscape, particularly in the Italian context (Ferrari, 2021).

In this context, scholars have questioned whether *"it is possible for an industry to sustain losses consistently on an annual basis and not eventually face a catastrophic industry transformation crisis"* (Hamil & Walters, 2010, p. 355). This reflection has been prompted by the observation that many European clubs have experienced challenging financial conditions for years, drawing the attention of oversight bodies such as UEFA and the media, thus highlighting a growing interest in the financial dynamics of football. A less than favorable economic situation certainly impacts the ability to attract talent and plan new investments. The wealthier and more successful clubs tend to stay at the top through a virtuous cycle of sporting and financial success. A club's ability to attract private investments and generate a high brand value can translate into success on the field, which, in turn, can further increase revenues. This is particularly crucial in unfavorable economic periods because it demonstrates that clubs with a solid financial foundation are better equipped to attract talent and sustain investments, even when the overall economy is in decline (Rohde & Breuer, 2016). Permissive management and soft budget constraints can lead to a spiral of unsustainable salaries and debts. Less financially stable clubs face numerous challenges to remain competitive, as an excessive emphasis on the short-term results in long-term financial difficulties. This is especially relevant for clubs that do not have the same ability to attract significant investments as their wealthier counterparts (Andreff, 2018).

In this context, it is essential to emphasize that, although there is a wide range of research on the value of sports enterprises (Sloane, 2015; Sanchez *et al.*, 2022; Ace Advisory, 2022;)), some gaps are identified that need to be addressed. Specifically, there is a lack of empirical studies that directly investigate the relationship between investments in infrastructure, such as stadiums and training centers, and the business value in football. This is a fundamental dimension, considering the significant role that such infrastructures play in shaping the profile and capabilities of a club. Similarly, while salaries and wages are recognized as one of the major costs for football clubs, there is insufficient research bridging the gap between these costs and the actual business value. Studies are lacking that thoroughly analyze how salary strategies influence long-term business valuation and how this correlates with sporting performance and commercial success.

These gaps in the literature suggest that further research is needed to better understand how infrastructural investments and salary policies can be optimized to enhance the value of football enterprises. A detailed analysis in these areas could provide valuable insights for sports executives, helping formulate more effective strategies for the financial and sporting success of clubs.

As the business value of football clubs is a multifaceted indicator that encapsulates not only the financial strength of these entities but also their sporting competitiveness and commercial appeal (Szymanski, 2017), this research poses the following research question: "*What are the tangible and intangible factors that influence the business value of a football club?*".

In this sense, business value is not only a reflection of the economic balance sheet but also an aggregate of perceived values that can influence corporate strategies and stakeholder decisions. Our study aims to provide an understanding of the forces shaping today's football landscape, contributing to more informed management strategies and entrepreneurial practices that take into account both tangible and intangible aspects in the assessment and enhancement of business value. The analysis focused on a group of 28 elite clubs from the most prestigious European leagues, employing a regression model to unveil the key determinants shaping the future value of these prominent football enterprises. The independent variables analyzed include investments in infrastructure, player salaries, player value, victories in international competitions, and stadium ownership. The model demonstrated a strong predictive ability. The results revealed a significant and complex relationship between the analyzed factors and business value, highlighting the importance of investments in infrastructure and salaries, success in international competitions, and team value as drivers of business value. In this study, we investigate the direct and yet under-explored link between infrastructure investments and player salaries, and the corporate value in football. This unique perspective offers a new understanding of how clubs can optimize such investments to enhance both sporting success and commercial value, highlighting the critical importance of balanced financial management in the unique context of professional football.

2. The paradox of the football industry: creation or destruction of value

This study makes a significant theoretical contribution to the analysis of determinants impacting business value in the football sector. On an applied

level, the work provides an analytical framework that can assist sports managers in investment decisions and strategic management. The analysis of top-tier clubs shows a substantial correlation between infrastructural investments, sporting success, on-field results, team value, and business value, indicating that careful management of these aspects can decisively influence long-term corporate value. Such understanding is crucial for clubs aiming to balance profitability with the development of a successful sporting profile.

The interaction between financial fair play (FFP) regulations and the financial management strategies of European and Italian football clubs reveals a complex context characterized by unique challenges and opportunities in professional football. While the experiences of teams like Inter, Juventus, and Milan underscore the need to adhere to FFP rules to preserve financial balance, it is also noteworthy how the assessment of corporate value and external capital injection are becoming central elements in this scenario. This reality is evident in the inclination of some clubs to make substantial investments, often in contrast to prudent financial management, indicating an approach to the world of football that goes beyond mere compliance with FFP. Emblematic examples of such dynamics include the acquisition of Chelsea FC by a consortium led by Todd Boehly (valued at 4.25 billion euros, Bellinazzo, 2022), marking one of the largest transactions in football, or the signing of players like Jack Grealish by Manchester City, for a record sum in English football (valued at 118 million euros, Fiorenza, 2021). These cases illustrate the trend of clubs engaging in significant spending despite deficit budgets, in open contradiction to cautious financial management and the principles of economic and social sustainability.

Only a limited number of clubs, such as Bayern Munich and Borussia Dortmund, have demonstrated an adaptation to Environmental, Social, and Governance (ESG) principles, integrating environmental, social, and governance criteria into their business model, thus supporting the long-term value of the enterprise. For instance, Bayern Munich had already installed solar panels on the roof of the Allianz Arena and used energy-efficient lighting systems. Borussia Dortmund had taken similar measures, also promoting public transportation for its fans on match days to reduce CO_2 emissions. Clubs have a long history of community involvement, with projects promoting social integration and support for various social groups. Bayern Munich has its "FC Bayern Hilfe eV", which supports people in financial difficulty, while Borussia Dortmund is known for its work with youth through its academies and initiatives aimed at combating racism and discrimination. The Bundesliga, the German league in which both clubs compete, is renowned for its financial sustainability and ethical governance. Bayern Munich and

Borussia Dortmund have followed this model with prudent financial management, including adherence to financial fair play rules and the implementation of transparent governance structures.

Simultaneously, significant investments in football from entities outside the sports world, such as the acquisition of Newcastle United by the Public Investment Fund (PIF) of Saudi Arabia, highlight an investment approach that goes beyond mere financial analysis, aligning with broader goals of market positioning and geopolitical influence. The rapid growth of this fund and its prominent position in the global economy have raised questions among academics not only about its role as an economic growth engine but also about the potential use of the PIF as a political tool in the hands of the ruling elite. In particular, there is concern about how this fund could be employed to influence political decisions, strengthen internal control, project power internationally, or even serve as a means to consolidate the position and authority of the ruling elite within the country and on the world stage (Seznec & Mosis, 2018). The literature has consistently argued that to create economic value, a business must be able to strike a balance between costs and revenues, i.e., between economic and financial situations.

However, this interpretation is not easily applicable in the football industry, where investors seem less attracted to the purely economic value of enterprises that often record substantial losses, while they are more drawn to other factors. The primary objectives of this research aim to investigate what these factors independent of the economic and financial balance strictly tied to costs and revenues might be that make a football club attractive to investors.

3. Literature Review

The enterprise value in the sports sector, particularly in the realm of football, takes shape as a complex interplay of various tangible and intangible variables (Yiapanas *et al.*, 2023). Investments in infrastructure represent a vital strategic lever for the value of an enterprise due to their direct impact on productivity, efficiency, and the organization's attractiveness. In the broader economic context, robust infrastructure can translate into increased operational efficiency, cost reduction, and enhance the ability to meet customer needs. According to the theory of enterprise value, this can increase revenues and reduce operational risks, leading to an overall better assessment of the enterprise (Brealey *et al.*, 2006).

However, infrastructure extends well beyond physical constructions, em-

bracing technological innovation and user experience. The adoption of advanced technologies, such as ERP systems or big data analytics, can provide businesses with tools to analyze and optimize processes, improving decision-making and market adaptability (Fiorucci, 2023). Furthermore, infrastructure enhances the user experience with intuitive digital platforms or engaging retail environments that can significantly increase customer loyalty and per-consumer spending. It has been empirically demonstrated that an online flow state, which is a momentary phenomenon, helps e-commerce websites build customer satisfaction and loyalty indirectly through the customer experience (Ertemel *et al.*, 2021).

Transposing this understanding into the specific context of football clubs, infrastructure takes on an even more complex dimension. Modern stadiums, world-class training facilities, and advanced technological systems for performance analysis and fan engagement are crucial for the success of a football club. According to an analysis conducted by Siegfried and Zimbalist (2000), new stadiums have a significant impact on urban renewal and economic activity. Their studies have shown how modern stadiums can serve as catalysts for urban development, stimulating not only sporting interest but also promoting tourism, employment, and the regeneration of declining urban areas. Through these multifunctional roles, stadiums contribute to creating new economic and social opportunities in the cities that host them.

In football, the importance of infrastructure is further amplified by the emotional nature and loyalty of fans. A club with advanced facilities can create an environment that enhances the fan experience, increasing their emotional connection and propensity to spend, both in terms of tickets and merchandise. Baade and Matheson (2011) discussed how improvements to the stadium influence consumer perception and behavior, primarily in the context of highly significant sporting events, such as the NFL (National Football League) Super Bowl. They particularly examined the economic impact of NFL mega-sporting events, like the Super Bowl, on the host city and consumer perception. In addition, a football club's infrastructure is often seen as a physical manifestation of its brand and cultural heritage. Investments in iconic structures or technologies that enhance fan engagement can, therefore, not only increase direct revenues but also significantly improve the club's market value (Romero-Jara *et al.*, 2023).

This research postulates that:

• **HP1**: *Investments in infrastructure have a positive correlation with the value of football enterprises.*

In contemporary economic literature, the impact of wages on enterprise value is a topic of crucial importance, explored in depth to reflect its complexity (Ouimet & Simintzi, 2018). Wages are not merely an operating expense but also represent an investment in human capital, an intangible asset that can generate significant economic returns. Human capital theory suggests that investing in skilled and well-compensated workers can increase corporate productivity and lead to a sustainable competitive advantage (Van Der Lugt *et al.*, 2023).

In the financial domain, the efficiency wage theory posits that paying employees above the market wage can reduce turnover and increase motivation, with a positive impact on corporate productivity (Ansari, 2023). These principles are also reflected in the human resources literature, discussing how fair and competitive compensation is crucial for attracting and retaining top talents and how wage disparities can influence morale and employee engagement (Morris Morant & Jacobs, 2018).

Effective management in football clubs, necessitates a balanced approach towards wage structures and relational dynamics, where harmonious internal relationships contribute to enhancing overall performance and value creation within the organization (Pellicano et al, 2016). In the football sector, the issue of wages takes on unique facets given its distinctive market dynamics. Salaries in football are closely tied to both sporting performance and the economic valuation of clubs. Szymanski (2009) has linked athletes' salaries to sporting performance, noting that teams investing more in high-level talents tend to perform better in championships, with direct implications for revenues derived from victories and participation in lucrative competitions.

Frank *et al.*'s research (2011) has highlighted that a fair distribution of wages could positively influence team cohesion and performance. In team sports, unlike many corporate environments, cohesion is particularly critical: a united group focused on the same goal can surpass teams with superior individual talents but less cohesion.

Managing player salaries in football must therefore consider the impact of these compensations not only on the club's budget but also on team dynamics and player morale. A balanced salary structure can promote a positive team environment, while significant disparity could cause tensions and envy, negatively influencing performance (Késenne, 2000). It is argued that salaries in football are not just a reflection of players' costs but also an investment in the club's sporting and commercial potential.

Therefore, hypothesis HP2 can be formulated as follows:

• **HP2:** *Player salaries have a positive correlation with the club's value.*

The link between a company's performance and its enterprise value is a fundamental principle in business and economics studies. In general, sustained successes in any sector, whether in sales, innovation, market expansion, or other indicators of success, tend to be associated with an increase in enterprise value. This association is based on the perception that success is an indicator of effective management, a winning corporate strategy, and potential future growth. Continued business successes over time contribute to improving a company's reputation. This enhancement in external perception, reflecting both past financial performance and initiatives beyond mere economic gain, strengthens the corporate brand and makes the company more attractive to investors. This elevated reputation, in turn, creates a virtuous circle, fueling and sustaining further positive outcomes. A solid and growing reputation, built on foundations of repeated successes, becomes a valuable asset that drives continuous growth and long-term business success (Roberts & Dowling, 2002).

In the sporting context, the results achieved on the field have a direct and tangible resonance on enterprise value, as demonstrated by the analysis of publicly traded sports entities, where a positive correlation between sporting performance and stock prices is observed (Pinnuck & Potter, 2006). Sporting triumphs can significantly enhance the value of a club through mechanisms such as increased brand value, higher revenues from victory-related prizes, and a boost in earnings from related activities such as ticket sales, merchandising, and television broadcasting rights (Mullin & Hardy, 2014).

Taking a closer look at the world of football, this relationship becomes even more evident. Sporting outcomes are a crucial determinant of a club's market value. Victories in major leagues and performances in international competitions like the UEFA Champions League have a direct impact on revenues, not only through immediate cash prizes but also by increasing global visibility, attracting more lucrative sponsorships, and expanding the international fan base (Késenne, 2006).

Furthermore, sporting successes influence the club's value in the transfer market. A winning club can attract top-tier talents eager to join successful teams and can also command higher fees for its best players, thereby increasing the valuation of the player roster, which represents a significant asset on the club's balance sheets (Carmichael *et al.*, 2001).

The relationship between on-field successes and a club's market value has also been examined in terms of the "halo effect," where success in a specific area can have a positive impact on stakeholders' perception in other areas. Applied to the context of sports clubs, this principle suggests that on-field successes, such as victories in important matches or the conquest of titles, can positively influence the overall perception of the club by fans,

sponsors, media, and other key stakeholders. When a club achieves significant results in sports, this success tends to create a positive aura that extends beyond mere athletic performances. Over the years, the crucial importance of relationships and value co-creation in emerging companies has been increasingly recognized, suggesting that these dynamics are essential for sustainable development and long-term success, positively influencing the firm's market value (Casali *et al.*, 2018).

The third hypothesis (HP3) of this research proposes that:

• **HP3:** *Sporting results have a positive correlation with the economic value of clubs.*

In the context of sports organizations and businesses in general, personnel value is strongly linked to enterprise value. Corporate values, when focused on personnel and effectively implemented, can significantly improve financial performance and overall organizational stability. An analysis of the Fortune Global 500 has shown that all corporate values indirectly influence income and operational performance through human values. The research has reconciled and explained inconsistent results in decades-old literature, redefining corporate values and establishing their impact on financial performance when human values are implemented (Taher, 2023). Studies on Employee Stock Ownership Plans (ESOPs) have demonstrated that companies with ESOPs outperform those without. This includes an increase in the market value of stocks, higher returns on assets, higher net profit margins, and sales growth rates (Blasi *et al.*, 2013; Stretcher, 2006; Han Kim, 2010).

In football, managing the value of the team is crucial for economic and sporting success. Successful clubs like Liverpool and Real Madrid have generated hundreds of millions of euros in value through team value management, surpassing the value derived from investing money in new players. Team value management offers the best opportunity to maximize the overall value of a club in the highly competitive world of professional football (Beiderbeck *et al.* 2020). The valuation of a club includes both physical and sports-related assets. The entire team roster is a key factor in the evaluation. For example, the difference in valuation between clubs like Chelsea and Milan can be partially explained by the different value of each team's players, measured through the players' market values (Cavallini, 2023).

In this research, the fourth formulated hypothesis (HP4) suggests that:

• **HP4:** *The value of the team has a positive correlation with economic value.*

Table 1. Bibliographic Analysis of Hypotheses

AUTHOR	JOURNAL	ABSTRACT	HP
Brealey *et al.*	Journal Of Apllied Corporate Finance	According to the theory of business value, investments in infrastructure can increase revenues and reduce operational risks, leading to an improved overall assessment of the company.	HP1
Pellicano *et al.*	Business Systems Laboratory International Symposium Book of Abstracts	It discusses how relationality is a key to understanding current and future entrepreneurial phenomena, and how systems thinking can contribute to this approach	
Yiapanas *et al.*	Auditing & Account-ability Journal	The enterprise value in the sports industry is a complex interweaving of various tangible and intangible variables.	
Ertemel *et al.*	Plos One	Infrastructure enhances the user experience with intuitive digital platforms or engaging retail environments that can significantly increase customer loyalty and spending.	
Siegfried & Zimbalist	Journal of Economic Perspectives	Stadiums can serve as catalysts for urban renewal and economic activity.	
Baade & Matheson	Regional studies	Analysis of the direct link between infrastructure and fan engagement.	
Romero-Jara *et al.*	Palgrave Communications	Positive correlation between infrastructure investments and business value.	
Ouimet & Simintzi	American Economic Review	The impact of salaries on the business value.	HP2
Van Der Lugt *et al.*	S&P Global	Salaries are not only an operational expense but also an investment in human capital, an intangible asset that can generate significant economic returns. The theory of human capital suggests that an investment in qualified and well-compensated workers can increase corporate productivity and lead to a sustainable competitive advantage.	
Szymanski	(monograph)	It discusses how salaries in football are closely linked to the sporting performance and economic valuation of clubs.	
Frank *et al.*	Journal of Labour Economics	A fair distribution of salaries positively influences the performance of a club.	
Késenne	Scottish Journal of Political Economy	Salary disparity negatively influences performance.	

Casali *et al.*	Sustainability	Examines how the adaptability of the business idea influences sustainability and the creation of shared value in emerging companies.	
Roberts & Dowling	Strategic Management Journal	Positive correlation between achieved results and enterprise value.	
Pinnuck & Potter	Accounting and Finance	Analysis of publicly traded sports companies, where a positive correlation is observed between sports performance and stock prices.	
Mullin & Hardy	(monograph)	It discusses how sporting triumphs can significantly enhance the value of a club.	HP3
Carmichael *et al.*	Applied Economics	It examines how sporting successes influence the value of the club in the transfer market.	
Morris Morant & Jacobs	Journal of Management History	They discuss how fair and competitive compensation is crucial for attracting and retaining top talent and how salary disparities can affect morale and employee engagement.	
Taher	Future Business Journal	It redefines corporate values and establishes their impact on financial performance when human values are implemented.	
Blasi *et al.*; Stretcher; Han Kim & Ouimet.	Emerald Insight; Journal of Employee Ownership Law and Finance; Corporations of America; Journal of Employee Ownership Law and Finance; AFA 2010 Atlanta meeting paper	They have shown that companies with ESOPs perform better than those without. This includes an increase in the market value of stocks, higher returns on assets, higher net profit margins, and growth rates in sales.	HP4
Beiderbeck *et al.*	Mckinsey & Company	Managing the value of the team provides the best opportunity to maximize the overall value of a club in the highly competitive world of professional football.	

4. Methodology

The main objective of this paper is to analyze the factors that influence the future value of European football enterprises. The research question that guides this study is: *What are the tangible and intangible factors that influence the business value of a football club?*

To answer this question, we adopt a quantitative research design based on multiple linear regression analysis. This approach allows us to examine the relative influences of multiple independent variables on the dependent variable, while controlling for the effects of other variables. We chose this methodology because it is widely used in similar studies (Buse *et al.*, 2010; Quarato *et al.*, 2023) and it provides a rigorous and robust way to test our hypotheses (Jobson, 1991).

Next we formulate a step-by-step summary of our research design and analysis process.

The sample for this study consists of 28 among the most relevant European football teams, for which we collected data from various sources for the period between 2018 and 2023. The data sources include Refinitiv database, AIDA database, official football teams' websites, *football benchmark* report, and other specialized web sources.

The dependent variable for this study is firm value (V.IMP.), which is extracted from *football benchmark* report. The independent variables include investments in infrastructures (INF), players' salaries (SALAR), team value (VALUE), and team performance in national and international competitions (RIS.N. and RIS.I.). The control variables include stadium ownership (STADIO) and total assets (T.A.).

To test the hypotheses, we used a multiple linear regression model presenting the first following specification:

$$V.IMP. = \beta_0 + \beta_1 \cdot INF + \beta_2 \cdot SALAR + \beta_3 \cdot VALUE + \beta_4 \cdot RIS.N. + \beta_5 \cdot RIS.I. + \beta_6 \cdot STADIO + \beta_7 \cdot T.A. + \epsilon$$

We performed the regression analysis using R software, version 4.1.2. We also applied some methodological choices to enhance the validity and robustness of the model, such as scaling the continuous variables, transforming the VALUE variable into a polynomial, and using the Akaike Information Criterion (AIC) for model selection. The regression model resulting from these multi-step refinement techniques is as follows.
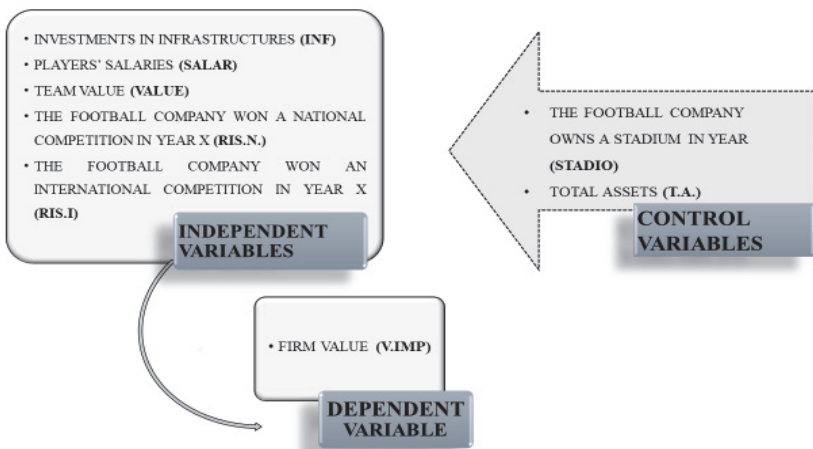
$$V.IMP. = \beta_0 + \beta_1 \cdot scale(INF) + \beta_2 \cdot scale(SALAR) + \beta_3 \cdot scale(VALUE) + \beta_4 \cdot scale(VALUE)^2 + \beta_5 \cdot RIS.I. + \beta_6 \cdot STADIO + \epsilon$$

4.1. Sample description

The present research is mainly based on desk data from various sources. The starting point is in fact the Refinitiv database, which is among the most complete and well reputed worldwide provider of financial market data and infrastructure. The dataset included information on more than 85000 among active and inactive companies across 125 markets, with time series available from the 1900s onwards. Guided by the objective of this paper, only the data of the most important European football companies were selected; furthermore, in order to ensure the availability of data to perform the analysis, the timeframe between 2018 and 2023 was considered. Similarly, 12 football companies have been excluded due to lack of data. The final dataset used for the analysis included a total of 140 observations between 2018 and 2023, expressing data about 28 among the most relevant European football teams. All information related to firms' governance structures were extracted from Refinitiv and AIDA (Bureau van Dijk's database on Italian firms) databases, and official football teams' websites. Information on sport performance of football teams were retrieved from football benchmark report (ACE advisory) and other specialized web sources (transfermarkt.it).

Data about investments in infrastructures (INF), players' salaries (SALAR), team value (VALUE), national (RIS.N.) and international (RIS.I.) team performance, stadium ownership (STADIO) and total assets (T.A.) were provided for the years ranging from 2018 to 2022, while firm value (V.IMP.) is also provided for 2023.

Figure 1. Research design: independent, dependent and control variables

- INVESTMENTS IN INFRASTRUCTURES **(INF)**
- PLAYERS' SALARIES **(SALAR)**
- TEAM VALUE **(VALUE)**
- THE FOOTBALL COMPANY WON A NATIONAL COMPETITION IN YEAR X **(RIS.N.)**
- THE FOOTBALL COMPANY WON AN INTERNATIONAL COMPETITION IN YEAR X **(RIS.I)**

INDEPENDENT VARIABLES

- THE FOOTBALL COMPANY OWNS A STADIUM IN YEAR **(STADIO)**
- TOTAL ASSETS **(T.A.)**

CONTROL VARIABLES

- FIRM VALUE **(V.IMP)**

DEPENDENT VARIABLE

4.2. Variables and analysis

The dependent variable employed in the present research is firm value (V.IMP.), extracted from football benchmark report. To capture the effect of the factors on the future value of football companies, this variable relates to year x + 1, while all independent and control variables relate to year x.

Independent variables included in the regression model cover information about firms' governance structures and sport performance. In order to capture the effect of football teams' performance in national and international competitions, two dummy variables (RIS.N., RIS.I.) has been constructed, being equal to one if the team won a competition in the corresponding year, zero otherwise. Continuous independent variables cover information on investments in infrastructures (INF) and players' salaries (SALAR), extracted from Refinitiv database and official team's websites, and team value (VALUE), extracted from transfermarkt website.

The set of control variables includes STADIO, a dummy variable taking value of one if the team owned a stadium in the corresponding year, zero otherwise, and firms' total assets (T.A.), a continuous variable extracted from Refinitiv database and official teams' websites.

As in Quarato *et al.* (2023), table 2 reports all variables measures.

Table 2. Variables measures

	Variable	*Measurement*
Dependent Variable	V.IMP.	Continuous Firm Value in year x + 1
Independent Variables	INF	Continuous Investments in infrastructures
	SALAR	Continuous Players' salaries in year x
	VALUE	Continuous Team value in year x
	RIS.N.	Dummy 1 = the football company won a national competition in year x; 0 = Otherwise
	RIS.I	Dummy 1 = the football company won an international competition in year x; 0 = Otherwise
Control Variables	STADIO	Dummy 1 = the football company owns a stadium in year x; 0 = Otherwise
	T.A.	Continuous Total Assets in year x

To test the hypotheses introduced in the previous section, a multiple linear regression model was used. The choice of a multiple linear regression model is supported by its widespread use in similar studies and its ability to examine the relative influences of multiple independent variables on the dependent variable (Jobson, 1991). For instance, the study by Buse *et al.* (2010) have successfully employed multiple linear regression models to analyze the impact of various factors on firm value, and Kologlu *et al.* (2018) used it to estimate market value of football players. Multiple linear regression models are particularly useful in this context as they allow for the examination of the individual effects of each independent variable on the dependent variable, while controlling for the effects of other variables. This is especially important in studies like the present one, where there are several independent variables that could potentially influence the dependent variable. Finally, it is of paramount importance to elucidate the specific methodological choices made downstream of the first specification of the multiple linear regression model. Firstly, the continuous variables within the model have been scaled.

This standardization procedure ensures that the regression coefficients are interpretable on a comparable scale, thereby facilitating a more intuitive understanding of the relationships between the variables. Secondly, a polynomial transformation to the VALUE variable has been applied.

This decision was informed by the recognition that the relationship between VALUE and the dependent variable may not be strictly linear. The polynomial transformation allows to capture potential non-linearities in this relationship, thereby enhancing the accuracy of the model. Lastly, the Akaike Information Criterion (AIC) for model selection has been employed. This step led to the exclusion of the independent variable RIS.N. and the control variable T.A. from the final model. The AIC is a well-established method for model selection that balances the goodness-of-fit of the model with the principle of parsimony (Kieseppä, 1997). Excluding RIS.N. and T.A., ensured that our final model is as simple as possible while still providing a good fit to the data. These methodological choices, while technical in nature, are crucial for the robustness and validity of the findings.

5. Results

The regression analysis conducted on the dataset provides a comprehensive understanding of the factors influencing the future value (year x + 1) of a football enterprise (V.IMP.). As presented below, the final model includes several independent variables, each of which captures a different aspect of the football enterprise's operations and performance in year x.

Table 3. Multiple linear regression summary

> summary(regrscelta_scaled)					
Call:					
lm(formula = dataset$V.IMP. ~	scale(dataset$INF) +				
	scale(dataset$SALAR) +				
	poly(scale(dataset$VALUE), 2, raw = TRUE) +				
	dataset$RIS.I. + dataset$STADIO)				
Residuals:	*Min*	*1Q*	*Me-dian*	*3Q*	*Max*
	-848.44	-143.63	-26.59	92.39	1523.7
Coefficients:					
	Esti-mate	*Std. Er-ror*	*t value*	*Pr(>|t|)*	
(Intercept)	610.8	64.31	9.498	< 2e-16	***
scale(dataset$INF)	186.72	41.63	4.485	1.56E-05	***
scale(dataset$SALAR)	544.06	59.36	9.165	7.99E-16	***
poly(scale(dataset$VALUE), 2, raw = TRUE)1	176.72	63.26	2.793	0.00599	**
poly(scale(dataset$VALUE), 2, raw = TRUE)2	115.99	28.46	4.075	7.86E-05	***
dataset$RIS.I.	363.62	146.53	2.482	0.01433	*
dataset$STADIO	222.07	74.18	2.994	0.00329	**

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
Residual standard error: 363.1 on 133 degrees of freedom					
Multiple R-squared: 0.8778, Adjusted R-squared: 0.8723					
F-statistic: 159.2 on 6 and 133 DF, p-value: < 2.2e-16					

The first variable, INF, represents the investment in infrastructure. The coefficient for this variable is 186.72, and it is statistically significant at the 0.001 level. This means that for every standard deviation increase in INF, we

expect an increase of approximately 186.72 million euros in V.IMP., holding all other variables constant. This result underscores the importance of infrastructure investment in enhancing the value of a football enterprise. Infrastructure can include facilities such as training grounds and stadiums, which are crucial for a team's performance and can generate significant revenue streams.

The second variable, SALAR, represents the salary paid to players. The coefficient for this variable is 544.06, and it is statistically significant at the 0.001 level. This implies that for every standard deviation increase in SALAR, there is an associated increase of approximately 544.06 million euros in V.IMP., holding all other variables constant. This result highlights the role of player salaries in determining a football enterprise's value. Higher salaries can attract top talent, which can enhance team performance and increase the enterprise's value.

The third variable, VALUE, represents the value of the team's players. This variable has been transformed into a polynomial to capture any non-linear effects on V.IMP. The coefficients for the linear and quadratic terms are 176.72 and 115.99 respectively, both statistically significant at the 0.01 level or better. These results suggest that VALUE has a complex, non-linear relationship with V.IMP. At lower levels of VALUE, increases in VALUE are associated with substantial increases in V.IMP. However, at higher levels of VALUE, further increases in VALUE still increase V.IMP., but at a decreasing rate.

In more detail, the first term of the polynomial, poly(scale(dataset$VALUE), 2, raw = TRUE)1, has an estimated coefficient of 176.72 and is significant at the 0.01 level. This represents the linear effect of VALUE on V.IMP.: for a one standard deviation increase in VALUE, we expect an increase of about 176.72 million in V.IMP., holding all other variables constant.

The second term of the polynomial, poly(scale(dataset$VALUE), 2, raw = TRUE)2, has an estimated coefficient of 115.99 and is significant at the 0.001 level. This represents the quadratic effect of VALUE on V.IMP.: it indicates the effect of VALUE on V.IMP. changes depending on the level of VALUE itself. Specifically, for every one standard deviation increase in the square of VALUE, we expect an increase of about 115.99 million in V.IMP., holding all other variables constant.

In sum, both the linear and quadratic effects of VALUE are significant, suggesting that VALUE has a complex, nonlinear effect on V.IMP. This might reflect the fact that the value of players on a team may have different effects on firm value depending on the context: for example, having very valuable players might increase firm value, but it might also entail higher

costs and financial risks that could have negative effects on firm value at very high levels of VALUE.

The fourth variable, RIS.I., is a binary variable indicating whether the team won an international competition in year x. The coefficient for this variable is 363.62 and it is statistically significant at the 0.05 level. This suggests that winning an international competition can significantly enhance a football enterprise's value, likely due to increased prestige and fan base.

The fifth variable, STADIO, is another binary variable indicating whether the team owns its stadium in year x. The coefficient for this variable is 222.07 and it is statistically significant at the 0.01 level. This result indicates that owning a stadium can significantly increase a football enterprise's value, possibly due to additional revenue from ticket sales and concessions.

Overall, these results provide compelling evidence that investments in infrastructure and player salaries, player value, international competition success, and stadium ownership are all key drivers of a football enterprise's value in the subsequent year. The model has indeed an adjusted R-squared value of 0.8723, indicating approximately 87% of the variation in V.IMP. can be explained by these variables.

6. Discussion

Understanding the complexity and dynamics behind the valuation of football clubs is crucial in the current context of professional football. This paper addresses this topic by providing a detailed empirical analysis of various factors influencing the value of businesses in the sector. The research specifically explores correlations between investments in infrastructure, player salaries, sporting results, player value, and corporate value. The adopted approach is a regression analysis based on a sample of 28 elite clubs from European leagues, providing an in-depth insight into the financial dynamics of professional football.

The study focuses on three main hypotheses: the first (HP1) concerns the effect of infrastructure investments on the value of football businesses, suggesting that an increase in these investments leads to an increase in the value of the enterprise. The second hypothesis (HP2) explores the correlation between player salaries and corporate value, indicating that higher salaries, attracting better talent, are associated with an increase in corporate value. The third hypothesis (HP3) examines the relationship between sporting results and corporate value. The fourth hypothesis (HP4) considers the relationship between the overall value of players and corporate value.

The document highlights that for each standard deviation increase in infrastructure investments (INF), an increase of approximately 186.72 million euros in the future enterprise value (V.IMP.) is expected, holding all other variables constant. This result emphasizes the importance of infrastructure investments, which may include facilities such as training grounds and stadiums, crucial for team performance and generating significant revenue streams.

The coefficient for player salaries (SALAR) is 544.06, indicating that for each standard deviation increase in salaries, an associated increase of about 544.06 million euros in enterprise value is predicted. This highlights the role of player salaries in determining the value of a football enterprise. Higher salaries can attract top talent, improve team performance, and increase enterprise value.

The analysis revealed that the value of players (VALUE) has a complex and nonlinear relationship with enterprise value. The results suggest that at lower levels of VALUE, increases are associated with substantial increases in V.IMP., while at higher levels, additional increases in VALUE enhance V.IMP. but at a decreasing rate.

The variable RIS.I., indicating whether the team won an international competition in year x, has a coefficient of 363.62, suggesting that winning an international competition can significantly increase the value of a football enterprise.

From a practical standpoint, these results have important implications for football club management. Clubs can use this information to formulate more informed investment strategies, focusing on aspects such as advanced infrastructure, talent management, and success in international competitions. The research also underscores that investing in competitive salaries is crucial to attract and retain top talent, a key factor for sporting success and enterprise value. In addition, teams can leverage these insights to optimize their marketing and branding decisions, capitalizing on sporting success and utilizing infrastructure to enhance fan experience and create new income sources. The results can influence governance and regulatory policies in football, promoting a better balance between financial investments, player welfare, and fan interests.

The implications of this research are broad and multidimensional, offering valuable insights for both academics and professionals in the field of football. They provide a solid foundation for further research and management strategies in the industry, highlighting the importance of a balanced and data-driven approach in evaluating football enterprises.

7. Conclusion

This research aimed to address the question of whether a company, particularly in the European football sector, can sustain annual losses consistently without incurring a confirmed financial and economic crisis. This rationale is based on a growing trend in the literature to consider a balanced approach reflecting the importance of managing both athletic and performance aspects and organizational and business aspects to ensure success both on and off the field of an elite sports organization.

Starting from the reflection by Hamil and Walters (2010) on persistent financial difficulties in many clubs, the goal was to delve into the financial dynamics using an empirical investigation conducted on 28 elite football clubs from the major European football leagues.

The work was primarily based on the analysis of data from various sources (information on corporate governance structures extracted from the AIDA database - Bureau van Dijk's database on Italian companies, from the official websites of football teams, as well as from the financial statements of companies). In particular, the Refinitiv database - one of the most comprehensive and well-regarded globally - was used for data and financial market infrastructure, including information on over 85,000 active and inactive companies in 125 markets, with time series available from the 1990s onwards. Only data from the most important European football companies were extracted from the dataset, covering the period from 2018 to 2023.

The results of the regression analysis revealed a significant and complex relationship between the various independent variables analyzed (INF, SALAR, VALUE, RIS.N., RIS.I) and the value of football enterprises. In particular, investments in infrastructure and player salaries emerged as particularly influential independent variables regarding corporate value, thus emerging as fundamental strategic factors for efficient business management.

Indeed, the analysis of the salary variable (SALAR) highlights the role of player salaries in determining the value of a football enterprise: higher salaries can attract the best talents, which can improve team performance and increase the value of the enterprise.

Regarding the infrastructure variable (INF), the analysis emphasizes the importance of infrastructure investments in increasing the value of a football enterprise: infrastructure can include facilities such as training grounds and stadiums, which are crucial for a team's performance and can generate significant revenue streams.

Furthermore, success in international competitions (RIS.N., RIS.I) and the overall value of the team (VALUE) were identified as additional drivers of enterprise value.

From a theoretical perspective, the study offers an innovative perspective that challenges traditional theories of corporate value, highlighting the importance of specific elements in the sports sector. The correlation between high player salaries and enterprise value supports the theory of efficiency wages in the sports context, suggesting that investing in higher wages can be an effective tool to improve club performance and attractiveness, while being careful not to exceed the threshold beyond which the positive correlation reverses.

The practical implications of this research provide important guidance for the management of football clubs. Formulating informed investment strategies on infrastructure, talent management, and success in international competitions can be crucial to ensure a balance between profitability and the development of a winning sports profile. Optimizing marketing and branding decisions, leveraging sporting success, and improving the fan experience through infrastructure emerge as keys to generating new sources of income.

Moreover, this research provides several points for reflection for both academics and professionals in the football sector. The work represents a solid foundation for future research and management strategies in the industry, highlighting the importance of a balanced and data-driven approach in evaluating football enterprises. Ultimately, understanding the complexity of financial dynamics in professional football is crucial for the long-term sustainability of businesses in the sector and, more broadly, for the community.

In conclusion, the importance of ongoing research in this field should be emphasized to identify and incorporate additional predictors that can enhance our understanding of the evaluation of football clubs. Indeed, this work aims to provide valuable insights into the determining variables of football club value and serves as a useful starting point for further investigations. Future studies could address these limitations by exploring specific non-linearities or incorporating additional control variables.

In summary, this study highlights the significance of certain strategic factors (SALAR, INF) in making the corporate management of a football club more efficient.

8. Limitations

The regression model under consideration in the present study provides a robust framework for understanding the factors that influence the future value (year x + 1) of a football enterprise. It incorporates both linear and quadratic terms for the value of the team's players (VALUE), as well as linear terms for the investment in infrastructure (INF), the salary paid to players

(SALAR), whether the team won an international competition (RIS.I.), and whether the team owns a stadium (STADIO) in year x.

The model demonstrates a robust explanatory power with an Adjusted R-squared of 0.8723, suggesting that it accounts for approximately 87.23% of the variation in the dependent variable, V.IMP. The F-statistic of 159.2 and its associated p-value, which is less than 2.2e-16, provide strong evidence against the null hypothesis that all regression coefficients are zero, indicating that the predictors included in the model have a statistically significant association with V.IMP.

However, like all models, it is an abstraction of reality and thus has certain limitations. These limitations, while important to acknowledge, do not detract from the model's utility but rather highlight areas for further investigation and refinement.

One such limitation pertains to the assumption of linearity between the dependent variable and the independent variables. While this assumption simplifies interpretation of the coefficients, it may not fully capture the complexity of the underlying relationships. For instance, the relationship between infrastructure investment (INF) and enterprise value may not be strictly linear; there may be diminishing returns to scale or threshold effects not captured in this model.

This presents an opportunity for future research to explore alternative model specifications that can better capture these complexities. Non-linear models or models incorporating interaction effects could provide a more nuanced understanding of these relationships.

The model also assumes that all relevant predictors have been included and correctly specified. While it controls for several key variables, there may be other factors influencing enterprise value that are not included in the model.

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Appendices

Added-Variable Plots