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Comparative Analysis of the Relationship Between Organizational Behaviour, Business Strategy, and Results - Study of European Football Clubs

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Abstract

Gone are the days when football was all about who scored the most goals. With the unstoppable growth in popularity of the world's most famous sport, it is increasingly essential to understand the key factors in club management and strategy in order for them to be successful at all levels. This study intends to carry out a simultaneous and dynamic analysis of the relationship between the strategic, financial and organisational management of the clubs and their sporting results, understanding which features best explain their titles and victories. The sample includes sporting seasons before, during and after COVID-19, so that some possible consequences of the pandemic for the clubs were also mentioned. The originality of this study lies in two points: firstly, financial and non-financial features were analysed within management, for example at the level of human resources and the connection with the "client"/fans; secondly, the analysis was done using machine learning tools, such as random forest, which is quite differentiating, and probably more useful, from what has been done before. The results indicated some similarities with other studies, and tried to corroborate already established theories, such as the notion of a Virtuous Circle in football, but also brought new inputs to this discussion, such as the inverse relationship between clubs' liquidity and their victories.

Keywords: Strategy, Financial Management, Virtuous Circle, Organizational Behaviour, Results, Feature Importance, Random Forest

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1. Introduction

In recent years, the world of professional football has witnessed a remarkable transformation, where clubs have evolved into multimillion-euro enterprises with global influence. This rapid growth and commercialization have intensified the need for a deeper understanding of the factors that contribute to the success of football clubs, transcending the traditional focus on sporting performance alone.

Football clubs operate within a highly competitive and dynamic environment, where strategic decision-making and effective organizational behaviour play pivotal roles in determining their long-term success. The long-term is, in fact, an expression that is often forgotten in football, since it is an industry where the priority is to maximise wins and the "Trophy Assets" (Quansah et al., 2021) of the respective clubs. Obviously, investors are more concerned with maximising profits, so there can sometimes be a conflict of interest between the different parties that interfere in the management of a club (Nagy, 2012). That is why it is so important to understand if there is a way for everyone to meet their objectives.

Previous studies on the interconnection between sporting success and the financial performance of football clubs have already been done. Lago et al. (2004) introduced the notion of a "Virtuous Circle" in football, emphasizing that clubs capable of offering higher salaries tend to achieve greater success on the field. Consequently, their victories lead to increased income from various sources such as competition prizes, sponsorships, and TV rights. This influx of funds enables these clubs to allocate even more resources towards player salaries, thus perpetuating an ongoing cycle of financial growth and on-pitch accomplishments.

Nonetheless, according to Galariotis et al. (2017), despite generating increased income, the pursuit of success in sports can frequently result in financial underperformance, due to a "stakeholder myopia". Clubs achieving success in terms of business performance, characterized by higher revenues, possess the means to invest those revenues to enhance their sporting performance. Consequently, this improvement can lead to increased revenues through factors like increased game attendance and merchandise sales. Paradoxically, however, clubs excelling in business performance often encounter difficulties in effectively translating their substantial revenues into sound financial performance. This happens because of that eagerness to buy the best players to win titles as quickly as possible,

sometimes causing clubs to spend more than they should. That is why there are several cases of clubs that end up going bankrupt and disappearing a few years after their sporting peak.

In addition to the aforementioned aspects, it is crucial to highlight the importance of strategic planning in football clubs to effectively navigate the challenges posed by the COVID-19 pandemic. The global health crisis has significantly impacted the football industry, with matches being cancelled or played without spectators, disrupted revenue streams, and increased financial uncertainty. In this context, strategic planning becomes indispensable as clubs must swiftly adapt to the changing landscape, mitigate risks, and identify new opportunities.

However, when we talk about strategy, we should not focus only on the financial aspects. Like any other company or organisation, a football club is made up of people, so there are fundamental issues to be addressed. The exploration of organizational behaviour will delve into the internal dynamics of football clubs, including leadership styles, decision-making processes, and organizational culture. Understanding how these elements shape the behaviour of individuals within the clubs and impact their collective performance can provide valuable insights into the broader organizational dynamics and their influence on strategic decision-making. And this is precisely one of the gaps that this study aims to fill. As already mentioned, there are several publications that have analysed the relationship between sporting results and financial success. But it is also important to include aspects of human resources management and organisational behaviour in this analysis. Lastly, it is crucial to understand, within all these features that involve the world of football clubs, which are the most and least important for the sporting results.

Therefore, this will be a dynamic and joint analysis of the various factors that can affect the sporting results of a football club. Taking into account the existing literature and the gaps we intend to fill with this study, these will be our three research questions:

1. Does the virtuous circle concept exist in football, and if so, what are its key components and dynamics?
2. Are non-financial management features important determinants of on-pitch results in football?
3. Are there consequences and effects of COVID-19 on the football industry?

This research aims to contribute to the existing body of knowledge by shedding light on the elements that underpin the success of football clubs, thereby assisting in the formulation of evidence-based strategies that can guide clubs towards sustainable growth and continued success in the highly competitive world of professional football. For this analysis, Machine Learning tools will be used, which are extremely useful in decision-making and strategy, and to date have been used very little in studies of this nature. In terms of sample, 35 of the top European clubs will be analysed.

In conclusion, the exploration of the relationship between organizational behaviour, business strategy, and results in European football clubs represents a crucial step towards unravelling the complexities of this unique industry. Instead of studying the isolated relationship between the sporting side and the financial side, or, in turn, the sporting side and the organisational side, what this study intends is to analyse these three factors together, in an interrelation dynamic. We believe that this type of simultaneous analysis and the fact that it is done with innovative tools is something that differentiates this study from others that have already been done.

As for the structure of the dissertation, in Section 2 we will have the literature review of existing studies on the topic. Section 3 will present the data that was collected for this study, along with the respective methodology adopted. In Section 4, the results of the quantitative analysis will be presented, so that the research questions can be answered, together with possible explanations. Finally, in Section 5, a conclusion of what was obtained with this study will be made, in addition to suggestions for future studies that can be done to complement this and other analyses on the subject.

2. Literature Review

This chapter will address the literature review of studies already done on the subject. With the huge popularity of football, many authors have sought new discoveries about the phenomenon, in an attempt to understand why it is so famous and also some reasons why some clubs are more successful than others.

In fact, the first sub-section will analyse the football industry as a whole. A sport that began in England in the 19th century is now an industry involving millions. So we will start by explaining how big it really is, what the clubs' biggest revenues are and where they come from.

In section 2.2, we will talk about the event that shook football and society as a whole, COVID-19. The impact of the pandemic on football has been multifaceted, encompassing financial, operational, and logistical dimensions. Understanding and addressing the potential consequences of it in the football industry is a crucial consideration for stakeholders seeking to navigate the post-pandemic era effectively.

Next, we will introduce the studies on the Virtuous Circle in football, which is related to one of our research questions. It means that a good financial health of the clubs provides good sporting results, which in themselves improve that financial health of the clubs. As such, it would become an endless cycle. Lago et al. (2004) introduced this concept and for years it was corroborated by other authors. However, Galariotis et al. (2017) modified it and, therefore, it is important to talk a little bit about these two different circles and what makes them up, before testing it properly.

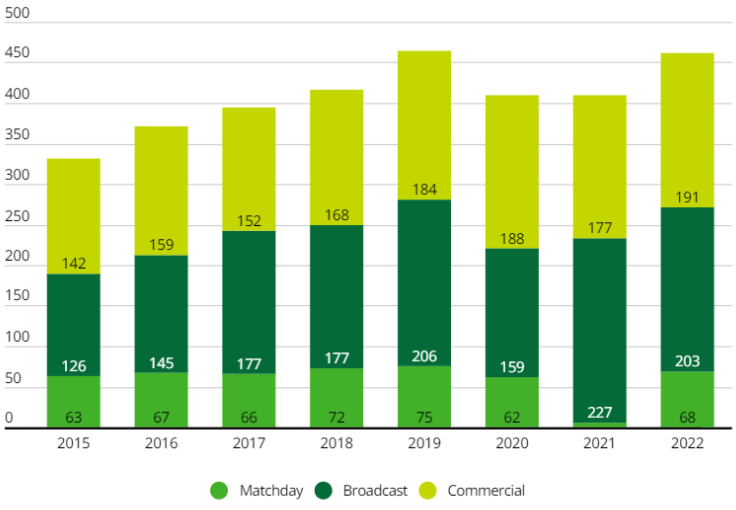
Finally, studies on determinants of business strategy and organisational behaviour in football will be presented. Although there is not exactly a study that aggregates all these determinants, much has already been said individually about potential management factors that contribute, positively or negatively, to the success of clubs. As such, section 2.4 will present them and the different findings they have made.

2.1. The Football Industry

The football industry, in the present era, has experienced remarkable growth and transformation, solidifying its position as one of the most popular and profitable sports worldwide. With its global appeal and passionate fan base, football has become a major economic powerhouse, generating substantial revenue streams and driving significant industry expansion.

According to Deloitte Football Money League 2023, in the 2021/22 season, the combined revenue of the top 20 revenue-generating football clubs reached €9.2 billion, marking a 13% increase compared to the €8.2 billion reported by the Money League clubs in the previous season of 2020/21. Notably, this revenue figure was only marginally lower than the pre-pandemic levels recorded in 2018/19, which also stood at €9.2 billion.

With the return of fans, the revenue composition of football clubs in the 2021/22 season closely aligned with pre-pandemic levels. Among the top 20 clubs, matchday activities accounted for 15% of their total revenue, broadcasting contributed 44%, and commercial sources represented 41% (Fig. 1). This distribution was nearly identical to the revenue split recorded in the 2018/19 season. The resurgence of matchday revenue emphasized the importance of live attendance in the financial success of clubs.



Source: Deloitte Football Money League

Figure 1: Average Matchday, Broadcast and Commercial revenue generated by Money League top 20 clubs (€m): 2015 to 2022.

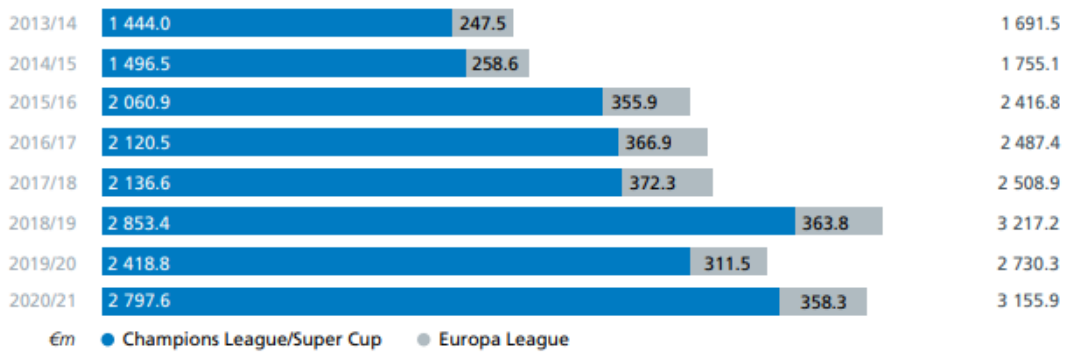
In fact, the primary driver behind this revenue growth was the return of fans to stadiums after two seasons heavily impacted by the COVID-19 pandemic. Matchday revenue, which had significantly declined in the previous season (2020/21) to €111 million, surged to €1.4 billion in the 2021/22 season. This substantial increase in matchday revenue can be attributed to the resumption of live attendance, as fans eagerly returned to support their favourite teams, boosting ticket sales, concessions, and other matchday-related income. Wills et al. (2020) discovered that match-going fans across different football leagues do not prioritize uncertainty of outcome or competitive intensity as their primary interest. Instead, the study revealed that the quality of the away team emerged as the key factor that holds importance for all fans.

This notion is supported by Addesa & Bond (2021), who analysed the impact of the main determinants of match-day stadium attendance of the Italian football Serie A, with a dataset split into three sub-categories, based on the pre-season fans' expectations (1st to 7th place, 8th to 13th place, and the bottom seven positions). Once again, the research revealed a common preference of Italian fans towards higher quality opponents. Besides, price was found to have little significance in affecting attendance, which could be attributed to the limited variation in ticket prices compared to the fluctuation in attendance levels (Reade, 2007). Rather, this author found that fans are more attracted by the quality of the product, which is influenced by the home team's form, the importance of the game itself, or the existence of a rivalry with the visitors.

If we look again at figure 2, we see that the biggest portion of club revenues does indeed come from broadcast rights. Like the industry itself, television rights have grown substantially in recent years. According to Union of European Football Associations (UEFA), organiser of the major international tournaments between European clubs, the media rights it has distributed have been increasing from season to season (apart from 2019/20, where fewer games were played, due to Covid-19) and in 2020/21 the figure is already more than double when compared to 2013/14. (Fig. 2).

The big reason for these numbers is the UEFA Champions League, which brings together the best teams in Europe every year. This is a competition that attracts the attention of the whole world, as people are keen to see football's biggest stars play against each other (Wills et al., 2020). Looking at football competitions in general, Macedo et al. (2022) discovered that the primary factors driving demand for football broadcasts specific to a

competition are the level of interest, being a fan of a club participating in that competition and having access to the broadcasts at home.



Source: UEFA Financial Report 2020/21

Figure 2: Total rights revenues distributed by UEFA, per competition, per season.

These rights play a vital role in the success and financial stability of European football clubs, allowing them, not only to generate substantial revenue, but also to reach a global audience, expanding their fan base, encouraging the growth of the club as a brand, enabling new sponsorships and commercial revenues. In fact, the commercial side and the positioning of clubs as a brand has been increasingly explored and makes perfect sense. Football clubs have the opportunity to expand their market presence beyond traditional sports-related revenue streams by positioning themselves as more than just sports teams. By diversifying their offerings and targeting both business-to-consumer (B2C) and business-to-business (B2B) markets, clubs can reduce their dependence on income solely derived from sporting activities (Pritchard et al., 2020).

This is crucial because sports-related income can be limited, challenging to significantly increase, and often subject to fluctuations based on the club's sporting success. By broadening their scope and presenting themselves as multifaceted entities, clubs can tap into alternative revenue sources and establish sustainable financial models for long-term growth. Besides, this also has a positive effect on the connection with the fans. Abosag & Roper (2012) indicate that football supporters are receptive to their club's branding efforts and are supportive of brand extensions. There is a clear connection between this acceptance of branding activities and the emotional attachment that supporters have towards their club.

2.2. COVID-19 Pandemic

The COVID-19 pandemic has had a profound impact on European football, disrupting the sport in numerous ways. From the suspension of leagues and tournaments to financial challenges faced by clubs, the virus has left an indelible mark on the beautiful game.

The reduction in revenue and profits for football teams was a major concern. In fact, Hammerschmidt et al. (2021) revealed that the corona crisis has led to severe liquidity problems that pose a threat to the existence of numerous professional football clubs, putting significant strain on their financial management. With matches being played behind closed doors or with limited attendance, clubs have lost significant income from ticket sales, hospitality, and merchandise. Luo (2023) says it exposed a "fragile ecosystem" within football. Precisely because it is a fragile ecosystem, Reade & Singleton (2020) said that the financial constraints on clubs could lead to necessary reforms in football and better use of resources, notably by reducing the costs of players' agents.

The losses the pandemic caused may not have been only economic. Grabowski (2021) says it led to a decline in the competitiveness of sports in both domestic and international competitions and its impact will be felt by European football clubs for an extended period. For example, some authors have argued that the structure of European competitions should be changed in an attempt to recoup lost revenue and to change a defective competition structure in itself.

2.3. Football's Virtuous Circle

Football has long ceased to be played only on the pitch. Especially since 1995, with the Bosman case, there has been an exponential increase in player mobility and transfer activity. Moreover, it brought about a transformation in player labour markets by shifting them from a monopsonist structure to a more competitive one (Baroncelli & Lago, 2006). Prior to the ruling, clubs held significant power over players due to restrictions on their movement and the ability to demand transfer fees. Since then, there has been a clear inflationary trend in the football industry, increasing exponentially the cost of salaries and other types of costs in club spending.

So, one of the big questions that arises, with the increasing interdependence between sporting and financial results, is whether club owners and managers should maximise profits or maximise wins and titles, also known as "Trophy Assets" (Quansah et al., 2021). Garcia-del-Barrio & Szymanski (2006) suggest that clubs in both the Spanish and English football leagues make decisions that closely align with maximizing their chances of winning, while operating within a budget constraint that aims for zero profit. Even when a football club is owned by a group of investors, the underlying objectives remain consistent.

While economic theory often emphasizes profit maximization as the primary goal for companies, in the context of football clubs, this objective is replaced by a financial aim of generating enough revenue to cover operational expenses and invest in acquiring and retaining top-quality players (Samagaio et al., 2009). The same is said by Osokin (2018), who compared the strategies of Russian clubs, based on the issue of maximising wins or profits. According to him, it is recommended for clubs to adopt a win-maximizing strategy while adhering to strict budget constraints, which can help mitigate challenges related to financial transparency for national clubs. These budget restrictions are particularly important to follow, as many clubs spend more money on salaries than they should, because this spending often does not translate into an efficient use of resources (Ribeiro & Lima, 2012; Késenne, 2006).

However, unlike sports in the United States, where concepts such as the salary cap exist and there is a greater tendency for the profit-maximization strategy (El-Hodiri & Quirk, 1974), this type of restriction has never been successful in European football. The closest that exists is Financial Fair Play (FFP), imposed by UEFA on clubs. The primary goal of FFP regulations is to enhance the financial and economic stability of football clubs. To achieve this objective, clubs are required to demonstrate that their revenue is equal to or greater than their expenses. Furthermore, there are limitations imposed on shareholders, preventing them from covering excessive losses (Solntsev, 2020).

Anyway, studies have already been developed to explain that these two strategies are actually compatible. In fact, there is the possibility of a virtuous circle in football (Lago et al. 2004; Rey & Santelli, 2017). Rey & Santelli (2017) indicate that in Serie A, football teams that are not burdened with debt tend to achieve the best sporting performances. Their findings indicate that the Italian football industry operates as a hybrid model, combining both profit maximization and win maximization approaches, as the most successful teams in terms of on-field performance also exhibit strong economic and financial stability.

Also, the ability of football clubs to offer higher wages is directly linked to their revenue-generating capacity, which is also defended by Quansah et al. (2021). In fact, these authors studied the clubs of the English Premier League and discovered that the coefficient of determination between club revenues and salaries is 0.97. Returning to the analysis of Italian football in recent decades (Lago et al. 2004; Rey & Santelli, 2017), football clubs that have the financial capacity to afford the highest wages tend to achieve the highest level of on-field performance, as reflected in their final league position. This finding aligns with the concept of the "virtuous circle" emphasized in the existing literature. It is a symbiotic relationship where the quality of the product, fan interest, financial resources, and investment in infrastructure and talent all reinforce each other in a continuous loop (Fig.3).

Figure 3: Football's Virtuous Circle, according to Lago et al. (2004); Rey & Santelli, (2017).

Nevertheless, despite generating higher revenues, the pursuit of success in sports can often lead to financial underperformance. This is because there is a tendency among stakeholders to prioritize short-term objectives over long-term sustainability, which can be referred to as "stakeholder myopia" (Galariotis et al., 2017). Indeed, these authors studied the dynamic interrelationship between such performance elements, as revenues, wages, or transfer costs, in French Ligue 1 clubs. They found that successful clubs in terms of business, characterized by high revenues, have the ability to invest those revenues to achieve better sporting performance. This, in turn, can lead to increased revenues through factors like game attendance and merchandise sales. However, paradoxically, clubs that excel in business performance often struggle to translate their high revenues into healthy financial performance.

Hence, according to this report, it is necessary to modify the virtuous cycle proposed by Lago et al. (2004). Firstly, the cycle may not be as virtuous as initially thought since financial performance actually has a negative impact on sports performance. Secondly, the direction of the arrow representing business performance should be reversed by 180 degrees towards the sport, as this aspect of performance does not influence financial performance but does have an impact on sports performance (Fig.4).

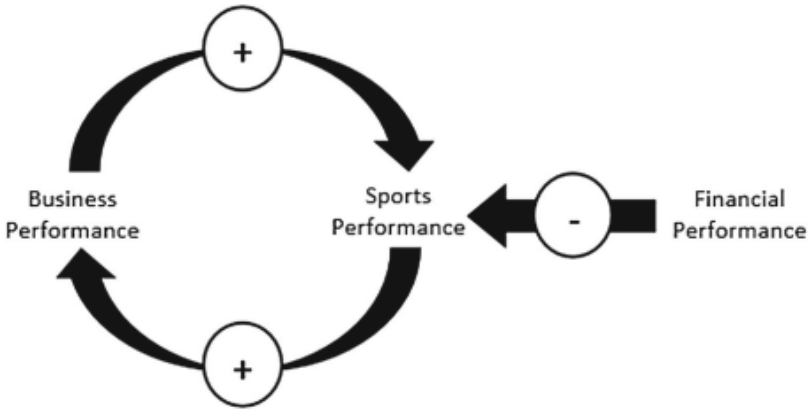


Figure 4: Actual dynamics of clubs' performance, according to Galariotis et al. (2017).

2.4. Business Strategy and Organizational Behaviour in Football

Football, being one of the most popular and competitive sports globally, has garnered significant attention from researchers and analysts seeking to understand the key drivers behind effective strategies and optimal performance in the sport. There are many studies on the possible relationship between the sporting success of clubs and their financial and business performance. However, these determinants do not stop there, and factors related to organisational behaviour also have an impact on the success or failure of a club, for example through the management of its "workforce", namely the coaches and players.

Szymanski & Kuypers (1999) say that, not only there is a positive correlation between team performance, as indicated by the league position at the end of the season, and club revenues, but also a positive correlation between the amount of wages paid by the club and team performance, which is also confirmed by Rey & Santelli, (2017); Madsen et al., (2018).

Sugumaran et al. (2020) support this argument, saying that there is a statistically significant relationship between sporting success and an increase in turnover, as well as

between stadium capacity and liquidity. Barajas et al. (2005) also reveal a non-linear relationship between the budget (expected income) of Spanish football clubs and their sports performance, with an explanatory power of 55.12%.

Rey & Santelli (2017) also measured the impact of the Italian Serie A clubs' liabilities to assets ratio and found that the higher it is, the worse the results are for the transalpine clubs. This could be due to the clubs' higher indebtedness and consequently lower financial capacity to strengthen their squads. In the opposite direction, these authors found that the wage/revenues ratio has a positive correlation with the final position of Serie A clubs. In other words, this indicates that it makes sense to spend a lot on players' salaries, as long as this is done with the club's own patrimonies. These findings are in line with the concept of a virtuous circle in football. Lastly, their report emphasized the significance of stadiums as significant revenue sources, it follows that teams playing in larger stadiums tend to experience greater on-field success.

Still related to stadium attendance, Pinnuck & Potter (2006) say it is influenced by a combination of factors, including the recent short-term and long-term success of the teams involved and the uncertainty surrounding the outcome of each match. Notably, their study's findings demonstrate a strong correlation between match attendance and the level of success achieved by football teams.

Quansah et al. (2021) argue that salaries, transfer fees, and market values in football clubs are closely tied to the level of club revenues and adapt to evolving market conditions. However, when the market experiences a downturn, clubs often face short-term losses due to the inability to quickly adjust their expenditures. This is primarily because of long-term contracts and obligations that restrict immediate cost-cutting measures. Additionally, the competitive nature of the industry drives clubs to prioritize spending over building reserves during favourable market conditions, which, most of the times, results in excessive debt and external funding.

If we look at the profitability metric, through, for example, the net profit of clubs, Michie et al. (2005) observed that most English clubs show annual losses because, in their eagerness to sign the best players and have the best teams, they invest "any putative profits even before these appear in the balance sheet", which corroborates Galriotis' theory (2017) and goes against the notion of the Virtuous Circle of Lago et al. (2004).

It is important to note that football clubs do not only spend money on staff, such as salaries or player transfers. Capital expenditure plays a vital role in the sustainable growth

and development of football clubs. It refers to the investment made by clubs in acquiring, improving, or expanding their physical assets, such as stadiums, training facilities, and infrastructure.

One of the key reasons why capital expenditure is important for football clubs is its impact on revenue generation. Upgrading or expanding stadiums can lead to increased seating capacity, enabling clubs to accommodate more fans and generate higher matchday revenues. Nonetheless, the driving force behind capital expenditure in football clubs goes beyond matchday attendance revenues. It is also motivated by the desire to provide fans with a distinctive and enhanced experience and atmosphere during live football matches, which differs from what is conveyed through broadcast events, which, obviously, brings more people to the stadium (Toti, 2017).

Additionally, improved training facilities can help attract and retain top talent, which can positively influence on-field performance and player development. This was particularly visible at Manchester City from 2011, where the investments made had positive spillover effects on younger footballers, as the club expanded its youth system (Jones, 2014). In fact, according to UEFA, investment by European top division clubs in training facilities during the period 2015-2020 was more than €1 billion. Besides, the total estimated annual youth development budget of European top division clubs in 2020 was €870m.

With regard to the management of club coaches, this can be measured by the relationship between the firing of coaches mid-season by clubs and sporting success in that same year. And this is a slightly disruptive question, as far as the studies already done are concerned. According to a commonly accepted perspective, it is considered common sense for change management when an organization is experiencing poor performance. However, the overall results of mid-season coaching changes do not show much effect on sporting performance (Audas et al., 2002; Hermansson, 2020; Arrondel et al., 2020). Since football is one of the most random sports, the improvement of teams is often only due to a regression to the mean.

Still, Arrondel's (2020) findings indicate that team performance shows a slight improvement in the short term (within 5 games) following a change in management. Yet, this effect does not have a significant impact in the medium-to-long term (within 10 games). These results can be attributed to the psychological influence on both players and fans. Initially, the arrival of a new manager can create a positive psychological effect, leading to a temporary boost in performance. However, as the initial impact wears off, the most crucial

factor determining team performance becomes the managerial ability to effectively lead the team.

Continuing with human resources management, in this case with the average age of the squads, evidence suggests that achieving long-term success at the highest level in football requires a good balance, particularly in terms of age structure within the team (Poli et al., 2018). Maintaining a balanced age distribution allows young players to develop alongside more experienced teammates and gradually take over as key contributors to the team's success. Poli also agrees with previous findings, that indicate that having a significant number of players under the age of 27 is vital for clubs aiming to achieve sustainable success.

Banos (2017) studied the sporting performance of Bayer Leverkusen between 2009 and 2017, comparing it with the average age of the different squads and there were some conflicting results. On one hand, older squads displayed the ability to turn around matches that did not start favourably by leveraging their mental composure and patience to score in the later stages. On the other hand, a younger squad demonstrated enthusiasm and a reduced tendency for in-game mistakes, as evident from their lower number of yellow cards. Overall, Bayer achieved higher league positions when they incorporated young talents into their team.

Regarding squad formation, there are some studies that tried to find out if the most successful squads are made of players of similar level, creating homogeneous squads, or if, on the contrary, they are made of some stars together with more "modest" players. Köhler (1926) created its own effect, where less proficient players are able to improve their skills and performance by being part of the same team as more skilled and capable players.

In that sense, Toma & Campobasso (2023) adopted the Gini Index to investigate the expenditure and the resulting value enhancement for each team. As spending levels vary around the median, particularly among mid-table teams, the clear relationship between expenditure and success becomes less apparent. In terms of resource allocation strategy, the majority of teams tend to concentrate their resources on a select few players, regardless of their financial capability. However, Chelsea and Manchester City stand out in this regard, deviating from the trend, which could be attributed to the exceptional wealth of these clubs' owners (Fig.5). The authors' research indicates that in football, only a small percentage (less than 20%) of players earn a significant portion of the overall revenue.

This aligns with previous studies, including Rosen's (1981) theory of superstars, which suggests that in various industries, including football, the majority of individuals offer similar services at a consistent marginal cost, while a select few provide exceptional services

that are difficult to replicate. These exceptional players, often referred to as "game changers," are rewarded with higher salaries due to their outstanding performance and valuable contributions to the team.

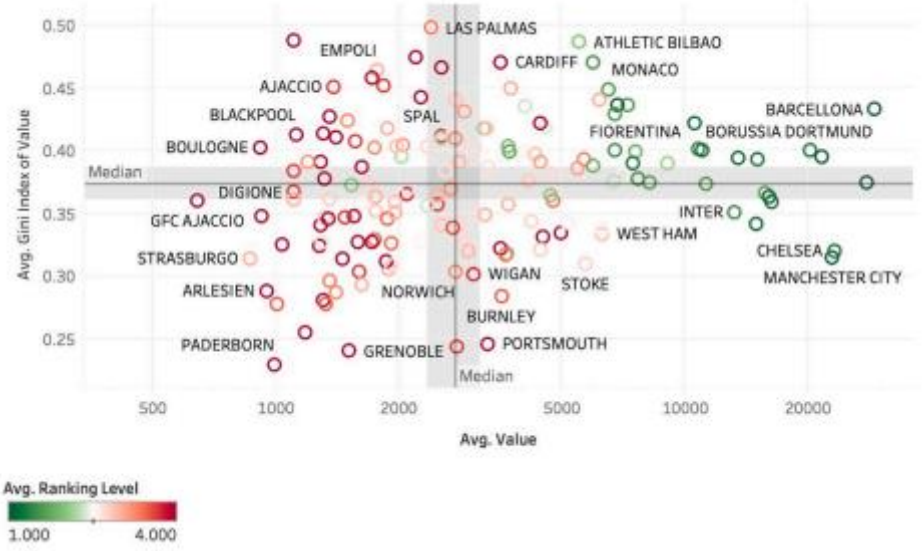


Figure 5: Average Gini Index of Value on Average of Value. (The colour assigned to each team represents their average ranking level, with top-ranked teams displayed in green and lower-ranked teams in red.)

Summarizing, we began this chapter by referring to the studies that explain where many of the clubs' millions come from and we realised that there is always one common element: the fans. Whether it is in the stadium, on television or buying merchandising, fans are clearly a key element for clubs. This element was lost during the pandemic, which caused serious losses for clubs, as we have seen in subsection 2.2, and even led to studies of possible changes in football that are here to stay. In section 2.3, we introduce the articles that consider whether clubs want to win money or titles. We then discuss the created concept of a virtuous circle in football, which seeks to link these two strategies. Finally, we presented the existing studies on other possible determinants for the good functioning of clubs.

After having discussed the existing studies on the topic, it is now important to present ours. Thus, the following chapter refers to the data and methodology of this study, namely its sample, the collected variables and the procedure.

To this extent, as stated in the introduction, the necessary and innovative joint analysis of all the impacting factors on football clubs can be made and consequently we can answer the three research questions.

3. Data and Methodology

While previous studies have predominantly focused on the relationship between financial performance and on-field achievements, the dynamic nature of managing a football club warrants a more comprehensive analysis. It is true that we will test the existence of a virtuous circle in football, and this is predominantly a financial issue, but this dissertation also aims to bridge the gap by examining not only financial indicators but economic and organizational factors that influence sporting success too. By incorporating multiple dimensions of management, this study seeks to provide a more holistic understanding of the intricate dynamics behind achieving excellence in European football. Moreover, we will not only assess whether the features have any correlation with the sporting results. We will also rank them from most to least important.

To conduct this research, data will be collected from 35 European football clubs over a period spanning from 2018 to 2021. For this analysis, we tried to choose the main clubs of different leagues, depending always on the information they make publicly available, namely economic and financial. As we will also be looking at potential effects of the COVID-19 pandemic, we have seen fit to analyse the three sporting seasons encompassing pre-, during and post-pandemic.

Regarding the indicators that will be compared to measure sporting success, our decision was to incorporate indicators from various aspects. We have chosen to include financial ones to examine the theories established in prior research. Additionally, we have included economic and management indicators, specifically focusing on human resource management.

In this set of indicators, we will include examples such as wages, revenues or net income, in an economic-financial context, but also indicators such as average attendance in the stadium, the dismissal of coaches or the Gini Index of the market value of players within the clubs' own squads.

3.1. Data Sources and Sample

Regarding the economic and financial information, it was collected mainly from the annual reports made publicly available by the clubs themselves, or by the League they play in. As for the sports information, it was obtained from two renowned websites in this matter, Zerozero and Transfermarkt. It was also in Transfermarkt that was retrieved the information of the average attendance in the stadium, or the market value of the players, something in which the website is specialized specifically. For the conversion of other currencies to Euro, in the case of clubs outside the Euro zone, the X-Rates platform was used.

The table below shows the sample of the 35 European clubs that were analysed. The initial criterion would have been to use the top 5 clubs of the 6 best positioned leagues in the UEFA ranking (English Premier League, Spanish La Liga, German Bundesliga, Italian Serie A, French Ligue 1 and Portuguese Primeira Liga), plus the top 5 clubs from the rest of Europe. However, due to some clubs not making their accounting information publicly available, some changes had to be made and some clubs were added.

Table 1: Description of the sample

Manchester City F.C.	S.S. Lazio
Liverpool F.C.	Paris Saint-Germain F.C.
Manchester United F.C.	Olympique Lyonnais
Tottenham Hotspur F.C.	Stade Rennais F.C.
Arsenal F.C.	Olympique de Marseille
Leicester City F.C.	LOSC Lille
Real Madrid C.F.	F.C. Porto
F.C. Barcelona	S.L. Benfica
Sevilla F.C.	Sporting C.P.
Club Atlético de Madrid	Vitória S.C.
Valencia C.F.	S.C. Braga
Borussia Dortmund	A.F.C. Ajax
Juventus F.C.	Feyenoord Rotterdam
A.S. Roma	PSV Eindhoven
F.C. Internazionale Milano	Celtic F.C.
S.S.C. Napoli	Rangers F.C.
Atalanta B.C.	F.C. Basel
A.C. Milan	

3.2. Random Forest Model

The Random Forest is a classification technique that incorporates multiple decision trees. It employs bagging and feature randomness during the construction of each tree, aiming to create a collection of trees that are uncorrelated. By combining the predictions of these trees, the Random Forest achieves higher accuracy than any single tree alone (Yiu, 2019) and its ability to capture non-linear relationships, robustness to outliers, handle multicollinearity, and facilitate model generalization offers a substantial advantage over panel regression, hence is the model used in this study.

In addition, it allows you to know respective Feature Importance, which enables you to identify areas for improvement and refine the model by focusing on the essential variables that have a substantial impact on the forecasts (Lewinson, 2019). As such, we consider it to be an extremely useful tool, in this case, for football clubs to better understand which of their management practices have the most impact on sporting results.

The concept of feature importance is straightforward. Inputs that contribute to accurate predictions hold significant information. By randomly shuffling the values of a feature and observing a decrease in prediction quality, we can infer that the original feature contained valuable information (Billiau, 2021). If the decrease in quality is minor, it indicates that the original feature had little impact on the predictions, implying a good model performance even without it. On the other hand, if the decrease is substantial, it means that the original feature greatly influenced the predictions.

In the field of statistics, the mean squared error (MSE) is a metric used to gauge the accuracy of an estimator. It calculates the average of the squared differences between the estimated values and the actual values.

As such, we will use the MSE to gauge the quality of the predictions. Then, the process for measuring the importance of the features will be done through three steps. First, randomly rearrange the data within the feature, ensuring that the values of other features remain unchanged. Second, generate new predictions using the shuffled feature values and assess the accuracy of those predictions. Finally, calculate the feature importance score by measuring the decrease in prediction quality compared to the original predictions.

3.3. Management Features

Particularly since the beginning of this century, many studies have been made on a possible link between the sporting success of football clubs and their financial performance. Among these, Lago et al. (2004) have created the notion of a virtuous circle in football, where financial performance, namely through revenues and wages, boosted sporting success and vice versa, which has been corroborated by other authors over the years. However, this circle was slightly altered by Galariotis et al. (2017), who argued that only revenues had a positive correlation with sporting success, as winning clubs often nevertheless exceeded team expenses in relation to revenues, preventing good financial health. Furthermore, with regard to comparative studies between the sporting success of clubs and non-financial management indicators, there is not much history in the literature, and it can be said that there is even a gap in this aspect.

As such, the aim of this work will be to study the relationship of sporting success, not only with the financial aspect of the clubs, but also with other organisational and management aspects, in an analysis that is intended to be dynamic and simultaneous. Additionally, this study, which will include 35 European clubs, for the 2018/2019, 2019/2020 and 2020/2021 seasons, will be done with the help of Machine Learning tools, namely Random Forest and Feature Importance.

Therefore, some features will be chosen to test their importance in the sporting results of the clubs. In the context of financial management, several authors have already tested possible links with the sporting side, so it makes sense to use them also in this case. Wages and revenues were already studied in this context and Szymanski & Kuypers (1999); Stenheim et al., (2018) defended that there is a clear positive correlation with sport performance.

Still in a purely financial view of clubs, this can be looked at through, for example, their profitability and/or liquidity. In the first case, Michie et al. (2004) revealed that clubs mostly make annual losses, as they spend more money on salaries or player transfers than they could ideally spend. In this sense, the net profits/losses of the clubs in the three seasons studied were also considered.

In the case of liquidity, this can be assessed through the ratio between liabilities and assets and Rey & Santelli (2017) said that the higher this ratio, the worse was the sporting performance of Italian clubs, probably due to a lower capacity to strengthen the squads, due

to higher indebtedness. Other authors who have examined this form of analysis have contended that it ought to be below 100%. If it exceeds this threshold, the club will find itself incapable of settling its debts by relying solely on its current assets and will instead have to seek additional loans, increasing the risk. Rey & Santelli (2017) also studied the ratio of wages to revenues and, contrary to the debt ratio, it had a positive correlation with clubs' sporting success. As such, these two ratios will also be part of the feature list of this study.

A football club, apart from the squad and staff, can also improve its infrastructure. Toti (2017) and Jones (2014) have already studied the various advantages that a better stadium or a better training centre can have on a club in the medium-long term, so we thought it would make sense to include clubs' Capital Expenditures (CAPEX) in our analysis.

However, as mentioned above, it is intended that these features are not only financial, but also encompass more managerial aspects. The average attendance in the stadium is a good measure of the relationship that the club has with its "customer", the supporter, and it is also a metric that some authors (Pinnuck & Potter, 2006) said that has a positive correlation with the sporting success of clubs. As such, we will also consider this number.

Finally, we will also include features more related to human resources management, which, in the case of football clubs, are linked to the coach and the player. In the case of the coach, through a categorical nominal variable, we will test whether the fact that clubs fire (or not) their coaches in the middle of the seasons has an influence on sporting results. Some studies were already done on this issue and the results are different, so we decided to test this feature as well.

As for the players, two features were included, both of which we consider useful for the different strategies of squad formation. Firstly, we wanted to test if the average age of the squad has any correlation with the results on the pitch. Banos (2017) and Poli (2018) presented different arguments in this aspect, as there are pros and cons of having younger or older players. Furthermore, a feature that has already been used by Toma & Campobasso (2023) and that we found interesting to include in this analysis was the Gini Index of the market value of players within the squad itself. That is, this index measures if the different squads are composed by "homogeneous" players, all the same value, or if, on the contrary, they are squads composed by some superstars and the rest by players of lower value. We thought that this is a metric that makes a lot of sense to evaluate a club manager's strategy and therefore we decided to include it.

A list of all these features and a summary of their values can be seen in the tables below.

Table 2: Feature Definition

Feature	Definition
Assets	Total Club Assets
Liabilities	Total Club Liabilities
Debt.Ratio	Liabilities/Assets
Wages	Total Club Wages
Revenues	Total Club Revenues
W.R	Wages/Revenues
CAPEX	Club's Capital Expenditures
P.L	Club's Net Profit/Loss
Av..Attendance	Average Club Attendance
Coach.s.Firing	Firing (or not) of a coach during a season
Gini.Index	Gini Index of market value of players within a squad
Age.Average	Average age of a squad

Table 3: Features' Values Summary

Feature/Variable	Variable Type	Minimum	Maximum	Mean	Median
Assets*	Continuous	36038,47	2041223,83	586574,11	428072,13
Liabilities*	Continuous	24625,13	1657024,36	452813,88	352526,46
Debt.Ratio	Continuous	0,339	1,501	0,803	0,778
Wages*	Continuous	16105,08	506210,26	173392,10	122519,73
Revenues*	Continuous	12011,66	706811,89	266010,74	188281,03
W.R	Continuous	0,344	1,829	0,739	0,705
CAPEX*	Continuous	-25003,07	206315,71	16512,00	5073,47
P.L*	Continuous	-192676,93	37792,76	-38040,91	-19561,12
Av..Attendance*	Continuous	11,311	81,006	45,187	47,214
Coach.s.Firing	Categorical Nominal	0,000**	0,667**	0,295**	0,333**
Gini.Index	Continuous	0,462	0,725	0,565	0,561
Age.Average	Continuous	23,26	26,38	25,03	24,97

*Values in thousands

** Categorical nominal variable, which takes the value 1 if the club fired the coach that season and 0 if it did not. Since three seasons were analysed, each one has a third weighting.

3.4. Measuring Club Results

In the realm of football clubs, there exists a multitude of methods for measuring sporting results, each aiming to evaluate team performance and success. These measurements encompass various aspects, including team rankings, and match outcomes (Szymanski & Kuypers, 1999; Palacios-Huerta, 2002; Koning, 2003; Goddard, 2005). Among these approaches, I have chosen to utilize the Index developed by Barajas et al. (2005), albeit with certain modifications.

This is a compound index, which considers the three main competitions in which European clubs can participate: their National League, their National Cup and one of the two main European competitions in force in the years under review, the UEFA Europa League or the famous UEFA Champions League. The index is represented by the following formula:

$$IND = \sum_{i=1}^{4} \alpha_i P_i$$

Equation 1: Sportive Index by Barajas et al. (2005).

In this index created by Barajas, the variable Pi represents the points obtained in competition i, while αi represents the weight assigned to each competition. The selection of these weightings was based on considering the clubs' economic perspective and the relative importance attached to each competition. Thus, the National Cup is assigned a weight of 1, the UEFA Europa League (UEFA) and the National League are assigned a weight of 2, and the UEFA Champions' League (UCL) is assigned a weight of 3 in order to construct the composite index. The simplification of the initial formula is represented in equation 2:

$$IND = \text{Cup Pts.} + 2 \cdot \text{UEFA Pts.} + 2 \cdot \text{League Pts.} + 3 \cdot \text{UCL Pts.}$$

Equation 2: Compound Index by Barajas et al. (2005).

After knowing the weightings of each competition in the final value of the index, it remains to demonstrate how the points of each competition are attributed. In the case of the national leagues, the points added by each club in the final classification of its own league are

counted. For example, Liverpool F.C. won the English Premier League for the 2019/2020 season with 99 points accumulated from 38 rounds. As such, in that season, Liverpool F.C. have accumulated 99 national league points for this index. This is the reason why the weighting of the national leagues is not higher. Since the leagues are already composed by several dozens of rounds, it is normal that clubs add many points at the end of this competition, so a weighting of 2 seemed adequate to Barajas et al. (2005) and also to who developed this work.

In the case of national cups, the system proposed by Barajas et al. (2005) was also applied, whose diagram can be seen in the figure below. For example, Vitória S.C. were eliminated in the quarter-finals (eight teams remaining) of the Portuguese Cup in the 2018/2019 season, so they accumulated 21 points for the national cup variable that season.

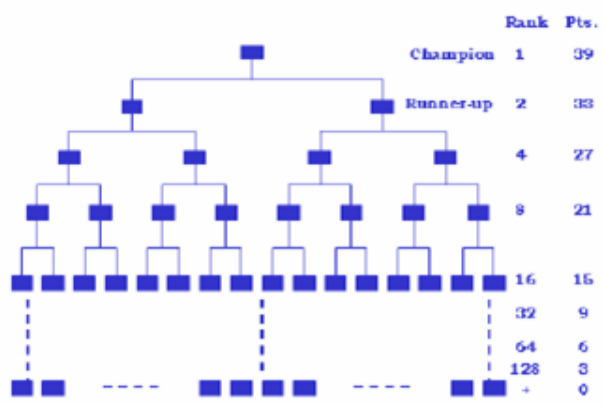


Figure 6: Diagram to measure result variable for national cups by Barajas et al. (2005).

Finally, in the case of European competitions, this is where we decided to slightly modify the index proposed by Barajas et al. (2005) and apply the changes made by Bollen (2010), since the UEFA Europa League and the UEFA Champions League do not have exactly the same rounds throughout the competition, so it makes sense to have slightly different scoring systems. In these cases, clubs receive a certain score for reaching each round and also a few extra points for each win and draw they achieve in those rounds. In tables 3 and 4 we can see these scoring systems for the UEFA Europa League and the UEFA Champions League respectively.

Table 4: UEFA Europa League scoring system, by Bollen (2010)

Qualifying Rounds		Group Stage		Round of 32		Round of 16		Quarter-Finals		Semi-Finals		Final		Winner
1	Qualified	3	Qualified	4	Qualified	5	Qualified	6	Qualified	7	Qualified	8	Qualified	9
1	Win	3	Win	3	Win	3	Win	3	Win	3	Win	3	Win	
0,5	Draw	1	Draw	1	Draw	1	Draw	1	Draw	1	Draw	1	Draw	

Table 5: UEFA Champions League scoring system, by Bollen (2010)

Qualifying Rounds		Group Stage		Round of 16		Quarter-Finals		Semi-Finals		Final		Winner
1	Qualified	5	Qualified	6	Qualified	7	Qualified	8	Qualified	9	Qualified	10
1	Win	3	Win	3	Win	3	Win	3	Win	3	Win	
0,5	Draw	1	Draw	1	Draw	1	Draw	1	Draw	1	Draw	

So, for example, in the 2019/2020 season, Sevilla F.C. won the UEFA Europa League. In that trek, they won 9 games and drew 2, giving them 29 extra points. As for qualifying points for the different rounds, since they went from the group stage to the final and won it, it makes 42 "qualifying" points. In other words, in total, Sevilla F.C. earned 71 points in the UEFA Europa League, according to this system.

Lastly, in the 2019-2020 season of Ligue 1 (France), Eredivisie (Netherlands), and Scottish Premiership (Scotland), the championships were disrupted by the Covid-19 pandemic and did not resume. Consequently, to fairly determine each team's points, an adjustment was made using the rule of three, scaling them to the number of regular matches played in those respective leagues.

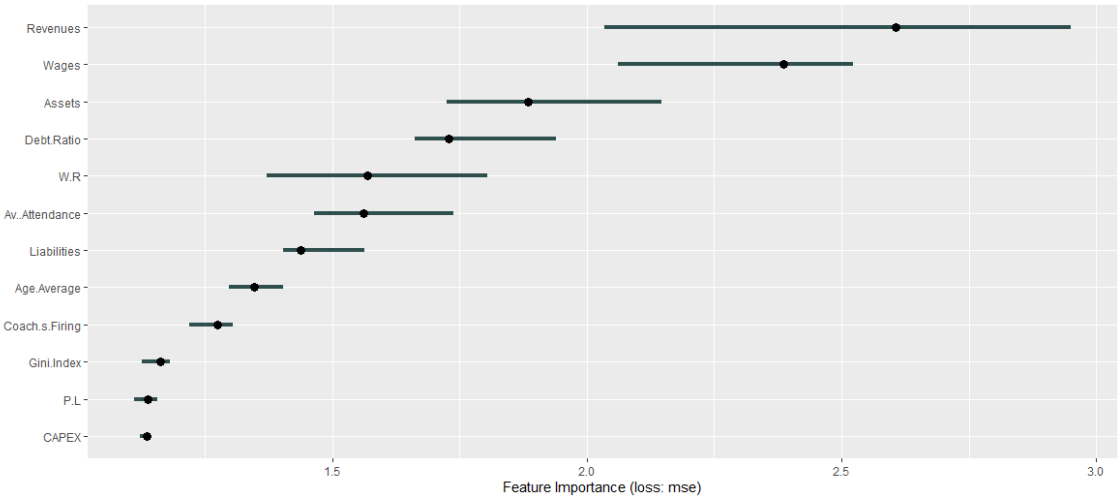
4. Results and Discussion

After listing the management features that will be analysed and the composite index that will be used to measure the sport results, this section will analyse the importance of each feature, with the help of the random forest model, finally making it possible for us to answer the research questions.

With this analysis, it will be easier to understand if there really are some features that create a virtuous circle in football. By allowing the ranking of the importance of the features, it also makes the job of club managers easier, because it prioritises some features over others and explains, in some cases, what clubs must improve if they want better results, and in other cases, what the differentiating factors in management are that are ensuring better results. By leveraging feature importance insights, clubs can gain a competitive edge in the ever-evolving football industry.

As already explained in the methodology section, the importance of the features will be measured by the quality that the prediction loses, if the values of that feature are randomly permuted, keeping the values of the other features constant. Furthermore, the Mean Squared Error (MSE) will be used to measure the quality of the different predictions.

Thus, the graph below shows all the features analysed, in descending order of importance. The graph will be in the form of a box plot, which shows the value of each feature importance and also the variance of that value.



Graph 1: Respective Features' Importance

4.1. Does the virtuous circle concept exist in football, and if so, what are its key components and dynamics?

As we can see in Graph 1, the most important features are clearly revenues and wages, with values of 2.5 and 2.2, respectively. This data is in line with all the studies done in the past (Lago et al., 2004; Galariotis et al., 2017; Szymanski & Kuypers ,1999; Stenheim et al., 2018; Rey & Santelli, 2017; Sugumaran et al., 2020;) and is not surprising. As these authors have already mentioned, a club with lots of revenues, be it through ticket sales, sponsorship, merchandising or competition winnings, will inevitably have more money to buy better players and offer higher wages. With better players, in theory, the teams are better and, therefore, it is natural that there are better results. These data are also in accordance with the virtuous circle of Lago et al. (2004) and also that of Galariotis (2017).

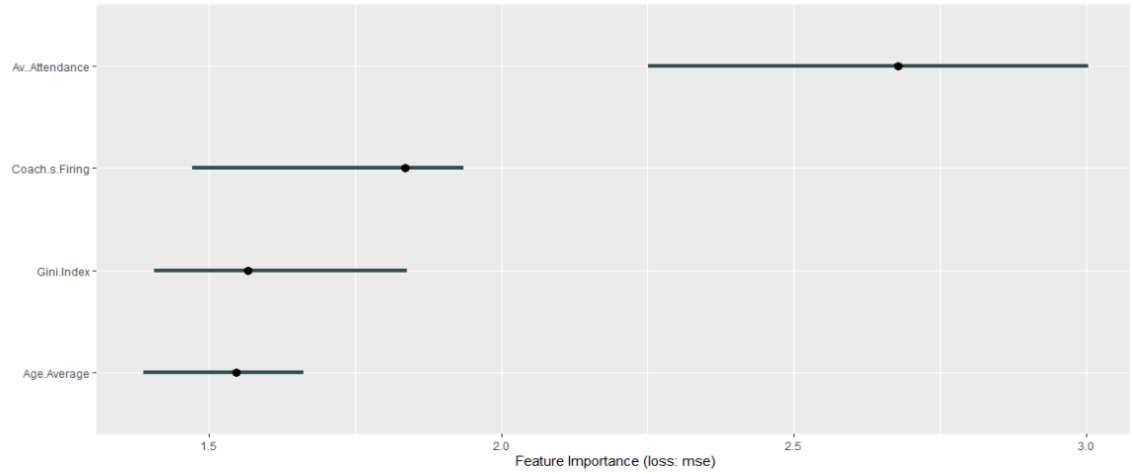
However, speaking again of these two types of virtuous circles studied in the past, they also analyse other financial issues, like profitability and liquidity. In this graph, we see that the debt ratio feature of the clubs, which is a good way to evaluate liquidity, has also a great importance in sporting results. That is, in these predictions, a club with a higher ratio of liabilities to assets, and therefore a worse degree of liquidity and worse financial health, has a greater tendency to have more victories. This goes against the virtuous circle of Lago et al. (2004) and reinforces the theory of Galariotis et al. (2017). Another aspect that reinforces this idea is profitability (P.L feature), which does not present a great importance in this analysis. In other words, we could observe that the clubs having profit or not at the end of the year did not influence particularly their sporting success. In fact, we could see this right away, since both the mean and the median of this feature in the sample are negative values.

So, to conclude the answer to this first research question, our analysis says that there is indeed a virtuous circle in football, between sporting results and club revenues. Nevertheless, financial health, as measured by the remaining indicators of this nature, does not seem to be linked to victories on the pitch, which makes the circle restricted to the feature of revenues only. This is in line with Galariotis et al. (2017) and against the original idea of the virtuous circle, by Lago et al. (2004).

4.2. Are non-financial management features important determinants of on-pitch results in football?

The feature at the bottom of the ranking, in terms of importance, is CAPEX. We do not think that this is a reason to underestimate the importance of this variable for the clubs, since the purpose of these expenses is actually to be an investment for the future and for the growth of the clubs, so it is natural that, in the short term, the sporting results of the clubs are not exactly impacted by this feature. Like Jones (2014) showed, Manchester City improved drastically its facilities in 2011 and the proper results on the pitch only appeared a few years later.

In second to last place is the Gini Index of the market value of players within the same squad. As a matter of fact, this feature is part of the group of indicators that we wanted to add to this analysis, when compared with previous studies. We believe that, for an adequate strategy within a football club, all its aspects should be analysed simultaneously, financial or not, and that is what Graph 1 represents. Still, since these "non-financial" features have not yet been much addressed in previous studies, we decided to also show the graph with the importance of only these features (Graph 2).



Graph 2: "Non-Financial" Features' Importance

In the graph above, we see that the average attendance in the stadium has an enormous importance, at the level of revenues and salaries in Graph 1, which goes in

accordance to what Rey & Santelli (2017) said. This reinforces that it should be a concern of the clubs to convince their fans to go to the stadium and support the team.

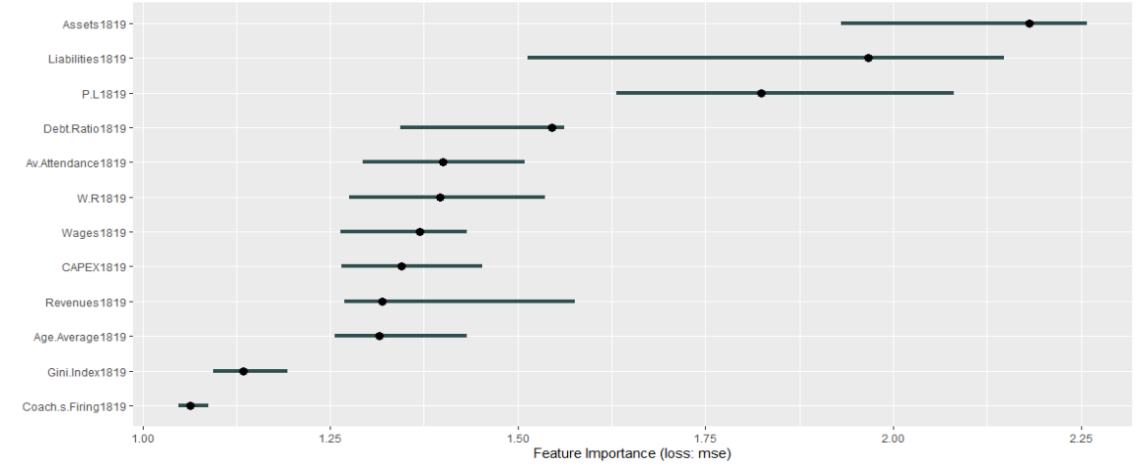
In the opposite direction, in last place in this graph is the average age of the squads. That is, a higher average age of a squad does not mean a higher composite sporting index (results). It corroborates the idea that younger players also bring value to the team (Banos, 2017), even if an age-heterogeneity makes sense in the squad.

In summary, to answer the research question, yes, non-financial management features are also important for clubs' sporting results, and as such, should be taken into account by club managers for proper and responsible management. All features showed to be relevant enough to be studied more than they have been so far, namely in conjunction with the financial aspect.

It is true that, in the graph with all the features included, the non-financial indicators appear mostly in the lower half of the ranking of importance. However, this is natural, as obviously the difference between, for example, wages and revenues within the sample are much higher - we are talking millions of euros - when compared with, for example, the average age of the squads, which are separated by decimals. Still, these features proved to be relevant enough to deserve further studies on their importance.

4.3. Are there consequences and effects of COVID-19 on the football industry?

Finally, in an attempt to check potential effects of COVID-19, we compared the importance of features, exclusively for the last season before the pandemic (2018/2019), with the overall results, to see if there were any relevant differences. The feature importance of that season is represented in the graph below.



Graph 3: "Non-COVID season" Features' Importance

The biggest differences we found are the loss of importance of the revenues and wages features, but in this case, we believe it is only due to a one-off situation, typical of the exclusive analysis of a season. That season, for instance, Real Madrid and Manchester United had the worst performances in this analysis.

However, in addition to that, we find it much more interesting that profitability (P.L) has increased in importance in the sporting results of that season. That is, before the pandemic, clubs being profitable at the end of the year had a much bigger impact on their sporting performances. It remains to be seen if this is due to the same reason as the features in the previous paragraph (short sample), or if, in fact, the pandemic brought serious financial difficulties to the big and victorious clubs, even if it was not noticed on the field.

In other words, we were indeed able to observe differences in football pre and post COVID-19. However, more studies in the future should be done in this regard, as the sample for this study cannot be considered fully relevant.

5. Conclusions

The aim of this study was to contribute to the existing literature on the relationship between strategy and results in football. Managing an organisation, whatever it may be, is a complex process and in the case of football clubs there are also many emotional factors involved, which makes it even more difficult. As such, understanding what the best practices are, at a strategic and organisational level, is fundamental to the sustained success of clubs. The three research questions involved, firstly, whether there is a virtuous circle in football and, if so, how it works; furthermore, it was important for us to find out whether non-financial management features impacted on clubs' sporting performance; and, finally, whether any impacts of the COVID-19 pandemic on our results were observable.

To this end, 35 of the top European clubs were analysed for the 2018/2019, 2019/2020 and 2020/2021 seasons. In addition, machine learning tools were used, such as random forest and feature importance, which are innovative in this ambit and, in our opinion, more useful and with more possible insights compared to what has been used in previous studies, such as the regression method.

Still, there were some limitations to this study. The fact that clubs often do not want to share some data publicly made it difficult to obtain information. Also, the impact of COVID-19 is not yet fully quantified, so the results of the seasons analysed may be somewhat biased by this issue.

At the level of findings, the first main questions this study wanted to address was the notion of a virtuous circle in football, as there have been contradictory studies in this regard in the past. Lago et al. (2004) argued that there was a virtuous circle in football, where the financial performance of clubs as a whole was fully intertwined with their sporting success, in an endless cycle, whereas Galariotis et al. (2017) said that this circle only applied to revenues and results and that, in the opposite direction, financial aspects such as profitability and liquidity of clubs had an inverse relationship with sporting success.

Our analysis has shown that clubs with higher debt ratios and potentially poorer liquidity tend to achieve more victories and also profitability does not appear to have a significant influence on sporting performance, suggesting that the financial aspect of generating profits may not directly translate into on-field success. With that said, it seemed evident the existence of a virtuous circle in football, but only between sports results and

revenues. The remaining financial indicators showed us that the financial health of the clubs, measured through profitability and liquidity, even has an adverse effect on what happens on the pitch. As such, it goes more in line with the findings of Galariotis et al. (2017), comparing to the ones of Lago et al. (2004).

This is a concept that has some validity in practice. We see more and more clubs with external investors, who inject large amounts of money, without much concern in managing it in the best way. The examples of Manchester City and Paris Saint-Germain are paradigmatic, of clubs that win many titles but spend extremely high amounts of money every year. If we look outside Europe, the recent example of the Saudi clubs, who are convincing the best players in the world to go and play there, through huge salaries, shows that the financial sustainability of football has not been a major concern for those who manage the clubs.

Additionally, the study introduces other non-financial features, such as average attendance and average age of squads, to assess their importance in predicting sporting outcomes. The results indicate that average attendance in the stadium plays a crucial role, similar to the impact of revenues and wages. This highlights the importance of fan support and emphasizes the need for clubs to engage their supporters effectively. On the other hand, the average age of squads does not correlate strongly with sporting success, suggesting that younger players can contribute value to a team, as supported by Banos (2017). It is not by chance that we have seen Real Madrid, the most successful club in the world, reshuffle its squad in recent times with an eye to the future. Players like Cristiano Ronaldo, Sergio Ramos or Karim Benzema have given way to younger players like Vinicius Jr or Federico Valverde, so that the sporting success will continue for more years to come.

All features, be they financial or otherwise, did indeed present importance for sporting results, as such, the answer to the second research question is also affirmative. Furthermore, future studies on this type of features are recommended, something that is scarce in the existing literature.

Lastly, considering the potential effects of COVID-19, the comparison between the overall results and the last season before the pandemic reveals a particular intriguing difference: an increased significance of profitability in influencing sporting performances before the pandemic. This shift in could be potentially reflective of the financial importance challenges faced by prominent clubs during the pandemic, even if those challenges were not immediately evident on the field.

Still, it seems logical to us that a pandemic that shook the whole world in various ways also had an impact on football, since the clubs lost, for a long period of time, practically all contact with the fans who, and we also perceived this in this study, are fundamental to the proper functioning of football and institutions.

After analysing the full results, it was proven that there is a relationship between the clubs' strategic practices and their results on the pitch, not only on the financial level. Although there are some features that are more important than others, they all revealed a loss of quality in the predictions if feature values were randomly permuted. As such, in an industry where more and more external investors are coming in, with virtually unlimited funds, it is extremely important for clubs without such investors to execute a well-defined strategy, so that the gap to the "rich" clubs does not increase significantly. Often we hear about long-term projects in football and, for example, after two or three defeats in a row, we see managers being sacked immediately. It is a sign that clubs sometimes seem to be run with the wind and that should not be the case, particularly when there are no indications that a change of coach will significantly improve the results of that team. Even so, in our opinion, it is important that entities such as FIFA and UEFA regulate these entries of new investors so that competitiveness does not disappear.

We reiterate that, for future studies, it is suggested to further develop the issue of non-financial features, as they are a very important part of the clubs' strategy management. Furthermore, an analysis that would allow us to know, in addition to the ranking of the importance of the features, which are the ideal values for each of them, is advisable. Finally, in the coming years it will already be easier to evaluate the real effects of the pandemic and if there are new trends that are here to stay in the long term.

6. References

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