

MASTER IN MANAGEMENT

**The internationalisation effect
in football teams**

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List of Abbreviations

| | |
|-----------------|--|
| CL | Champions League |
| EU | European Union |
| FFP | Financial Fair Play |
| HGP | Home Grown Player |
| FIFA | Fédération Internationale de Football Association |
| UEFA | Union of European Football Associations |
| CONMEBOL | CONfederación sudaMERicana de Fútbol |
| AFC | Asian Football Confederation |
| UO | Uncertainty of Outcome |
| DAG | Direct Acyclic Graph |
| <i>I</i> | Investments |
| <i>T</i> | InTernationalisation |
| <i>S</i> | Sporting results |
| <i>E</i> | Economic result |
| <i>R</i> | Regulations |
| <i>Q</i> | Quality |
| <i>s</i> | Stability |
| <i>P</i> | Prestige |
| <i>U</i> | UEFA prize |

Introduction

With the conclusion of another football season marked by the uncertainty of the pandemic, we hear again about the long-awaited revolution of European competitions. After last year's introduction of the new UEFA Conference League and following persistent rumours regarding the possible birth of the Super League, a competition desired and organised by the top clubs, it was a few months ago that UEFA announced the transformation of its main competition, the UEFA Champions League. From 2024, the cup will expand from 32 to 36 teams divided into 2 rounds with round-trips. This massive change is mainly due to the need for European clubs to take advantage of the increased revenue from the sale of TV rights and the media resonance of European competitions.

In this study, we will take as a starting point the scientific literature on the relationship between investment, sports results and the economical results of football teams and focus on the causal effect of the increase in the international dimension of football teams participating to the Champions League, from 1955 to 2020. In particular, we are going to look for a effect of teams' investments on the economic outcome of the same team, mediated by the sports placement in the UEFA tournament and the heterogeneous dimension of teams' internationalisation, a latent dimension proxied by the quantity and quality of foreign players in the team, the presence of international managers, and foreign ownership. The main objective of this study is to assess the internationalisation effect in football clubs taking into account the fundamental role of investment on economic performance. In fact, since the 1990s, the football sector has accelerated its globalisation dimension, leading to the growing need for international football stages to finance the operations of major clubs that have in the market and in international competitions two of their main sources of income.

In this contribution, that is conceptually rooted in a the much broader field of international business, we investigate whether the international dimension of clubs influences their economic and sporting performance. This is one of the first contributions that examines this very issue, and it is the first one with an explicit causal view, that is made evident by the use of Direct Acyclic Graph modelling and the correspond use of regression techniques in estimating the elasticity of teams' revenues

to investments, considering the mediating role of sport outcomes and internationalisation.

The structure of this essay is the following: In Chapter 1, the reasons for choosing the Champions League (CL) as the reference tournament and sample of teams over other possible alternatives are quickly analysed. Chapter 2 includes research conducted previously about the relationships between the different factors as economic investments, sportive and financial performances and internationalisation elements of football clubs. In Chapter 3, the data collected are described and the results of the analysis are explained graphically and statistically. The final section concludes and include some reflections on the relationship between the results obtained and the current trends in the football sector.

Chapter 1

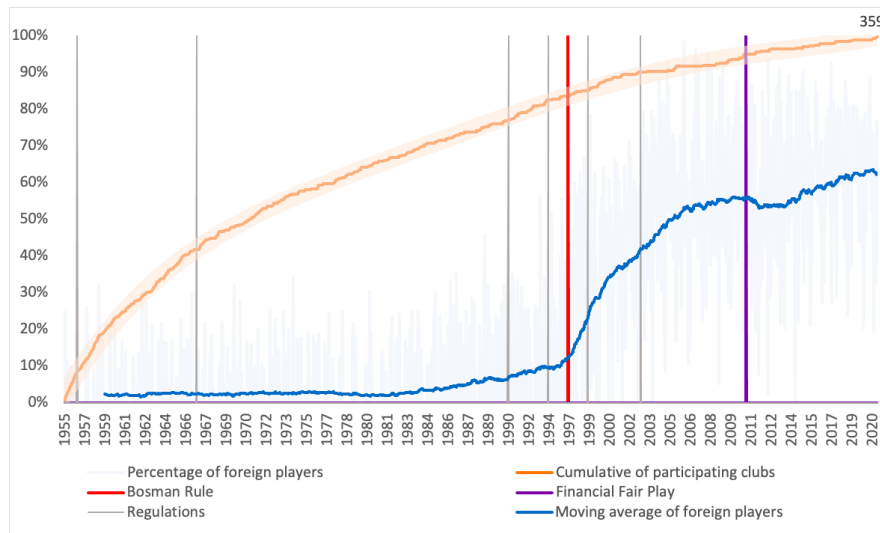
Football teams' performance and the UEFA Champions League

The sample used in this analysis includes the 66 editions of Europe's main football competition. Introduced in 1955 as the *Coupe des Clubs Champions Européens*, and commonly known as the European Cup, today's Champions League (CL), is the most prestigious stage in football and the most popular club football event on the planet with only the top clubs in national competitions participating since 1955.

Originally designed as a 16-team tournament and then transformed to its current 32-team composition, the competition has seen 359 clubs from 45 different countries taking part of the event, and it has always been an essential source of visibility and revenue. Economic interests, and in particular television rights, played a crucial role in the creation and organisation of the tournament and in bringing new sources of revenue to the football industry. The idea of an annual tournament involving the strongest teams on the European continent caught the interest of those owners and managers who could no longer realise an acceptable return on their large investments in the national championship alone. Throughout the competition's history, sporting legends, rivalries and the prestige of the major clubs have been formed, known and supported beyond their home nations and continents.

Since 1955, the reputation of the sport has grown thanks to the possibility of watching international challenges between the best teams from different countries, inevitably attracting major sponsors and new talent from all over the world. The data collected shows that, over the course of its history, the competition has offered to an increasing number of teams (359) and top talent the opportunity to show off. Both because of the increased international attractiveness and the greater investment possibilities that the competition has guaranteed, the number of foreign players has also increased from the meagre percentages recorded at the beginning to today's quota of over 60%, on average, per participating team.

FIGURE 1.1: Internationalisation



Note: Figure 1.1 was created using original data, collected on purpose from the official UEFA Champions League website and the football specialised web page transfermarkt.com. It displays the increasing number of clubs taking part in the competition (in orange), the percentages of foreign players per club (the light blue vertical lines depict the interval between the minimal and the maximal percentage) and the dark blue line is the yearly moving average. The grey vertical segments indicate the corresponding year to the change of the tournament regulations; the red one indicates the adoption of the Bosman rule in 1997, and the purple one the introduction of Financial Fair Play in 2010.

The growth path in the percentage of contracts involving, on average, foreign players has been characterised by phases of rapid expansion and slowdowns. In the summer of 1996/97, for example, following the Bosman ruling,¹ the borders were opened-up to non-EU players, allowing the unrestricted registration of foreign players from the EU, who were also registered in the presence of other foreigners and free of charge when they had no contract. Moreover, in 2009, the slowdown in the moving average of the percentage of foreign players under contracts in CL European teams seems to be related to the introduction of the UEFA "break-even" rule of "Financial Fair Play" (FFP),² which obliged clubs not to spend more than what they earn, with the aim of guaranteeing potential creditors of football clubs from

¹ The Bosman ruling was a jurisdictional measure implemented by the European Union's Court of Justice in 1995 to govern professional football player transfers between federations inside the European Union. The ruling was followed by an implementation by UEFA, which in 1997 also gave non-European players the possibility to transfer freely between clubs of European federations and to be purchased as free agents once their previous contract had expired.

² Financial Fair Play is an initiative launched by the UEFA Executive Committee in September 2009 with the goal of preventing football clubs from defaulting on their obligations and encouraging them to become financially self-sufficient over time. The rule has been in operation since 2010 and has allowed clubs to adapt to the required cost reduction within three years. The stated aim was to make it

excessive indebtedness of the same clubs, but inducing a widening in the gap and the financial dominance of the top clubs compared to mid-ranking teams. The FFP adoption seems to be related also to the slowdown in the growth curve of CL participating clubs. It is important to underline how the rules introduced by UEFA for this competition (including the Home-Grown Players rule)³ influenced the entire football market and the composition of the teams, even of those teams that did not systematically took part in the tournament.

Having described the importance and the characteristics of the CL competition, it is imperative to explain the reasons that led to the selection of the CL and not the FIFA World Cup as the event to study. The FIFA World Cup can in fact be considered the most representative and prestigious international competition in football. However, if on one hand it could certainly be a benchmark for evaluating the level of the football movement of a nation, on the other, not being open to clubs, the World Cup is not a useful case study of teams behaviour in terms of the role of foreignness (Lu et al., 2021) in influencing the economic and sport performance of teams. National selections, in fact, have the possibility to choose among the national players available a shortlist of the best talents, but they have no way to include players from other nations. Similarly, national teams have an audience that is generally limited to national fans who follow the team only during the competition in question, which engages the team once every two years (alternating World Cup and Continental Cup). In addition, the recent willingness expressed by the top clubs to establish a Super League (a competition similar to the CL) composed and organised independently by the European top clubs, only reinforces the idea that this type of competition is a fundamental element for the profitability, visibility and awareness of the major and emerging football clubs.

In Deloitte's report (Ross et al., 2019) regarding the 17/18 season, it is stated that the UEFA Champions League and UEFA Europa League played an important role in improving, or maintaining, Money League positions for Liverpool, Chelsea, Tottenham, AS Roma, Everton and AC Milan, while Arsenal, Juventus, Leicester City and Southampton lost positions or even their top 20 status altogether after the reduction in revenues from European competitions. This is because, as Ajadi et al. (2020)

mandatory for top clubs to have a solvency that would protect stakeholders and maintain a high level of competitiveness, preventing richer clubs from systematically spending more than they earned.

³ The Home-Grown Players Regulation is a UEFA competition rule that was first applied in the 2006-07 season and has been fully operational in the 2008-09 season. According to this rule, in addition to a maximum of 25 players for List A, teams were obliged to select a minimum of eight home-grown players from clubs in the same national league, four of whom came from the club's youth system. The purpose of the rule was to provide an indirect limitation on the number of foreign players while protecting the growth of young national footballers.

explains, even in the 18/19 season, which ended still in the absence of the pandemic, TV rights revenues remain the main source of income for clubs, accounting for 44% of total revenues, with the UEFA Champions League being the competition that distributes more to its participants.

To conclude, its centrality in the economic expectations of the football teams, combined with its prestige unequalled by other 'minor' competitions such as the UEFA Europa League (composed of the teams excluded from the CL), AFC Champions League and CONMEBOL (Copa) Libertadores (the less globally followed Asian and South American counterparts of the CL), makes the UEFA Champions League the most suitable case for studying the interplay between investments, sport and economic outcomes in the world of football. Winning this cup is not only the gateway to football history, but also the main ambition of European clubs, both sportingly and economically. It is no coincidence that the clubs that take part are said to become part of the 'Football that counts' (Kuper and Szymanski, [2018](#)).

Chapter 2

Literature review

Having introduced the competition being researched, let's look at the factors that the scientific and professional literature proposes as being of interest in the study of role of international dimensions of football teams on sport and economic outcomes.

We can start by saying that, nowadays, there is a consistent economic and business literature on the sport sector, and on football in particular. Since the late 90s, most of this research has attempted to analyse the relationship between sporting and economic performance with the expectation of finding a direct dependency and proportionality.

2.1 Sporting and economic outcomes

In their seminal contribution, El-Hodiri and Quirk (1971) argued that the income of a sports club was proportional to the percentage of victories of this team in its league. However, as we shall see in the present analysis and as it has been stated by Murphy (1999), the relationship between economic performance and sporting performance is less direct and more complex than we might expect. The reason lies in the important role of mediating factors and on the important difference between correlation and causation. Both points will be examined in Chapter 3.

According to Barajas et al. (2005), using regression analysis to establish a correlation between the position of the football teams in the Spanish league 98/02 and their seasonal incomes, there was no evidence of a relationship whatsoever. Haas et al. (2004), using the concept of efficiency in their analysis of the 99/00 German league, show that lower-middle ranking teams often outperform top ranking clubs economically. Moreover, Kuper and Szymanski (2018) state that according to their study on league positions and profits of clubs that played in the English Premier League from 1997 to 2016 the data shows neither a connection between placing and making money, nor between changing position and changing profits. As far as the latter

point, the focus on profits can lead to ambiguous results, since the courses of action are either to increase earnings above costs, aiming to dominate the most lucrative competitions, or to reduce costs below returns while suffering on the pitch. For this reason, profits do not seem to be a meaningful economic variable in measuring the economic success associated to sporting results, because they can be achieved by successful teams as well as by clubs that give away competitiveness in order to reduce costs.

On the other hand, however, as described by Szymanski (1998) and Szymanski and Kuypers (1999), there is strong evidence that better League performance leads to higher revenue. This is certainly true if one limits the consideration to the economic revenues deriving from the championship prizes and from the television rights which are somewhat mechanically proportional to sport performance, but, as exemplified by Szymanski and Kuypers (1999), there is also more general empirical evidence coming from the various cases that they studied. Looking at the period between 1978 and 1997, 89% of the changing income of football teams was explained by the English league position of the club in that season. In this case the measure used to quantify the teams economic outcome was the logarithm of the revenues of each club (normalised by the average annual revenues of all other teams). The evidence of a positive correlation between sporting and economic outcomes, would therefore reinforce the idea that revenue is the correct indicator of economic performance that can be dependent to sporting performance, at least in the long run. Certainly, the importance of the time factor must be taken into account. For a study based on a single football season, the investments do not perfectly reflect sporting results and these do not reflect the economic results due to the so-called uncertainty of outcome (UO). As explained by Dalziel et al. (2013), the more evenly balanced the competitive forces are, the more unpredictable the outcome of each match and, by extension, the tournament as a whole will be. One of the reasons for the famous and historic victory of the underdog Leicester City in the most competitive league in the world (117Th Premier League 15/16) is precisely the uncertainty of the sport. In that year, in fact, the Foxes were neither the team that invested the most (only £80m spent on wages compared to Manchester UTD's £232m) nor the one with the highest revenue (around £129m compared to Manchester UTD's £515m).¹ Since low levels of UO at the match or championship level can lead to predictable leagues, in an attempt to preserve the attractiveness and the sustainability of the game, federations have introduced rules, as the HGP rule and financial fair play (discussed below),

¹ Conn, D. (2017) Premier League finances: the full club-by-club breakdown and verdict. The Guardian. (<https://www.theguardian.com/football/2017/jun/01/premier-league-finances-club-by-club>)

aimed at allowing a fairer a competition as possible, inducing a high level of UO. Despite this, some aspects are still difficult to interpret. What the study by Dalziel et al. (2013) tries to address is the distinction between the short- to medium-term unpredictability from the long-term one. In the shorter run of a match or a season the sporting outcome of a club are affected by a certain degree of unpredictability because even the best players in the best conditions are human and not infallible. This factor is fundamental for football and has for sure to remain unpredictable in order to keep the fans' interest high, at least in the short run. The situation is different in the long run where there is evidence of domination of the leading positions by the richest clubs.

This hypothesis is, however, not confirmed in Michie and Oughton (2004), that uses Lorenz curves of total points scored by English clubs for the 50/51, 93/94 and 04/05 seasons, but is instead the central idea of Utt and Fort (2002) critique of a similar study conducted by Schmidt and Berri (2001) concerning baseball. Schmidt and Berri (2001) used the Gini coefficient, which is a useful measure of horizontal industrial concentration, to assess the level of league monopoly. Utt and Fort (2002) adjusted the Gini coefficient by comparing the actual distribution of winning percentages with the more unequal case where the champions win all their games and the losers lose all their games, suggesting that leagues are in fact less competitively balanced than was claimed.

Therefore, summarising what is expressed in the controversial literature on this subject, we can take as a starting point the idea that, although complex and mediated, there is a relationship between revenues and sporting results. This is based on greater competitiveness in the long term of the clubs which, having greater revenues can afford higher costs maintaining more competitive teams. In the jargon of causal analysis (Pearl, 2009), teams' revenues and sporting results are potentially *adjacent variables*. The main goal of this research is to unveil the causal link between them, and to highlight the mediating variables that can eventually separate them.²

Another possible relationship between sporting and economic performance can be found in the influence that sporting results have on the share price of clubs listed on the stock market. Looking at the Turkish league 02/03, Devocioğlu (2004) confirmed this idea by showing a relationship between the value of shares and the football

² In probability terms: if we call S the measure of sporting results, and E the measure of teams' economic outcome, both $p(S)p(E|S)(S \rightarrow E)$ and $p(E)p(S|E)(E \rightarrow S)$ can describe the observed relation $p(S, E)$. This is why observing a correlation between the two variables is non equivalent to precisely identify the causal link between them. If the connection between S and E is mediated by a third variable, observed or latent, the causal path between S and E is said to be *d-separated* (Pearl, 2009).

results achieved by clubs. However, this evidence is less relevant to the present analysis, as most of the clubs considered are not listed and the few that are, have only become so in recent years.

2.2 Investments and sporting outcomes

The second aspect to be defined for this research is the relationship between a club's investments and its sporting results. Even taking into account the normal uncertainty of this sport, it can still be argued that teams that invest more win more. Like in every production function, the quality of the output depends on the quality of the inputs used in the production process. This idea is common to numerous studies including Murphy (1999); Szymanski (1998); Szymanski and Kuypers (1999); and Kuper and Szymanski (2018). According to Murphy (1999), the concentration of economic resources is inevitably reflected on the pitch and therefore in performance rankings. This suggests that there is a strong likelihood that some clubs, the wealthiest in the Premier League under his consideration, will retain their status while the others will fight for the bottom positions. Szymanski (1998) and Szymanski and Kuypers (1999) described as one of the basic principles of performance in football that, increased expenditure on footballers' wages leads to better performance in the league. Players' payroll which represents one of the two main components of investment in a club's sporting season, together with the transfer balance. In their book, Kuper and Szymanski (2018) point out two key aspects: on the one hand, the club's wage bill is an excellent predictor of league position, on the other hand, investment in player acquisition is much less significant. Studying English leagues from 1978 to 1997 they found that the net outlay on transfers explained only 16% of the variation in a team's league position while wage bill contributed 92% of the variation. While it is possible to assume that having a squad of higher paid players attracts better performing ones the same reasoning does not apply to transfers and signings. To give an example, a team could buy a lot of young players with good potential with the aim of earning money from resale and spend the same amount of money that is necessary to buy a top player at peak performance. Obviously, the top player is likely to perform better than the group of youngsters but there may also be that a new talent hides among them, ready to emerge. Moreover, Kuper and Szymanski (2018) explain that what applies to the relationship between sporting and economic results can also be translated to the correlation between wages and sporting results. That is, in a single season the correlation is weaker than in the long run, as demonstrated by the case of Leicester who won the title in 2016 with 15th highest wage bill. Again, a longitudinal analysis will guarantee a lower weight to outliers.

2.3 Regulations

A very important additional factor to consider when assessing the possibilities of investing in and acquiring players are the above-mentioned regulations, put in place by the federations with the aim of keeping the game competitive and engaging. In this research we will consider the rules of financial fair play (FFP) and home-grown players (HGP) as important complications to the more liberal Bosman ruling. The free market in football ensures the possibility of securing the performances of a player in two ways: buying him by paying the club that owns his contract, or taking players once their contract is expired and they are therefore in possession of their own card. This second possibility was introduced by the Bosman ruling, which then allows European players to move freely to another club once their contract is over (Madichie, 2009). As Gardiner and Welch (2016) remind us, it should be noted that in 1997, FIFA decided to change its rules to allow any player (not only European) to transfer to other clubs within the EU on free transfers once their contracts expire, also removing the maximum limit of foreign players in the squad.

This boost to liberalisation resulted in a rapid growth in the percentage of foreign players and was then restricted in the following years, about a decade later, by rules that indirectly limit the flow of players through economic and demographic barriers. Economically speaking, according to Vöpel (2011) and UEFA, Financial Fair Play provides a regulatory framework that prevents clubs from becoming insolvent and indebted beyond their ability to generate revenue, ensuring competition based on the resources these clubs generate. This regulation affects both small and big clubs by limiting the possibilities of buying top players from domestic or foreign leagues for an economically unsustainable price, thus limiting the possibilities of investment. But the question that Vöpel (2011) himself asks is, do we really need financial fair play in European club football? His answer is that on the sporting side, the dominance of the national champions will be less contestable, as limiting a club's deficit and limiting the possibility of acquiring outside money will decrease the ability of the underdogs to close the gap with the national champions. On the economic side it is Kuper and Szymanski (2018) who explain that the rule does not so much benefit the competitiveness of the game as it does the ability of the owners to enrich themselves. If in fact cost control cuts the payment of wages and the purchase of players, there is no reason to think that these savings will be reinvested in football. It is also questionable whether the reduction of expenses is effective, since, apart from 2014 when the rule was introduced, teams in the top divisions continued to spend more than 60% of their revenues on wages.

The second rule that this study considers is a demographic limitation of the players' market, the home-grown players rule. Littlewood et al. (2011) describes the HGP rule as a campaign relating to a Europe-wide policy that obliges each club entering UEFA competitions to register a squad of 25 players that includes at least four players trained by its own academy and four additional places for players trained by other clubs but in the same association. As mentioned by Gardiner and Welch (2016), the aim of this regulation is to preserve the development of young local talent from the clubs' youth sector which are often suffocated by the influx of ready-made foreign players. This influx is constantly growing as evidenced by research showing that foreign players signed by teams in the top 5 European leagues in each country accounted for 42.4% of all players in the 2007-2008 season, rising to 46.59% in the 2013-2014 season. In the English Premier League, the number of international players rose from 59.5% to 62.9% in those two seasons. Despite the introduction of the rule, however, Poli et al. (2019b) report in their study that between 2009 and 2019 the percentage of club-trained players in European league teams decreased from 23.2% to 17.2%. If only the top five leagues are taken into account, the average value drops to 14.3% in 2019. In contrast, expatriates marked a record value for the fifth consecutive year. The latter henceforth account for 41.8% of players in the sample. Ten years previously, this percentage was only 34.7%. Research therefore does not seem to be able to demonstrate a concrete impact of regulations in the management of club investments, but one must also consider the huge increase in football-related business. Poli et al. (2019a) report that at big-5 league level, the investments in transfer indemnities have grown from €1.5 billion in 2010 to a new record of €6.6 billion in 2019 (+340%). This may indicate that although the new rules have not interrupted the growth trend of foreign players at Europe's top clubs, they may have limited its scope. Probably, given the completely new dynamics linked to increased investment and inflation in football, it is not possible to establish what the values linked to economic results and the composition of the rosters would have been in the absence of these rules.

Another measure that this field of study identifies as mediating between investment and sporting success, and closely linked to the regulations introduced, is the quality level of the team to which a given investment gives access. As mentioned above, for a given level of investment, there is a tendency to consider more qualitative a team with fewer players but with a higher technical and economic value, both in terms of price of the card and of salary. In this case, however, international factors also come into play and some countries are considered more of a talent factory than others, influencing players' prices. Adewole (2014) for example, defines "The black market" a free market for clubs to 'snap up' unregistered prodigiously talented footballers

from Africa for basically nothing. On the other hand, Kuper and Szymanski (2018) talk about 'fashionable' football countries. In other words, countries for which nationality alone is a guarantee of innate vocation and natural ability. One example is Brazil, which is part of a cluster of South American countries that has always produced talents with a high technical rate. More recently, Belgium, first in the FIFA ranking, and France have been coming into fashion. Once again, the reasons can be traced back to the ability of Western European countries to periodically produce generations of talent that are the result of know-how shared in countries with the most widespread football culture. Obviously, this predilection for the more 'glamorous' nationalities leads to more money being spent on buying players than on those who are equally talented but more difficult to scout. In their report, Poli et al. (2021) highlights through the rankings for countries exporting footballers those countries with the highest number of exports and those that have seen the greatest increase in recent years. Numbers confirm that there are 1287 Brazilian expatriate players, followed by 946 French and 780 Argentinian. In 2021, the biggest increase was in France with +124 followed by Belgium with +54 compared to 2020. What most supports the hypothesis linking foreign imports to higher perceived quality, however, is the import information. The report shows that the top 5 European leagues are all in the top 9 import rankings with England, Italy and Spain in the top 3. This data supports the idea that the top clubs that aspire to dominate the international scene are also those that make the most use of importation. In the same report by Poli et al. (2021), there is also a qualitative analysis of exported players. The ranking in question uses a coefficient based on the sporting strength of the clubs in which these players play. This strength is calculated on the basis of the results obtained by the club at national and international level. Brazil is still in first place with a player production index of 1.6 million (6.8% of the total). France (5.1%) and Spain (4.8%) complete the podium ahead of Argentina (4.6%) and two other European countries: England (3.5%) and Germany (3.1%).

2.4 Strategic interactions

Having said that, the dynamic that influences the purchasing decisions of clubs aspiring to win is explained by Haugen and Solberg (2010) using the idea of "the soccer globalisation game." The paper defines that if marginal expected pay-off increase by the "Foreigner" exceeds the marginal cost associated to the "Foreigner" wage, a "Foreigner" is bought. Obviously the research takes into account the specific case of a single game in which the only determinant of success is based on the higher quality of the foreign player with respect to that of the domestic one, but the reasoning can be used as a reference to understand that, if in a league a club invests an extra

budget to secure foreign players considered more talented, the competing teams will be implicitly more likely to replicate the same strategy by spending more on "Foreigners" and ending up trapped in the Nash equilibrium of a prisoner's dilemma, of which the research refers to.

2.5 Management, staff and ownership

After commenting on the aspects related to the team's roster, another factor that the research examined in the qualitative assessment was the quality of the manager and staff. With regard to managers, Poli et al. (2020) try to find evidence that data on players replicate also in coaches, but if on the one hand there seems to be a concentration in expatriates from countries with a deep football culture (Argentina, Spain, Germany and Italy in the top 5 places) on the other hand there does not seem to be a real concentration of foreign coaches in the top 5 leagues (only 19th place for the first big-5, Premier League with 55%). This study on the demographical characteristics of professional football club managers globally reveals that the normal profile for a coach is a male just under 50 years old (48.8), in charge for less than a year (301 days), and having grown up in the nation of the club managed (in more than 7 out of 10 cases). However, the percentage of expatriate coaches is higher than that of expatriate players: 28.3% vs 24.7% in the leagues surveyed. Previously, research by Kuper and Szymanski (2018) stated several key considerations for this study. First that, as with players, the higher salary a team is able to offer the manager selects those deemed to have the best skills. Best skills that are limited to managing internal and external relations and introducing technical or tactical innovations. That is because, as Johan Cruyff said while coaching Barcelona, "if your players are better than your opponents, 90% of the time you win." The remaining 10% can be identified in the extraordinariness of some managers who throughout the history of football have successfully changed the dynamics of the game, on or off the field. However, these stars of the bench are not the norm but the exception. The study focuses on determining those coaches who have systematically achieved better Premier League rankings than their position on the list of teams with the highest wages. Among the small number of names are Scotland's Sir Alex Ferguson (Manchester UTD 1986-2013) and France's Arsene Wenger (Arsenal 1996-2018). In both cases, in addition to on-field management and the choice of talent, what stands out is the ability to maintain a cohesive and solid group of players over time. Therefore, this stability in a club is achieved both by keeping the annual turnover of players to a minimum and by extending the permanence of coaches, staff and sports administrators. Poli et al. (2015) lists among the main areas of operation of a manager to achieve long-term success some interesting characteristics: "Ability to compose a balanced roster in

terms of age, experience and length of contract in order to ensure sufficient stability in the long term; Ability to renew the pool of players available to optimise, or maintain in the long term, group unity, demographic balance and performance levels." From this perspective, the habit of reshuffle teams after a bad season is deeply criticised, especially in comparison with data. These show that, for example between 2009/10 and 2014/15, players from Champions League finalists had, on average, been in the team for 3.8 years when their team reached the final. This value was 3.0 years for the other clubs that participated in the competition and only 2.3 years for the non-participating teams from the represented leagues. In another research by Poli et al. (2018), are shown data on average percentages of new signings for champions, by league. Here, in the period 2009/17, the turnover of players was only 20.8% in Spain, 22.4% in Germany, 28.9% in France, 30.7% in England and 33.4% in Italy, with the lowest percentage of new signings overall recorded at Bayern Munich for the 2016/17 season (9.1%). Obviously, as mentioned above, the stability of the team is not solely the responsibility of the manager. In this respect, reported by Kuper and Szymanski (2018), Emmanuel Hembert³ explained how in his view "the great secret of a successful team is stability" but in the case of his Lyon "it was not with the coach but with the sporting director, Lacombe." Lacombe was known for having the best pair of eyes in French football and was the club's 'special adviser' on signings from 1980 to 2017, deserving credit for part of the club's success.

A further aspect related to both the stability and investment potential of a club is its management and ownership, which are increasingly international and wealthy. According to Madichie (2009), in fact, the example of the best teams in the Premier League not only presents a wide range of foreign players (mainly from Eastern Europe and West Africa), but they are all foreign owned and managed. While the reigning champions, Manchester United is owned by Malcolm Glazer (an American) and managed by Sir Alex Ferguson (Scotland); Chelsea is owned by Roman Abramovich (Russian) and managed by Avram Grant (Israel); Arsenal is owned by Stan Kroenke (American) and Alisher Usmanov (Russian) and managed by Arsene Wenger (French); and Liverpool is owned by an American duo of George Gillett and Tom Hicks and managed by Rafael Benitez (Spanish). These top English teams have recently been joined, for example, by the rich Arabs who own Manchester City coached by the Spaniard Guardiola and the Bangkok ownership who in Leicester city under Italian coach Ranieri won the 2016 championship. In the rest of Europe, too, many clubs have passed from the hands of a national family or company to those of a foreign tycoon or billionaire. Kuper and Szymanski (2018) argue that

³ Head of the sports practice of the management consultancy A.T. Kearney in London and Olympique Lyon supporter.

part of this phenomenon could be explained by the attraction businessmen have for football clubs that have become cash machines. Thanks to increased revenues from sports rights, advertising and the misleading effect of depreciation, often even clubs that report losses are actually generating cash from their activities, the same cash that these businessmen can use to build stadiums or invest in alternative businesses.

Part of this phenomenon has slowed down due to China's 2018 foreign investment laws that prevent many Chinese club owners from investing but it still remains a popular trend in the rest of the world. For example, according to Ginesta et al. (2019), the following European clubs have received Chinese capital in recent years: Manchester City, Wolverhampton Wanderers, Aston Villa, West Bromwich Albion, and Reading in Britain; AC Milan, Parma, and Inter Milan in Italy; ADO Den Haag in the Netherlands; Slavia Prague in the Czech Republic; Lyon and Sochaux in France; and RCDE, Granada CF, and Atlético de Madrid in Spain. After the new China's investment rule, most of these clubs changed ownership but passed into the hands of other foreign billionaires, consolidating the process of internationalisation.

2.6 Conclusion

In conclusion, the literature does not yet seem to have found a shared view on the relationships linking the different factors of investment and success of football clubs. There seems to be a general consensus that the level of investment is linked to sports results and that these are able to influence economic results in some way, even if not according to a direct dependency. What the study aims to find out is whether, by introducing a factor of internationalisation, it is possible to describe the relative advantages of clubs that make greater use of inputs from abroad - using again a production function paraphrase - that could contribute to the quantification of the relationships between investment, sporting success and economic results. The research therefore starts by reinterpreting the analyses made in the previous literature with the aim of creating a model of football team's decision that includes a measure of internationalisation or foreignness as a mediating variable, so to precisely estimate the causal effect of investments on sporting and economic outcomes of teams.

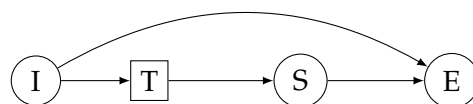
Having done this, we will exploit the longitudinal dimension of the data, covering 66 editions of the CL tournament, to control for the effect of observed and *unobserved* characteristics of teams. With the use of fixed-effects estimators, we will causally estimate the influence that the individual elements related to international inputs (foreign players, capital and managers) have on clubs' performance.

Chapter 3

Data analysis

3.1 A Directed Acyclic Graph of football teams' outcomes

Based on the evidence derived from the literature review, we can now sketch a model of football team's decision that could highlight the links between the main elements of football business: Investment (I), sporting result (S) and economic result (E). We make use of Causal Analysis (Pearl, 2009) and Direct Acyclic Graph (DAG) modelling (Morgan and Winship, 2015; Cunningham, 2021): Nodes represent random variables; arcs represent a causal effect between two random variables, moving in the direction of the arrow. The solid arrows indicate the presence of an *observed* relationship in the study while the dashed lines indicate an *unobserved* one. The basic model takes the following structure:



where I stands for the club's investment, consisting of wages and transfer balance; T is a measure of teams' internationalisation, and it is our main variable of interest (that is highlighted using a squared node-shape); S measures the sporting result, that is, CL placement; and E stands for the economic result represented by team's revenues. There is a direct effect from I to E , while S acts as a *mediator* between I and E , and T is a moderating variable, that capture the heterogeneity of the results in teams' that have a different degree of internationalisation. We can therefore say that the direct effect $I \rightarrow E$ is reinforced by an indirect effect represented by the path $I \rightarrow T \rightarrow S \rightarrow E$. The main interest is in quantifying the role of T .

According to Pearl (2009) the indirect effect mediated by T and S opens a back-door

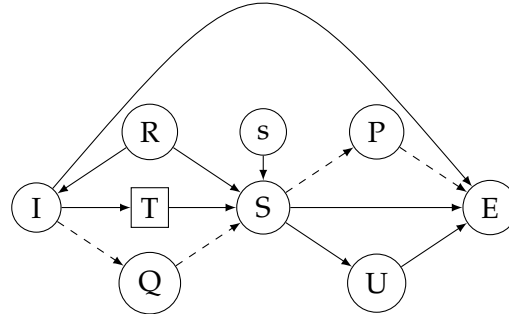
path in the causal link between I and E , that bias the estimate of the causal effect of I on E . One way of controlling for that potential bias (omitted variable bias) is to block the back-door path conditioning the link between I and E to the mediating and moderating variables.

The same DAG can be, therefore, represented by the following linear regression:

$$E_{it} = \beta_0 + \beta_1 I_{it} + \beta_2 T_{it} + \beta_3 S_{it} + \epsilon_{it}, \quad (3.1)$$

where, subscript i indicates the football team and subscript t indicates the edition of the tournament, with $t = 1, \dots, n$. This functional form will constitute our baseline regression in the analysis included in Section 3.4.

Following the description that Cunningham (2021) makes of DAG modelling, we augmented the model in equation 3.1 including additional variables. The selection of the variables to be included comes from the literature review in Chapter 2, investment and sporting result do not appear to have a only direct influence on E , but rather are also mediated by other factors, which have therefore been identified as follows:



In this case, R , the different regulations, is considered a *confounder* because it jointly determines both I , by influencing the possibilities and value of the investment (see FFP and HGP rule), and S , by modifying the tournament that can result in a higher or lower probability of winning. Q , on the other side, represents a *unobserved mediator* based on the unmeasured quality achieved by the team through investment. This latent variable plays a fundamental role because, it is not the money spent that directly causes the best result, but it is also important how this money is spent and whether it improves the team to the point where it is more competitive in the current season. This team's quality element is represented by both the roster and the coach, the presence of a top player, and the general good management and the harmonic atmosphere in team, a variable that is notoriously difficult to quantify. We will exploit the longitudinal dimension of the data and control for the effect of this latent

variable with the use of team fixed-effects. Then we have s , a variable that introduces the element of stability, decisive for success and identified by the reciprocal of the number of incoming and outgoing transactions. For the relationship between the sporting and economic result, instead, we included U , which is again a mediator that represents the mechanical effect of the UEFA CL prize for the placement in the tournament and related to the TV rights distributed on the basis of the number and media resonance of the matches played in the edition, and P , an element that can be summed up as 'prestige' and that can probably be seen as a second unobserved mediator taking into account the club's history of success, national successes and all other specific characteristics, and that we will proxy with a time fixed-effect.

The augmented model takes the following linear regression form:

$$E_{it} = \beta_1 I_{it} + \beta_2 T_{it} + \beta_3 S_{it} + \mathbf{X}_{it}\gamma + \phi_i + \phi_t + \epsilon_{it}, \quad (3.2)$$

where \mathbf{X}_{it} is a matrix of covariates (including R , s , U), and ϕ_i and ϕ_t are individual team and time fixed-effects (capturing the effect of Q and P).

Augmenting the model has the scope of precisely define the potential confounding factor biasing the direct effect of I on E . This requires the closing of every back-door path with the inclusion of the relevant "good controls," and avoiding the inclusions of "bad controls" (Cinelli et al., 2020).¹

Finally, since the inclusion of the internationalisation variables in Equation 3.2 is necessary to block the back-door path $I \rightarrow T \rightarrow S \rightarrow E$ and to correctly estimate the direct causal effect of I on E , to inspect the role of internationalisation on sporting performances, we will run a supplementary regression to estimate the following equation with a logit model:

$$\Phi(S_{it}|X_{it}) = \Phi(\beta_0 + \beta_2 T_{it} + \beta_3 X_{it} + \phi_i + \phi_t), \quad (3.3)$$

where the probability of qualification in the CL quarter of finals (a dummy variable taking a value of 1 if team i has obtained the qualification in CL quarter of finals at time t and 0 otherwise) depends on the team's internationalisation, measured by the percentage of foreign players in the team; the percentage of the time played by foreign players in the CL tournament; the foreign ownership of the team; and the

¹ The model in Equation 3.2 implies a main path (a) $I \rightarrow E$ and several backdoor paths: (b) $I \rightarrow T \rightarrow S \rightarrow E$, that we discussed before; (c) $I \leftarrow R \rightarrow S \rightarrow E$, opened by the mediation of R ; (d) $I \leftarrow Q \rightarrow S \rightarrow E$, opened by the mediation of Q ; (e) $I \rightarrow T \rightarrow S \rightarrow P \rightarrow E$, opened by the mediation of P ; (f) $I \rightarrow T \rightarrow S \rightarrow U \rightarrow E$, opened by the mediation of U . In all cases the empirical strategy adopted to reduce the omitted variable bias is to control for the relevant covariates and, in case of latent variables, to include appropriate fixed-effects.

presence of a foreign manager; a vector X_i of the team's characteristics, and a team dummy and a time dummy.

In all the regressions, standard errors are robust to heteroskedasticity and allowed for clustering at the team level.

3.2 Data description

Let us now look at the data collected. These come mainly from www.transfermarkt.com, with the addition of Deloitte reports (for revenues), www.wikipedia.org (for historical clubs' data), www.capology.com (for wages) and www.uefa.com (for prize distributions). Specifically, the data contains (for each edition): name of participating clubs, country, placement (S), revenue (E), regulations in force, presence of foreign ownership, number of total and foreign players in the team, foreign players' playing time in the tournament, player and staff wages, number and value of purchases and disposals, nationality of the coach and presence of one or more foreign top players. The descriptive statistics of the variables are summarised below.

TABLE 3.1: Data description

| Variable | NA | Mean | St. Dev. | Min | Pctl(25) | Pctl(75) | Max |
|--------------------------------------|------|--------|----------|---------|----------|----------|--------|
| Revenues | 1663 | 285.40 | 169.00 | 60.00 | 156.80 | 392.80 | 841.00 |
| Wages | 1785 | 174.97 | 124.97 | 6.00 | 77.25 | 261.75 | 576.00 |
| Balance of transfers | 922 | -6.74 | 35.05 | -226.15 | -11.00 | 1.89 | 256.11 |
| Foreign players' percentage | 230 | 28.08% | 21.85% | 0.00% | 10.00% | 46.00% | 88.00% |
| Foreign players' minutes percentage | 499 | 29.98% | 27.55% | 0.00% | 0.00% | 53.62% | 98.30% |
| Relative foreign players' percentage | 230 | 0.04% | 13.00% | -49.00% | -9.00% | 8.00% | 58.00% |
| Domestic manager | 75 | 0.64 | 0.48 | 0.00 | - | - | 1.00 |
| International ownership | 0 | 0.05 | 0.21 | 0.00 | - | - | 1.00 |
| Placement | 0 | 12.07 | 6.78 | 1.00 | 5.00 | 17.00 | 25.00 |
| Ranking | 0 | 3.09 | 1.06 | 1.00 | 2.00 | 4.00 | 4.00 |
| Quarter of final | 0 | 0.13 | 0.34 | 0.00 | - | - | 1.00 |
| First place | 0 | 0.03 | 0.18 | 0.00 | - | - | 1.00 |

The table shows a summary of the characteristics of the collected data including the number of missing observations, mean and standard deviation, maximum value and minimum value.

3.2.1 Revenues

Regarding revenues, the number of missing observations is very high. Of the total of 1976 observations, only 313 of them have a reliable figure for the level of revenues. This data comes from the Deloitte reports only available from 2000 onward. The data as collected therefore only captures the changes in the level of the teams' revenues over the last 20 seasons and therefore presents a very high average (285.40 million) and high variability (St. Dev. = 169.00). The reasons for this are related to the growth trend of football clubs' revenues proportionate to the enormous price inflation of the market itself and the growth of revenues from the sale of TV rights. The continuous occurrence of record seasons for club revenues also the high average that exceeds the maximum revenues recorded by the top clubs in the early 2000s. The minimum and maximum belong respectively to Anderlecht, which in 2017/18 was eliminated in the first group stage (€60.00 million), and Barcelona in the 2018/19 season (€841.00 million), a semi-finalist defeated only by Liverpool, who would later become champions.

3.2.2 Wages

Similar reasoning applies to wages. In this case, the absence of data affects 1785 observations and specifically concerns all values prior to 2010 and some clubs belonging to minor leagues (of which no reliable sources could be found). Again, therefore, the data only represent values for recent years and are characterised by figures that are not representative of the reality of the same market over 60 years ago. The mean of the distribution is €174.97 million with a variability of 124.97. The lowest value (€6.00 million) is recorded by Dynamo Kiev, eliminated in the first group stage in the 2016/17 season. The highest value instead (€576.00 million) belongs to Barcelona in the 2018/19 season.

3.2.3 Balance of transfer

For the balance of transfer the number of missing observations is 922. These mainly refer to the first editions of the competition and to clubs from the minor leagues or teams that no longer exist. The average value is negative but nevertheless close to zero (-€6.74 million), a sign that the investments made by the top clubs to purchase players tend to be compensated by as many disposals. The variability is 35.05

while the values of the first and third quartiles are -€11.00 and €1.89 million, respectively, underlining the concentration of most observations around 0. Minimum and maximum respectively belong to Manchester City, which invested €226.15 million to reach the quarter-finals in 2017/18, and Borussia Dortmund, which in 2017/18 collected €256.11 million but did not make it past the rounds.

3.2.4 Internationalisation

Foreign players' percentage (and relative foreign players' percentage) and foreign players' minutes percentage have respectively 230 and 499 missing observations due to lack of information in the database www.transfermarkt.com. These are mostly related to the absence of rosters from the first editions of the CL. Interestingly, both observations have a mean close to 30%, a sign that a given presence of players on average corresponds to an equal employment on average. While they differ slightly in variability and maximum value. The 27.55% variability in the percentage of utilisation, greater than that of the presence of foreigners (21.85%), could mean that for a given number of players on the roster there are teams that make extensive use of these players and teams that do not. Even the value of maximum utilisation, 98.30% recorded by Arsenal in 2006/07, compared to the relative 84.00% presence of foreigners suggests a preference for players from abroad. Two factors that might influence these percentages are the presence of foreign ownership and a foreign coach. Perhaps it was no coincidence that in 2006 that Arsenal was coached by Frenchman Arsène Wenger. Relative foreign players' percentage, on the other hand, is a variable created by the difference between the foreign players' percentage of each club and the average of all clubs for each edition. This percentage is able to express the variability of the foreign players' percentage in relation to individual editions and shows how, although over the course of the editions the teams in deficit have always been balanced by others in surplus (average = 0.04% for the all-time differential) there are teams that have deviated far from the seasonal average. These extreme values are represented for example by the minimum reached by Athletic Bilbao, which in 2014/15 did not present any foreign players (49% less than that year's average) and the maximum of Tavriya Simferopol, which in 1992/93 presented 13 foreign players (58% more than that year's average of 19%).

Regarding the nationality of the manager and ownership we have 75 and 0 missing observations. Again, the absence of the data is explained by a lack of information in the database used (www.transfermarkt.com) for coaches, while for ownership, all teams prior to the first international takeover were considered national. The two dichotomous variables have values between 0 and 1. While manager takes value 1

in the case of the same nationality of the club, ownership takes value 1 in the case of international property. In both cases the mean suggests a prevalence of domestic observations (Domestic manager = 0.64 > 0.5 and International ownership = 0.05 < 0.5).² While this can be considered persistent over time as far as the manager is concerned, the rapid and recent growth of the phenomenon of international ownership is not described by the near-zero mean of the relative factor. This is, of course, strongly influenced by all 0s prior to the first international takeover (the purchase of Chelsea in 2003 by Roman Abramovič).

3.2.5 Sporting result

Regarding placement we have 2 categorical and 2 dichotomous variables. Among the categorical are placings and ranking. The placements contain 1st, 2Nd, 3rd, 5Th, 7Th, 9Th, 10Th, 11Th, 12Th, 13Th, 14Th, 17Th, 19Th and 25Th positions. The ranking ranges from "high" for semi-finalists, "medium-high" for quarter-finalists, "medium-low" for round of 16, "low" for elimination in the first round and corresponds to values 1 to 4 respectively. "High" position is the highest result associated with the lowest indicator and vice versa for "low" with the largest indicator. The mean values of 12.07 for placement and 3.09 for ranking express the fact that there are more low-ranking positions than high-ranking ones. All other factors being equal, the expected outcome of participation in the CL fluctuates between 9Th and 17Th position (The majority of the editions do not have positions 10Th, 11Th, 12Th, 13Th and 14Th) with a "medium-low" ranking. This is because of the approximately 32 teams participating in the tournament over time, only eight make it to the quarter-finals and as many as 24 are excluded between the group stage and the round of 16. On the other hand, quarter of final and first place are two dichotomous variables. They take on value 'quarter' and 'first' when the team achieves the related placement, 'other' in the opposite case. In the table, 1 is associated with the achievement of the goal and 0 with the opposite case. The extremely small average values of both variables express the difficulty for clubs, other factors being equal, to reach the final stages of the competition (13% of probability for quarter-finalist and 3% of probability for finalist).

² As we are in front of two dichotomous variables (0;1), the mean can be seen as indicating the percentage of values equal to 1.

$$Mean = (1n_1 + 0n_0)/(n_1 + n_0), \quad (3.4)$$

A mean value equal to 0.5 represents a distribution with as many 0 as 1. For this reason, having a mean greater than 0.5 expresses a prevalence of observations equal to 1 and vice versa for a mean less than 0.5.

Detailed descriptive analysis of the variable used in the analysis can be found in Appendix A, Table A.2.

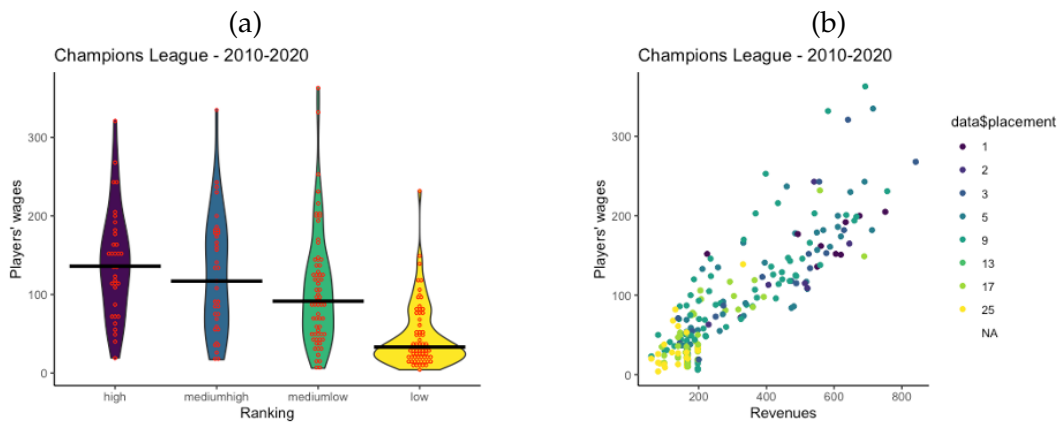
3.3 Visualisation of bi-variate relationships between model's components

After collecting all the necessary data, we first focused on the descriptive analysis of the variables included in the model. Most of the descriptive analysis is based on data visualisation, and the graphs express bi-variate relationships between factors, following the logical order of the model. Only in some cases, we include a third factor to modify the graphical aspect of the bi-variate relations, to describe how some of the factors interact in determining the heterogeneity of the outcomes.

3.3.1 Relationship between investments and club performances

Looking at the relationship between investment and sporting result, we see a dependence of the latter on the level of wages and investment in transfers. About wages, when we rank them in order based on the sporting result achieved by the team in that season (Figure 3.1, panel (a)), we can observe a clear increase in sporting result, from low ranking to high ranking in the position in the tournament, as spending increases, confirming the idea that the more one spends the more one wins (Kuper and Szymanski, 2018). The ordered variable ranking subdivides the teams on the basis of the final placement: "high" for semi-finalists, "medium-high" for quarterfinals, "medium-low" for round of 16, "low" for elimination in the first round. The meaningfulness of the ranking variable is associated to UO concept discussed in Chapter 2, and associated to the randomness of the final result. In fact, a higher investment can contribute to teams sporting performance, making them climbing to the top of the league table, but does not guarantee their success since we are in an environment characterised by the game uncertainty, under conditions exposed to the unexpected, to randomness and to the luck in an individual match. This means that the different levels of expenditure found between the first, second and third places are not decisive for success but tend to be higher than those of teams not reaching the final stages.

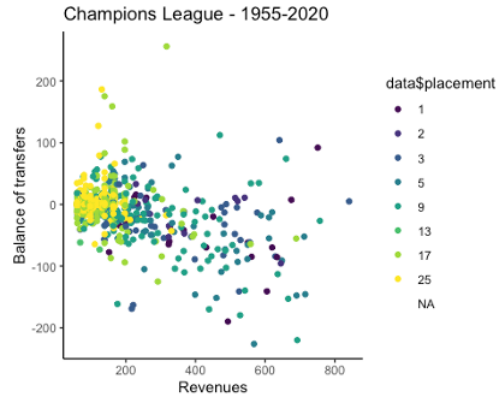
FIGURE 3.1: Relationship between players' wages and sporting and economic outcomes



Note: Figure 3.1 includes in the left panel (a) the violin plot of the distribution of clubs' wages expenditures split by CL placement ranking. For each of the four categories, it is possible to see a different shape of the violin based on the distribution on the 'y' axis of the club's wage bill. The black line represent the mean of the distribution of wages values for each category. Red dots are teams' wages jittered. The shape of the violin plot reveal the concentration of the distribution around the mean. In the right panel (b) we have instead a scatter plot of wages over revenues from 2010 to 2020. Each point expresses the level of revenues and wages of a club in one single edition and is coloured according to the placement in that CL season (from yellow for the last positions to purple for the winner).

As further validation of this hypothesis, we can see that (Figure 3.1, panel (b)), even when we relate economic performance, as a measure of E , and wages, as a measure of I , conditioning the correlation to the placement in the tournament, the relationship of the two variable with the sporting performance remains evident in the CL editions between 2010 and 2020, when most of the relevant data are available. The lowest placings corresponds to low spending and revenues, while the best placings is characterised by high wages and high revenues.

FIGURE 3.2: Relationship between investments in players' cards and sporting and economic outcomes



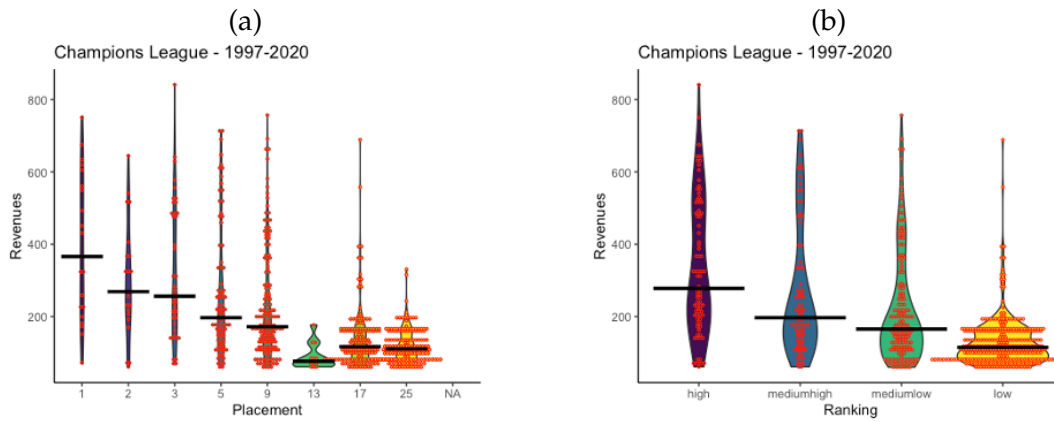
Note: Figure 3.2 includes a panel that shows a scatter plot of balance of transfers over revenues from 1955 to 2020. Each point expresses the level of revenues and the difference between the inflows and outflows for the purchase and sale of players' cards of a club in one single edition and is coloured according to the placement in that CL season (from yellow for the last positions to purple for the winner).

Looking instead at the balance of transfers (Figure 3.2), the connection is less evident but still perceptible. In order to maintain a sufficient level of financial health, most teams tend to keep their income and expenditure budgets for player cards fairly stable and around zero, balancing the need to make purchases with the disposal of other players not at the centre of the team's project. This makes most of the data collected close to zero, but when distributed according to that season's revenues, it can be seen that most clubs in a condition of transfer surplus have low revenues and low placement rankings, while the high-ranking positions, represented by dark-blue colours, are mostly associated with clubs with a deficit transfer balance and higher financial performances.

3.3.2 Relationship between sporting and economic results

Turning to the second relationship, the one between sporting and economic results, the data show a positive relationship both at the level of the individual positions achieved and at the aggregate level based on the ranking (Figure 3.3). In fact, the randomness that influences sporting results does not seem to influence that much the relationship between placement and revenue, *on average*, which shows an increasing proportionality with extremely explicit average values (especially in panel (b) and in the top placements in panel (b)). The sporting uncertainty, associated to the UO concept, appears to be effective at the level of the *variance*, and is made evident by the long tails of the distributions.

FIGURE 3.3: Relationship between sporting and economic outcomes

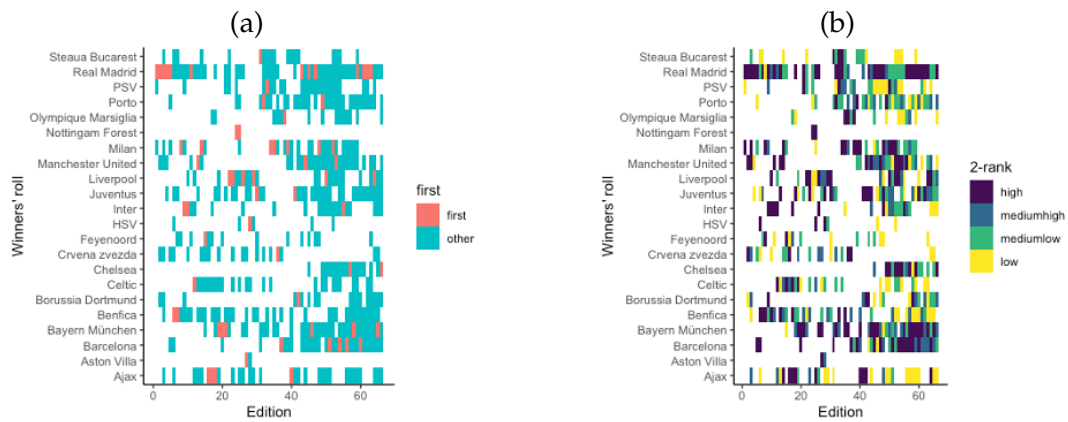


Note: Figure 3.3 includes in the two panels (a) and (b) two violin plots of the distribution of clubs' revenues split by CL placement (a) and placement ranking (b). For each of placements and the four categories, it is possible to see a different shape of the violin based on the distribution on the y-axis of the club's revenues. The black line represent the mean of the distribution of revenues for each placement and category. Red dots are teams' wages jittered. The shape of the violin plot reveal the concentration of the distribution around the mean.

This positive correlation seems to give support to the hypothesis that placing in international competitions is an essential element in determining the respective revenue of football clubs. This relationship, combined with the one illustrated above linking investment to sporting results, leads us to consider the possibility that football clubs have an incentive to use one season's revenue to increase their investment in the following one, with the aim of maintaining a high level of sporting success in a sustainable manner.

Corroborating this assessment, Figure 3.4 show that of the 359 clubs that participated in the European competition, only 22 of them won at least one edition, and among these teams only 14 got to the top at least twice. This shows that winning the Champions League is not for everyone, but that most clubs that manage to do it then maintain a high level of competitiveness, having higher revenues and being able to invest more to improve their team for the following season. At the same time, winning once or twice is not a guarantee of future top performances, as the cases of the Nottingham Forest and Aston Villa show.

FIGURE 3.4: All time winners' roll



Note: Figure 3.4 shows two Heatmap of the sporting results achieved in the 66 editions of the CL for the subset of clubs that have won at least one edition of the trophy. Panel (a) shows all the participations of a club in light blue and the victories in red while panel (b) colours the points on the map according to the level reached by the team in the ranking of each edition in which it participated. (yellow for "low" ranking, green for "medium-low", blue for "medium-high" and purple for "high")

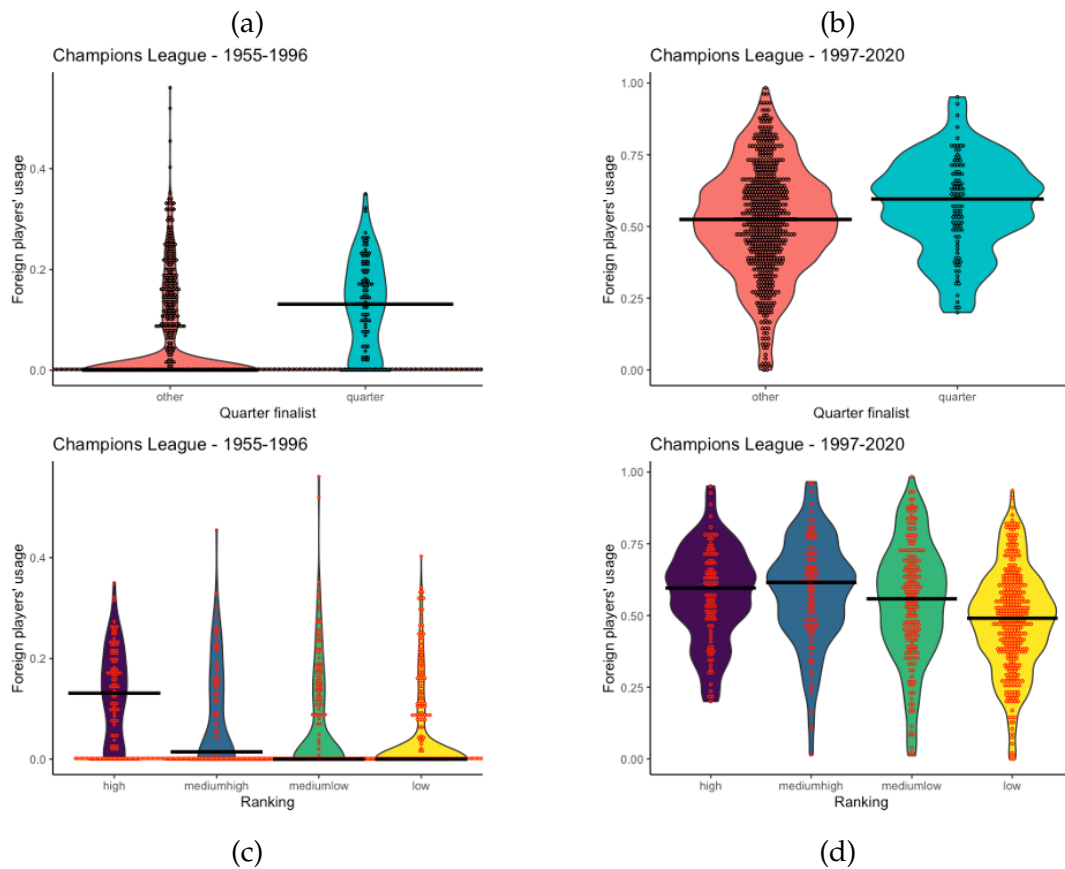
A further factor of interest is found when looking at the placings achieved by the dominant teams in the cup. In fact, the persistence of a good placement tends to determine not only the permanence in the competition but also the maintenance of a good level of results in the following years. It is no coincidence, therefore, that between the clubs with the highest revenues in the last two decades are included the most competitive clubs like Real Madrid, Barcelona, Manchester United, Chelsea, Liverpool, Bayern Munich, Juventus and Milan, as the coloured cells in Figure 3.4 reveal.

3.3.3 Effects of the internationalisation factors

Having analysed the relationships that constitute the basic model, let us now look at what happens with the internationalisation factors.

As mentioned in Chapter 2, with reference to the contributions to the literature, the purchase and use of foreign players is a factor that often goes hand in hand with the quality of the team, both because players of certain nationalities are considered to be better on average and because obviously having access to players from all over the world gives one the opportunity to exploit a wider set of resources from which to select the best players available. For these and other reasons, which we will analyse later, the use of foreign players has increased significantly from the origins of the competition to the present day.

FIGURE 3.5: Effects of foreign players on sporting and economic outcomes



Note: Figure 3.5 is another case in which violin graphs are used to show the distribution of factors relating to foreign players split by sporting results. In the first two panels, the violins express the distribution around the mean of club's percentage use of foreign players divided according to whether or not they reached the CL quarter-finals. Panel (a) refers to Pre-Bosman ruling editions while panel (b) refers to Post-Bosman. The black line represent the mean of the distribution of foreign players' usage while the black dots are teams' percentage of use of foreign players jittered. Panels (c) and (d), on the other hand, show the distribution of teams' foreign players' usage split by CL placement ranking, respectively in the Pre- and Post-Bosman ruling phases. For each of the four categories, the different shapes of the violin are based on the distribution on the y-axis of the teams' percentage of use of foreign players jittered. The black line represent the mean of the distribution and the red dots are teams' percentage of usage of foreign players. The shape of the violin plot reveal the concentration of the distribution around the mean.

The four plots in Figure 3.5 show, both the important difference when comparing the data before and after the Bosman rule, and how on average the top positions are reached by teams that make greater use of foreign players.

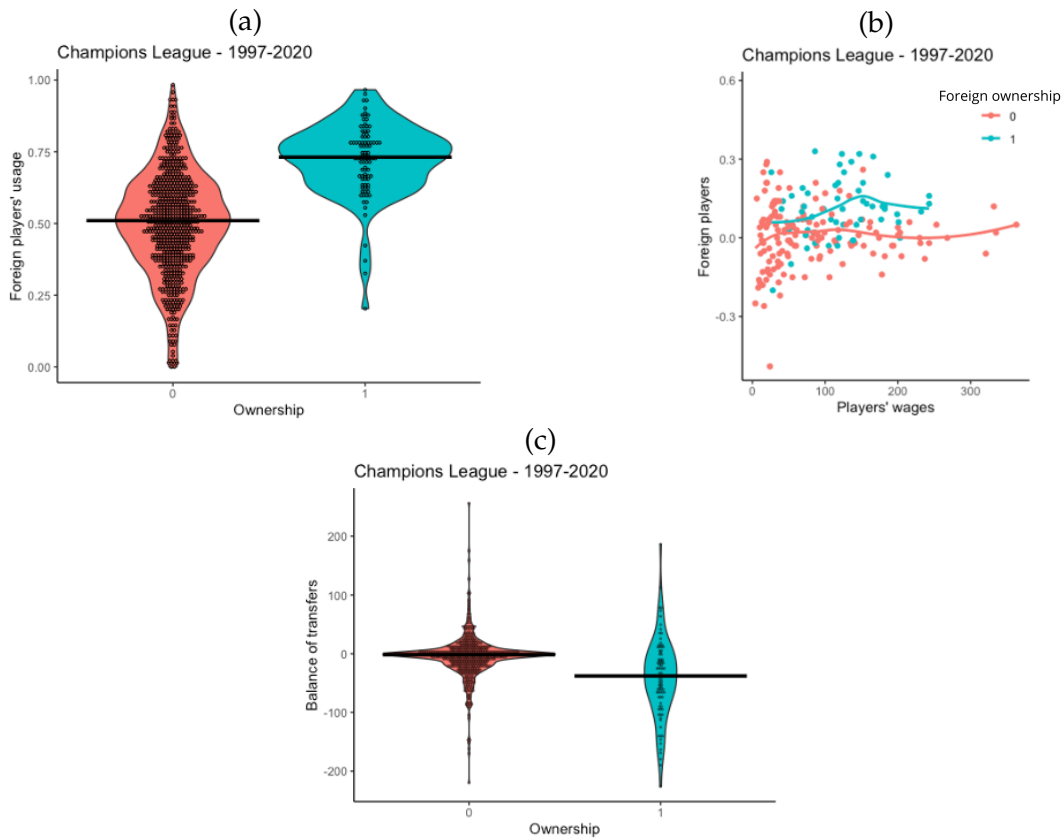
If in the first 42 editions of the CL, the achievement of a high ranking position was closely linked to the use of resources from abroad (Figure 3.5, panel (c)), the effect seems to have changed slightly in the last 24 editions. In fact, after the Bosman ruling, the percentages of use of foreign players have grown exponentially and seem to have reached a level where, a high percentage of foreigners is necessary to get to the first half of the CL placement ranking. On the other hand, an excessive use

of foreign players could cause a reverse effect, being counterproductive in terms of reaching the top positions (Figure 3.5, panel (d)). The shape of the plots for the first two levels of ranking (Figure 3.5, panels (a) and (b)), showing a progressive reduction in the role of foreign players on teams' performance, can be related to aspects of group integration and stability or by the increase in communication difficulties among team members, an issue explored in the economic literature (Alesina and Ferrara, 2005). These elements seem to determine a limit after which the positive effects of an increased use of foreign players are smaller than the marginal disadvantages associated to it.

A different consideration, can be related to the Prisoners' dilemma aspect of the issue. If all teams are adopting an "internationalisation strategy" the use of foreign players will not discriminate any more successful teams from the rest of them. Especially in the context of tighter budget constraint due to the FFP.

Having seen how the use of foreign players determines sports results we move on to look at the effects of other internationalisation elements that can influence both results and the composition of the team itself. The first factor analysed is the nationality of ownership. In this case it is possible to give evidence to an influence of this internationalisation element at two levels. Figure 3.6 shows that, for the seasons between 1997 and 2020 (for which the data are more interesting) a foreign ownership club is on average more likely to use foreign players than domestically owned clubs, both in terms of minutes (Figure 3.6, panel (a)) and in terms of the percentage of foreign players in the roster compared to the competition average (Figure 3.6, panel (b)).

FIGURE 3.6: Effects of foreign ownership on club investments



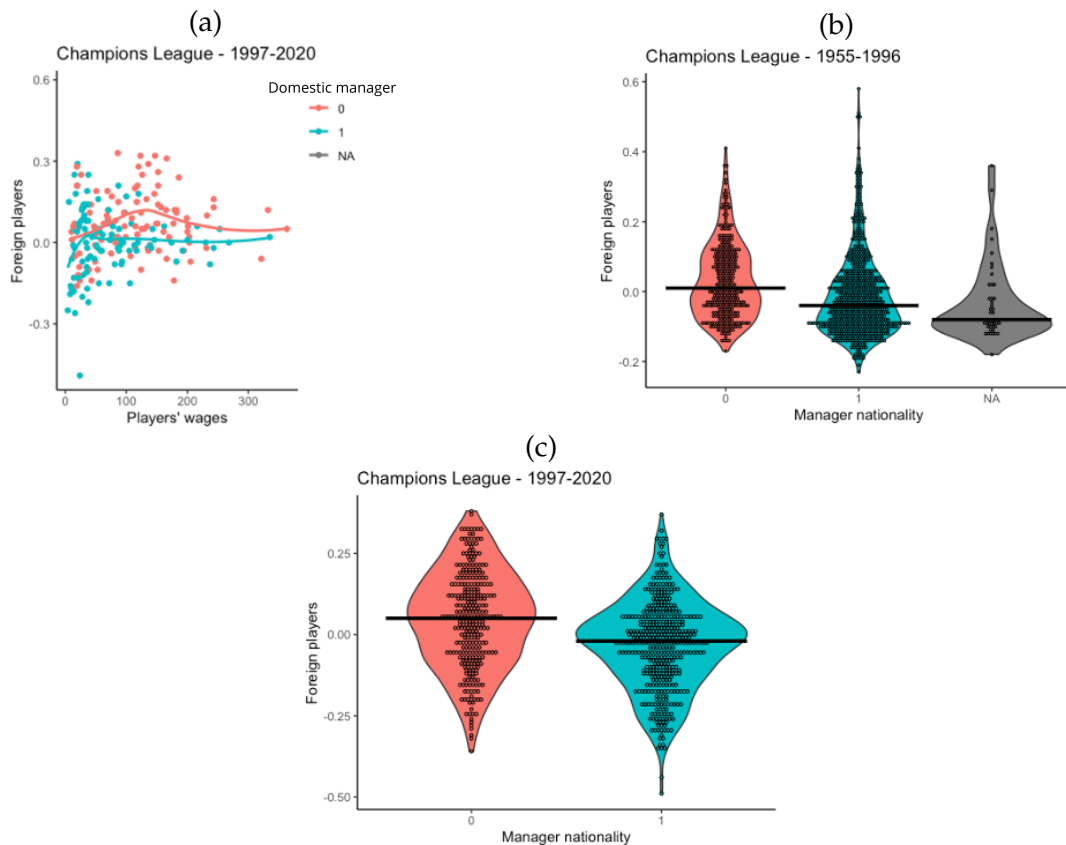
Note: Figure 3.6 shows the various effects of foreign ownership on the composition of the roster, both in international and economic terms. Panels (a) and (c) use violin graphs to show respectively the distribution of foreign player use percentage and balance of transfer split by the nationality of the ownership, 0 when national and 1 when international. In both cases, the black line represent the mean of the distribution while the black dots are teams' percentage of use of foreign players jittered in panel (a) and teams' balances of transfers in million in panel (c). The different shapes of the violin reveal the concentration of the distribution around the mean. Panel (b) is a scatter plot of the foreign players' percentage over players' wages from 1997 to 2020. Each point expresses the level of wages and the percentage of foreign players of a club in one single edition and is coloured according to the nationality of the ownership in that season. The blue and red lines represent the moving average curves for internationally and domestically owned teams respectively.

Figure 3.6, panel (c), instead shows that the factor, measured by the nationality of the ownership, is also linked to a tendency to spend more on buying new players, with the average value of the transfer balance in a deficit status.

The analysis of this evidence can lead to two different considerations. The first induces to think that an internationally owned club on average has a more discerning eye toward the foreign market than the domestic one and that for the same level of wages it prefers players from abroad. The second consideration is related to the apparent greater buying potential of foreign properties, which can not only afford to pay higher wages for international players but can also spend more to acquire these players, having on average a transfer balance in deficit.

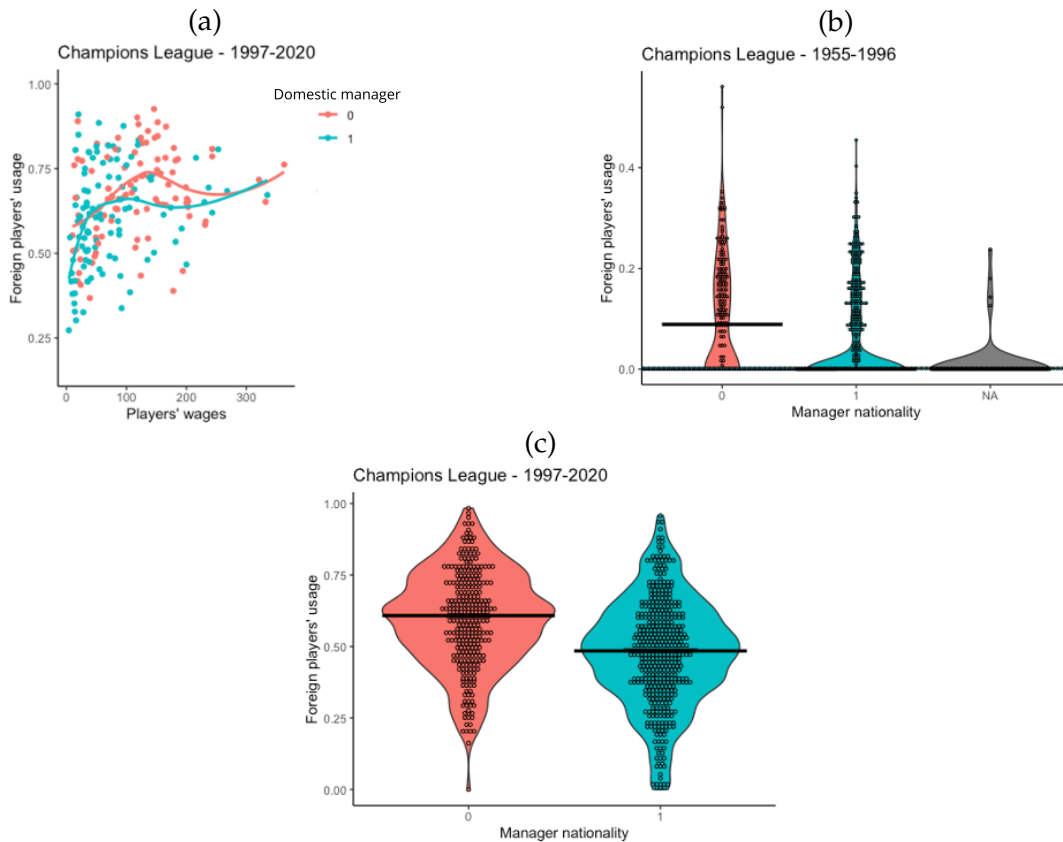
A further element of internationalisation is related to the nationality of the coach. While the manager is considered to be a minor influence in determining teams' results, he is often instrumental in the choice of players, their playing minutes, the strategy to follow in the transfer market, and in the team stability. Indeed, looking at the scatter plot in panel (a) of Figure 3.7 and Figure 3.8, it shows that, given the same level of wages offered to players, teams with foreign coaches (red dots) tend both to have more foreign players on the roster and to use them more than teams with domestic managers (blue dots).

FIGURE 3.7: Effect of the foreign managers on foreign players' percentage



Note: Figure 3.7 shows the various effects of manager nationality on the composition of the roster, both in international and economic terms. Panel (a) is a scatter plot of the foreign players' percentage over players' wages from 1997 to 2020. Each point expresses the level of wages and the percentage of foreign players of a club in one single edition and is coloured according to the nationality of the manager in that season. The blue and red lines represent the moving average curves for internationally and domestically managed teams respectively. Panels (b) and (c) use the violins graphs to represent the distribution around the mean of club's percentage of foreign players divided according to the nationality of the manager, 0 when international and 1 when national. Panel (b) refers to Pre-Bosman ruling editions while panel (c) refers to Post-Bosman. The black line represent the mean of the distribution of foreign players' percentages while the black dots are teams' percentage of foreign players jittered, distributed on the 'y' axis.

FIGURE 3.8: Effect of foreign managers on foreign players' usage



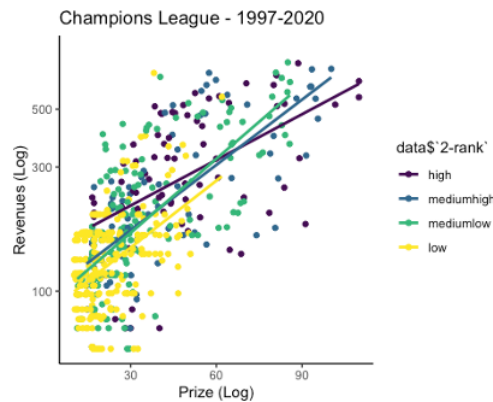
Note: Figure 3.8 shows the various effects of manager nationality on the usage of foreign players, both in international and economic terms. Panel (a) is a scatter plot of the foreign players' usage percentage over players' wages from 1997 to 2020. Each point expresses the level of wages and the percentage of usage of foreign players of a club in one single edition and is coloured according to the nationality of the manager in that season. The blue and red lines represent the moving average curves for internationally and domestically managed teams respectively. Panels (b) and (c) use the violins graphs to represent the distribution around the mean of club's percentage of foreign players usage divided according to the nationality of the manager, 0 when international and 1 when national. Panel (b) refers to Pre-Bosman ruling editions while panel (c) refers to Post-Bosman. The black line represent the mean of the distribution of foreign players' usage while the black dots are teams' percentage of use of foreign players jittered, distributed on the 'y' axis.

The two evidences are confirmed both in the first historical phase of the competition (Figure 3.7, panel (b) and Figure 3.8, panel (b)), characterised by a smaller presence of foreigners, and nowadays (Figure 3.7, panel (c), and Figure 3.8, panel (c)) where the manager's influence, together with the previously shown influence of the ownership, seems to be decisive for the ethnic formation of the team.

The last consideration regarding internationalisation factors relates to the prize distributed by UEFA for participation in the competition based on revenues from the sale of television rights. Clearly, the premium, depending largely on the position in the cup, assumes increasing values as sporting success increases and leads to increasing values of revenues. The fact, however, that in the right-hand side of Figure

3.9 the interpolation lines for the medium-low and medium-high rankings exceed that of the high rankings suggests that, if the relationship between sporting and economic performance is not directly proportional, the reasons may be partly related to the value of the prizes distributed.

FIGURE 3.9: Effects of UEFA prize on sporting and economic results



Note: Figure 3.9 includes the scatter plot of clubs revenues over UEFA CL prizes. Each point expresses the value of the logarithm of revenue and the logarithm of prize distributed by UEFA CL for each club in each single edition from 1997 and is coloured according to the level of CL ranking achieved. The four coloured lines represent the average line for the teams that reached the same level in the CL ranking in the different editions. The colours of the curves follow those of the points (yellow for "low" ranking, green for "medium-low", blue for "medium-high" and purple for "high")

The idea in this case is that, because of the way the prize is designed, mid-ranking clubs facing big clubs in matches with great international interest generate more revenue from participation than the final victory does for a top club. This is because, teams from minor leagues are often the only ones representing a country and can obtain a larger slice of the prizes distributed. This makes the level of influence that the premium has on the revenue different depending on the type of club.

To sum up, the graphical analysis expresses clear relationships between both the main factors and between the basic model and the elements of internationalisation. Thus, it remains to define the levels of bi-variate and multivariate correlation between these factors in order to assert the correct definition of the model.

3.4 Regression analysis

This Section reports the results of the regression analysis based on the Equation 3.2. First, it will focus on the direct and indirect paths between I and E , and will adopt an empirical strategy based on closing back-door paths via the inclusion of "good

controls” and fixed-effect estimation. Second, it will zoom of the path between T and S , using a logistic regression and applying the same strategy as before.

3.4.1 Relationship between investments and club results

The investment component I is measured by two variables: the balance of transfers and the players’ wages (in logs). The dependent variable of the regression, E , is represented by the teams’ revenues (in logs). The coefficients of the regression can be therefore interpreted as elasticities (Békés and Kézdi, 2021).

All regressions results are summarised in Table 3.2. The first model (1) gives evidence of the positive time-trend of revenues. From 2000 to 2020, the time span for which data on teams’ revenues are available (e.g. the number of observations used in the regression is 312 out of 1975), the value of revenues increased with time. The value in Table 3.2, model (1), (0.048) represents the expected difference in the value of revenues from one year to the subsequent one. Although small, this number underlines a positive slope of the revenue curve over time. Using a subdivision of time in five phases, in model (2) (without the constant),³ the result is similar: with the mean logarithm of revenues rising from 5.074 (€172.655 million in phase 3) to 5.596 (€283.982 million in phase 4, with an increase of +€111.327) to 5.699 (€372.026 million in phase 5, +€88.044), with a high level of significance ($p < 0.01$). In the last phase, the smaller increase compared to phase 4 can be explained by the influence that the Covid19 pandemic had on club income, reducing earnings from ticket sales. So if revenue growth can be largely explained (the R^2 of model (2) is already 0.99) by an increasing trend over time, what happens if we introduce the investment factor? For the 143 observations for the years after 2010 considered in model (3), both transfer and wages have a significant ($p < 0.01$) effect on E , while for their interaction term the significance drops slightly ($p < 0.05$) but is still remarkable. This confirms the evidence visualised in Figure 3.1 and Figure 3.2. With regard to the point estimates, the inverse relationship between transfers and revenue is confirmed. The negative value of -0.006 expresses a marginal negative effect of an increase of one unit in the balance on the value of revenues and can be explained by recalling that a positive balance indicates less investment in the squad and lower potential competitiveness. The logarithm of wages, on the other hand, has a positive value (0.864) and increases as revenues increase. This means that if we have a marginal increase of 1% for the value of wages, revenues also increase by 0.864%, underlining a direct relationship between how much teams spend and how much they earn. The interaction between

³ Phase 1 includes the years from 1955 to 1982; Phase 2 includes the years from 1983 to 1996; Phase 3 includes the years from 1997 to 2006; Phase 4 includes the years from 2007 to 2014; Phase 5 includes the years from 2015 to 2020.

the balance of transfers and the logarithm of wages also has a positive value of 0.01, indicating that the negative effect of the transfer surplus is marginally reduced if high-wage players are purchased. For this interaction, the slope of the curve will therefore be equal to $-0.006 + 0.001 = -0.005$.

TABLE 3.2: Results: $I \rightarrow E$

| | <i>Dependent variable: (Log) revenues</i> | | | | |
|---------------------------------------|---|---------------------|---------------------|----------------------|---------------------|
| | <i>OLS</i> | | | <i>Fixed-effect</i> | |
| | (1) | (2) | (3) | (4) | (5) |
| Time | 0.048*** (0.005) | | | | |
| Phase 3 | | 5.074*** (0.057) | | | |
| Phase 4 | | 5.596*** (0.048) | 1.344*** (0.163) | | |
| Phase 5 | | 5.699*** (0.052) | 1.239*** (0.160) | | |
| Balance of transfers | | | -0.006** (0.003) | -0.007*** (0.003) | -0.006** (0.003) |
| (Log) wages | | | 0.864*** (0.031) | 0.867*** (0.032) | 0.864*** (0.031) |
| Balance of transfers × (Log) wages | | | 0.001** (0.0005) | 0.001** (0.0005) | 0.001** (0.0005) |
| Constant | 2.749*** (0.274) | | | 1.254*** (0.163) | |
| Observations | 312 | 312 | 143 | 143 | 143 |
| Fixed-effects | no | no | no | no | yes |
| R ² | 0.245 | 0.991 | 0.999 | 0.873 | 0.879 |
| Adjusted R ² | 0.243 | 0.991 | 0.999 | 0.871 | 0.876 |
| Residual Std. Error | 0.512 (df = 310) | 0.530 (df = 309) | 0.214 (df = 138) | 0.218 (df = 139) | 0.214 (df = 138) |

Note: In Table 3.2 the dependent variable E is measured by the logarithmic transformation of teams' revenues, and I is measured by the logarithmic transformation of players wages and by the teams Balance of Transfers, in thousands of euros (see Table 3.1). The temporal factors, time and phases, are, respectively, continuous and ordered. Phase 1 includes the years from 1955 to 1982; Phase 2 includes the years from 1983 to 1996; Phase 3 includes the years from 1997 to 2006; Phase 4 includes the years from 2007 to 2014; Phase 5 includes the years from 2015 to 2020. Finally, regression (5) shows the values of the investment factors in the presence of the phases fixed-effects. In all the regressions, standard errors are robust to heteroskedasticity and allowed for clustering at the team level. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Model (4) in Table 3.2, which does not consider any time element, shows that the

coefficients of the I variables remain very similar to the ones of model (3), an indication that I and E share a common time-trend, that we controlled for, in model (5) with time (phases) fixed effects, getting the same estimates than model (3). Model (5) is our preferred estimate and we consider it as our baseline regression. Now, to give a causal interpretation of the regression estimates, we have to check that the relationship between I and E is not biased by not including relevant covariates in Equation 3.1. We control for the omitted variable bias in the subsequent step of the analysis.

The strategy adopted to block the back-door path, highlighted in the discussion of Equation 3.1, is to include in the regression all covariates that mediate the indirect effect of I on E .

3.4.2 Mediating effect of sporting outcomes

To isolate the direct effect of I on E , we now introduce sports results as a mediator between investment and economic performance.

The four models in Table 3.3 show that investment maintains an independent and important level of significance, with coefficients varying only slightly from the unmediated models in Table 3.2, despite the introduction of the sports components. This confirms the presence of a direct path between investment and economic outcome in addition to the mediated one, and, controlling for the sporting outcomes of teams no matter they are measured (e.g. reaching the first placement, in model (1); entering the quarter of finals in model (2); comparing the ranked positions, with High-ranking being the reference factor level, in model (3); comparing the ordered placements, in model (4)), allows to give a causal interpretation to the estimated $\hat{\beta}_1$ coefficient of Equation 3.1.⁴

⁴ Examining the unconditional correlation between sporting and economic results, reported in Table B.1 in Appendix B, we get a negative value of -33.995, with a high level of significance at $p < 0.01$. Here again, the inverse relationship is perfectly explained by the fact that the highest levels of revenue correspond to the teams in the highest positions of the league table, which are, however, characterised by position indicators ordered in ascending order. This means that the top positions correspond to the lowest values of the Placement variable (and the highest values of revenues) and the bottom positions to the highest numerical values of the Placement variable (but the lowest values of revenues).

TABLE 3.3: Results: I → S → E

| | <i>Dependent variable: (Log) revenues</i> | | | |
|---------------------------------------|---|----------------------|---------------------|---------------------|
| | (1) | <i>Fixed-effects</i> | | (4) |
| | | (2) | (3) | |
| Balance of transfers | -0.006** (0.003) | -0.006** (0.003) | -0.006** (0.003) | -0.006** (0.003) |
| (Log) wages | 0.858*** (0.032) | 0.855*** (0.033) | 0.844*** (0.036) | 0.832*** (0.038) |
| Balance of transfers × (Log) wages | 0.001** (0.0005) | 0.001** (0.0005) | 0.001** (0.0005) | 0.001* (0.0005) |
| First place | -0.072 (0.081) | | | |
| Quarter-finals | | 0.045 (0.046) | | |
| Medium-high ranking | | | -0.056 (0.045) | |
| Medium-low ranking | | | -0.002 (0.039) | |
| Low ranking | | | -0.003 (0.037) | |
| 2nd position | | | | -0.126 (0.082) |
| 3rd position | | | | -0.024 (0.064) |
| 5th position | | | | -0.043 (0.063) |
| 9th position | | | | 0.009 (0.061) |
| 17th position | | | | -0.028 (0.053) |
| 25th position | | | | 0.004 (0.046) |
| Observations | 143 | 143 | 143 | 143 |
| Fixed-effect | yes | yes | yes | yes |
| R ² | 0.880 | 0.880 | 0.881 | 0.882 |
| Adjusted R ² | 0.876 | 0.876 | 0.874 | 0.873 |
| Residual Std. Error | 0.214 (df = 137) | 0.214 (df = 137) | 0.215 (df = 135) | 0.217 (df = 132) |

Note: Table 3.3 shows the regressions carried out to highlight the effect of the mediation of the sports result on the correlation between investment elements and revenue. In the case of model (1) the factor used is the first place finish. In model (2) it is the quarter final. Model (3) and (4) are mediated by the level in the CL ranking and the final position respectively. All regressions include phases fixed-effects. In all the regressions, standard errors are robust to heteroskedasticity and allowed for clustering at the team level. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

3.4.3 Mediating effect of internationalisation

The same reasoning made for the sporting placement mediation applies to the internationalisation component. As seen in Table 3.1, the component T of Equation 3.1

can be proxied by different variables: the percentage of foreign players in teams; the minutes played by foreign players in the tournament; international ownership; and the presence of a domestic or international manager.

The results of the inclusion of these mediating effects in the regression is summarised in Table 3.4. Controlling for these internationalisation choices by teams also allows to de-bias the estimated elasticity of I on E , as we did before with the inclusion of S as a covariate. The back-door path gets blocked and the direct path from I to E can be isolated. The estimated elasticity of players' wages and the semi-elasticity

TABLE 3.4: Results: $I \rightarrow T \rightarrow E$

| | <i>Dependent variable: (Log) revenues</i> | | | | |
|---|---|---------------------|---------------------|---------------------|---------------------|
| | (1) | (2) | (3) | (4) | (5) |
| Balance of transfers | -0.006** (0.003) | -0.006** (0.003) | -0.006** (0.003) | -0.006** (0.003) | -0.006** (0.003) |
| (Log) wages | 0.867*** (0.031) | 0.871*** (0.032) | 0.865*** (0.032) | 0.852*** (0.033) | 0.850*** (0.034) |
| Balance of transfers \times (Log) wages | 0.001** (0.0005) | 0.001** (0.0005) | 0.001** (0.0005) | 0.001** (0.0005) | 0.001* (0.0005) |
| Foreign players % | -0.182 (0.170) | | | | -0.260 (0.248) |
| Foreign players minutes % | | -0.141 (0.154) | | | -0.044 (0.218) |
| International ownership | | | -0.005 (0.040) | | 0.010 (0.047) |
| Domestic manager | | | | -0.042 (0.039) | -0.062 (0.042) |
| Observations | 143 | 143 | 143 | 143 | 143 |
| Fixed-effect | yes | yes | yes | yes | |
| R ² | 0.880 | 0.880 | 0.879 | 0.880 | 0.882 |
| Adjusted R ² | 0.876 | 0.876 | 0.875 | 0.876 | 0.875 |
| Residual Std. Error | 0.214 (df = 137) | 0.214 (df = 137) | 0.215 (df = 137) | 0.214 (df = 137) | 0.214 (df = 134) |

Note: Table 3.4 shows the regressions carried out to highlight the effect of the mediation of the internationalisation factor on the correlation between investment elements and revenue. Model (1) uses the percentage of foreign players as a mediator. In model (2) the factor is the percentage of minutes of usage of foreign players. Models (3) and (4) are mediated by the nationality of ownership and coach respectively. Model (5) simultaneously studies all internationalisation elements of regressions (1), (2), (3) and (4) as mediators. The factors measuring investment are once again the balance of transfer, the logarithm of wages and the interaction between the two. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

of the Balance of transfer remains quite stable and significant: $\frac{\partial E}{\partial \text{wages}} = 0.8$, and $\frac{\partial E}{\partial \text{Balance of transfers}} = -0.006$, *ceteris paribus*.

3.4.4 The direct effect of internationalisation on sporting results

The analysis of the direct effect of T on S requires the use of a logistic regression, as expressed by Equation 3.3.

Results are summarised in Table 3.5, where in the first five columns the estimates of bi-variate regression of sporting performance on every single measure of internationalisation are reported. Models (1) to (5) investigate the relationship between the values of foreign players percentage, relative foreign players percentage, foreign players minutes percentage, international ownership and domestic managers. With the exception of the value for managers, all coefficients are positive (0.452, 3.452, 0.686 and 0.835, respectively). However, since the variable of domestic managers is a dichotomous variable that takes value 1 when the nationality of the manager correspond to the national origin of the team, the negative value of the elasticity, equal to -0.390, expresses a positive effect of the international dimension. When the nationality of the manager is foreign, the probability of reaching the quarter-finals increases by 0.390% (all other factors being equal). The positive coefficients of the measures of T show an average benefit to a team's on-field performance from increasing the level of internationalisation, even when (as in the case of foreign players percentage) the elasticity is not significant.⁵

In model (6), the coefficients of foreign players minutes percentage, international ownership and domestic managers reveal an interesting result. Again, the positive value of international ownership (0.504) and the negative value of domestic manager (-0.445) highlight a positive effect of internationalisation on sports performance, with an high level of significance. In contrast, the percentage of use of foreign players, while maintaining a positive marginal effect on the probability of placement,

⁵ The non significance of the foreign players percentage can be rationalised recalling the Prisoners' dilemma effect discussed in Section 2.4, and the resulting inflation in the use of foreign players in football teams. On the other hand, the acquisition of foreign players does not necessary imply the *use* of foreign players. Some players can be engaged, even if unnecessary to the team, so to exclude the acquisition of them by other teams; other players can be engaged just because of speculative reasons, betting on the increase future value of the same players.

Moreover, as shown in model (2) of Table 3.5, teams that invested in foreign players more than the average of other teams participating to the CL in the same season show an higher probability of entering the quarter of finals.

The effective 'use' of foreign players, model (3) of Table 3.5, has instead a positive and significant effect on teams' performance.

loses significance. This can be explained by the fact that, as mentioned in the comments to Figures 3.6, 3.7, 3.8, the nationality of ownership and coach also affect the composition of the rosters and the utilisation of players, explaining part of the variation.

TABLE 3.5: Results: T → S

| | <i>Dependent variable: Quarter of finals</i> | | | | | | | |
|----------------------------|--|----------------------|----------------------|----------------------|----------------------|----------------------|---------------------|---------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Foreign Players % | 0.452 (0.304) | | | | | | | |
| Relative Foreign Players % | | 3.452*** (0.498) | | | | | | |
| Foreign players minutes % | | | 0.686** (0.269) | | | 0.138 (0.306) | 3.321*** (0.638) | 1.140 (0.807) |
| International ownership | | | | 0.835*** (0.251) | | 0.504* (0.290) | 0.452 (0.305) | 1.081*** (0.416) |
| Domestic manager | | | | | -0.390*** (0.135) | -0.445*** (0.160) | -0.280* (0.165) | -0.296 (0.200) |
| Constant | -1.877*** (0.112) | -1.939*** (0.070) | -2.043*** (0.118) | -1.919*** (0.069) | -1.592*** (0.102) | -1.608*** (0.161) | -0.846* (0.499) | -1.382** (0.576) |
| Fixed-effect: Regulations | no | no | no | no | no | no | yes | yes |
| Fixed-effect: Teams | no | no | no | no | no | no | no | yes |
| Observations | 1,745 | 1,975 | 1,476 | 1,975 | 1,900 | 1,426 | 1,426 | 1,426 |
| Log Likelihood | -731.743 | -753.040 | -591.506 | -771.910 | -759.823 | -578.868 | -554.650 | -441.928 |
| Akaike Inf. Crit. | 1,467.487 | 1,510.080 | 1,187.012 | 1,547.820 | 1,523.646 | 1,165.737 | 1,131.301 | 945.856 |

Note: Table 3.5 shows the regressions carried out to highlight the effect of the mediation of the internationalisation factors on sporting result. Models (1), (2), (3), (4) and (5) show the effects that a marginal variation of individual factors has on the probability of reaching the quarter-finals. These factors are respectively: Foreign Players %; Relative Foreign Players %; Foreign players minutes %; International ownership and Domestic manager. Model (6) uses the last 3 of this list (Foreign players minutes %, International ownership and Domestic manager) to study the overall effect of these elements and their specific significance. Models (7) and (8) show the results of the same regression as model (6) but with the introduction of fixed effects, respectively regulation (the (7)) and the combination of regulation and ID of the winning clubs (the (8)). * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Finally, models (7) and (8) include fixed-effects in the regression. The first set of fixed-effects, ϕ_t , is related to the component R in the DAG corresponding to the Equation 3.3 and control for the changing regulations influencing S . The second set of fixed-effects, ϕ_i , control for the team's specific characteristics that can also have an effect on S .

Model (7) shows how part of the ownership effect (since it is a recent phenomenon)

is explained by the different regulations introduced, thus losing significance. Instead, the positive effect of the percentage use of foreign players (3.321) and international manager (negative effect of domestic manager = -0.280) remain significant. Interestingly, the all regulations fixed-effects tend to have a negative coefficient with respect to the first one, reducing the probability of access to the final stage of competition. Particularly important is the effect of the last 3 regulations introduced, which considerably increased the number of participating teams (from 16 to 24 to 32) and introduced stringent elements regarding internationalisation and investment. The transition to the most recent regulation has marked a reduction in the probability of reaching the quarterfinals by 3.084%.

In model (8), in addition to considering the specificity of regulations, club specificity was also controlled for. The idea was to incorporate into this element those unobserved factors related to team qualities and prestige.

In this case, the only element to retain significance is the internationalisation of ownership (1.081). The reason for this result is that by taking into account the winning clubs and their results in the 66 editions, one is able to capture the difference between clubs that are historically familiar with winning and those that have built their success and prestige only in recent times as a result of purchase by a rich foreign owner. This is the case of Chelsea, for example, which first participated in 1999, then was purchased by the Russian tycoon in 2003, and over the next 18 seasons won two CL Cups (2011/12 and 2020/21) reaching the quarterfinals eight times.

Regarding the aspect of prestige, it is interesting to note that if your team is called Real Madrid and holds fourteen titles in the competition, the probability of reaching the quarterfinals is 3.083% higher (given by the Real Madrid fixed effect: $\phi_{Real-Madrid}$) And even though this is no guarantee of success, a club's reputation and winning history can still have an impact on the final result.

Given the importance of the different regulations, Table 3.6 distinguishes the regressions conducted previously, Table 3.5, Model (6) and (8), on the basis of a specific time span. Models (1), (2) and (3) replicate model (6) by running a logistic regression on three different time phases, respectively: the phase before the Bosman ruling (1955-96), the phase between the ruling and the introduction of FFP (1997-2009), and the phase after the FFP implementation (2010-21). Models (4), (5) and (6), use the same time phases to analyse the logistic regression of sporting performance on the internationalisation variables including the ϕ_i and ϕ_t fixed effects.

As in Model (8) in Table 3.5, the models in question take into account both ϕ_t , which is related to the R and controls for regulatory, and ϕ_i , which controls for team-specificity Q (see the components of DAG corresponding to equation 3.3).

TABLE 3.6: Evolution of the probability of reaching the CL quarter-finals

| | <i>Dependent variable: Quarter of final</i> | | | | | |
|---------------------------|---|----------------------|----------------------|----------------------|----------------------|----------------------|
| | Pre-Bosman | Post-Bosman | Post-FFP | Pre-Bosman | Post-Bosman | Post-FFP |
| | (1) | & Pre-FFP (2) | (3) | (4) | & Pre-FFP (5) | (6) |
| Foreign players minutes % | 0.780 (0.772) | 1.059 (0.950) | 0.904 (1.112) | 0.477 (1.189) | 0.598 (1.393) | 0.712 (1.630) |
| International ownership | 0.593 (0.398) | 1.835*** (0.576) | 0.218 (0.409) | 0.659 (0.603) | 1.756** (0.813) | 1.586** (0.668) |
| Domestic manager | -0.502* (0.273) | -0.253 (0.345) | -0.548 (0.350) | -0.284 (0.365) | -0.070 (0.446) | 0.106 (0.503) |
| Constant | -2.102*** (0.469) | -2.403*** (0.579) | -2.286*** (0.715) | -2.699*** (0.709) | -2.580*** (0.745) | -3.826*** (1.073) |
| Fixed-effect: Regulations | no | no | no | yes | yes | yes |
| Fixed-effect: Teams | no | no | no | yes | yes | yes |
| Observations | 580 | 388 | 352 | 580 | 388 | 352 |
| Log Likelihood | -218.370 | -142.141 | -129.672 | -161.968 | -114.163 | -88.787 |
| Akaike Inf. Crit. | 444.740 | 292.282 | 267.345 | 373.936 | 278.326 | 223.574 |

Note: Table 3.6 shows the regressions carried out to highlight the effect of the mediation of the internationalisation factors on sporting result over time. In the case of model (1), (2) and (3), the values show the results of the logistic regression carried out as in Table 3.5, model (6), but divided into the three main historical phases delimited by the events of the 1997 Bosman ruling and the 2010 FFP introduction. Models (4), (5) and (6) are the study of the same time division but for the equivalent of model (8), Table 3.5. In this case indeed, fixed effects related to regulations and IDs of the winning clubs are also taken into account. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

The results show that, although estimated with less precision because of the reduction of observation for each time phase, the coefficient maintain concordant sign with those of Table 3.5, with the exception of Domestic manager during the Post-FFP period.

The reduction in significance implies that part of their effect is explained by the time element and conditioned by the historical homogenisation of the strategies undertaken by the teams with respect to internationalisation choices. The only factor to retain its significance is the internationalisation of ownership. Both in the study

without fixed effects and in the one capturing the specificity of teams and regulations, ownership is confirmed as significant ($p < 0.01$ and $p < 0.05$) in the period between the Bosman ruling and the introduction of the FFP. In these time phase, international ownership guaranteed a positive effect on the probability of reaching the CL quarter-finals (1.835% in model (2) and 1.756% in model (5)). Finally, considering fixed-effects, the 1.586% value of international ownership for the most recent historical period is also highly significant ($p < 0.05$). The reason for this may lie in the fact that, by including teams fixed-effects that capture the specificity of the teams, those teams that won the cup only after the international takeover, make the relative relevance of international ownership more prominent.⁶

3.4.5 Conclusion

In conclusion, the graphical and statistical analyses seem to confirm the correctness of the general model developed and the relevance of the international dimension. The effect of foreign input resources appears to be a decisive mediating element between what teams invest and the results they achieve. On a probabilistic level, internationalisation factors have a consistent relevance on a team's chances of achieving a high-level sporting result. In some cases this relevance is limited to a specific time period (as in the case of ownership during the first decade of the 2000s), in other cases it is a constant trend from the first editions of the competition until today.

⁶ The inclusion of stability among the variables included in the logistic regression is further examined, as it is the inclusion of specific measures of the quality of the team or of specific international players that won the Ballon d'Or. All results are included in Appendix C.

Conclusion

In conclusion, the research shows that there are several aspects of the internationalisation of football that could be relevant for the definition of sporting and economic results. This provides the impulse to deepen a research that has not yet reached a consensus explanation in defining links between the different determinants of football clubs' success.

A further valid motivation for deeper research are the limitations found in the regression analysis, in which the apparent graphical results of bivariate relationships do not reflect perfectly the results of multivariate and fixed effect mediated studies. The reasons for this could be both limitations in the development of the model and in the collection of data. In particular, the model has issues in its aim of simplifying reality as most of the relationships between factors are mediated by a number of additional elements that complicate the study of dependencies.

Data collection, on the other hand, is strongly influenced by the scarcity of systematic economic records for the years prior to 2000. The absence of data concerns both wages and incomes. The unavailability of this information plays a decisive role in the degree of assertiveness of the study on the early editions of the competition and those most critical for the analysis, those between the 1990s and 2010. Indeed, in this period, it might probably be possible to capture the difference between the pre- and post-Bosman ruling effects of the studied elements. Before the ruling, low levels of foreign player usage were generalised and the few teams that used international players the most managed to have a clear advantage in the final ranking, as visible in Figure 3.5, panel (c). However, this evidence on correlation with sports results cannot be evaluated for investment and economic results due to a lack of data. In the years immediately following the 1997 ruling, the growth of foreign players in the teams could have a decisive effect on the correlation assessments, as in this period it was the richer teams that were more active in transactions and thus also in the purchase of foreign players, as well as in investments in international top players and coaches. In this case, revenue figures are able to make a rough assessment of the effects on the bottom line possible, but they are not available for all teams in each edition and thus not sufficient to draw a clear distinction.

The reasons why, in recent times, some of the effects of internationalisation have gradually diminished are probably related to the fact that the very high levels of competition have pushed the teams that participate in the tournament on a permanent basis to standardise their strategies. For this reason, those who aspire to win know that they will have to maintain a certain level of quality and that they can and must make extensive use of resources from abroad to increase it. The general uniformity of outlook towards foreign players, as well as coaches and managers, has led to a decrease in the marginal effects of international factors that can now be considered common to most teams. Generally speaking, on the basis of the data collected, it is possible to identify heterogeneity and hypothesise long-term relationships, but not, however, any strong evidence of a systematic causal influence of a specific international factors on sporting and economic results, common to all teams and all times.

Taking a look instead at current trends, what can be seen is a general confirmation of the relevance of the research topic. The idea that seems to be confirmed concerns the economic interests that international clubs have in international competitions. Focusing on foreign-owned clubs, it can be seen that these tend to be among those that spend more on player purchases and salaries, generating an improvement in the team's sporting performance and a tendency to achieve greater financial results.

In 2020/21, the last season considered in the study, of the top eight clubs in order of revenues, five are foreign-owned (Manchester City, Manchester Utd, PSG, Liverpool and Chelsea), four of these play in the English league, the richest on the European scene, and no less than three were European semi-finalists out of four available places (Manchester City, PSG and Chelsea).

Furthermore, in the last 4 editions (17/18 - 20/21) there have been no less than five finalists and two winning clubs with a foreign owner, a sign that investment from abroad is doing foreign teams good. Considering the growth in the number of teams with international ownership and the general tendency of these to make greater use of foreign and better-paid players and coaches, it is spontaneous to consider a continuation of the current trend despite the opposition of fans and governments.

Another noteworthy element then links the richest teams with the highest cost structures to the topic of international competitions. Nine of the top twelve clubs ranked by revenues in CL are among the potential founding clubs of the competition with three of these (Barcelona, Real Madrid and Juventus) considered proponents of the project and respectively 1st, 2nd and 9th clubs in order of wages (Figure 3.10, in red).

FIGURE 3.10: Revenue ranking CL 2020-21



Note: Revenue ranking graph shows the Champions League ranking ordered according to the revenues of the participating teams in the 2020-21 edition. Figure 3.10 also shows the wages level and the competition prize for the season under consideration. Among the teams in the rankings, those under foreign ownership are highlighted with brighter colouring. In addition, among the domestically owned teams, the wages of the three Superleague's proposing teams (Real Madrid, Barcelona and Juventus) are highlighted in red.

Finally, trends to be taken into account include: price inflation in the players' market and wages, stimulated by the influx of huge investments by tycoons with little spending limits; national laws regarding foreign trade, such as the Italian decree on economic development, which provides tax relief for international purchases; and the growth of the so-called '0-parameters', players wrested from their home clubs by guaranteeing increased contracts through often secret deals between clubs and prosecutors in order to undermine contract renewals and avoid paying the previous club the cost of the card, a dynamic that stresses the importance of prosecutors as well as the relevance of players' ambitions and the economic power represented by the fascination of top club prestige.

All these elements must be considered in the coming years to the analysis of the causal effect of internationalisation in football, a sector defined by Kuper and Szymanski (2018) 'possibly the most globalised industry of all.'

Appendix A

Data and data fonts

This first appendix provides a more detailed qualitative and quantitative description of the variables considered in the study.

Table A.1 is an extended version of Table 3.1. It presents additional variables under study but not the used in the discussion in the paper.

TABLE A.1: Extended quantitative data description

| Statistic | NA's | Mean | St. Dev. | Min | Pctl(25) | Pctl(75) | Max |
|--------------------------------------|------|--------|----------|---------|----------|----------|--------|
| Revenues | 1663 | 285.40 | 169.00 | 60.00 | 156.80 | 392.80 | 841.00 |
| Approximated Revenues | 1303 | 193.10 | 146.53 | 60.00 | 97.00 | 217.00 | 841.00 |
| Wages | 1785 | 174.97 | 124.97 | 6.00 | 77.25 | 261.75 | 576.00 |
| Balance of transfers | 922 | -6.74 | 35.05 | -226.15 | -11.00 | 1.89 | 256.11 |
| Player's payroll | 1771 | 94.05 | 72.80 | 4.00 | 35.00 | 136.50 | 363.00 |
| Foreign players' percentage | 230 | 28.08% | 21.85% | 0.00% | 10.00% | 46.00% | 88.00% |
| Foreign players' minutes percentage | 499 | 29.98% | 27.55% | 0.00% | 0.00% | 53.62% | 98.30% |
| Relative foreign players' percentage | 230 | 0.04% | 13.00% | -49.00% | -9.00% | 8.00% | 58.00% |
| Foreign players' minutes average | 499 | 2.55% | 2.17% | 0.00% | 0.00% | 3.72% | 33.30% |
| Domestic manager | 75 | 0.64 | 0.48 | 0.00 | - | - | 1.00 |
| International ownership | 0 | 0.05 | 0.21 | 0.00 | - | - | 1.00 |
| Placement | 0 | 12.07 | 6.78 | 1.00 | 5.00 | 17.00 | 25.00 |
| Ranking | 0 | 3.09 | 1.06 | 1.00 | 2.00 | 4.00 | 4.00 |
| Quarter of final | 0 | 0.13 | 0.34 | 0.00 | - | - | 1.00 |
| First place | 0 | 0.03 | 0.18 | 0.00 | - | - | 1.00 |
| Stability | 224 | 0.12 | 0.18 | 0.005 | 0.03 | 0.14 | 1.00 |
| Prize | 1335 | 30.58 | 22.23 | 5.57 | 16.55 | 38.47 | 126.81 |

For each component, Table A.2 specifies the reference variable, the description of it and the original source.

TABLE A.2: Qualitative data description

| Component | Variable | Description | Source |
|----------------------|---|---|--|
| Investment | Players' payroll | Amount of club expenditure in players' wages | www.capology.com |
| | Wages | Total amount of club expenditure in wages | newspapers |
| | Balance of transfers | Incremental number identifying updates to tournament regulations | www.transfermarkt.com |
| Regulation | Regulation | Incremental number identifying updates to tournament regulations | www.wikipedia.org |
| | FFP | Binary variable equal to 1 when financial fair play regulation is in place | www.wikipedia.org |
| Internationalisation | Percentage of foreign players | Percentage of foreign players out of total in the season's roster | www.transfermarkt.com |
| | Relative percentage of foreign players | Per year difference between the percentage of foreigners in the club compared to the tournament average | www.transfermarkt.com |
| | Foreign players minutes percentage | Percentage of minutes played in the season by foreign players | www.transfermarkt.com |
| | Foreign players minutes average | Average percentage of minutes played in the season by each foreign players in the team | www.transfermarkt.com |
| | Foreign players candidate for the Ballon d'Or | Binary variable equal to 1 when the award finalist candidate is foreign | www.wikipedia.org |
| | Manager's nationality | Binary variable equal to 1 when the manager has the same nationality as the club | www.transfermarkt.com |
| | Ownership nationality | Binary variable equal to 1 when the ownership has the same nationality as the club | www.wikipedia.org |
| Sporting result | Placement | Final position of the club in the tournament in that edition | www.wikipedia.org |
| | Ranking | Ordered variable which clusters a group of clubs according to their ranking between 'high', 'mediumhigh', 'mediumlow' and 'low' | www.wikipedia.org |
| | Quarter | Variable equal to 'quarter' for all the semifinalists in each edition and to 'other' for the remaining clubs | www.wikipedia.org |
| Stability | Stability | Variable equal to the reciprocal of the sum of incoming and outgoing transactions | www.transfermarkt.com |
| UEFA prizes | Prizes | UEFA Champions League distribution of revenue from the sale of television rights | www.uefa.com |
| Prestige | Club ID | ID number of the football club | New data |
| Economic result | Revenues | Annual gross revenues of the club | Deloitte report |

Appendix B

Insights from the correlations between study factors

In this second appendix are shown some models of correlation studies that did not feature in the main discussion of the text.

Table B.1 shows the effect of the marginal increase in sports placement on the economic result. In this case, it was preferred to show the values for other factors of the sports result variable in the text, as in Table 3.3.

TABLE B.1: Unconditional correlation between E and S

| | <i>Dependent variable:</i> |
|-------------------------|----------------------------|
| | Revenues |
| Placement | −33.995*** (4.909) |
| Constant | 442.293*** (24.348) |
| Observations | 312 |
| R ² | 0.134 |
| Adjusted R ² | 0.131 |
| Residual Std. Error | 157.526 (df = 310) |

Note: *p<0.1; **p<0.05; ***p<0.01

Table B.2 instead, shows the effect of the marginal increase in internationalisation elements on the economic results and investments.

TABLE B.2: Effects of the internationalisation factors

| | <i>Dependent variable:</i> | | | |
|--------------------------------------|----------------------------|-------------------------|------------------------|----------------------|
| | Log(revenues) | Wages | Players payroll | Balance of transfers |
| | (1) | (2) | (3) | (4) |
| Relative foreign players' percentage | -0.783*** (0.298) | -198.159*** (70.572) | -110.162** (50.177) | -18.680 (18.984) |
| Foreign players minutes percentage | 0.890*** (0.232) | 296.277*** (62.227) | 173.255*** (39.087) | 11.434 (14.630) |
| Foreign ownership | 0.312*** (0.078) | | -9.022 (26.594) | -16.196** (6.558) |
| Domestic manager | -0.081 (0.052) | -9.766 (11.960) | -10.729 (7.994) | -4.415 (3.071) |
| Stability | -2.971* (1.741) | 302.258 (464.709) | -565.421* (333.137) | -70.016 (57.514) |
| Foreign candidate Ballon d'Or | 0.138** (0.060) | -16.010 (14.805) | -24.059** (10.795) | -9.251* (5.346) |
| Observations | 311 | 190 | 204 | 917 |
| R ² | 0.785 | 0.898 | 0.828 | 0.338 |
| Adjusted R ² | 0.743 | 0.850 | 0.764 | 0.193 |
| Residual Std. Error | 0.297 (df = 260) | 48.382 (df = 128) | 35.382 (df = 148) | 33.611 (df = 751) |

Note:

*p<0.1; **p<0.05; ***p<0.01

Table B.3 shows the effect of internationalisation elements as mediators between the investment and the sporting result in different historical phases.

TABLE B.3: The probability of enter the quarter of finals of the Champions League in the different phases

| | <i>Dependent variable:</i> | | | | | | |
|----------------------------------|----------------------------|----------------------|-----------------------|---------------------|----------------------|---------------------|----------------------|
| | Quarter of final | | | | | | |
| | (1) | (2) | Phase 1 | Phase 2 | Phase 3 | Phase 4 | Phase 5 |
| Log(wages) | 1.143*** (0.419) | | | | | | |
| Balance of transfers | | -0.003 (0.003) | -1.198* (0.617) | -0.023 (0.045) | -0.016* (0.008) | -0.007 (0.006) | 0.003 (0.004) |
| Relative Foreign Players % | 2.223 (3.099) | 3.903*** (0.921) | 2.469 (5.863) | -0.148 (2.960) | 0.344 (1.931) | 5.575 (3.399) | 2.541 (3.686) |
| Foreign players minutes % | -1.668 (2.841) | -3.111*** (0.655) | -2.723 (5.390) | -0.537 (2.982) | 0.867 (1.593) | -3.228 (2.913) | 3.115 (3.346) |
| International ownership | -0.182 (0.582) | 0.812** (0.362) | | | 1.382 (1.066) | 0.544 (0.713) | 1.044 (0.675) |
| Domestic manager | -0.476 (0.516) | -0.448** (0.211) | -0.290 (0.497) | -0.262 (0.546) | -0.031 (0.406) | -1.000* (0.570) | 0.457 (0.638) |
| Stability | 13.514 (15.533) | 5.681* (2.999) | 1.534 (4.436) | -11.627 (10.210) | 5.094 (10.962) | 26.087 (18.522) | 51.348** (20.206) |
| Foreign candidate Ballon d'Or | 1.438** (0.592) | 3.088*** (0.334) | 17.736 (1,447.196) | 2.939*** (1.116) | 1.844*** (0.584) | 4.232*** (0.774) | 2.452*** (0.726) |
| Constant | -6.832*** (2.370) | -0.685* (0.399) | 0.004 (0.904) | -0.186 (1.171) | -2.811*** (0.999) | -1.425 (1.758) | -6.265*** (2.403) |
| Observations | 190 | 917 | 81 | 101 | 288 | 288 | 159 |
| Log Likelihood | -68.305 | -346.959 | -47.520 | -52.840 | -102.304 | -68.177 | -47.305 |
| Akaike Inf. Crit. | 152.611 | 709.918 | 109.040 | 119.679 | 220.607 | 152.353 | 110.610 |

Note:

*p<0.1; **p<0.05; ***p<0.01

In Table B.4 the analysis is also carried out for the balance of transfers in the specific time intervals related to the Bosman ruling and the introduction of FFP in models (3), (4) and (5). In the text, the table 3.6 was preferred as it has no investment elements and is therefore able to study correlations with a larger number of observations.

TABLE B.4: The probability of enter the quarter of finals of the Champions League in the different historical periods

| | <i>Dependent variable: Quarter of final</i> | | | | |
|-------------------------------|---|----------------------|---------------------|-----------------------|----------------------|
| | (1) | (2) | Pre-Bosman | Post-Bosman & Pre-FFP | Post-FFP |
| (Log) wages | 1.587*** (0.379) | | | | |
| Balance of transfers | | -0.008*** (0.003) | -1.177** (0.568) | -0.021*** (0.006) | -0.020** (0.008) |
| Relative Foreign Players % | 1.541 (3.011) | 3.273*** (0.811) | 1.004 (5.635) | 1.266 (1.555) | -0.159 (1.861) |
| Foreign players minutes % | -2.146 (2.661) | -3.051*** (0.488) | -0.367 (4.878) | -0.127 (1.245) | 1.199 (1.512) |
| International ownership | -0.449 (0.556) | 0.409 (0.333) | | 1.715*** (0.620) | 1.333 (1.050) |
| Domestic manager | -0.592 (0.481) | -0.524*** (0.191) | -0.357 (0.473) | -0.054 (0.346) | -0.070 (0.389) |
| Constant | -8.056*** (2.245) | -0.073 (0.240) | 0.110 (0.683) | -2.107*** (0.675) | -2.634*** (0.792) |
| Observations | 190 | 917 | 81 | 396 | 288 |
| Log Likelihood | -71.571 | -400.777 | -52.458 | -145.016 | -107.090 |
| Akaike Inf. Crit. | 155.142 | 813.553 | 114.915 | 302.031 | 226.180 |

Note: Table B.3 shows the logical regressions carried out to study the effect of the mediation of internationalisation factors (the percentage of foreign players, the percentage of minutes of use of foreign players, the nationality of ownership and manager), on the probability of reaching the quarter-finals. Model (1) shows the results of a regression using the logarithm of wages and international factors. Model (2) perform the same calculations using the balance of transfers as the investment element. Models (3), (4) and (5) represent a temporal breakdown of model (2) on the basis of the 2 main market changing events, the 1997 Bosman rule and the 2010 FFP. Model (3) thus considers the editions from 1955 to 1996, model (4) those from 1997 to 2009 and model (5) from 2010 to 2020. In model (3), the absence of the variable of internationalisation of ownership is based on the fact that the period studied was prior to the first international takeover for a football club participating in the CL. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Appendix C

Deepening the internationalisation effects

Table C.1 shows an in-depth look at the Table 3.5 with the addition of the stability factor to the regressions.

TABLE C.1: Results: T → S (Stability)

| | <i>Dependent variable: Quarter of final</i> | | | | | |
|---------------------------|---|---------------------------------|-----------------------|----------------------|---------------------------------|----------------------|
| | Pre-Bosman (1) | Post-Bosman & Pre-FFP (2) | Post-FFP (3) | Pre-Bosman (4) | Post-Bosman & Pre-FFP (5) | Post-FFP (6) |
| Foreign players minutes % | 1.494* (0.815) | 1.338 (0.987) | 2.515* (1.310) | 0.473 (1.193) | 0.565 (1.403) | 1.193 (1.697) |
| International ownership | 0.691* (0.403) | 1.882*** (0.578) | 0.369 (0.441) | 0.662 (0.604) | 1.753** (0.814) | 1.642** (0.688) |
| Domestic manager | -0.466* (0.274) | -0.233 (0.345) | -0.304 (0.368) | -0.284 (0.365) | -0.067 (0.446) | 0.126 (0.504) |
| Stability | 23.290*** (7.485) | 10.432 (9.398) | 53.685*** (12.015) | 1.038 (12.069) | -1.842 (15.257) | 26.513* (14.945) |
| Constant | -3.273*** (0.618) | -2.909*** (0.750) | -4.953*** (1.028) | -2.742*** (0.907) | -2.484** (1.046) | -4.854*** (1.251) |
| Fixed-effect: Regulations | no | no | no | yes | yes | yes |
| Fixed-effect: Teams | no | no | no | yes | yes | yes |
| Observations | 579 | 387 | 352 | 579 | 387 | 352 |
| Log Likelihood | -213.735 | -141.473 | -118.647 | -161.935 | -114.125 | -87.377 |
| Akaike Inf. Crit. | 437.471 | 292.946 | 247.295 | 375.870 | 280.251 | 222.754 |

Note:

*p<0.1; **p<0.05; ***p<0.01

To conclude, the three graphs below (Figure C.3, C.2 and C.1 show a further study of the influence of internationalisation factors in the history of CL. These represent a year-by-year evolution of the coefficients, with respect to the probability of reaching the quarter-finals, of the different factors studied in the models in Table 3.5. The absence of the international ownership factor is explained on the basis of the recent development of the phenomenon, which did not allow for a valid study of past editions.

FIGURE C.1: Influence of the % foreign players on the probability of reaching the quarter-finals

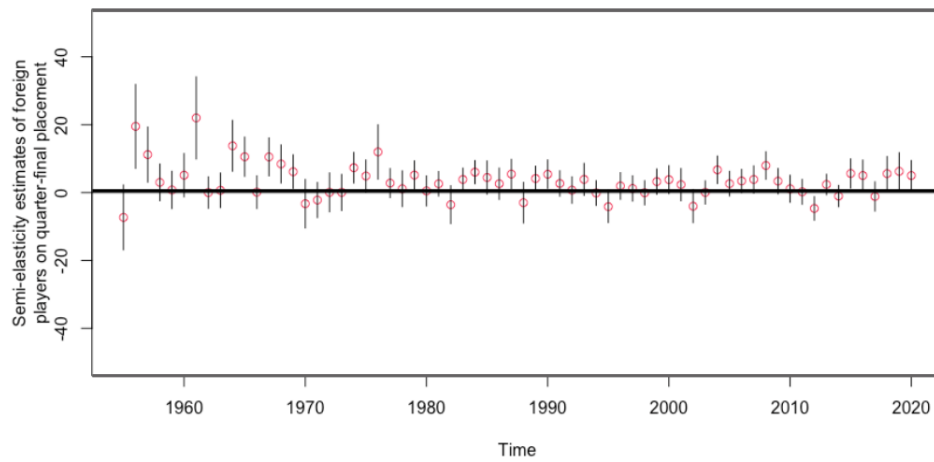


FIGURE C.2: Influence of the % of minutes of usage of foreign players on the probability of reaching the quarter-finals

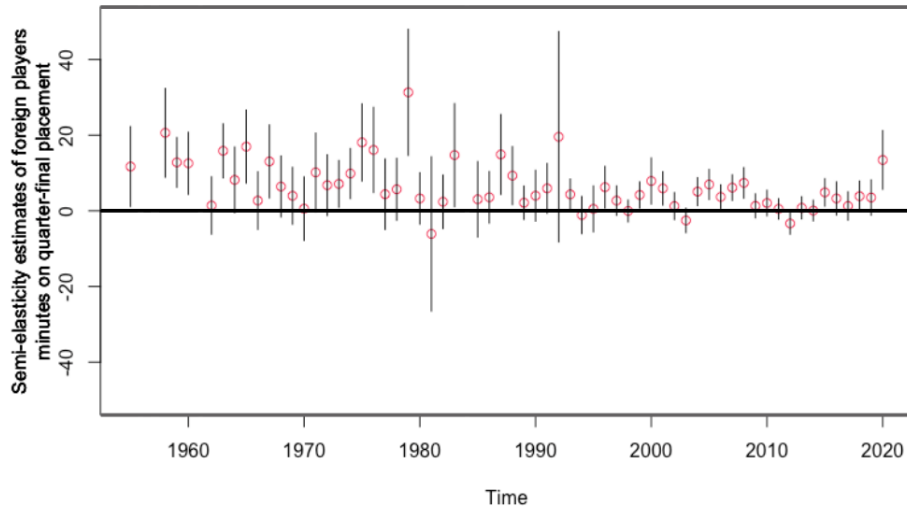
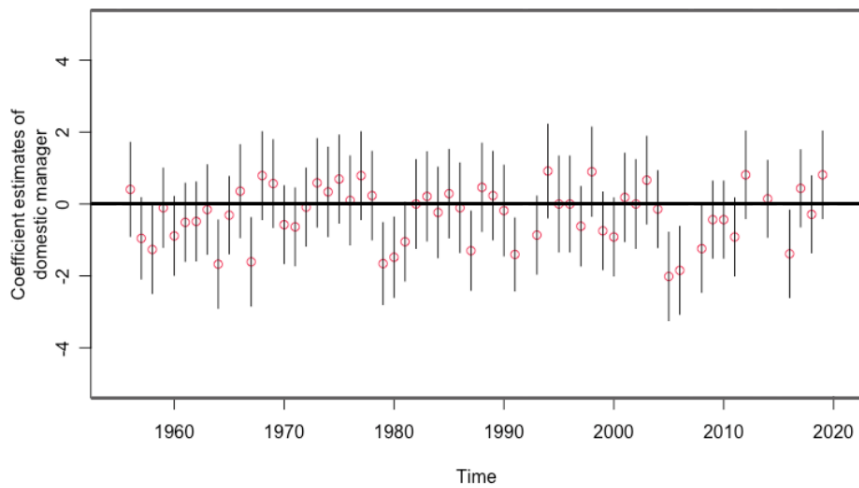


FIGURE C.3: Influence of the manager nationality on the probability of reaching the quarter-finals



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Summary

This study explores the economic and sporting reasons that have led the football industry to be one of the most globalised in the world. The research is based on the analysis of numerous data collected on the 66 editions of the UEFA Champions League. Specifically, by analysing the composition of the teams, the clubs, the level of sporting results achieved and economic elements related to investments and performance, an attempt has been made to move the scientific research on the issue from correlation to causation, with the aim of creating a reference model that proposes a general structure of teams choices. This has been used to investigate the relevance of internationalisation factors (resources imported from abroad and foreign markets to be conquered) for the revenues and blazon of football clubs.

We build upon the professional and the scientific literature on the relationship between investments, sports results and the economic performance of football clubs, and extrapolated the influences of the internationalisation dimension on these aspects of sport.

The literature reveals a not fully specified dependence of economic results on investment and sporting results, the latter in turn appearing to be linked by a relationship that favours those teams that invest more in achieving success on the field. The literature, however, emphasises that the relationships between these factors, in addition to not giving a satisfying explanation of the phenomenon based on empirical evidence, due to the uncertainty of the outcome typical of sport, are also often mediated by other observable elements, such as regulations imposed by the organisers of leagues and competitions, and unobservable ones, such as the quality of resources, players and coaches, or club prestige. What the literature has allowed us to do, however, is to select the elements to be taken into account in order to then be able to calculate the effect played on them by international factors. As a result of the research, wages and the balance of transfers were defined as the variables underlying the investment, placement in the UEFA Champions League for the sporting result and revenues for the economic result. We included these variables in a Direct Acyclic Graph framework that guided the regression analysis in search of a causal evidence.

From the analysis of the collected data, the Champions League, throughout its history, has offered an increasing number of teams and talents the opportunity to show off. Both because of the increased international appeal of the sport itself, and because of the increased investment opportunities that the competition has provided. Moreover, the recent willingness expressed by the top clubs to establish an international Super League composed and organised independently by the European top clubs themselves, only reinforces the idea that this type of multinational stages are a key element for the clubs' profitability and visibility. Income from new markets that clubs need to exploit in order to increase their revenues if they want to manage the huge inflation in the football sector while remaining competitive on the pitch. The topic of the need for new sources of revenue is closely linked to that of investment. In fact, the inflation we are talking about refers to the clubs' expenses for the purchase of players' cards and the wages of footballers and coaches. The growing trend behind these costs for clubs means that the gap between Europe's top teams and the small teams, that cannot afford large investments and with these the best players, has grown ever wider. The gap has led to a concentration of sporting success in the hands of the richest clubs, which by achieving goals on the pitch have also had access to greater revenues, activating a positive circle.

Internationally, the numbers for foreign players have also steadily increased from the near-zero percentages recorded at the birth of the competition to the current share of over 60 per cent. The liberalisation in 1997 following the Bosman ruling led to an exponential growth in the use of foreign resources. The new possibility of using foreign players gave European clubs access to a pool of talent from South America, Africa and Eastern Europe, which led to an increase in the quality level of teams with more and more foreign, better-paid and more decisive players. This dynamic thus characterised a competitive game in which any team aspiring to win a competition was forced to make extensive use of foreign players as well as other resources from abroad (coaches and capital). The revolution in the composition of teams, in fact, does not only come from the nationality of the players on the pitch but also from the nationality of those sitting in the back. Indeed, the study also observed the increasing effects that the foreign nationality of managers and club owners had on the choice of players and the results of teams. These seem to confirm the idea that foreign-managed teams tend to utilise and invest more in foreign resources, composing qualitatively better player rosters and thus creating a positive effect on club results.

In conclusion, the results of the research analysis show that: revenues are a dependent variable positively influenced by both investment and sporting results. Sports results in turn are both a mediating element between investments and economic results, and a dependent variable of team quality and the club's level of internationalisation. Even in the absence of much economic data on the previous century's editions, it is possible to argue for the influence of international elements as mediators between the capital invested at the beginning of the season and the final results, which then vary according to the quality of the resources accessed. The interest in the research topic cannot therefore be considered exhausted and new studies with access to even more economic data could be decisive in confirming the importance of internationalisation among the success factors of a football club.