The Determinants of Success in European Football Competitions

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Biographical Note

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After finishing his degree, he started a Master in Finance degree, in 2012, at Faculty of Economic of University of Porto (Faculdade de Economia do Porto), where he currently is.
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I want to thank all my friends in Madeira for direct or indirect support, particularly to Pedro and his girlfriend, Cristina, Hugo, Gil, Renato, “Os Mosqueteiros”, “Ratas Velhas”, Dudu, André and the Perneta brothers.

To all my family I have no words to describe the strength and support I’ve always received from them, specially my father, brother, sister and brother in law.

Finally, I dedicate this dissertation to my “Tia Bossa”, “Tia Lenita”, “Tio Zito” to my mother and to my unborn niece who hopefully will get a pretty name.
Abstract

A lot has changed in football in the last decades. These changes were mainly driven by the appearance of the mega sized Champions League and the Bosman Case, making this industry a very good case study in the financial area. This study identifies the main determinants of football club’s revenues and success between 2009 and 2012. This study will be a breakthrough not only in finance literature, but also in the football industry. To our best knowledge there is no studies regarding the football industry in the field of identification of success determinants in the European main competitions (Champions League and Europa League) and the relation of that success (or lack of) to the club’s revenues. Our results showed a positive correlation between market area and sportive success with higher revenues. Regarding success, results showed that wages, total assets and capital expenditures in the year before are positively correlated. However, the clubs that don’t control their expenses in relation to their revenues tend to not succeed as they predicted.

Key-words: Football industry, European Competitions, Success, Revenues
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1. Introduction

Before being a business, football is supposed to be an entertainment show with a very deep social impact in almost every country in Europe, where the fans play a major role in the club decisions and the primary objective is to win to keep the fans happy and proud.

With time, something has changed and football became a major business in Europe where the common fans have little or nothing to say about how the club (or more precisely the company) is managed. On one hand because they don’t understand the new concepts of football management which encompasses planning, risk management and financial management and on other hand because the fundamental sports objectives which is the fans objectives can enter in conflict with the investors intentions (Nagy, 2012).

For Peeters (2011) one of the biggest changes in European football was the appearance of the Champions League as a supranational competition. The huge financial compensations paid to the participants in this league have an important impact on their performance at national level. Additionally, Champions League defines itself as the world’s most important club competition and a good performance in this competition normally means a significant appreciation of the value of the assets of the clubs while a bad campaign in that competition normally has the opposite effect.

Another important cause of this change occurred in 1995 when the European Court of Justice ruled in the Bosman Case that the player transfer system and restrictions on the maximum number of foreign players were illegal violations of the treaty of Rome. Before this, players could not move freely from one club to another even after the end of the contract, unless the involved clubs agreed on a transfer fee and the clubs could only hire a limited number of non-national players. These limitations on mobility kept the wages low. After those changes the financial impact was huge and the wages escalated to what was believed to be incredible levels at the time (Andreff and Staudohar 2000).

The changes occurred in European football created new reality for fans and company shareholders. Fans need to understand the importance that a responsible and

\[^1\] The definition of “good performance” varies according to each club expectations
competent financial management has for the sporting future of their team and for the sustainability of the entire industry. Shareholders need understand the relation between winning and the value of a team as a company. A very well managed team/business is the team/business that balances the financial and sporting performance because in this industry one can’t succeed without the other, (Baroncelli and Lago 2006). There are several known cases in which clubs went almost or completely bankrupt because of their attempt to reach greatness in countries like England, Scotland, Portugal or Italy.

As the European football has been experiencing considerable levels of financial instability, the annually increase of revenues across European football industry should be seen as a golden opportunity for controlling the industry costs and enhance its financial stability. However, what truly is happening is that teams across Europe are investing millions of Euros every year buying players at an increasingly price, increasing each year their payrolls with the objective of not only making good internal championships but also to succeed in the European competitions. This behavior has created an inflationary trend in the European football industry.

The purpose of this dissertation is to examine the main financial drivers of sportive success in the industry of football. To do so, we will follow the Virtuous Circle between sportive results and financial resources as Lago et al (2004). The Virtuous Circle starts with the necessary financial power to purchase the talent needed to create the most competitive team possible in order to achieve the better results possible. With success the teams should increase their revenues through match day tickets, merchandising, TV rights or asset appreciation, which will be necessary to restart the cycle. This brings us to the main hypothesis that we attempt to answer on this study:

- Are the revenues of European clubs correlated with success and the economic power of the surrounding football club area?
- What determines success of football clubs in Europe?

Although there are other studies regarding football industry determinants, the existing literature is focused on studying national leagues, leaving a big gap in the existing literature about the football industry: studies about the most important football league in the world The UEFA Champions League (CL) that as argued by Peeters (2011) is an important determinant of national success.
We have used data of 31 football clubs from 9 different European countries. Football clubs in our study are among the best football clubs in the world, such as Real Madrid, Barcelona, Bayern Munich, Manchester United, Chelsea, Juventus, FC Porto or SL Benfica. Our study will cover the years 2009 to 2012 with data from 2008 to 2012.

The reminder of this dissertation is structured as follows. Section 2 reviews the literature and similar studies. Section 3 presents the database used in this study. Section 4 addresses the methodology followed by the presentation of the success variable in section 5. Section 6 discusses the empirical results and section 7 concludes.
2. Literature Review

2.1. The European Football Industry

With the changes in European football after the Bosman Case, it is easily observable that the changes did not happen only in the costs side but also in the revenues side. In the season of 2000/2001 the aggregate revenue of all clubs in the top divisions throughout Europe was €6.6 billion. In the 2011/2012 season, this number rose to €19.4 billion\(^2\) meaning an increase of 194% in little more than a decade, representing an average growth of more than 17% per year. In the same period in the 28 countries of European Union, according to Eurostat the yearly inflation rate was only two years above 3%. This tendency is recorded despite the major financial crisis that started after the 2008 Lehman Brothers bankrupt and only in the last year, the revenues grew 11%. German Bundesliga, Spanish La liga, French Ligue 1, English Premier League and Italian Serie A (the 5 major football leagues) contribute with 9.3 Billion which corresponds to 48% of the total European market share. Each one of these leagues reached record levels on revenue which suggests that the football industry still have growth potential.

The wage costs of the top five leagues combined reached €6.1 billion in 2011/12 which represents a 8% growth when compared to the 2010/11 season. This means that despite the European financial crisis, the salaries in football are also still rising which goes in favor of the hypothesis of inflationary trend in European football.

However there are good signals coming from football clubs finances. In 2012, for the first time since UEFA started collecting and analyzing Europe-wide club financial data the revenue growth was bigger than the wage growth. The same report shows that the player’s value on balance sheet represents 48% of the original purchase value, (UEFA 2013).\(^3\) Considering that the biggest clubs don’t normally buy players to sell later at a higher price, and most of the aggregate value of football players in Europe is concentrated in the biggest clubs balance sheet, it is not a surprise.

\(^2\) All data from Deloitte Annual Review of Football Finance 2013 and Deloitte & Touche Annuel Review of Football Finance 2003

\(^3\) UEFA club benchmarking report: 2013/2014 season
2.2. Steps towards the football industry sustainability

Even before UEFA, Bundesliga was already giving significant steps towards financial stability and efficient governance mechanisms. First the clubs are obligated to have more than 50% of voting power which prevent that very rich foreign persons invest there, second the league also controls the clubs spending which is a prudent measure because financial control is necessary. On the downside it can hold back the German Clubs in terms of European competitions, Szymanski (2010).

Later, UEFA also gave a step forward and issued the Financial Fair Play (FFP)\(^4\) Regulation making all clubs competing in UEFA club competitions to be under their scope. The regulation was characterized by the president of UEFA Michel Platini with the following words: “These new FFP requirements which have been phased in since 2010 represent one of the most ambitious but necessary projects in the world of sports governance.” (UEFA 2013). The main reasons behind the UEFA financial fair play rules according to UEFA are to: “introduce more discipline and rationality in club football finances; decrease pressure on salaries and transfer fees and limit inflationary effect; encourage clubs to compete with(in) their revenues; encourage long-term investments in the youth sector and infrastructure; protect the long-term viability of European club football; ensure clubs settle their liabilities on a timely basis.”\(^5\)

The clubs playing in European competitions need to prepare themselves for the new UEFA financial fair play rules. The wage costs represent around 66% of total revenues in the top 5 major leagues making the costs on human capital the main cost on the football clubs income statements and wages are specified for the break even requirement that started to take place in the current season, 2013-14 (UEFA Financial Fair Play Regulations Art. 58-63).

Costs control is an important UEFA issue because although revenues are growing European football is facing financial instability. According to Muller, \textit{et al} (2012) the reason why UEFA decided to take action and issued the Financial Fair Play Regulation is to ensure a level of integrity in UEFA competitions limiting the so called “financial

\(^4\) Financial fair play rules says that clubs can spend up to €5 million more than they earn per assessment period (three years). However it can exceed this level to a certain limit (€45 million in 2014/2015) if it is entirely covered by a direct contribution/payment from the club owner(s) or a related party. Sanctions for not complying can go from a small warning to not be able to register in European competitions.

\(^5\) http://www.uefa.org/footballfirst/protectingthegame/financialfairplay/
doping” by new (very rich) investors and to ensure financial stability in the future of European football. Barros (2006) stated that football clubs are financially mismanaged and the main reasons are lack of efficient corporate governance mechanisms as well as the following of win maximizing strategies and Dimitropoulos (2011) believes that although the new regulation is a good step towards a brighter future of European football industry, without the incorporation of efficient monitoring and governance mechanisms in clubs the current financial status of the clubs will not be efficiently improved by the new UEFA regulation.

Dimitropoulos, (2011) and Dimitropoulos and Tsagkanos, (2012) argued about the importance of corporate governance mechanisms as tools to achieve a positive impact in the financial markets and the later study concluded that efficient corporate governance mechanisms in football clubs can lead to greater levels of profitability, and improve the clubs solvency which could result in a positive contribution for a better financial market performance.

2.3. Win Maximization vs. Profit Maximization

Solber and Haugen (2010) found that European football clubs, contrary to North American clubs, are not profit maximizing. Instead they are win maximizing. Win maximization clubs often hire more talent than they can afford. So other things being equal, aggregate profit of win maximizing clubs are lower because costs increase and profits decrease when more talent is hired. However, with no restrictions across countries in salaries, the most effective instrument to improve performance is to have more talent. A different strategy with lower talent purchased and lower costs could have in long term a negative impact because bad results in the pitch normally mean reduction of revenues. In order to avoid that trap, football clubs in Europe adopt a more aggressive strategy in the competition for talent. This strategy more than being the main cause for the costs increase is also the reason for the lack of correlation between revenues and costs in football clubs.

Késenne (2009) argues that players in a win maximization league are overpaid and that can lead to financial problems. Szymanski and Smith (1997) concluded that clubs are able to follow a win maximization strategy because of a failure of the market to corporate control in the industry that creates obstacles to take overs and acquisitions.
2.4 Football industry: Efficiency and Determinants

Hass (2003) argued that there are teams that are spending too much money in players and coaches and are not getting both sufficient sport results and revenues. He also argues that there are teams from bigger towns that should have higher revenues, or in another words, their social impact is lower than it should be.

Szymanski and Smith (1997) argued that in the English league the amount of skill a club purchases determines its position in the League. With similar results, Barajas and Rodríguez (2010) studied the Spanish league and explained that the production function in football is linked to the sports entertainment offered in the matches to the audience, therefore the players are essential elements to develop team production, and that is the reason why they represent the main part of the football clubs expenses. They argued that the league outcome is significantly explained by the expenses on players. On the other hand revenues are explained by both market size/sporting outcomes. There is also a correlation between total revenues and expenses on players, and almost all debt belongs to the most competitive clubs.

Mourao (2012) studied the Portuguese league debt and said that the most competitive clubs enter in the so called “race of indebtedness” for three major reasons. First, clubs face the pressure from the investors and the supporters to win. Second the inflationary wage trend in European football that occurs because of the competition for top players among the leagues. This inflationary trend has a negative impact to the game because it doesn’t correspond to an increase in player’s quality. The last reason is that players and managers are valued not only by their talent, but also for their media potential, which is a big source of revenue but at the same time a reason to spend more money. However soccer teams should have better control of their costs since the increase of debt/indebtedness can lead to restrictions on the players’ wages that will subsequently lead to lower the team quality in the future. A lot of football clubs do not have sustainable debts making their market value to deteriorate. In the Portuguese case, it was observed that the debt ratio of Portuguese clubs is positively influenced by a higher share of wages in the costs structure, by a higher number of points achieved in the championship and by a larger market area.
Hoffmann et al. (2002) studied the socio economic determinants national teams performance and the results show that factors such as culture, demography, geography and per capita level are important determinants of success. The impact that the market area has in a football club success was also studied by Barros (2006) and by Mourao (2008) for Portuguese football. Both studies confirmed that first, the Portuguese league structure of success is a reflection of its cities with the three most successful teams and every champions in the league history coming from the two most important cities and second, the population size, income per capita and the number of infrastructures are positively correlated with the ability of achieving sportive success. On the same subject, Mourao (2010) made a very important contribution, studying the regional determinants of competitiveness in Europe, using the UEFA Champions League achievements as measure of success, and found that although the absolute population of the area where the club comes from is important for success, the proportion of people living in the area when compared to the evolving region is more important. It was also pointed out the importance of urban population and income per capita of the area. This study confirms the idea that the place where the club come from does matter not only in a regional level but also in international level.

Peeters, (2011) studied what shapes the competitive balance of football and found evidence that a participation in Champions League has a negative effect in the national leagues competitive balance because of the prize money and broadcast rights revenues given to the participants. Also, the competitive balance of the Champions League, as long as any other league, can be enhanced if the prizes and TV rights revenues are more equalitarian distributed among all clubs, instead of always giving higher shares to the already richest clubs. Mourao (2012) shares the same opinion and also believes that a more egalitarian distribution of TV rights would result in an improvement of the financial sustainability of more clubs.

Lago et al (2004) studied the Italian league and described football as a Virtuous Circle in which the level of competitiveness of a team depends on the clubs financial power measured by revenues and this will determine the success that a team has, which in turn will determine the revenues. It is a never ending cycle that repeats itself. Among national leagues this cycle is easily observed, since the difference between the top teams and the others is normally huge. But when the goal is the CL, the prize is only as big as
the temptation to get it. There are teams taking big risks and in some national leagues there are teams that find very hard to keep the balance between both European Competitions and National League. When this happens the results can be very bad in both competitions.

As we have seen most studies cover national leagues or talk about the socio-economic determinants of national success. So, the idea is to join and replicate the main ideas in an international level covering the existing gap. Although there consensus opinions among the authors regarding the importance of the purchasing of talent to success in the short term among national leagues, there is not clear results regarding long terms, because normally the studies cover one season. On the other hand national leagues are far less competitive than the CL meaning that talent purchase by itself may not be enough to succeed in Europe because the competition for talent is huge.
3. Data

We proposed to study European competitions from the year 2009 to the year 2012. We were able to gather relevant data from 33 major European clubs. Our sample includes all European football clubs that make public available their Annual report.\(^6\)

In order to understand if the “virtuous circle” of Lago et al (2004) exists in European level, first we needed to gather socio-economic data such as city population, country population, GDP per capita and GDP Variation. More importantly, we also needed the football clubs financial data such as the debt ratio, total liabilities, total financial debt, medium and long term financial debt, capex, total assets, revenues, wages, players value, variation of debt, variation of liabilities, depreciations and amortization.

3.1. Data Sources

The financial data was collected from the clubs annual reports. For all the clubs listed in stock market we took the balance sheets and income statements provided by the Financial Times website\(^7\) – here all data is uniform and with easy access. For the French clubs we took our data from the website of the French League, the “Ligue De Football professionnel”\(^8\).

The data needed for our most valuable variable, the success, was taken from a highly respected soccer website, www.zerzero.pt while the socio-economic data was gathered from the World Bank data base\(^9\) and from Eurostat\(^10\).

The coach variable is a dummy variable that assumes 1 if the club coach changes in a specific year and 0 if the club coach didn’t change. This information was obtained in Wikipedia\(^11\).

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\(^6\) For the years 2009 and 2011 we have only information for 32 clubs and in a later stage of our dissertation 2 clubs were excluded for lack of data and sportive results – FC Basel and AIK Fotboll.
 \(^7\) http://www.ft.com/home/europe
 \(^8\) www.lfp.fr
 \(^9\) http://data.worldbank.org/indicator
 \(^10\) http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database
 \(^11\) In the wikipédia page of each club, there is a link for managers list. If we decided to put all the links for this variable, we would have to put more than thirty links, so we are going to put one example. http://en.wikipedia.org/wiki/List_of_F.C._Porto_managers
All the data of the clubs outside the Euro Area was presented in their home currency, so we had to convert the home currency to Euros. For that we took the historical exchange rates from onda.com website.

3.2. Sample Description

Table 1 details the descriptive statistics of our sample. A few important things can be observed from the results.

Table 1 – Summary Statistics

The sample has annual data from 31 football clubs from 9 different countries between 2008 and 2012 and does not include market potential variables – PIB per capita and football clubs home city population. WAGES_REVENUESt is the ratio between wages and revenues. DEBT_VARIATIONt is the total financial debt yearly variation in % and LIABILITIES_VARIATIONt is the total liabilities yearly variation in %. The values that are not ratios or success are in millions of euros.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Std. Dev.</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt Ratio</td>
<td>0.84</td>
<td>0.79</td>
<td>3.77</td>
<td>0.12</td>
<td>0.42</td>
<td>98</td>
</tr>
<tr>
<td>Total Liabilities</td>
<td>249.94</td>
<td>201.54</td>
<td>1,028.00</td>
<td>10.03</td>
<td>204.03</td>
<td>98</td>
</tr>
<tr>
<td>Financial Debt</td>
<td>110.51</td>
<td>81.11</td>
<td>754.32</td>
<td>0.00</td>
<td>128.49</td>
<td>98</td>
</tr>
<tr>
<td>Capex</td>
<td>12.71</td>
<td>6.05</td>
<td>209.03</td>
<td>-78.52</td>
<td>38.93</td>
<td>98</td>
</tr>
<tr>
<td>Total Assets</td>
<td>308.68</td>
<td>261.30</td>
<td>1,174.18</td>
<td>19.00</td>
<td>248.59</td>
<td>98</td>
</tr>
<tr>
<td>Revenues</td>
<td>161.37</td>
<td>138.44</td>
<td>439.18</td>
<td>13.20</td>
<td>106.35</td>
<td>98</td>
</tr>
<tr>
<td>Wages</td>
<td>98.04</td>
<td>93.77</td>
<td>251.43</td>
<td>0.59</td>
<td>67.34</td>
<td>98</td>
</tr>
<tr>
<td>Wages revenues ratio</td>
<td>0.61</td>
<td>0.62</td>
<td>1.65</td>
<td>0.02</td>
<td>0.23</td>
<td>98</td>
</tr>
<tr>
<td>Debt variation</td>
<td>1.67</td>
<td>0.06</td>
<td>82.66</td>
<td>-1.00</td>
<td>8.90</td>
<td>98</td>
</tr>
<tr>
<td>Liabilities variation</td>
<td>0.20</td>
<td>0.01</td>
<td>10.75</td>
<td>-0.53</td>
<td>1.37</td>
<td>98</td>
</tr>
</tbody>
</table>

First, from 2009 to 2012, the clubs in our sample achieved on average (median) revenues equal to €161.37 million (€138.44 million). The revenues range from an average of €13.2 million in the case of Braga to €439.18 million in the case of Barcelona. Regarding the wages, during the same period the clubs spent on average (median) is €98.04 million (€93.77 million) ranging from €0.51 million (Trabzonspor) to €251.43 million (Manchester City).

During the four year period, the average (median) capital expenditures was €12.71 million (€6.05 million). However if we analyze the maximum or minimum value invested, we observe that in a given season there are teams that make huge investments,

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12 In the case of the revenue in a single year, the highest value was attained by Real Madrid in 2012 (€514 million)
whether to “build” a team or upgrading the club’s infrastructures. During this period the club that made the highest investment was Bayern Munich in 2011 (€209.03 million) and the lowest investment was Barcelona (€78.52 million) also in 2011.

Regarding the size of the club, the clubs in our sample have on average (median) total assets equal to €308.68 million (€261.3 million). The biggest and only club in the world to pass the mark of one billion of euros in assets is Manchester United, and the smallest club in our sample is Braga. Naturally the biggest financial debt and liabilities amounts are mostly among the biggest clubs.

As to the capital structure, the average (median) debt ratio is 0.84 (0.79). The highest leveraged club is the Turkish club Besiktas with a 3.77 debt ratio and the club with the lower percentage of liabilities used to finance its assets is Fenerbahce.

Graph 1 represents the same statistics as table 1 but it can give a better insight on what some of these statistics means.

**Graph 1 – Summary statistics**

Graph 1 is a combination of BoxPlot graphics in some of the most important variables between 2009 and 2012. Revenues and Wages are in millions of euros.

![BoxPlot Graphics](image)

Looking at the revenues in Graphic 1 we observe that most of the sample seems to fall in the lower part of the graphic meaning that the 25% of the clubs are much richer than the other 75%.

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13 The negative value comes from the “sale” of football players.
The wages graph presents a similar shape as the revenues graph. However the difference between the top 25% clubs and the rest of the clubs (especially the clubs between the median and the third quartile) is not so big as in revenues, which suggests that there are clubs that even with less revenues are trying to close the gap in the competition for talent, spending a higher percentage of its revenues in wages than the top 25%.

Although only 25% of the clubs have higher debt than assets, about 75% of the clubs in the sample are financing their assets mostly with debt.

Graph 2 presents the ratio between revenues and wages. There is an increase in wages bigger than revenues in 2010 and 2011. In 2012 despite the growth in the Turkish clubs salaries payments, in the entire sample finally the wages grew less than the revenues. The sample mean in 2012 is under 58%, far from the maximum of 70% recommended by UEFA. However there are still clubs that spend more money in salaries than they earn in revenues.

Graph 2 - Wages revenues ratio between 2009 and 2012

In 2012 the sum of the revenues of the clubs in our sample was €5.545 billion, representing 29% of the entire European market which is €19.4€ billion, and 59% of the top five European leagues combined\(^\text{14}\). The top 6 success clubs represent 41% of the sample’s revenues and 26% of the sample’s total liabilities (6 clubs represented 19% of the sample).

\(^{14}\) Deloitte Annual Review of Football Finance 2013
4. The Model

In this chapter the variables will be explained, the methodology used will be described and the sample will be defined. As already told in the bibliographic revision, Lago et al (2004) argued in their study about Italian football about a Virtuous Circle that exists in football among the biggest and the smaller clubs. They argue that while the smaller clubs need to invest on younger and cheaper talent (even here some financial power is needed) to construct a competitive team and later collect money with higher revenues or by selling these players to bigger teams allowing the cycle to repeat. The bigger clubs with more financial resources are able to construct strong teams that lead them to better results and consequently raise their revenues through merchandising, TV rights sells and match day tickets sells. To confirm the existence of the virtuous circle among the biggest European clubs and to understand it, we need to first understand the drivers of financial power, measured by the revenues (our first dependent variable) needed to construct the competitive team. We also need to investigate what are the determinants of success and if the success actually increases the revenues. This is the primal objective of the study and to meet the objectives it was fundamental to construct and define a variable “Success” (our second dependent variable).

We use panel data regressions and in all our regressions we report standard errors that are robust to heteroskedasticity and are clustered at the team level, covering the study period between 2009 and 2012.

4.1. Determinants of Revenues Hypothesis

This section sets out the empirical methodology to analyze if there is any evidence that Virtuous Circle exists. The determinants of financial power will fit in two categories: Market Area (Mourão 2008 and Mourão 2010), Success (Lago et al 2004).

\[ \text{Financial Power}_{it} = f(\text{Market Area}_{it}, \text{Success}_{it}) \]

The club’s revenues are used as proxy for financial power (dependent variable) since the clubs that are normally considered the richest in the world of football are always the clubs with higher revenues.

As exogenous variable that proxies for regional economic development we use the city population of each club divided by the number of clubs in the city that played in the CL during the period analyzed and the country GDP per capita of each club. Finally the
(international) success of a team will be measured according to a new variable that takes into account how each team performed/advanced in the European competitions in each of the years analyzed\textsuperscript{15}. Given the exponential characteristics of this variable the logarithmic of the variable “success” will also be, alternatively used.

\subsection*{4.2. Determinants of Success Hypothesis}

In order to identify the determinants of success, several variables grouped according to the Competitiveness of a team (Lago \textit{et al} 2004), Coach (Haas 2003), Size (UEFA 2010; Oberstone 2009; Mourão 2012) and Leverage will be used as exogenous variables:

\[ \text{Success}_t = f(\text{Competitive team}_t, \text{Change in coach}_t, \text{Size}_t, \text{Debt}_t) \]

Our measure of success (or its logarithmic) will be used as dependent variable. As proxy for the team competitiveness we are going to use wages and the ratio wages over revenues.

Wages are the best proxy for player’s talent. In a perfect competitive industry, each player is expected to receive his marginal revenue product in revenues. The common sense is that you get in performance for what you pay (Szymanski and Smith 1997).

As proxy for change in coach, we are going to use a dummy variable that assumes number 1 when there is a change in coach during or in the pre-season or 0 otherwise. A change in coach can happen due bad results or less likely because the coach wants to go somewhere else. That change can affect the success of a team for both ways, and without a good coach it is not likely that any team would have a good season.

As proxy for size we will use total assets of the clubs. The biggest clubs are the clubs that have made higher investment over the time not only in players but in infrastructures. Kern, \textit{et al} (2012) argued that the net transfer activity is a valuable input for sportive performance as shows the club activities in the transfer market or in other words, mainly the club investment in talent. Given that, we are also going to use as a proxy for the net transfer activity the total Capital Expenditures.

\textsuperscript{15} The construction of the variable success will be explained in the next Chapter
Finally, we will use as proxy for leverage the total liabilities of each club as well as the change on total liabilities. The total liabilities of a club can influence the success of a team because football clubs may incur in debt in an attempt for success or to improve the club’s infrastructures.
5. European Competitions and the Construction of the Success Variable

5.1. European Elite play in the CL

It is widely accepted that the UEFA Champions League (CL) is the most important football club competition in the World. It is organized every year since 1956 and since its first edition until now it has been significantly modified in terms of number of clubs that play in the competition, structure and even the competition name as changed.

In the beginning, only each national league champion could play in CL, leaving strong teams, even potential winners, in the other European competitions. So, the European competitions were more leveled in terms of quality and difficulty than they are today.

Nowadays UEFA has a country league ranking defined according to the country clubs success in European competitions. That ranking determines how many clubs from each country can play in CL and in European Competitions. A higher ranked national country puts more clubs in the European competitions and in CL than a lower ranked country. For example, national leagues of the top 3 countries can take up to 4 teams to the CL. The Portuguese league is currently in 4th position meaning that 3 Portuguese teams have an opportunity to play in the CL. In the worst ranked leagues not even the national champions have direct entry guaranteed in European Competitions.\footnote{www.uefa.com}

There were changes along the way and the CL is not for the European leagues winners anymore, but for the elite. However, one thing remains the same: only the most successful and competitive clubs of each European league play in the European Competitions.

5.2. The hardest club competition in the World

The group phase of the CL starts in September and the Final is in May, so it lasts for the entire season. The competition starts with 32 clubs forming 8 groups with 4 teams each. The group stage has 6 games and each team is awarded by UEFA with 3 points per victory and 1 point per draw. The 2 teams with the most points qualify to the playoffs, the 3rd team is relegated to the Europa League (EL) and the last team is eliminated from
European competitions. The three playoffs rounds (eighth-finals\(^{17}\), quarter-finals and semi-finals) are 2 games each and the final is only 1 game in a neutral pre-defined place. In the competition structure lays one of the reasons why it is so hard to win: it is not a competition based on regularity.

Since the competition changed its name from Champion Clubs Cup to Champions League in 1992 no club won the competition two times in a row. It is an extremely hard competition to win and, when comparing to national leagues, it is much more difficult to predict a winner because, every year, there are several very strong candidates to the final victory.

In 58 years of history, 22 clubs won the CL (or the Champions Club Cup) and, since 1992, 13 clubs won the CL. Table 2 presents the 12 most successful football clubs in CL (or the Champions Clubs Cup) history in terms of final victories.

<table>
<thead>
<tr>
<th>Club</th>
<th>Wins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real Madrid</td>
<td>10</td>
</tr>
<tr>
<td>Milan</td>
<td>7</td>
</tr>
<tr>
<td>Bayern Munich</td>
<td>5</td>
</tr>
<tr>
<td>Liverpool</td>
<td>5</td>
</tr>
<tr>
<td>Barcelona</td>
<td>4</td>
</tr>
<tr>
<td>Ajax</td>
<td>4</td>
</tr>
<tr>
<td>Internazionale</td>
<td>3</td>
</tr>
<tr>
<td>Manchester United</td>
<td>3</td>
</tr>
<tr>
<td>Porto</td>
<td>2</td>
</tr>
<tr>
<td>Juventus</td>
<td>2</td>
</tr>
<tr>
<td>Benfica</td>
<td>2</td>
</tr>
<tr>
<td>Nottingham Forest</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: [http://www.uefa.com/uefachampionsleague/history/index.html](http://www.uefa.com/uefachampionsleague/history/index.html)

Besides the historical Nottingham Forest that nowadays does not even play in the English Premier League, all the clubs in Table 2 are present in our study.

\(^{17}\) Also known as “Round of sixteen”, “Last sixteen” or “Octo finals” (Wikipedia)
5.3. The Construction of the Success Variable

To measure the success of our clubs, we constructed a “Success” variable based on a ranking system. The ranking assumes that the CL is the “1st division” of European Football, the EL as the “2nd division” and the achievements of each club in these competitions will determine their ranking i.e. their success. The 8 (3rd place of each group) teams that were relegated in the group stage from the CL to the EL go directly to the last 32 EL stage (the other 24 teams come from the EL group stage) and have a good chance of winning the competition (In the last six seasons, seven of the twelve EL finalists were relegated from CL). However, the relegation happens in December and any team can start the season with bad performances, so is a fair assumption that this relegation is also a second opportunity for success. Thus we have decided that: being in the group stage of CL has the same sportive importance as reaching the semifinal of EL; reaching the CL eighth-finals equals reaching the final of EL; reaching the CL quarter-finals is equivalent to be the winner of EL.

Our final success ranking is the sum of two variables: A Fixed Score and a flexible Bonus Score which can be seen as follows:

\[ \text{Fixed Score} + \text{Bonus Score for win or draw} = \text{Total Score (Success Ranking)} \]

5.3.1. Fixed Score and Bonus Score

Both fixed and bonus scores are presented in Table 3. Fixed score points are awarded depending on each club final classification (or stage reached) in the European competitions. The bonus score points exists to guarantee the continuity in the Success Ranking. The scores are based on an exponential mode because it takes a lot more for a club to move from the semi-final to the final than to move from the eight-finals to the quarter-finals.
The winner of the CL will get 2,981 fixed points while the finalist will get a fixed score of 1,096.6 points and so on. However, two teams can reach the same stage of the competition with different performances in all round/group stages. The bonus will reward the teams that had a better performance (more victories and draws) throughout the competition.

So, in terms of bonus points each victory is worth the total bonus points of the stage where the victory occurred divided by the number of possible matches in that stage. For example, the semi-final of the CL is played over two games, so the bonus score for a victory is 346.6 (693.2 / 2 = 346.6). As the CL group stage is six matches, the bonus score for a victory is the total bonus score divided by six (34.51 / 6 = 5.75). A draw in the playoffs worth half the points of a victory and in the group stage worth one third of the points awarded to a victory, reflecting the different characteristics between the group stage and the playoffs while a defeat in any stage is awarded 0 bonus points. The final bonus score in one season is the sum of the bonus points earned in each different stage of the competitions.

As previously mentioned, the exponential element in our success variable (that we believe to better translate the success in European competitions) also justifies the logarithmic mathematical application as proxy for the success of each club. To a better understand of our measure three examples are presented in Appendix 1.
6. Discussion & Results

The upcoming section is divided into 2 subsections, with the aim of examining the Virtuous Circle in European Competitions. The first section focuses on the determinants of the financial power required to build a competitive team and the second stage is aimed to examine the determinants of success.

6.1. Determinants of Revenues

In Table 4 we present the estimated coefficients of the fixed effect panel regression of our first model. The dependent variable is the club revenues and the exogenous variables are: the GDP per capita, the city population divided by the number of the teams playing in CL and the log of our success variable. In Models I, II and III we regress each variable individually against the revenues. Model IV reports the results of regressing revenues on market area potential variables. In Model V we report the results of regressing revenues on all three variables.

In Models III, IV and V we regress each variable individually against the revenues.

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>44.422*</td>
<td></td>
<td>42.89*</td>
<td>38.827*</td>
<td></td>
</tr>
<tr>
<td>City2</td>
<td></td>
<td>0.003*</td>
<td>0.003*</td>
<td>0.003*</td>
<td></td>
</tr>
<tr>
<td>Log Success</td>
<td></td>
<td></td>
<td>16.435*</td>
<td>14.945*</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>118</td>
<td>118</td>
<td>118</td>
<td>118</td>
<td>118</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.944*</td>
<td>0.939*</td>
<td>0.941*</td>
<td>0.954*</td>
<td>0.965*</td>
</tr>
</tbody>
</table>

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

The results are not surprising. First all coefficients associated to the exogenous variables are statistically significant. Even when all variables are used in the some model the significance of the coefficients associated to all variables don’t change which suggest that all variables together explained the club revenues. These results are consistent with the results of other authors, such as Mourão (2010), and suggest that the geographic location of football club does matter.

The results also show that the success in European competitions also helps to explain the club revenues even without considered the market area potential.
6.1.1. The Real Impact of Success in Revenues

According to the previous Model V, for each additional point of our success (logarithmic) variable the club earned on average more €14.4million in revenues. Table 5 relates the log variable for each CL stage with the actual UEFA prize money and with the model prediction for revenue increase by reaching each different stage in the competition.

Table 5 – Revenues Increase Prediction vs UEFA Prize Money

<table>
<thead>
<tr>
<th>Stage</th>
<th>Log_Success</th>
<th>UEFA Prize Money(€Million)</th>
<th>Revenue increase predicted(€Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL Eight-Final level</td>
<td>2.011</td>
<td>16.6</td>
<td>30.06</td>
</tr>
<tr>
<td>CL Quarter-Final level</td>
<td>2.439</td>
<td>20.5</td>
<td>36.46</td>
</tr>
<tr>
<td>Semi-Final</td>
<td>2.948</td>
<td>25.4</td>
<td>44.05</td>
</tr>
<tr>
<td>Finalist</td>
<td>3.369</td>
<td>31.9</td>
<td>50.35</td>
</tr>
<tr>
<td>Winner</td>
<td>3.722</td>
<td>42.4</td>
<td>55.62</td>
</tr>
</tbody>
</table>

Table 5 shows us that part of the revenue growth is directly related to the UEFA prize money which is consistent with the fact that although the UEFA prize money is not the only revenue linking with the European competition success, is representative. Reaching higher stages of the competition also increases revenues from match day tickets, TV rights, marketing, merchandising and the very important asset appreciation which allows poorer teams to restart the Virtuous Circle.

For example, Bayern Munich and Real Madrid, the winners of CL in 2013 and 2014 won from prize money and television rights €55M and €57M respectively, close to what the model predicts for a CL winner. If we would consider the match day tickets and merchandising the revenue increase would be even bigger. Asset appreciation is not as important for these teams, because they are “buyers”, not “sellers” as for example FC Porto or SL Benfica.

Chelsea in 2014, a “buyer” club, reached the semi-final and earned from TV rights and prize money €43.3 million. The model says that during 2009 and 2012 a semi-finalist would earn €44 million and considering that football clubs revenues have been increasing, it seems very accurate.
6.2. Determinants of Success

6.2.1. Results with the Success Variable

In Tables 6 and 7 we report the estimated coefficients of the fixed effect panel regression of our second model. The dependent variable is our success variable and the exogenous variables are several financial statement variables and one non-financial variable (coach dummy variable).

In Table 6, Models I and II report the results of the fixed effect panel regression of our second model using as exogenous variables either the total wages or the ratio wages to revenues. Table 7 shows the inclusion of other financial and non-financial variables in order to analyse the incremental explanatory of those variables (Models III, IV, V, VI VII and VIII). Finally on Models IX, X and XI, we took off the wages and wages/revenues in order to understand the explanatory power of the other variables when “left alone”.

Table 6 – Determinants of Success 1

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>I</th>
<th>II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wages</td>
<td>6.407</td>
<td></td>
</tr>
<tr>
<td>Wages/Revenues</td>
<td>-699.354</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>118</td>
<td>118</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.279*</td>
<td>0.279*</td>
</tr>
</tbody>
</table>

Table 6 shows that without the other exogenous variables, both the total wages and the ratio wages/revenues are statistically insignificant.

Table 7 shows that even with the inclusion of the others financial and non-financial variables, the coefficients associated to wages and to wages/revenues ratio are still statically insignificant. We can also assert from Table 7 that the European competitions success can be partly explained by the previous year capital expenditures and the total assets. Oberstone (2009) also suggested that success is associated to the total assets of the club. Nevertheless, the explanatory power of these exogenous variables is relatively low.
However, Table 7 also shows that capital expenditures in a year damage the prospect of success in that same year. This result suggests that the club’s investment in infrastructures and mainly in new players does not have an immediate impact on the success. The success only comes in the following year. We may speculate that these results are due to the fact that every year in the European competitions (especially CL) there are very good teams with players that are already together for a while and are fully adapted to the team. So, an investment in new players can bring problems of adaptation to the new colleges, to the city or to the style that the team plays. The study of Frick (2011) may also help explaining this phenomenon. The author finds evidence that the players increase its effort and performance over the years of their contract, i.e., as the contract approaches its end.

### 6.2.2. Results with the Logarithmic of the Success Variable

The Tables 8 and shows the estimated coefficients of the fixed effect panel regression of our second model but now the dependent variable is the logarithmic of our success variable.

In Table 8, Models I and II report the results of the fixed effect panel regression of our second model using as exogenous variables either the total wages or the ratio wages to revenues. Then we include the other financial and non-financial variables in order to analyse the incremental explanatory of those variables (Table 9 - Models III, IV, V, VI
Finally in order to better understand the explanatory power of these financial and non-financial variables, we took off the wages and wages/revenues (Table 9 - Models IX, X and XI).

**Table 8 – Log Success 1**

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>I</th>
<th>II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wages</td>
<td>0.007</td>
<td></td>
</tr>
<tr>
<td>Wages/Revenues</td>
<td>-3.57*</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>117</td>
<td>118</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.462*</td>
<td>0.577*</td>
</tr>
</tbody>
</table>

Table 8 shows that while the total wages are statistically insignificant with a p value of 13% (Model I), the ratio wages to revenues are statistically significant and present a negative relation with success. These results together suggest that paying higher wages (more talent) increases the chance of success, however if the team struggles to pay high wages, since they are not proportional to their revenues those high salaries have a negative effect in the success of the team.

**Table 9 – Log Success 2**

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>IX</th>
<th>X</th>
<th>XI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wages</td>
<td>0.011***</td>
<td>0.01***</td>
<td>0.009***</td>
<td>-2.57*</td>
<td>-2.81*</td>
<td>-2.659*</td>
<td>0.0005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wages/Revenues</td>
<td></td>
<td>-0.005***</td>
<td>-0.003***</td>
<td>-0.003***</td>
<td>-0.003***</td>
<td>-0.004***</td>
<td>0.0003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capex t-1</td>
<td></td>
<td>-0.012***</td>
<td>-0.012***</td>
<td>-0.017</td>
<td>-0.053***</td>
<td>-0.049</td>
<td>-0.091*</td>
<td>0.0003</td>
<td></td>
</tr>
<tr>
<td>Total Assets</td>
<td></td>
<td>-0.091***</td>
<td>-0.091***</td>
<td>-0.431**</td>
<td>-0.373**</td>
<td>-0.439**</td>
<td>-0.445***</td>
<td>-0.689*</td>
<td>-0.707*</td>
</tr>
<tr>
<td>Liabilities V. (%)</td>
<td></td>
<td></td>
<td>-0.011***</td>
<td>-0.011***</td>
<td>-0.011***</td>
<td>-0.011***</td>
<td>-0.011***</td>
<td>-0.011***</td>
<td>-0.011***</td>
</tr>
<tr>
<td>Debt V. (%)</td>
<td></td>
<td></td>
<td>-0.634*</td>
<td>-0.634*</td>
<td>-0.634*</td>
<td>-0.634*</td>
<td>-0.634*</td>
<td>-0.634*</td>
<td>-0.634*</td>
</tr>
<tr>
<td>Coach</td>
<td>104</td>
<td>104</td>
<td>104</td>
<td>0.533*</td>
<td>0.499*</td>
<td>0.533*</td>
<td>0.533*</td>
<td>0.533*</td>
<td>0.533*</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.558*</td>
<td>0.558*</td>
<td>0.558*</td>
<td>0.558*</td>
<td>0.558*</td>
<td>0.558*</td>
<td>0.558*</td>
<td>0.558*</td>
<td>0.558*</td>
</tr>
</tbody>
</table>

Table 9, confirms that the coefficients associated to wages are statistically significant when other variables are included (Models III, IV and V). These results are consistent with Barajas and Rodríguez (2010) who detected a positive relation between wages and success.
The coefficient associated with the current year capital expenditures are negative reinforcing the idea discussed in section 6.2.1 that football players perform better after the first year in the club. It is also important to notice that the coefficients associated to the size of the club (total assets) are insignificant in all regressions.

The coefficients associated to a change in debt (or total liabilities) are negative and statistically significant which suggest that an increase in debt decreases the probability of success.

Finally, our results suggest also suggest that a change in the team coach decreases the probability of international success.
7. Conclusions

When studying the financial situation of the major European clubs, it is necessary to be conscious about the limitations derived from the different languages and the low quality of the information that some financial statements provide.

Despite the existing literature, studies focused on the connection between main financial issues of the football industry on international level are still rare or nonexistent.

The present dissertation tries to fill in this gap, by exploring empirically the Lago et al (2004) Virtuous Circle on international level. This study shows that club’s revenues are explained by the market size, the market’s wealth and the sporting outcome, confirming the results of other authors such as Mourão (2010) and Barajas and Rodríguez (2010).

Consistently to the presented bibliography, our results show that the amount of wages paid Barajas and Rodríguez (2010), the total assets Oberstone (2009) and previous year capital expenditures (capex t-1) are positively correlated with sporting success. However, the present year capital expenditures (capex t) are negatively correlated with success suggesting that the players perform worst in the first year of their contract due to integration problems or personal financial reasons (Frick 2011) and increasing productivity as their contract nears its end. There are several reasons for a coach change, some of them passing through the past success or failure. However, our results show that the coach change itself doesn’t help to explain sporting success.

Although wages are the biggest expense of football clubs, our results show that they are also the most important financial variable that helps to explain success, making it the most important financial variable in the industry. However our results also suggest that if the wages paid by club are not supported by revenues the effect on success is negative.

Mourão (2012) pointed out that top clubs resort on financial instruments to grant and maintain their top players, even if provided by debt. Nevertheless our results show that increases of financial debt or total liabilities are negatively correlated with success. So, we believe that the football clubs that are incurring into unsustainable debt in the attempt of achieving success should be aware that this is a very risky strategy, with a real failure possibility (as our results show) that can result in financial distress.
The financial situation of the clubs in our sample is actually improving and 40% have revenues higher than 200 million, meaning that there are some clubs with financial conditions able to construct a team with good possibilities to win the competition once in a while. Moreover 2012 was a good financial year in football as the value of the total assets grew more than the liabilities and the wages grew less than the revenues.

Our results clearly show that the clubs that are revenue generators are the clubs that have more success. This fact is very damaging for the competitiveness of European Football, so, the introduction of a “salary cap”, a more equalitarian TV rights distribution or the obligation to have more players formed in the clubs playing, are measures that would give the smaller teams a real possibility to compete against the richest teams without compromising neither the sustainability of the industry nor the overall quality of the match.

While there is an ongoing debate between football bosses and fans about the direction that football is going, further studies are needed to understand the real economic impact that outside funding has in football and in society. Is it morally correct to assume that profits coming from natural resources are being used to power up millionaire teams (as Manchester City, PSG or Zenit), disregarding the welfare of the communities? Moreover, we must not forget that in the football industry almost all of its revenues are shared within a very limited set of people, as “Football Companies” and investment funds in the business don’t have many employees.

Football clubs are treated more like business companies and although it makes the football clubs more efficient, it can also make them to lose their connection to the fans. The future of the football sport as the people’s entertainment is at risk and maybe even its natural beauty as a game may not be enough to stop it.
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Appendix

Appendix 1 – Total Score - Practical Examples APPENDIX

Example 1: Arsenal played the CL in 2010. During the group stage had 4 wins, 1 draw and moved to the next phase with 13 UEFA points. According to the total bonus point to this stage Arsenal was rewarded with 24so in the group stage Arsenal was awarded 24.9 (4 times 5.75 plus 5.73/3 for one draw) bonus points. In the last eighth-finals Arsenal won 1 game and lost the other and so was rewarded with 46.9 additional bonus points. Because of goal difference Arsenal managed to move to the next stage. In the quarter-finals Arsenal draw 1 match, lost the other and was eliminated. The draw gave Arsenal 63.8 bonus and the elimination in the quarter-finals gave Arsenal a total of 148.4 fixed points. So, the total points awarded to Arsenal in 2010 season was equal to 284 points (148.4+24.9+46.9+63.8).

Example 2: Braga during the 2011 season is an example for the exception mentioned in Table 3 as was relegated from CL to EL and so win two times the fixed points in one season. Braga in 2011 was relegated from CL to EL and lost the final of EL against Porto. So, Braga was awarded 20.1 fixed points for having reached the CL group stage plus 54.6 fixed points for having reached the final of EL. In terms of bonus points, Braga was also awarded from points earned in the CL group stage plus the bonus points from the different EL stages he played. In total Braga was awarded with 44.9 bonus points for a total of 119.6 points.

Example 3: Chelsea in 2008 lost the final of the CL in penalties (the result was a draw at the end of the game) against Manchester United. The bonus point of the final was the same for both teams, 942.2, but while Manchester United won the winner prize of 2,981 fixed points, Chelsea won only 1096.6 fixed points for being the defeated finalist. Both teams earned also bonus points for the previous stages of the competition. In the end Manchester United ended the season with 4799.1 total points while Chelsea earned 2779.6 total points.
Appendix 2 – The Sample Clubs

This table lists the names, the home country and the ranking according to the Success Variable of the 31 football clubs in our final sample.

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Club</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Barcelona</td>
<td>Spain</td>
</tr>
<tr>
<td>2</td>
<td>Chelsea</td>
<td>England</td>
</tr>
<tr>
<td>3</td>
<td>Inter</td>
<td>Italy</td>
</tr>
<tr>
<td>4</td>
<td>Bayern</td>
<td>Germany</td>
</tr>
<tr>
<td>5</td>
<td>Manchester United</td>
<td>England</td>
</tr>
<tr>
<td>6</td>
<td>Real Madrid</td>
<td>Spain</td>
</tr>
<tr>
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<td>Arsenal</td>
<td>England</td>
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### Appendix 3 – Variables Formula

<table>
<thead>
<tr>
<th>Variable</th>
<th>Formula</th>
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<tr>
<td>Debt Ratio</td>
<td>Total Liabilities/Total Assets</td>
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<tr>
<td>Debt Variation</td>
<td>Financial Debt$<em>t$/Financial Debt$</em>{t-1}$</td>
</tr>
<tr>
<td>Liabilities Variation</td>
<td>Total Liabilities$<em>t$/Total Liabilities$</em>{t-1}$</td>
</tr>
<tr>
<td>Wages Revenues Ratio</td>
<td>Wages/Revenues</td>
</tr>
<tr>
<td>Revenues</td>
<td>Revenues excluding player trading</td>
</tr>
</tbody>
</table>
Attachments

Attachment 1 – The Virtuous Circle of the Leading Clubs

Financial resources

Players’ salaries

Increase in revenue

Creation of competitive teams

Sporting results (victories)

The Virtuous Circle Between Sporting Results and Economic Gain (Leading Clubs)
Attachment 2 – The Virtuous Circle of the Small Clubs

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The Virtuous Circle Between Sporting and Economic Results (Small Clubs)