The Determinants of a Professional European Soccer Club's Value: An Economic Approach

Rui Wang

Ohio University (United States)

E<u>mail:rw128111@ohio.edu, wingstorm1988@126.com</u>

Abstract:

Purpose: Discuss the factors which influence the value of an European soccer club.

Approach: Using regression and try to explain the meaning of results.

Findings: We discover that revenue is highly correlated with a soccer club's value. Ranking and average attendance are also determinants of an European soccer club's value.

Research limitations: Not enough data.

Value: This is the first work that aims to explain what factors affect the value of a European soccer club.

Keywords: European soccer club, value of a firm, sports economics.

1.Introduction

Academic interest in the economics of professional team sports dates back to the mid-1950s. Commercial articles about soccer and soccer clubs are usually written in the headlines. The media spent many pages to report soccer finances (Dobson and Goddard, 2011).

Today, soccer is a worldwide popular game. Several million people attend matches each season, and many millions more watch soccer games on television. According to statistics, 1.3 billion people watched the 2006 FIFA world cup final game.

Between 2003 and 2005, an American billionaire Glazer gradually bought out the shares of Manchester United (a soccer team of the England premier league) in a deal that valued the club at around $1.47 billion. Why does a soccer club cost that much to purchase? Soccer is not only popular, but also a good business because it makes money. The highly developed professional soccer leagues are all over the world. Soccer has become "big business." The aggregated market value of the first and second division teams from the "Big 5" European Leagues (England, France, Germany, Italy and Spain) is nearly €12 billion (Dobson and Goddard, 2011).

Alexander and Kern (2004) discuss the economic determinants of North American professional sports franchise values. In their paper, income and team performance was included as an important variable. Although North American sports leagues and European leagues have different rules and different ways of management, their article is important to us since this paper is the first one that tries to analyze the value of an European soccer club. We can learn from their article and apply similar methods to our analysis.

In section II, we provide our data set, summary statistics, and the model we propose. In section III, we analyze and interpret the main results of the regression model. In section IV, we explain other variables that might affect the value of an European soccer club. In section V, we conclude.

2.Data and Methodology:

We collect data for thirty two European soccer teams from 2007 to 2012. The panel data contain their revenue, value, average salary, cups and champions they have won, Union of European Football Associations' (UEFA) ranking, average attendance,

population of the city where the soccer team is located, and the debt of the soccer club. Our panel data has some missing observations. Thus, we choose nineteen European top clubs that had nearly fully panel data for our research. They are AC Milan, A.S.Roma, Arsenal, Barcelona, Bayern Munich, Chelsea, Dortmund, Hamburger SV, Internazionale, Juventus, Liverpool, Manchester City, Manchester United, Olympique de Marseille, Olympique Lyonnais, Real Madrid, Shalke 04 and Tottenham Hotspur.

Table 1: Summary statistics				
	Real Value (Millions of Euro)	Real Revenue (Millions of Euro)	Rank (Points)	Attendance (Number of people)
Mean	485.658	209.907	18.877	53655.85
Median	365.125	186.255	19.15	53528
Maximum	1442.451	494.1046	36.67	84119
Minimum	134.332	96	2.05	21329
Std. Dev.	307.460	93.373	9.268	15859.14
Skewness	1.136	0.951	-0.124	0.021
Kurtosis	3.621	3.178	2.345	2.058
Jarque-Bera	20.575	13.52453	1.819	3.298

	Probability	0.000	0.001	0.403	0.192
Observations (number)	89	89	89	89

Note: See appendix for the sources of the dataset.

Table 1 presents the summary statistic for the variables used in the regression models. Manchester United has the highest value (1442.451 million of Euro) in 2012. Marseille in 2008 have the lowest value (134.332 million of Euro).

We use a model that contains three variables to estimate the value of a soccer club:

$$\log(V_{it}) = C_i + \beta_2 \log(Rev_{it}) + \beta_3 R_{it} + \beta_4 \log(A_{it}) + \mu_{it}.$$

Where i=1, 2, 3…,18, and t=2008, 2009, 2010, 2011, 2012.

V_{it} is the Forbes real value of the soccer club, which we use as the estimated value of the club. Rev_{it} is real revenue reported by Deloitte football money league, R_{it} is the ranking point of every team given by UEFA, A_{it} is the average attendance of each match for the clubs reported by ESPN, and μ_{it} is an error term. The measurement units for the variables V, Rev, Rank and A are Millions of Euro (inflation adjusted), Millions of Euro (inflation adjusted), point, and number of people, respectively. Since no one did the similar work before, we formulate simple hypothesis that the value of an European soccer club is positively related to revenue, ranking, and average attendance. To cancel the effect of inflation, all data were adjusted with the consumer price index of each country and year. However, the value of an European soccer club in real world might be affected by many other factors. We add several other variables that might affect the value of a soccer club in the sensitivity analysis part.

3.Main Results and Discussion

We took a look at the average data of the 5 years (2008-2012) and present some scatter plots before our regression results. From Figures 1, 2, and 3 in the next page we see that the three variables are positively correlated with the value of a soccer club. Using the regression model we discussed in section II, we expect the coefficients of all the independent variables to be positive.

Figure 1. Average value of a soccer club and average revenues (2008-2012)
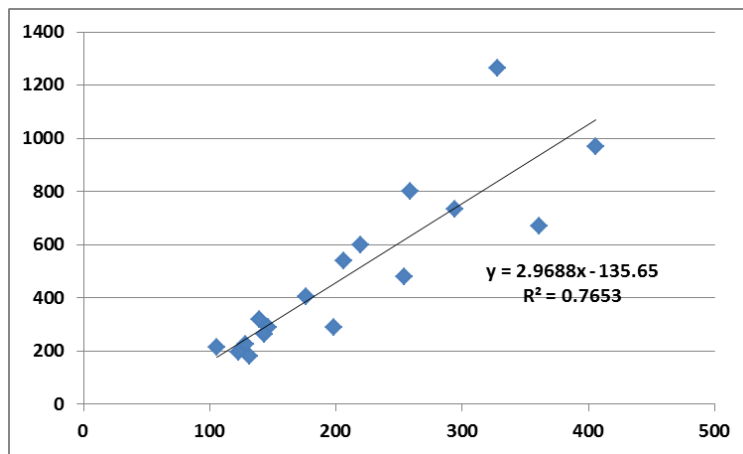

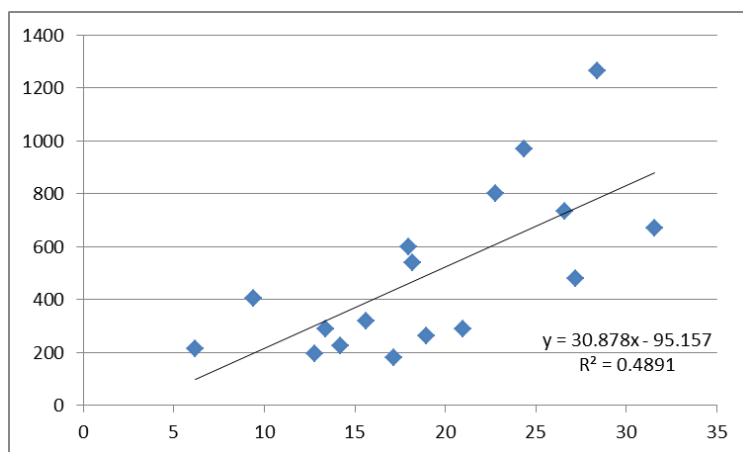Figure 2. Average value of a soccer club and average rank (2008-2012)

Figure 3. Average value of a soccer club and average attendance (2008-2012)

y = 0.0106x - 79.111
R² = 0.2933
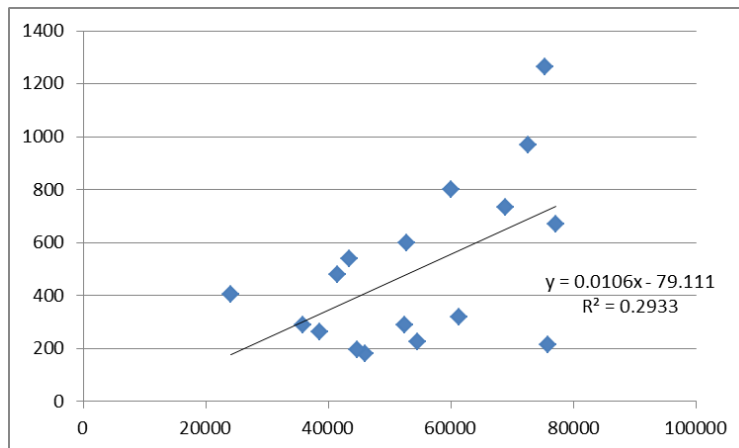
Table 2: Pooled Least Squares Regression Analysis of Professional Soccer Club Values (Dependent Variable = log[V])	
Regressors	Coefficient Estimates(Standard Errors in parentheses)
Log(Rev)	0.329(0.098)***
R	0.005(0.003)*
Log(A)	0.250(0.149)*
R-squared	0.952
Adjusted R-squared	0.937
Number of teams	18
Number of observations	89

Note: V is the real value of the soccer club, Rev is the real revenue of the clubs, R is the ranking point given by UEFA, A is the average attendance. *Significant at the

ten percent level. **Significant at the five percent level. ***Significant at the one percent level.

The adjusted R-squared in the main result is 0.937 which indicates the value estimation function shows a good fit. We perform White test and obtain a statistic value of 8.27. The chi-square critical value at the 5% level with 85 degrees of freedom is 101.88, which is greater than 8.27. This means heteroskedasticity does not exist. The p-value for Ramsey reset test (number of fitted terms=1) is 0.120, which is above the significance level of 0.05. That is to say there is no model misspecification. The Durbin-Watson statistic is 1.761, which is greater than 1.681. This implies first-order auto correlation does not exist.

This result shows that revenue, ranking point, average attendance is positively correlated to the estimated soccer clubs' real value.

From the results, we could see that the elasticity of the real value with respect to the real revenue is 0.329, which means that a 1% increase in Real Revenue would cause a 0.329% increase in the Clubs' real value.

The result is reasonable. Under the assumption that every club has the same cost, the club that has more revenue will make more profit, which will greatly contribute to increase the club's real value.

Actually, Manchester United was the most valuable soccer team with the second highest income from 2007-2011. In 2012 they had the third highest income and the highest value. Real Madrid—the club that has the most income in soccer world from 2007 through 2013—finally exceeded Manchester United in 2013 on Forbes list. Same thing occurred in the past few years. Teams with more revenue had a higher increase rate on their value and replaced the old giants on Forbes list.

---

[1] According to DW test table, $D_L = 1.63, D_U = 1.68$ at the 5% significant level (K=1)

Ranking point of every team given by UEFA represents the team's performance for each season. According to the coefficient of ranking point in Table 2, we know that if the ranking point of the soccer club increases by 1 unit, the value of the club will increases by 1.005 million of Euro[2].

The UEFA ranking points were calculated based on results over the previous five years of European competition. In Table A2 (in Appendix) we could see the maximum of ranking point is below 37 points. This means that increasing 1 point is not too easy. Some clubs at the bottom of Forbes list have to make real improvements to get this single point. However, for those clubs that have a lot of talented players like Real Madrid and Barcelona, a 1-point change could be a small change on players' status.

This indicates that a better performance helps improve the club's value, but not too much. The result could be explained. Manchester United has a lot of fans that are willing to buy its tickets, beer and hot dogs (on a match day), souvenirs, uniforms and other products. When other teams get the league championship, Manchester United fans still buy tickets to watch Wayne Rooney's (most valuable player in Manchester United) show, but those who just start to watch Manchester United game might turn to Chelsea or Manchester City, causing a slight reduction in value. And when Manchester United get premier league Championship and they even won the European Champions League title, it attracts new fans. They might buy products and service of the club, thus increasing the club's value.

The coefficient of logged average attendance is 0.250. This means that when average attendance increases by 1%, the value of the club will increases by 0.25%. When we take a look at average attendance data, we might need to look at the effect of average attendance in a different way. The average attendance for the 18 clubs is 54,404. One percent of the number is about five hundred. The average

---

[2] This value is an underestimator due to an anti-logarithmic transformation

stadium capacity for the eighteen clubs is 62527. We can see that five hundred is not a big number.

It's very hard for England clubs to make improvement at this part. Compared to other clubs, England clubs tend to have less spare tickets. Take Manchester United as an example. At the beginning of season 2006-2007, they sold more than 64,000 season tickets. The stadium capacity of Old Trafford (Manchester United's stadium) is 76,212. Only 12,212 tickets (maximum) will left before each match. Manchester United has to reserve some of the tickets (more than 2,500) for the fans of the visiting team. Tickets left for every match will be less than ten thousand. The average attendance for Manchester United in the past five years is 75,271, which is nearly full capacity. It's easier for clubs in other countries to make improvement at this part. The average attendance for Real Madrid in the past five years is 72,536, far from its stadium capacity 80,353.

If a club successfully increases the number of spectators that attend each match, they could have a chance to introduce the club and the players to the new audience, sell them merchandise and services and make these fans willing to pay for tickets in future seasons. This will increase the club's income and, thus, increase the value of the club.

4.Sensitivity Analysis

In this part we are going to include more variables in regression and discuss about the effect they might have. But we will have several variables that are not significant in the new model.

We have noticed that there are many more factors in soccer that we have not included in our model like: cups and champions the club has won, population of the city where the club is located, and GDP of the country where the club is in.

Here we provide a model that includes more variables:

$$\log(V_{it})$$

$$= C_i + \beta_1 \log(Rev_{it}) + \beta_2 R_{it} + \beta_3 \log(A_{it})$$

$$+ \beta_{45\text{ariables that are not significant be another option to attract more fans.yer training is are } 99999999999999999999999999999999999} \log(GDP_{it})$$

$$+ \beta_5 LC_{it} + \beta_6 DC_{it} + \beta_7 CL_{it} + \mu_{it}$$

Where i=1, 2, 3, 4…, 16. t=2010, 2011, 2012.

GDP corresponds to the country where the club belongs to, LC is the number of league championship the club got, DC is the number of domestic FA cup titles the club got, CL is the number of Champions league champions the club got, μ is an error term. The measurement units for GDP, LC, DC, CL are: millions of Euro (inflation adjusted), number of champions, number of titles, and number of titles, respectively.

In this model, the adjusted R-squared is 0.950 which indicates the value estimation function shows good fit. We perform White test and obtain a statistic value of 41.20. The chi-square critical value at the 5% level with 82 degrees of freedom is 101.88, which is greater than 41.20. This means heteroskedasticity does not exist. The p-value for Ramsey reset test (number of fitted terms=1) is 0.052, which is above the significance level of 0.05. That is to say there is no model misspecification. The Durbin-Watson statistic is 1.847, which is greater than 1.683. This implies first-order auto correlation in the residuals does not exist.

Table 3: Pooled Least Squares Regression Analysis of Professional Soccer Club Values (Dependent Variable = log[V])	
Variables	Coefficient Estimates(Standard Errors in parentheses)
LOG(REV)	0.439(0.087)***

---

[3] According to DW test table, $D_L = 1.63, D_U = 1.68$ at the 5% significant level (K=1)

LOG(GDP)	3.271(0.591)***
R	0.003(0.003)
LOG(A)	0.077(0.147)
LC	0.076(0.031)**
DC	0.032(0.032)
CL	0.014(0.055)
R-squared	0.964
Adjusted R-squared	0.950
Number of teams	18
Number of observations	89

Note: GDP corresponds to the country where the club belongs to, LC is number of league champions the club got, DC is the number of domestic Football Association cup the club got, CL is the number of Champion league champion the club got. *Significant at the ten percent level. **Significant at the five percent level. ***Significant at the one percent level.

The result in Table 3 shows that revenue, GDP and number of league champions the club got are positively correlated to the estimated soccer clubs' real value.

GDP is positive related to the real value of the club and will greatly increase the club's real value. This result corresponds to the real world. People are willing to spend money on soccer, which will increase the value of soccer clubs. But when

depression comes, people will spend less money, which will reduce the value of soccer clubs.

Number of league champions is a new factor that positively affects the clubs' value. Just as we have illustrated before. Number of league champions the club got could be treated as part of the team's performance. Better performance makes the team more valuable.

The problem in this model is that we have some variables that are not significant in this model and variables like ranking, LC, DC, CL could all measuring team's performance, and, therefore, causing collinearity.

We could not say that GDP and number of league champions do not affect the real value of a soccer club. If we are able to get more data and doing further research on it, we might be able to include many more factors to our model such as variables that measure teams' costs.

Even though the adjusted R-squared in the first model is lower than the adjusted R-squared in the second one, we choose to present the first one as our preferred model because of the statistic significant and signs of the coefficient. We also estimate a model like the second model without GDP and the adjusted R-squared was even lower than the adjusted R-squared of our preferred model.

5.Conclusion

In this article, we examine the economic determinants of a professional European soccer club's value. The regression results show that revenue of the club, team performance and average attendance increase a team's value. We also check sensitivity by including GDP and the number of league championship the club has won. These factors might increase the value of the club, but this needs further research. Number of domestic cup titles, number of champions league titles are not related to European clubs' real value according to the data we have. Based on the

results, several suggestions can be made with regard to the development of professional soccer leagues in Europe.

Revenue reported in Deloitte Football Money League contains three parts: Match day income, broadcasting income, commercial income. Different clubs have different income structure. Some clubs are good at selling merchandise so they have higher commercial income. Some clubs are expert in managing the stadium and facility during match days so they have higher match day income. Some clubs are popular on TV and get paid by media every season so they have higher broadcasting income. In my point of view, European soccer clubs should pay more attention to what they are not good at, because they can learn the experience from other clubs.

As we have mentioned in section III, top clubs should maintain their players' status so they will have stable performance. For smaller clubs, they have to make real improvements. They can pay attention to player training so their players might have improvement. Smaller clubs can also buy some good players if their budget allows.

Clubs that do not belong to England tend to have more spare tickets than other top clubs so it's easier for them to increase their average attendance. If the price of their ticket is higher revenue maximizing monopoly price, they could reduce their ticket price to attract more fans. Holding more fans activities might be another option to attract more fans.

6.References

Alexander, D.L., & Kern, W. (2004). The Economic Determinants of Professional Sports Franchise Values. Journal of Sports Economics, vol. 5, 1: pp. 51-66.

http://jse.sagepub.com/content/5/1/51.abstract

Dobson, S. & Goddard, J. (2011). The Economics of Football. New York: Cambridge University Press.

Smith, K. (2004). Valuing Professional Sports Franchises: An Econometric Approach. Unpublished paper.

http://economics.about.com/library/weekly/aa043004g.htm

Si, S.C. (2008). Research on the Commercial Value Assessment of China's Professional Soccer Club. Master degree, China Central University of Finance and Economics.