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Macroeconomics and European club football

- an economic viewpoint on the richest football assembly in the world –

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Foreword

We would like to begin with a special thank you to our supervisor Pontus Hansson for his much appreciated guidance as well as Peter Jochumzen for his supplementary support during our working process. Their contribution is highly thought of.

Abstract

Football is getting more and more connected to business as well as economics by each day. Almost annually, a transfer record or an all-time-high sponsorship deal is signed. This essay will attempt to take an economic point of view on the footballing industry and try to analyze whether a relationship between seven chosen macroeconomic variables and the UEFA coefficient can be observed and defined. To be able to analyze this link, a Tobit model will be used on sixteen countries during a time period from 1980 to 2012.

Results show that a relationship between the chosen macroeconomic variables and the UEFA coefficient indeed exist. The relationship is not completely as on beforehand assumed, but a clear connection is established.

Keywords: Tobit model, UEFA coefficient, football, macroeconomic, growing industry

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1. Introduction

Football is the world's most popular sport according to topendsports (2014). Its origin can be traced back centuries but it is widely believed to be introduced in its current form in the year 1863 in England, the same year the FA, The Football Association was founded. The FA is the governing body of the English football. Football is popular all over the world but above all in Europe, Africa and South America (FIFA, 2014).

Nowadays, the highest governing body in the football world is Federation Internationale de Football Association, FIFA. One of FIFAs responsibilities is the ranking of countries out of their performance. Currently, 207 countries are listed on FIFAs world ranking, all of which have the chance and right to enter the qualification rounds for the World Cup Championship played every 4th year. The World Cup final is one of the most viewed sporting events with more than 900 million in-house audience, last time played in South Africa 2010 (FIFA, 2014).

Similar responsibilities regarding a multinational ranking system within European football have been given to and processed by UEFA. This ranking system is the core of European football and its structure (UEFA, 2014). UEFA are mainly responsible for two important rankings, the national team coefficient which determines the status of each country's national team and the country coefficient, positioning each country's respective league. This paper focuses on the country coefficient, called the UEFA coefficient (UEFA, 2014). UEFA is the host of two big club competitions on an annual basis, UEFA Champions League being the most prestigious one and UEFA Europa League considered somewhat less prominent. These are the base of how UEFA ranks different countries in rankings on club level via the UEFA coefficient.

The purpose of this study was to examine, by using a regression model, if seven different macroeconomic variables have affected the ranking based on the UEFA coefficient. We examined the sixteen most successful teams in Europe during a time period from 1980 to 2012. The empirical model that was used is a Tobit model. The macroeconomic explanatory variables examined were GDP, GDP/CAP, population, unemployment, debt, inflation and CAB. The countries investigated were Austria, Belgium, Cyprus, Denmark, England, France, Germany, Greece, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and Turkey. Investigations on European level in general and on the club level in particular taking

the UEFA coefficient in consideration have not been implemented. We believe that this sort of study is well-needed.

This essay will continue with a part where some background to our investigation is presented along with some information about previously written essays within the field. Following, our data will be presented along with the line of thought behind chosen variables. The first part of the data section will introduce the UEFA coefficient for obvious reasons as it is our depending variable. Subsequently, we will continue through introducing our model. Then we have chosen to add another section called consideration in which we analyze some of the limitations made as well as some of the obstacles we have encountered along the way. We have also chosen to include some proposals of other studies that could be made. The next section will consists of our results and analyzes, followed by the final part, conclusion.

2. Background

Business and sports are often discussed together and this connection has grown even stronger in recent years. During the London Olympics in 2012, the Guardian published an alternative medal ranking. This ranking highlighted how many medals each country won and how many medals each country won in comparison to population, GDP and team size. The conclusion was that the most medals were won by countries with the largest population and the highest GDP, however the highest medals to GDP or population ratio did not belong to countries with the largest GDP. This proves that in one competition, in one sport, on a particular day it might be the case that one small country receives a gold medal but in the end, the largest countries win the most medals. One of the reasons behind this is that countries with a large population do have a larger talent pool to choose from. Another explanation why richer countries are performing better is that these countries have larger funds to spend on the athletes (Simon. R,2012).

Europe is one of the richest parts of the world, especially considering GDP per capita. Many European powerhouses have high production levels and feature large output and export figures per capita, especially Germany but also France and Great Britain. (Madisson, A, 2009). As previously mentioned, football is highly popular in Europe as well as globally and the best financed and thus most prestigious leagues can be found right here in Europe (Euroyouth). The biggest and best financed leagues considering number of television-viewers, spectators, revenues, prestigious trophies and worldwide fan bases are the English Premiership, Spanish La Liga, German Bundesliga and Italian Serie A. Two challengers to these four are SuperLiga in Portugal and Ligue 1 in France. Global competition to these leagues are mainly the Brazilian and Argentinian leagues (Comparetheleagues, 2012).

During recent years, the football industry has become much larger and therefore it has become more and more interesting to discuss both the integration between football and business as well as football and economics. This field of study has been very popular and several different investigations have been made in this area. Our interest was particularly in analyzing if it was possible to determine wherever a country's macroeconomic performance could translate into performance in a footballing sense. A presentation of previously done studies will be followed by our own results.

2.1 Previous studies within this field

Studies examining the relationship between different macroeconomic variables and football variables to explain the FIFA world ranking have been done before. Leeds' and Markova Leeds' (2009) study regarding how national institutions affect the FIFA world ranking is one example. In this study, the authors used variables including colonial heritage, political regime and GDP, among other. This is a very comprehensive study, including almost all the countries on the FIFA world ranking. The regarded study shows that there is a positive relationship between national success, wealth and success in football country wise which would support our thesis that there is a relationship between macroeconomic variables and the UEFA coefficient.

Other essays confirm the fact that it has been important for football clubs to participate in the two big European cups, UEFA Champions league and UEFA Europa league. In some way, qualifying for Europe matters almost as much as a minor domestic trophy, illustrated by the expression "4th place trophy" referred to by Arsenal coach Arsene Wenger (Taylor. L, 2012). The importance of participating in European cups is intensified by the magnitude of sponsorship and advertisement money that comes through competing in these cups. The net amount available for clubs competing in Champions League in 2012/13 season was an astounding 910M € (UEFA) and is most likely to increase in the upcoming season (IOL). Being the most prestigious trophy in football on the club level, Champions League have been able to attract the biggest sponsor deals, the best players as well as managers and thus, it is vital to be a part of this competition for every major club that aspires to stay at the top (Rodgers. I)

Feddersen (2006) featured in his study the importance of qualifying for the two cups in general and the Champions League in specific, mainly due to the financial benefits received from the participation. As mentioned above, higher costs tend to result in a better final position in a league. A higher league result will in its turn generate a chance for the respective club to qualify for the two big European cups. Feddersen showed that it is crucial for German football clubs to reach the UEFA Champions League as the generated income enables them to maintain a top position domestically the upcoming years and thus qualifying for the highly profitable European competitions again. Over the chosen period, Feddersen analyzed revenues for the UEFA Champions League participants and made the conclusions that Champions League football equals 6,4% of total revenue, transfers excluded. This could be

seen as insignificant but looking at the individual teams, the author concluded that by using a Gini coefficient, revenues are indeed skewed in favor of the teams participating in the UEFA Champions league. Therefore, we must assume that the individual teams in all European leagues generally strives for a spot in the European cups. This has been in almost every case equal to a top position in the national league a particular team is competing in, although for the UEFA Europa League some exceptions are made. For example, some teams qualify for UEFA Europa League by being the team ranked at top of the Fair Play table or winning a domestic cup trophy (Premier League, 2014).

Another great example of how important the UEFA Champions league has been is the case of Liverpool FC, one of the biggest clubs in English football and European football and the winner of UEFA Champions league in 2005. Liverpool FC participated in the European cups almost every year 1994-2009. Liverpool FC finished in seventh place during season 2009-2010 in the Barclays Premier League and missed any chance of qualifying for the European cups. After that, their stagnation regarding league results has restricted Liverpool FC to make a mark on the European scene and thus benefiting financially. The fact that Liverpool FC have not participated in the UEFA Champions league has made it harder for the club to attract the best players and the biggest commercial deals as well. These obstacles formed a negative loop which made it even harder to get back among the European finest clubs. (Liverpool FC, 2014).

Olofsson (2011) discussed how extern factors affected the league table results in Swedish top flight Allsvenskan. This study highlighted the importance of stadium attendance, previous results as well as clubs revenue. It also highlights that higher expenditure render in better result in the Swedish first division. However, this study took an microeconomic point of view and no international comparisons were made, therefore the author chose to use a binary logit and multinomial approach.

The relationships shown by Olofsson (2011) was also confirmed by Lindquist (2012) in which the author studied the relationship between costs and final league position in the Swedish first division, Allsvenskan. These results highlighted the fact that, ceteris paribus, higher expenditure carry on towards better results on the pitch. Lindquist used the ordinary least squares approach arguing that the gap between the spots in the table was equal.

As we can see, a number of studies within the field of football and finance combined have been done. However, most of them did study a specific league or compared the biggest clubs

in each country, for example Olofsson (2011) and Lindquist (2012). There have been those that took a broader point of view and tried to analyze large sectors such as previously mentioned Leeds and Markova Leeds (2009). The current hot topic of European club football financial fair play has also been investigated narrowly.

2.2 Problem discussion

The previous sections provided a brief background on some of the issues that has already been studied and how these studies are linked to the specific field we decided to investigate. This will be further discussed upon below.

It has been shown that the countries in Europe are strong economies. The stronger the economy of a country is the more money it can spend on its football association which in the end will render more money to each club in that specific country. It has been shown that clubs strive for a top position in respective domestic leagues and thereby aim for spots in the European cups because of the financial and sporting advantages. Therefore, one could assume that a country in general strives towards a high UEFA coefficient. Our question is as following; is it doable to link well performing countries in an economic sense to well performing countries in a footballing sense?

Previously mentioned studies along with our personal football interest convinced us of trying to investigate any possible relationship between macroeconomic variables and the UEFA coefficient. One important aspect for us was to analyze something new in this field. Therefore, we have chosen to collect macroeconomic data for sixteen European countries and analyze if these macroeconomic factors affect European football. European football is defined by a ranking we have created from 1 to 16 based upon the UEFA coefficients ranking. This is further explained in section 3.1.1 UEFA coefficient. The chosen countries are were Austria, Belgium, Cyprus, Denmark, England, France, Germany, Greece, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and Turkey. We have chosen to collect data regarding the seven following macroeconomic variables; GDP, GDP/CAP, population, unemployment, debt, inflation and current account balance (CAB). The time aspect studied was 1980-2012. A regression model was used to investigate this relationship, the model was a Tobit model.

3. Data

We have chosen to collect our data mainly from several online sources. We collected the data from the OECD database, IMF database, Eurostat and the Office for National Statistics. Using different sources is of course not optimal since there are different ways to calculate and present macroeconomic data but we have tried to take that into consideration as thorough as possible and describe our steps. One problem we stumbled upon is that most institutions have macroeconomic statistics for the UK but not for England and Scotland separately. Therefore, we had to use the Office for National Statistics as a getaway and calculate country specific data available in this manner. This is of course a potential problem discussed further in section 5. One important thing to stress is that these are macroeconomic variables meaning that they are inert and are affected a lot by the values from previous time periods. Therefore one might assume that lagged values of both the explanatory variable sand the y-variable are important to consider.

3.1 Variables

In the upcoming chapter, we have decided to include an explanation of all by us chosen variables meant to represent the macroeconomic part of the essay. In this part, we have explained the reason behind why each variable was chosen, how it is assumed to effect the UEFA coefficient and how it is measured. The number of explanatory variables were chosen to be seven. We will start by presenting our dependent variable, the UEFA coefficient.

3.1.1 UEFA coefficient

In this paper, the country specific UEFA coefficient was used to determine how well a country performed on football terms. Therefore, the UEFA coefficient is the Y-variable in this essay, which hopefully can and will be explained by the chosen macroeconomic variables. The UEFA coefficient was received from Bert Kassies homepage. This homepage gathers relevant statistics regarding the UEFA European cup football (Bert Kassies, 2014). In this essay, we have chosen to use the sixteen best performing countries accumulated from 1980 to 2012. This time period was the longest possible considering the restructure of Europe in recent decades as well as lack of established and adequate data. The trade-off between a large number of countries with a shorter time period and vice versa will be discussed further on. In figure 3.1 the UEFA coefficient for 2014 is presented. One ranking similar to that one was established for every year. The choice of studying the top 16 countries meant that in one particular year, one excluded country could be higher ranked than one included country. Therefore we chose to rank the sixteen best countries from 1 to 16 with the UEFA coefficient as the underlying ranking. This did not change the relative order, only the absolute ranking. The reason for this was that the result turned out to be easier to interpret. If we would have had data for all the countries and all countries would have had existed from 1980 to 2012 we would not have had to takes these measures. To conclude, a ranking was created by us but it was based on the UEFA coefficient and the absolute order was not changed (UEFA, 2014).

The coefficient has been used in order to rank countries and to determine how many spots each league received in the two European club competitions, UEFA Champions League and UEFA Europa League. An example of how this ranking was determined in a specific year is shown below in figure 3.1. In order to compute the coefficient, UEFA added each leagues performance during the previous 5 years starting the year before the selected year. For example the coefficient determined in 2010-2011 was used to see how many teams from each country were invited to participate in the two cups 2012-2013. This highlights the huge importance of performing well in European cups in general. Each country received points when a club reached the group-stage, additional points if a club won or drew a game, further points if a club qualified to the knockout-stage and finally in the case when a club went through in the knockout-stage. In addition to this, UEFA added together the points gathered by each team from a certain country and divide it by the number of clubs in the country. To obtain the value of the coefficient, this value was then added up to the values of the four

previous seasons calculated in the same way. The coefficient has been determined every November and then used for the upcoming season. This is done due to the fact that different leagues around Europe finish their season at different times of the year and every club needs information regarding how many spots they are competing for each season in advance. The higher spot a country received on the ranking, the more spots in the European Cups it got, which in turn made the possibility to earn further points in the upcoming seasons even larger. This issue was helped a bit by the fact that it is an average of how well each team in a certain country performs but the ranking is still skewed in favor of the best teams. Another important thing to take into consideration is that the UEFA coefficient ranking is the sum of previous five seasons. One league could have performed poorly for a part of this period and still receive a relatively high spot in the end of considered time period (UEFA, 2014).

We considered this coefficient to be a good measurement for how well a country has been performing due to above-mentioned reasons. We were aware of the fact that the coefficient may not have been the perfect variable to determine whether the football system in a specific country is competitive on a general level, but it has determined which country had the top performing clubs and in the end the best first division. There were plenty of cases where a domestic league consisted of a smaller amount of high performing teams that could have made a mark on the international scene but the domestic competition was second-rate at best. Some examples during the chosen time period were the Norwegian Tippeligan during the 90's and early 00's, Scottish Premier League and Swedish Allsvenskan in 80's and 90's. This segregation within respective league was not taken into account in this essay. We assumed that the UEFA coefficient was a good measurement of how well a country and its football league performed on the European scene (UEFA,2014).

RANKING 2014		SEASON					Table 3.1			
#	Country	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014	ranking	UCL	UEL	TOTAL
1	Spain	17.928	18.214	20.857	17.714	22.571	97.284	4	3	7
2	England	17.928	18.357	15.250	16.428	16.785	84.748	4	3	7
3	Germany	18.083	15.666	15.250	17.928	14.714	81.641	4	3	7
4	Italy	15.428	11.571	11.357	14.416	14.166	66.938	3	3	6
5	Portugal	10.000	18.800	11.833	11.750	9.750	62.133	3	3	6
6	France	15.000	10.750	10.500	11.750	8.500	56.500	3	3	6
7	Russia	6.166	10.916	9.750	9.750	10.416	46.998	2	4	6
8	Netherlands	9.416	11.166	13.600	4.214	5.916	44.312	2	4	6
9	Ukraine	5.800	10.083	7.750	9.500	7.833	40.966	2	4	6
10	Belgium	8.700	4.600	10.100	6.500	6.400	36.300	2	3	5
11	Turkey	7.600	4.600	5.100	10.200	6.700	34.200	2	3	5
12	Greece	7.900	7.600	7.600	4.400	6.100	33.600	2	3	5
13	Switzerland	5.750	5.900	6.000	8.375	7.200	33.225	2	3	5
14	Austria	9.375	4.375	7.125	2.250	7.800	30.925	2	3	5
15	Czech Republic	4.100	3.500	5.250	8.500	8.000	29.350	2	3	5
16	Romania	6.083	3.166	4.333	6.800	6.875	27.257	1	3	4
17	Israel	7.250	4.625	6.000	3.250	5.750	26.875	1	3	4
18	Cyprus	4.250	3.125	9.125	4.000	2.750	23.250	1	3	4
19	Denmark	4.400	6.700	3.100	3.300	3.800	21.300	1	3	4
20	Croatia	3.000	4.125	3.750	4.375	4.375	19.625	1	3	4
21	Poland	2.125	4.500	6.625	2.500	3.125	18.875	1	3	4
22	Belarus	3.375	5.875	3.125	4.500	1.750	18.625	1	3	4
23	Scotland	2.666	3.600	2.750	4.300	3.250	16.566	1	3	4
24	Sweden	2.500	2.600	2.900	5.125	3.200	16.325	1	3	4
25	Bulgaria	3.125	4.625	1.500	0.750	5.625	15.625	1	3	4
26	Norway	2.100	2.375	2.300	4.900	2.600	14.275	1	3	4
27	Serbia	3.000	3.500	2.125	3.000	2.500	14.125	1	3	4
28	Hungary	2.750	2.750	2.250	3.000	0.875	11.625	1	3	4
29	Slovenia	1.375	1.500	2.250	3.250	2.625	11.000	1	3	4
30	Slovakia	2.500	3.000	2.375	1.500	1.625	11.000	1	3	4
31	Moldova	2.125	2.125	0.500	2.250	3.375	10.375	1	3	4
32	Azerbaijan	1.500	2.000	1.375	3.000	2.500	10.375	1	3	4
33	Georgia	1.750	1.875	2.875	1.500	1.875	9.875	1	3	4
34	Kazakhstan	1.250	0.875	1.625	1.375	3.125	8.250	1	3	4
35	Bosnia-Herzegovina	1.750	1.875	1.125	1.250	1.500	7.500	1	3	4
36	Finland	1.375	1.800	1.500	2.000	0.500	7.175	1	3	4
37	Iceland	1.250	0.375	1.375	1.250	2.500	6.750	1	3	4
38	Latvia	2.250	0.500	0.625	1.250	1.625	6.250	1	3	4
39	Montenegro	1.125	1.750	0.500	1.375	1.250	6.000	1	3	4
40	Albania	1.000	0.875	0.875	0.750	2.000	5.500	1	3	4
41	Lithuania	1.250	0.625	1.000	1.125	1.250	5.250	1	3	4
42	Macedonia	0.500	1.375	1.625	1.250	0.500	5.250	1	3	4
43	Ireland	1.375	1.000	1.500	1.000	0.250	5.125	1	3	4
44	Luxembourg	0.250	0.625	1.125	1.375	1.500	4.875	1	3	4
45	Malta	0.750	1.500	0.833	0.875	0.875	4.833	1	3	4
46	Liechtenstein	1.000	0.500	2.000	0.000	1.000	4.500	0	1	1
47	Northern Ireland	0.125	1.125	0.500	1.000	0.875	3.625	1	3	4
48	Wales	0.250	0.875	0.625	0.500	0.750	3.000	1	3	4
49	Armenia	0.500	0.250	0.125	0.875	1.125	2.875	1	3	4
50	Estonia	0.875	0.250	0.375	0.375	1.000	2.875	1	3	4
51	Faroe Islands	0.000	0.250	0.500	0.500	0.875	2.125	1	3	4
52	San Marino	0.500	0.166	0.000	0.000	0.333	0.999	1	2	3
53	Andorra	0.500	0.000	0.000	0.000	0.333	0.833	1	2	3

3.1.2 GDP

Gross domestic product, GDP (Y), is the aggregated value of all production in private and public sector for a given time period, usually one year. GDP is likely the most common macroeconomic factor used to determine on what level a specific country performs.

GDP is assumed to have an intuitive effect on the UEFA coefficient. According to previously done studies, a country with high GDP could increase funds towards sports and education regarding health which will led to better broad athletic performance, in this case on the football pitch. Therefore, we expected higher GDP to result in a higher UEFA coefficient, ceteris paribus. (Leeds and Markova Leeds, 2009 and Bibek. D, 2011)

A technical issue using GDP in a regression as an explanatory variable appeared since GDP has been constantly growing and the dependent variable, UEFA coefficient has not. This paper has thus used an index system of GDP. All GDP values for one year were added together and then used as the denominator in calculating a percentage value for each country in our study. A specific country's value will thus be represented as the percentage of the gathered GDP for the entire study group on an annual basis.

3.1.3 Current account balance

Current account balance, represents all non-financial transactions and highlights the difference between savings and investments in a country during a given time period. One can define current account balance as the sum of exports less imports and net income from abroad as well as net current transfers. Positive current account balance will thus mean that a country has been a net lender to the rest of the world and vice versa. Current account balance is a good measurement of how competitive and effective a country's industry and thus economy is, especially if the majority of countries considered are located in the same geographical sphere and no significant trade barriers are in place. That is the main reason for including current account balance in this study as the countries investigated are located near each other and are pretty similar in an economic sense. Another fact strengthening this assumption is that all but three countries are members of the European Union. This stresses the fact even more that the countries' economies are very closely correlated and linked. The current account balance has been somewhat more difficult to interpret than the other variables. A negative current account balance could in the short run be seen as positive as foreign investors want to invest their

capital in the country in question. On the other hand, in the long run a negative current account balance is undesirable because foreign investors do not get any return on their investment and it also increases the debt owned abroad. We expected the relation between current account balance and the UEFA coefficient to be positive meaning that a higher current account balance will result in a higher UEFA coefficient. (Amadeo Kimberly, 2013)

3.1.4 Population

Population was a very important variable in this investigation. A smaller population means that there is a smaller pool of talent to explore and thus a smaller chance to find top class players in the considered country. Fewer top class players available leads to higher costs necessary if a club or league wants to compete at the highest level. This increases the difficulty since the costs are significantly higher for an established world class player then for a home grown talent brought through the clubs youth system. This fact has also been discussed above in section 2 background (Olofsson, 2011 and Leeds and Markova Leeds, 2009).

Some leagues apply restrictions on the number of foreign players allowed in each squad. These restrictions stress the importance and advantage of a large population even further. These rules might be seen as somewhat odd since a large number of the countries in consideration are members of the European Union. The latest contribution to this area is that several countries has presented a rule saying that each club is obliged to have a specific amount of homegrown players in their squad (Premier League, 2014).

A large population was even more important before 1995 when the Bosman ruling came. In short this was a ruling that lead to a freedom of movement for the European football players. Before 1995 almost every country had restriction on how many foreign players they were allowed to have in their team but after the Bosman ruling this restriction was loosened. In the end these ruling lead to the free labour markets that today exists in the European Union but that is a complete different essay. (Erik Lindgren, 2014)

According to Olofsson (2011), a higher population should result in a higher UEFA coefficient. We will encounter the same problem with population as with GDP, continual growth. Thus, the same index method has been used in this section.

3.1.5 GDP per capita

Gross domestic product per capita is total GDP divided by the population in respective country. This variable is a solid measure of how much each person in a country produced. GDP per capita is also a very common macroeconomic variable and is highly related to total GDP and population. It is a materialized measurement of standard of living, which means that it will not cover soft values such as happiness, health and education. GDP/capita has also been indexed in the same way as GDP and population in order to obtain a similar ranking system. GDP/capita is obviously highly correlated with GDP and population as already stated and should thus have the same effect on the UEFA coefficient as GDP and population. (Fregert & Jonung, 2010 and Leeds and Markova Leeds, 2009)

Many studies have argued that this measurement is not complex enough to measure the welfare of a country. Nevertheless, this variable amongst other macroeconomic ones such as GDP, exports, imports, population and unemployment is very useful while ranking countries in economic terms (Fregert & Jonung, 2010, p. 62)

3.1.6 Unemployment

According to the OECD glossary, unemployment is defined as the amount of people in a specific age segment whom during a certain time period are without work, currently available for work and seeking employment. A somewhat more everyday used explanation is simply that unemployment rate is the ratio of unemployed people compared to the total labor force. The labor force is the sum of the employed and unemployed. Unemployment is an obvious waste of resources in the society since unemployed people could work, earn and contribute to a country's output and GDP. If the unemployment rate in a country increases the GDP will decrease. Therefore in this paper high unemployment was expected to have a negative effect on the UEFA coefficient meaning that a higher unemployment should lead to a lower UEFA coefficient. (Fregert & Jonung 2010)

3.1.7 Inflation

Inflation is a measure of how much the price level changes in a country during a specific time period. One of the most common procedures of measuring inflation is to use a general basket of goods and measure how much the price of this basket of goods changes over a chosen time period. When prices of goods in a country rise, the purchasing power of this country's

currency declines. This means that, ceteris paribus, consumers will be able to buy less with the same amount of money. A majority of developed economies have inflation targets that focus on stabilizing inflation at a low and stable rate. This means that the central bank should strive for an inflation clarified beforehand since unforeseen inflation rates are more damaging for an economy even if they are on a low level. Most of the countries analyzed in this paper are members of the European Union and thus use a measure called harmonized index of consumer price index (HICP). One of the purposes of European Central Bank, the governing body in EMU region regarding economic issues, is to make sure that inflation stays at the decided level, in this case 2% (ECB, 2014). Therefore we expected that a lower inflation rate would lead to a higher UEFA coefficient. (Fregert & Jonung, 2010)

3.1.8 Debt

Sovereign debt consists of all liabilities that involve repayment to the creditor by country borrowing the resources. In this paper, we have worked with the debt to GDP ratio since the absolute values of debt would be higher the larger a country is, ceteris paribus. Government budgets, ratings and prognoses are done by looking at the debt to GDP ratio and it is thus the most logical measurement for us to use. An absolute debt increase might not be an issues as long as GDP growths in a more rapid way (Burda & Wyplosz 2009).

Arguments can be made that debt is not necessarily a bad thing. This is however only true in the short run. Borrowing in order to invest or cover up for short term losses instead of cutting government expenses and thus reducing general economic activity is considered a good move (Riksgälden, 2012). A constantly high level of sovereign debt however obstructs the repayment since interest charges will be high due to two facts. First of all, a highly indebted country will most likely have a low credit rating at a rating agency such as Standard & Poor's or Moody's, resulting in a high interest rate. Secondly, a large debt level is in most cases a sign of a structural error in the general economy, a path that is difficult to turn around swiftly.

Due to these facts, we have considered lower debt to GDP ratios preferable meaning the lower ratio a country display, the higher up in rankings the specific country should be.

4. Empirical specification

When deciding upon what model would be the best suited for this essay, we looked at some of the previously mentioned essays as well as other written within similar fields. The binary logit model and the multinomial logit model were used by Olofsson(2011), where the author tried to examine whether external factors affected the final position in Allsvenskan, Swedish highest ranked football league. Lindquist (2012) discussed whether to use a logit approach, multinomial logit approach or the Ordinary Least Squares (OLS) approach in her study and decided to use the OLS. In the essay, Lindquist (2012) argued that the distance between different league placements in the table are the same across the board, meaning that the distance between first and second place is the same as between last and second last place. Lindquist's essay attempted to test whether there was a negative relationship between costs of a club and final position in the league i.e. if higher costs generated a better final position in the league.

In our essay, we wanted to test whether a country's macroeconomic variables affected the UEFA coefficient i.e. we wished to test whether there was a relationships between the UEFA coefficient and some country specific macroeconomic variables. As previously mentioned, the UEFA coefficient itself determines how many spots a domestic league receives in the respective European cups. A higher ranking results in more slots, obviously. A country that finishes at the top of the UEFA coefficient rankings has a larger chance of receiving a high position next year due to the fact that they will have more clubs competing in each cup. However, if the respective representatives fail to make a mark in any of the competitions, the country's ranking would have been affected negatively and thus the ranking system must be seen as quite fair. If one takes this fact into account, the distance between different spots in the ranking must be seen as equally large but they are not. It is always harder to end up at the top of a ranking than at the bottom. To end up at the bottom of the ranking a country does not even have to play a game but to end up at the top, a certain country needs its clubs to perform well over a large amount of time. This means that the gap between the ranking spots would not be equally large, a conclusion also drawn by Leeds and Markova Leeds (2009).

The fact that the gaps between the positions in the ranking were not equally large was a problem while finding a suitable model. This problem has also been discussed in many other essays in the field. One could argued that the multinomial logit model considered by Olofsson (2011) could solve this problem if the chosen time period was shorter than the one chosen by

us. In order to perform this model, Olofsson (2011) chose to divide the analyzed league into different segments. A fifteen-team league would be divided into 3 groups with 5 teams in each. Teams that occupied places 1-5 would form one group, 6-10 a second group and 11-15 the third one. This approach would in fact also cause one issue. A certain team might and in fact probably will jump between the different segments chosen by the author. This problem is very hard to correct for and it is difficult to find a suitable model that will take this into account. Leeds and Markova Leeds (2009) also argued that the ranking system caused the biggest problem while trying to find a suitable model because of the gaps and the fact that the ranking was based on accumulated ranking points. Leeds and Markova Leeds (2009) solved this problem by using a negative binary choice model. However our approach was slightly different from previous written essays in the field.

Because of the distance between spots in the table are not equally large and because of the fact that the ranking is based upon accumulated point we chose to use a Tobit model to estimate our regression. The Tobit model would be truncated because we left out a part of the sample as we decided to use the sixteen best countries. The Tobit model uses maximum likelihood to estimate its probabilities which is discussed below.

The best ranking possible to obtain is number one. We decided to restrict our regression to the sixteen top performing countries during our time of investigation, meaning that the regression would become truncated since it used a subsample of the best countries in a footballing sense while estimating the model. A truncated regression is a regression where some data on both the dependent variable as well as the regressors are excluded. This was the case in our survey as we only tested the sixteen best performing countries during the chosen test period and excluded the rest.

To be able to receive a better result we did choose to form our own ranking based upon the UEFA coefficient. This ranking does not shuffle any considered leagues among each other, it only categories them into one solid group instead of being a ranking with gaps . The reason for this has been explained in the section about the UEFA coefficient above.

To be able to understand the chosen model used in this essay, one example of a Tobit model from the book "A guide to modern econometrics" written by Verbeek M (2012) is used. We have also used this book as a source to explain our model below.

A Tobit model is suitable for modelling regressions when the dependent variable is continuous but its range is constrained. For example, while observing a large population but

for many observations the dependent variables is zero. A great example is tobacco consumption which differs a lot among the population and is non-existing for a lot of individuals. Trying to explain the expenditure on tobacco, Y would express the amount itself, z would be all other expenditures and x represents total income. This could be described as a utility maximization problem:

$$\frac{max}{y,z} U(y,z), y + z \leq x \; and \; y,z \geq 0 \; (1)$$

The corner solution in this problem is $z = 0$ and can be excluded directly, y will be zero or positive. Lets denote the solution to $\frac{max}{y,z} U(y,z), y + z \leq x$, without the constraint $y,z \geq 0$ as y^*. Then the regression can be written as:

$$y^* = \beta_1 + \beta_2 x + \varepsilon \; (2)$$

Where ε is unobserved heterogeneity. Without any restrictions on y, the consumers would spend y^* on tobacco. Thus the solution to the original constrained problem will be given by:

$$y = y^* \; if \; y^* > 0 \; and \; y = 0 \; if \; y^* \leq 0 \; (3)$$

This means that if a household wants to spend a negative amount on tobacco that particular household will be given a value of zero. This results gives us the standard Tobit model which could be written as:

$$y_i^* = x_i'\beta + \varepsilon_i, i = 1,2, \dots, N \; (4)$$

$$y_i = y_i^* \; if \; y_i^* > 0 \; (5)$$

$$y_i = 0 \; if \; y_i^* \leq 0 \; (6)$$

ε_i is NID(0,σ^2) and independent of x_i. The model above is also called a censored regression model because all negative values are mapped to zeros. The Tobit model uses maximum likelihood to estimate the probabilities of the different outcomes stated above.

The remaining thing to do was to connect the model in this study to the Tobit model. In this study the data consists of observations regarding seven different macroeconomic variables from 1980-2012. The dependent variable is the UEFA coefficient, the seven macroeconomic variables are GDP, population, GDP/capita, unemployment, inflation, current account balance and inflation. Once again, the reason why this model is truncated is the discussion to exclude a number of countries and the custom made ranking going from place 1 to 16.

The truncated regression model will instead be given by:

$$y_i^* = x_i'\beta + \varepsilon_i, i = 1, \dots, 16 \ (7)$$

$$y_i = y_i^* \ if \ 0 < y_i^* < 16 \ (8)$$

$$x_i, y_i \ is \ not \ observed \ if \ y_i < 1 \ and \ y_i > 16$$

Now, it is necessary to consider the fact that the sample is not random anymore. Thus, one can conclude that the log likelihood function for a model that is not truncated is given by:

$$\log L_1(\beta, \sigma^2) = \sum \log[1 - \Phi\left(\frac{x_i'\beta}{\sigma}\right) + \sum \log[\frac{1}{\sqrt{2\pi\sigma^2}} \exp\{-\frac{1}{2}\frac{(y_i - x_i'\beta)^2}{\sigma^2}\}] \ (9)$$

The log likelihood function in the case of our investigation is represented by:

$$\log L_2(\beta, \sigma^2) = \sum \log f(y_i | 0 < y_i > 16) = \sum [\log f(y_i) - \log P\{y_i > 0, y_i < 16\}] \ (10)$$

Our likelihood function can be reduced to:

$$logL_2(\beta, \sigma^2) = \sum \left\{ \log \left[\frac{1}{\sqrt{2\pi\sigma^2}} \exp \left\{ -\frac{1}{2}\frac{(y_i - x_i'\beta)^2}{\sigma^2} \right\} \right] - \log \Phi \left(\frac{x_i'\beta}{\sigma} \right) \right\} \ (11)$$

The parameter β is a vector consisting of explanatory variables. These variables are further discussed in section 5 below. y_i is of course the variable y-variable, the UEFA coefficient. x_i is the data for each individual country. σ^2 is the variance within the sample. Using this formulas requires the assumption of normality.

Next important formula is the one calculating the marginal effect of each variable. If one calculates the marginal effect for one of the explanatory variables, the interpretation of the marginal effect is the following; if a variable increases by one percent the dependent variable, UEFA coefficient, for this particular country increases or decreases by a certain amount in percent. It is important to stress the fact that respective marginal effect will not represent the entire sample but only one individual country. The reason for using marginal effects in a Tobit model is that the coefficient value of a parameter does not say anything about the effect of the parameter upon the dependent variable, it is only possible to use the sign of the parameter. This is the formula for calculating marginal effects:

$$\frac{\partial E\{y_i\}}{\partial x_{ik}} = \beta_k \Phi \left(\frac{x_i'\beta}{\sigma} \right) (12)$$

Now we have got the tools for both estimating a suitable model for the relationship in question and to find out what the marginal effect for each variable for a certain country is. Before moving on to explaining the explanatory variables it is important to know how a suitable model is determined. There are a couple of different things one should take in consideration. We decided to look at the significance of each variable, the coefficient value, the two different information criterions called Akaike as well as the Schwarz Bayesian and last but not least the relevance of the model. To be able to find a suitable model it is important to look at all these three issues simultaneously. Most important of all, the information criterion is more of a guideline than the whole truth and it is more often used to determine lag lengths.

5. Consideration

In this section we have decided to discuss some of the potential problems and a number of the limitations we decided to include and the reasons for those. Some are pretty obvious and are mentioned in previous sections but some are of a more philosophical character.

The time perspective of this paper has been restricted to 1980-2012 due to the lack of credible data in previous years. We have also restricted the number of countries in this survey to the sixteen most successful ones on the UEFA country ranking since 1980. The reason for restricting the number of countries is that there were a number of issues regarding credible data as well as the fact that many Europeans countries did not even exist in 1980. We could have started our survey in the year 1993 instead of 1980 and include a larger number of countries, however, there is a trade-off between number of year and number of countries and we decided to work with the 1980-option. We thought of the time aspect as much more important than the need of including a large amount of countries. It would however be interesting to compare this study to a study considering additional countries done from 1993.

Another source of error in this investigation is the fact that we had to construct our own ranking excluding a lot of countries. In the best of worlds we would have had a full ranking and a full set of macroeconomic variables. The result might have differed but in the end we believe that these countries represent the football industry in Europe sufficiently enough. One interesting thing is that there were almost no East European countries included, mainly due to the matter of things in this region before early 1990's, mainly in Soviet Union and Yugoslavia. Nowadays these countries are significant sources of power in the European football and it would have been interesting to investigate how these countries affect this relationship. One particular country that would be interesting to include is Russia.

Another restriction in our essay is the matter of the United Kingdom. United Kingdom consists of Scotland, England, Northern Ireland, Wales and a number of small islands. Wales has its own UEFA coefficient but their most successful teams are playing in the English league system, therefore, Wales has been considered as a part of England in this paper. We have, in some extent, found macroeconomic variables for the other countries but not all in full detail. We did calculate the GDP in percentages for Northern Ireland over the last ten years, leading towards an average of 1.5 percent. We assumed that this is true for the entire time period and thus calculated England's data in this manner, simply by subtracting the GDP of

Scotland plus 1.5% of the GDP of UK to receive GDP of England. This is of course not optimal but it is the fairest way within our time restriction of receiving a reliable result representing the GDP of England. We did also chose to use West-Germany as the representative for Germany for the years before the reconciliation of East- and West-Germany.

One limitation did have a big impact on our y-variable, the Heysel tragedy. In 1985, 39 spectators lost their life and approximately 600 were injured during a match between the Italian side Juventus and the English side Liverpool FC. As a result, all English clubs were banned from international competition the following 5 years. The issue limited our dependent variable during this time period since there is a big probability of England performing well during these years being ranked as a top-3 nation both before and after the ban. After consideration, we chose to use the existing ranking because handling and correcting for this problem would affect the whole ranking for ten years, which could potentially have an even larger impact on the result. Calculating an average or compensating for this "error" in other ways would affect other nations and been unfair towards their ranking, thus the discussed ranking was used. However, this was not taken into consideration while analyzing the result (Bert Kassies, 2014 and Herner. M, 2012)

The fact that the UEFA coefficient is an equally weighted average of the five recent years was not a problem but it could have be seen as an unfair measure. A country that has been performing badly the last two seasons could still have a high ranking due to their strong result in previous years. One positive thing with an equally weighted average is that it makes the coefficient slower to change which could be preferable if we assume that during a certain time period, a country performs badly but in the long run the country does well. Then one bad season will not have such an impact on the ranking position in Europe. The negative aspect of this is that a country that is declining in performance will still receive a decent number of spots in the cup taking up potential spots from other countries on the rise. This could be stagnating for the competition and could make investors uninterested to support teams in smaller countries. It would be interesting to test how the UEFA coefficient would look like if it was an age-weighted average instead of equal weighted.

The problem with missing data did force us to exclude some countries from our estimation because we were not able to find relevant data for the chosen time period. The only variable we chose to estimate was debt expressed as a percentage of annual GDP. This variable was

estimated by taking the average annual growth rate of debt and then using this rate to compute values for missing years. This was done for roughly half of the countries in our study and for no more than 5 years for respective country. More specifically, average annual growth rate was calculated for Cyprus, Denmark, Germany, Italy, Netherlands, Turkey, Sweden and Portugal.

One big issue with these kind of essays is that there is a huge problem measuring how much each country spends on football each year. Most papers we found did observe the same issue, being that it is very hard to find data on how much each country spends on their respective football association as well as how much each club receives from external owners. Some authors have found this kind of data for a restricted time period and only in a small amount of regions. Our essay must be seen as a long run alternative in this field and therefore this data is almost impossible to obtain. One solution used by some of authors is to use a proxy called "football history". This proxy measures how old the football association in the country is. This variable is then thought to show how well established football is in the specific country. The variable is, as mentioned, used as a proxy for how much each country spend on the football association of the country. We have chosen to not include this variable because the essays we have found using this proxy had a larger set of countries and countries that are geographically further apart from each other than the ones we chose to target. We believed that the most interesting investigation that could be done in this area is an essay where the investigator has all input regarding the footballing variables. If one could find other economic variables related to the football associations and clubs in each country, there is a great opportunity to create a very exiting paper (MacMillan. P and Smith. I).

The football industry is nowadays a very attractive investment option for several oil sheikhs, oligarchs, investment groups and other well-founded institutions and individuals. The hype and prestige of owning a football club at the top level brings is seen as almost priceless amongst the wealthy. It all begun in the early 21st century when Roman Abramovich bought Chelsea F.C and started to invest, at that time, an enormous amount of money (Chelsea FC, 2014). This style of owning a football club then continued and nowadays, there are many examples of clubs owned by wealthy individuals, for example Paris Saint Germain (Sayare. S, 2012) and Arsenal F.C (Arsenal FC, 2014). This could have imposed a problem in our essay because these clubs are not entirely dependent on what country that specific the club is located in. External investors not highly dependent of demand or financial power of the region

caused our essay some problems since this climate is only a relatively recent issue and not representative of the entire time period in consideration. As mentioned above, the world of football has become much more commercialized and there has been a rapid rise of funds in the industry compared to the early and mid-1980's. What is more important is that resource allocation is highly skewed in favor of the biggest leagues and thus the biggest clubs. One does not have to go far to find an example. The Swedish club IFK Göteborg won the UEFA Cup, today's version of Europa League, twice during the 1980's. This was of course a big sensation but at that time nowhere near on the same scale as it would have been if IFK Göteborg succeeded to win the competition in near future. Nowadays, it is almost impossible for a Swedish team to win UEFA Europa League or UEFA Champions league (IFK Göteborg, 2014). This new allocation of resources and the raised competition within the industry was hard to take into account and to measure. It would have been interesting to investigate how external investors have influenced the UEFA coefficient or to compare for example the 1980s to the 2000s and analyze the differences between and within regions during this period.

6. Result and analyses

The last two parts of this essay are divided into a part called results and analyse and the final part called conclusion. The reason for having results and analyse in one part is that it will be a lot easier to embrace the result if these two parts are not divided.

In econometrics, there are two common ways to take into consideration when working with issues such as the one we struggle with. One either chooses to go from a general model to a specific or go from a specific model to a more general one. We have chosen to start with a general model and then tried to find a specific one that was suitable for this relationship. From time to time, econometricians tend to test several different models and only present the one they find most useable. We decided to present a number of different models and conclude why they do not satisfy our goal and then conclude which model is the most well suited one of those investigated.

In the result section presented below, the variable COEF is the y-variable the UEFA coefficient and CAB is the current account balance, the other variables are obvious in their abbreviation.

6.1 Regressions and estimations

This part discusses the different model specifications we have tested. As stated in the data chapter, we decided upon seven explanatory variables and tried to explain the dependent variable, the UEFA coefficient. The underlying theory suggests that higher GDP/CAP, higher GDP, higher population, lower inflation, lower unemployment, lower debt and higher CAB would have an effect on the UEFA coefficient in a positive way meaning that it would lead towards a higher UEFA coefficient. The underlying theory also suggests that lags of the seven variables might affect the relationship. Our strategy was to test different model specifications and different lag lengths in order to be able to conclude which model was the most suitable one. The way we processed this workload was to first and foremost conclude which variables to include, meaning which model specification we have got and then test which lag length of each variable was preferable.

Table 6.1	Averages parameters country wise							
Country	*Ranking*	*GDP*	*GDP/CAP*	*Inflation*	*Unemployment*	*Population*	*Debt*	*CAB*
Austria	10,73	2,27	6,99	2,60	3,77	1,82	60,89	0,17
Belgium	7,52	2,78	6,64	3,00	8,55	2,35	110,32	1,99
Cyprus	15,64	0,10	3,55	3,97	3,89	0,15	60,30	-5,53
Denmark	12,42	1,88	8,68	3,42	6,17	1,21	56,74	0,78
England	4,79	14,93	6,21	4,00	7,85	13,49	46,96	-1,47
France	5,03	16,44	6,90	3,57	9,11	13,39	51,10	0,00
Germany	2,91	21,89	6,66	2,28	7,81	18,46	53,59	2,15
Greece	9,64	1,51	3,48	10,52	9,35	2,43	86,79	-5,60
Italy	2,64	13,48	5,72	5,65	8,91	13,24	103,75	-0,76
Netherlands	6,73	4,45	7,00	2,42	5,10	3,56	67,42	4,62
Norway	13,88	1,95	10,67	4,03	3,69	1,02	40,87	6,77
Portugal	6,48	1,19	2,85	7,82	7,22	2,35	61,41	-5,44
Spain	2,58	6,97	4,16	5,55	16,80	9,36	48,52	-2,92
Sweden	12,79	2,98	8,26	4,11	5,72	2,03	63,01	2,62
Switzerland	11,27	3,17	11,02	2,00	2,41	1,61	49,25	7,35
Turkey	10,97	2,96	1,22	46,68	8,71	13,52	55,85	-2,25

Our first action before estimating any of the above-presented models was to examine the data visually to see if we could draw any conclusion straight away. To be able to understand the conclusions drawn from this examination we have chosen to present table 6.1 with the average values of each variable for each country and the average ranking for each country during the estimated time period. A significant number of countries ranked high up of the UEFA ranking also possessed large population figures. This made us to draw the conclusion that the larger the population is, the better the ranking should be. Not a surprising nor a controversial conjecture. Another important conclusion was that countries with high GDP/CAP had a low UEFA coefficient which leads us to believe that higher GDP/CAP should, ceteris paribus, result in a lower UEFA coefficient in contrary to our first assumption in the data section. It is also important to stress the fact that we obviously need to test all variables in the model before drawing any final conclusions about each variable, this is only the average values for each country presented in table 6.1.

We analysed the type of data we collected and could conclude that the data is stationary as well as not heteroscedastic. Due to the simplicity of the data layout, we did only perform one test before starting estimating our model. This was a test for multicollinearity which showed that our data is not suffering from multicollinearity. Prior to estimating any models we also drew the conclusion that it was impossible to include GDP, GDP/CAP and population in the same estimation due to obviously high correlation between these three variables. We chose to

include one table with an estimation of these variables to display the correlation between them and concluded that it is impossible to include all three of them simultaneously. To be able to analyse which model is preferable, the tools mentioned in the empirical specification section are used along with the theory explained in the data section. Now we will continue by presenting our result.

Table 6.2

Variable	*Coefficient*	*Std.error*	*Probability*
C	10,53042	1,20054	0,0000
GDP/CAP	0,623096	0,12941	0,0000
DEBT	-0,031485	0,007958	0,0001
INFLATION	0,055132	0,019201	0,0041
UNEMPLOYMENT	-0,205171	0,060347	0,0007
GDP	-0,687659	0,099723	0,0000
POPULATION	0,162983	0,105749	0,1233
CAB	-0,005152	0,045543	0,9099

The first model estimated by us is shown in table 6.2. We concluded that we could not include GDP, GDP/CAP and population due to the mentioned correlation. This result made us draw the conclusion that we had to remove one of the variables and we chose to remove GDP. However, one important conclusion could be drawn from table 6.2. The results showed that higher GDP would render a better UEFA coefficient. The reason why the coefficient of GDP is negative is that each country strives for a ranking as low as possible. The best ranking possible is one and therefore the negative sign means that higher GDP lead to a better UEFA coefficient.

Table 6.3

Variable	*Coefficient*	*Std.error*	*Probability*
C	13.16946	1.332534	0.0000
DEBT	-0.038833	0.008967	0.0000
GDP/CAP	0.216782	0.124680	0.0821
INFLATION	0.145266	0.020856	0.0000
POPULATION	-0.605525	0.056020	0.0000
CAB	0.050886	0.049594	0.3049
UNEMPLOYMENT	-0.157486	0.067365	0.0194

Table 6.4			
Variable	*Coefficient*	*Std.error*	*Probability*
C	12.68649	1.243225	0.0000
DEBT	-0.038824	0.008995	0.0000
GDP/CAP	0.289099	0.104301	0.0056
INFLATION	0.149700	0.020664	0.0000
POPULATION	-0.605810	0.056257	0.0000
UNEMPLOYMENT	-0.155253	0.067673	0.0218

After the decision to exclude GDP was taken, we then estimated the model shown in table 6.3, which resulted in a more gratifying result. The only insignificant variable at a ten percent confidence level was CAB. GDP/CAP ended up insignificant as well at a five percent level, which was a problem. CAB is a variable highly dependent of GDP within each country as well as the population; therefore we considered the fact that CAB would also be highly correlated with GDP, GDP/CAP and population. Therefore, the next logical step was to exclude CAB from the estimation. This estimation, shown in table 6.4, shows, as expected, a result where all of the variables turned out to be significant at the five percent level. Model 4 in table 6.4 explains the relationship in a representative way, therefore we decided to continue by explaining what this model shows.

While analysing coefficients in these estimations, we concluded that some of the explanatory variables received coefficients opposing to those of our underlying theory. Two of the variables tracked our theory, more exactly population and inflation. Population possessed the expected negative sign and inflation the expected positive sign. Interpretation of the coefficients would be the following; if population rises, it would result in a significantly positive effect regarding the UEFA coefficient. The opposite is true in the case of inflation, if inflation declines it has a significant effect on the UEFA coefficient. This result was not surprising because as stated above, the highest ranked countries are the ones with the highest population. In the case of inflation, most of the countries in this investigation are members of the European Union and as stated in the data section, the Union does have an inflation target set. The aim is to have a low and stable inflation around the 2 percent mark, thus it was not surprising that a lower inflation would have a significant effect on the UEFA coefficient.

Lower GDP/cap turned out to have a significant effect on the coefficient. The richest countries did have larger opportunities to spend funds towards health and education and thus improve the football environment. On the other hand, the richer the population is, the higher is the probability and need of a university education. Ceteris paribus, there would be a larger white collar work force and thus fewer feeling the need of performing as a football player in order to provide for their families.

Our results show that a lower GDP/CAP level had a significant effect on the UEFA coefficient. Higher debt had a positive effect on the UEFA coefficient as did higher unemployment rates. This result was most likely a consequence of the fact that the countries occupying the top of the UEFA coefficient ranking also had high unemployment and high debt. The top 5 consists of Spain and Italy among others, countries with significant economic difficulties in recent times. Looking at the bottom of the list, countries such as Sweden, Denmark, Norway and Switzerland did have high GDP/CAP figures. These two facts combined indicate why our results turned out the way hey did. If we have chosen to exclude GDP/CAP and consider GDP instead, one could look at table 6.2 and see that in fact a higher GDP did result in a higher UEFA coefficient. The result received when estimating our model without any lags seems to be correct according to the dataset but not fully according to the underlying theory.

Table 6.5

Variable	*Coefficient*	*Std.error*	*Probability*
C	12.18475	1.150022	0.0000
DEBT	-0.168999	0.045187	0.0002
DEBT(-1)	0.133114	0.044929	0.0030
GDP/CAP	-0.332165	0.744498	0.6555
GDP/CAP(-1)	0.649579	0.743834	0.3825
INFLATION	0.066508	0.041409	0.1082
INFLATION(-1)	0.027674	0.039182	0.4800
POPULATION	20.34375	4.997316	0.0000
POPULATION(-1)	-20.91390	5.003677	0.0000
UNEMPLOYMENT	0.128315	0.188563	0.4962
UNEMPLOYMENT(-1)	-0.228723	0.196805	0.2452

Analysing the estimation shown in table 6.5 where all chosen variables were lagged once, we could observe a very inconsistent result. Our thought was that some of our data was highly correlated and that our sample might have been too small for estimating this model with several lags. Another possible explanation for this result is that there might have been one variable explaining a large part of the relationship which would make the other variables

insignificant. There turned out to be two significant variables in this estimation, population and debt. The other variables were not. The significant ones provided inconsistent coefficient values, the interpretation of this result would be that the lagged values did not affect the relationship on any level. The difference between the two coefficients of population were almost -0,60 which was the same as in the first examination. This highlights the fact that the lagged variables did not affect the relationship. The reason for this is most likely that almost all of these macroeconomic variables are very inert and therefore the lagged values did not affect this specific relationship. In the end, this means that population did not change rapidly enough over the course of one year to have a significant effect on the relationship.

One must also analyse the high coefficient values of population. This is obviously completely wrong and therefore this model must be considered to be a nonsense result. The other significant variable was debt which suffered the same problem as population, the coefficient values summed up to approximately -0,04 but the coefficient values were also in this case too large and proved the conclusion of a nonsense result. In order to sum table 6.4, results cannot be considered as valid, due to the inconsistent coefficient values. Therefore we decided to denote the results of table 6.4 to be a nonsense result.

Theory suggests that lags should have affected the UEFA coefficient while the results from 6.5 suggests lags does not affect the UEFA coefficient. The problem of correlation and a high degree of explanation from some of the variables forced us to move on in another direction while testing this relationship. We have chosen to lag each variable separately with a lag length from one to five to see how a longer relationship would look like for the concerned variable. However, this result was not satisfying leading us to exclude most of the result. To stress the fact that the lagging variables did not lead to a better model, we chose to add three models that would symbolize this. One model where population was lagged once, one model where population was lagged twice and one model where we lagged inflation once. This is presented in table 6.6-6.8.

Table 6.6			
Variable	*Coefficient*	*Std.error*	*Probability*
C	12.28533	1.174173	0.0000
DEBT	-0.038770	0.008567	0.0000
GDP/CAP	0.335675	0.099627	0.0008
INFLATION	0.091348	0.021489	0.0000
POPULATION	23.04148	5.085136	0.0000
POPULATION(-1)	-23.62059	5.093782	0.0000
UNEMPLOYMENT	-0.105058	0.063964	0.1005

Table 6.7			
Variable	*Coefficient*	*Std.error*	*Probability*
C	12.35665	1.162743	0.0000
DEBT	-0.040648	0.008557	0.0000
GDP/CAP	0.342319	0.098835	0.0005
INFLATION	0.078749	0.021144	0.0002
POPULATION	14.94870	5.512432	0.0067
POPULATION(-1)	-4.354396	9.306590	0.6399
POPULATION(-2)	-11.17398	5.189600	0.0313
UNEMPLOYMENT	-0.087941	0.062774	0.1612

Table 6.8			
Variable	*Coefficient*	*Std.error*	*Probability*
C	12.70847	1.251859	0.0000
GDP/CAP	0.300880	0.105086	0.0042
DEBT	-0.040298	0.009029	0.0000
INFLATION	0.068419	0.044669	0.1256
INFLATION(-1)	0.082219	0.042477	0.0529
UNEMPLOYMENT	-0.152400	0.066843	0.0226
POPULATION	-0.604303	0.055783	0.0000

The result presented in 6.6-6.8 suggests that lagging the variables did not result in a better model. The reason for not receiving significant lags could have different reasons and we decided to comment on some of those in upcoming sections. Three of the reasons are presented above; too high correlation, not sufficiently large enough sample and the fact that one variable might have explained the whole relationship. Another possible explanation might be that the macroeconomic variables are somewhat inert. Consider the population of a

country. It might only rise or fall with a thousandth or a hundredth a year. Therefore, the lagged variables would be very similar to the present value and result in a nonsense result in the estimation. It would have been interesting to test lags down to ten, fifteen or even twenty years but as the dataset is not long enough, it was impossible to construct such model and receive a consistent result.

Table 6.9

Variable	*Coefficient*	*Std. Error*	*Probability*
C	11.32758	1.095893	0.0000
DEBT	-0.043857	0.008975	0.0000
INFLATION	0.164491	0.020793	0.0000
GDP/CAP	0.404251	0.095693	0.0000
POPULATION	-0.655968	0.056665	0.0000

To receive a more significant result and higher coefficient values one might exclude another variable. This will in the end lead to the fact that the remaining variables will explain the relationship and thus not necessarily result in a better model. We chose to feature one such model where we excluded unemployment. The result is presented in table 6.9 and supports our discussion above.

In order to be able to choose which model is the preferred one we decided, as stated in section 4, to investigate the significance of each variable, the coefficient values, the two chosen information criterions and if the model made sense at the time of decision making. When analysing the model from these four perspectives, we concluded that the model in table 6.4 was the preferred one and this will be the model that we decided to further analyse and discuss.

The underlying macroeconomic theory seems to be consistent with the result in some cases and in some not. Therefore, we had to conclude that the UEFA coefficient partially could be explained by our theory but not to the full extend. We concluded that a larger population did contribute to a higher UEFA coefficient. A lower inflation seemed to be consistent with a better football performance for an individual country as well. These two variables acted according to the theory stated in section 5. The other three variables chosen in our model displayed similar patterns, more specifically that a higher debt, a higher unemployment and a lower GDP/cap are all preferable for a country's UEFA coefficient. This was quite surprising

but in the end, taking our data in consideration as well as the countries in question, we were not astonished by the result. Countries such as Spain, England and Italy proved to be at the top of the ranking while countries such as Switzerland, Sweden, Norway and Denmark were at the bottom.

6.2 Marginal effects

This part highlights the marginal effect for three different countries assuming that model 6.4 was the correctly chosen model. When the correct model is established it is most convenient to look at the marginal effects to see how this model affects the countries. There were two possible approaches here, either to look at the marginal effect of one hypothetic country or to look at the marginal effect of some different countries and compare the marginal effects among them. We chose the second approach and estimated the marginal effect of one top ranked country, one middle ranked country and one bottom ranked country. The chosen countries were Spain, Netherlands and Sweden.

Spain

Coefficient	*Marginal effect*
Debt	3,738579279
GDP/CAP	-27,83895351
INFLATION	-14,4154471
POPULATION	58,33682035
UNEMPLOYMENT	14,95017641

Sweden

Coefficient	*Marginal effect*
Debt	0,717071217
GDP/CAP	-5,339598491
INFLATION	-2,764927911
POPULATION	11,18918489
UNEMPLOYMENT	2,867490668

Netherlands

Coefficient	*Marginal effect*
Debt	1,348647577
GDP/CAP	-10,04256815
INFLATION	-5,200199419
POPULATION	21,04430735
UNEMPLOYMENT	5,393096596

As stated in section 3, an index was applied on some of our variables in order to compute the values of the dataset. These were population, GDP/CAP and GDP. Due to this approach, the interpretation of a marginal effect would be slightly different. For these variables, the interpretation of the marginal effect is as follows; for a one percent higher population in comparison to the total population of the countries in the investigation the marginal effect will be the value in the result, for Spain this is approximately 0,584%. This means that if Spain has one percent more of the total population of the countries investigated the result will be a rise in the ranking by 0,584%. The same interpretation holds for GDP/CAP. The other variables debt, unemployment and inflation were expressed in percentages from the beginning which meant that the interpretation of these marginal effects would be as in the prior case, as explained in section 4. For example, a one percent increase in inflation would result in a 0,144% rise in the UEFA coefficient considering Spain.

As one can see in the result section, marginal effects were lower for a lower ranked team than for a higher ranked team. The marginal effects supports the fact that the countries at the top indeed were the countries with the highest parameter values. For example Spain's population proved to be about 5 times as big as Sweden's which also points the marginal effect upwards. But and an important but, this did not hold for every single parameter, the reason for this result is the way the marginal effect in this model was calculated.

The marginal effects seem to confirm the result we received and the fact that the higher ranked countries would be more affected than the lower ranked countries. We decided not to compare every single marginal effect with one and another. Instead, we chose to state that for the chosen model, marginal effects seem reasonable. The fact that the marginal effects proved to be low supports the fact that the explanatory variables turned out to be extremely slow to change.

7. Conclusion

After processing our data we conclude that the most suitable model states that higher population, lower inflation, lower GDP/CAP, higher unemployment and higher debt did affect the UEFA coefficient and that we had to exclude GDP and CAB due to high correlation. We can also conclude that the marginal effects for the chosen countries is higher for a country in the top of the ranking and lower for a country in the bottom of the ranking. In the essay we experience a huge problem with correlation in the beginning but in the end the high correlation is removed and this model should be seen as reliable.

We believed that we would receive a result that supported our thesis that higher population, lower inflation, higher GDP/CAP, lower unemployment and higher debt reflects the UEFA coefficient but in the end the result was a bit different from what we first thought. This is not something negative but it stresses the fact that some of the variables might not be as important for the UEFA coefficient as we first thought. For example unemployment might not affect the performance of the football teams of a certain country. We believe in the end that the most important variables are GDP and above all population. In the end it is important to have a big population so that the talent pool becomes larger. This leads to a lot more players which in the end results in a better UEFA coefficient.

We believe that this investigation could be further investigated and we propose that one should try to add some footballing variables to this relationship to avoid the problem of correlation. One might also investigate the difference between for example 1980-1993 and 1993-2012, or maybe even better 1980-1995 and 1995-2012 due to the Bosman ruling. This lead to a lot more movement between countries for football players and as population might be seen as the most important variable, this would be very interesting to analyze.

The answer to our issue is; yes, there exists a relationship between the chosen macroeconomic variables and the UEFA coefficient. The relationships shows that higher population, lower inflation, lower GDP/CAP, higher unemployment and higher debt leads to a higher ranking on the UEFA coefficient ranking.

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