Biases in voting behaviour of the Ballon d'Or 2013-2015

ERASMUS UNIVERSITEIT ROTTERDAM

Economics and Business
Behavioural Economics

Niels Konijnenburg
348763
17 June 2017

THANKS

I would like to thank the Erasmus University for their great education. This definitely prepared me for the rest of my professional career.

Also, I would like to give special thanks to dr. Georg D. Granic. Your guiding really helped me to get the best out of me.

Last but not least I would also like to thank my mom and girlfriend, who supported me all the time, even when I got a little grumpy.

TABLE OF CONTENT

1. INTRODUCTION

A ball and a couple of players. You do not need much to play the world's most popular game. From balls made of paper to professional football pitches. The conditions might be different in different places, but the game stays the same. Football is not just a game, it is about connecting people. We see this happening on the field, with your teammates, but maybe even more with the fans. Worldwide we are dealing with around 3.5 billion football fans. They unite and support their team through the good and the bad times. Even though some clubs are true rivals, their fans can still unite when their national team is playing. Like in the Netherlands, the moment the Dutch team comes to action, everything turns orange, and for one moment, we are the same. The country unites.

But football is not just interesting to watch. It is also interesting to study. The motivations are clear. Everybody on the field (and the fans) wants to win. The outcomes are also not complex, you either win, draw or loose. A lot of people care about football. The Ballon d'Or is the most important individual award for players to win. Every year, captains, coaches, and media[1] of countries all over the world determine who is the best player. However, there are no restrictions on who voters are able to vote on, e.g. they could vote on players from their own country or from their own team (captains). This might make the voting process flawed. In particular, it might encourage biased voting, which undermines the legitimacy of appointed winners. Although this is a possibility, we do not know for sure if biased voting is present in the Ballon d'Or voting process. Therefore we will study if there are biases (e.g. home bias) present in the voting process of the Ballon d'Or.

So in this paper, we want to investigate if there is biases voting in the Ballon d'Or voting process. One of the biases we will examine further is the 'Home bias'. The home bias is a key concept in our paper. We want to see if home bias has something to do with choosing the best player in the world. To test this, we first have to know what home bias is exactly. Home bias is a well-known phenomenon in the world of finance. It describes the fact that investors are more likely to invest in domestic assets than in foreign assets. If we translate this to the voting process of the Ballon d'Or, this would mean that voters have the tendency to favour candidates with the same nationality over candidates with another nationality, hence they 'invest' more in 'domestic' players.

[1] This will change in the voting process of 2017, from then only the media will be able to vote for the Ballon d'Or.

We will extend the home bias by not only looking at the same county, but also at the same continent. We call this the 'Regional bias' and it will be a frequently used concept in the remainder of this theses. The regional bias is the tendency to overinvest in a certain region, in our case thus a continent. So we will look if voters have the tendency to favour candidates from the same continent over candidates from other continents.

Besides the home and regional bias, we also expect some more biases to be present in the voting behaviour. Therefore we will also look if the social relationship influences the voting behaviour. Social relationship describes the connection between a voter and a candidate. In this paper we will talk about a social relationship when a voter plays in the same team as a candidate. This also means that we will only test this relationship for the captains, as it is not possible for a coach or media to play in the same team as a candidate. So we will test if voters are more likely to vote for a candidate from their own team[2].

We will also look into the possibility of differences between the groups. In September 2016, France Football announced that the Ballon d'Or award would be changed after their split from FIFA. Not only the shortlist will grow from 23 to 30 players, but also the input of national team captains and coaches will be left out. So only a group of international media will be able to vote. What if only media were able to vote before? Do these different types of voters really vote differently? We will test if the three groups differ in propensity to vote on players of the same nationality. We will do the same with regards to the regional bias.

Furthermore we will test if there is strategic voting present in the voting process of the Ballon d'Or. Strategic voting is the process best described by voting with the intention of maximizing the likelihood of a good election outcome given the expectation of how other voters are voting. This is also a concept that will be frequently used throughout this paper. Messi and Ronaldo dominate the Ballon d'Or in each year of our data. Since these players really have their own fans, we could say that these fans could exhibit strategic voting to maximize the chance of their candidate to win the Ballon d'Or. A Messi fan could for example not vote for Ronaldo (although he could still think Ronaldo is a good player), just to give Messi more chance of winning the Ballon d'Or. So here we will test if the 'Messi fan' and

[2] There are two assumptions that we have to made. The first is that we assume that for a captain to favour a candidate who is a teammate, the relationship has to be 'positive' between captain and candidate. We thus speak of a friendship between to two teammates. This way we can test if friendship (the social relationship) affects the voting behaviour. Second, the voter sees his teammate more often than the other candidates, so it might be the case that the voter really thinks that his teammate is the best player. But because the top players play against each other in the competition, Champions league and in international games, we will make the assumption that voters have the same information about all 23 candidates that are on the list. So they know each candidate well and are informed enough to make a decision.

the 'Ronaldo fan' vote less than the 'other voter' on their big rival to maximize the likelihood of their preferred candidate to win. We will define a Messi fan as a voter who rewarded Messi with 5 points (the maximum amount of points), and thus with first place. A Ronaldo fan is thus a voter that rewards Ronaldo with 5 points. The other voter is a voter who rewarded another player than Messi or Ronaldo with 5 points and thus the first place. Since this group is neither a Messi nor a Ronaldo fan, we will use this as a control group.
To test for all these biases we have come up with the following hypotheses:

H1: Voters vote significantly more on players with the same nationality.

H2: Voters vote significantly more on players from the same continent.

H3: Voters (captains) vote significantly more on a player from his team.

H4: Voter groups differ in their propensity to vote on players with the same nationality/ from the same continent.

H5: The samples 'Messi/ Ronaldo fan' vote significantly less on Ronaldo/ Messi than the 'other voter' does.

These hypotheses will help us to answer the following question:
'Are there voting biases present in the voting behaviour of the Ballon d'Or?'

If we indeed find evidence for biased voting behaviour, it might be a good idea to change the way the voting is conducted. Nowadays there is a lot of money involved in football with the clubs, transfers, sponsor contracts etcetera. The sponsors for example pay huge amounts of money to players to represent their brands (e.g. Messi is sponsored by Adidas, Ronaldo is sponsored by Nike). Finishing high in a contest like this will make a player even more interesting for the different brands. This is just one of the reasons why it is important for the Ballon d'Or to give a trustworthy outcome. Therefore we want to investigate which biases could be present in the voting process so that this can be taken into account with any new changes of the Ballon d'Or voting process.

1.1 The research

We will use a Probit regression to test whether there are biases in the voting behaviour of the FIFA Ballon d'Or. Our independent variable will be the whether a voter voted for a particular candidate yes (=1) or no (=0). In our regression, we will use variables that are related to our hypotheses. With the variables 'Same nationality', 'Same continent' and 'Teammates' we will test if home bias, regional bias and social relationship respectively influences the voting process of the Ballon d'Or. We will also use 'Performance' and 'Popularity' variables to control for the quality and popularity of each individual player. This

way, we try to control for the fact that a good player (or a popular player) would have gotten more votes than other players without any bias being present.

To get a more detailed view on the voting behaviour we will also run an 'Ordered probit regression' with the amount of points as an independent variable. So instead of only looking at whether a voter voted for a particular candidate (yes or no), we will now look at the amount of points (0, 1, 3 or 5)[3] a voter gave to a particular candidate. Furthermore, we will run a probit regression for each voter group (captain, coach and media) to see if they differ in their propensity to vote on a player with the same nationality or from the same continent. To test if strategic voting is present in the voting process, we will compare the 'Messi fan' and the 'Ronaldo fan' to the 'other voter'. We will use a Fisher's Exact test to test if the 'Messi and Ronaldo fans' did vote less on their rival (Ronaldo/ Messi) than the 'other voter' did.

We will use real life data of the last three years (2013, 2014 and 2015, which were the most recent ones at the start of this research) of the Ballon d'Or. With our outcomes we want to extend the existing research of the home bias to today's football.

1.2 Results

Probit regression reveals a tendency for voters to vote more on candidates with the same nationality. This effect is also present when a voter and a candidate are from the same continent. Captains also tend to vote more a candidate who is a teammate. The ordered probit shows that this effect is even stronger when the point are going up. So, for the first place (5 points) these effects were higher than for the second place (3 points) and the third place (1 point). These biases (home and regional) were also present when we tested each group (captain, coach and media) individually. Furthermore we found that both 'Messi fans' and 'Ronaldo fans' did not show any sign of strategic voting. All the above mentioned results were statistical significant. We thus have found supporting evidence in our data that there are biases present in the voting process of the Ballon d'Or.

[3] The voters assign 0, 1, 3 or 5 points to each candidate. So instead of 2 outcomes (yes and no) we will now have 4 outcomes of the dependent variable.

2. BIASES & THE BALLON D'OR

To get a better insight in biases in voting, we will discuss papers that are related to our research. First we discuss papers that found proof for the existence of the home and regional bias. Furthermore we will discuss papers that investigated the voting process of the Eurovision Song Contest, a voting process similar to that of the Ballon d'Or. Also biases in sports (mostly jury sports) will be discussed. We will then discuss papers that discuss the influence of social relationship to the behaviour of people. At the end we will shortly discuss the Ballon d'Or.

2.1 Home Bias

To help us test whether *voters vote significantly more on players with the same nationality,* we will need a good understanding of what the home bias is exactly, and how we will use this concept in our research. Investopedia, the dictionary for finance related topics, describes home bias as follows:

'*Home bias is the tendency for investors to invest in a large amount of domestic equities, despite the purported benefits of diversifying into foreign equities*'

The home bias thus shows that investors invest more in domestic equity than would be optimal. This related to proximity, perceived informational advantage and expected higher returns (Lütje and Menkhoff, 2004). The home bias is a well-known and investigated phenomenon that is mostly used in finance. Tesar and Werner (1992) did research in five OECD countries and found that there was underinvestment in foreign countries, or in other words, too much investments in the home country, despite the apparent gains from diversifying and thus also investing in foreign equities. Cooper and Kaplanis (1994) also found this result (portfolios which are heavily concentrated in the domestic stock market). They listed costs which could prevent an investor to choose for the foreign stock, like taxes. But they also mentioned that the cost to explain for the level of home bias is above the level of the observable costs. Or in other words, the costs could explain part or the reason why an investor would choose to not invest in foreign equity, but not all of it.

So there is still something missing. French and Poterba (1991) also researched the home bias. They also found that investors tend to hold their portfolios domestically (in Japan, 98% of the portfolio is held domestically). They found that this result is basically explained by the fact that investors tend to overestimate the results of the domestic equity in comparison to the foreign equity. Investors in their research expect return in their domestic equity to be

several hundred basis points higher than the returns in foreign markets. So the lack of diversification appeared to be the result of the choices an investor made.

But why are these researches relevant to our study? Well, they show that although there ae sometimes reasons to invest in domestic equity (like the costs that come with an investment in foreign equity), but that this does explain the 'total reason' why an investor would choose for an domestic portfolio. French and Poterba (1991) offer the solution that the domestic equity is actually overrated, maybe because they really believe it is better, or because of lack of information about the foreign equity. This is where it gets interesting for our research. A voter could claim that the candidate with the same nationality is better, like the investor claims that his domestic equity is better, but is this really the case. Could the voter be overvaluing the 'domestic candidate'? If this is the case, the voter would be exhibiting home bias in his voting behaviour (given the fact that we control for performance and popularity).

2.2 Regional Bias

Home bias can also be extended further than just 'same country'. Schoenmaker and Bosch (2008) found evidence of the 'regional bias'. This bias works the same as the home bias (invest more in domestic equities), but is not limited by the borders or a country. Schoenmaker and Bosch (2008) investigated the impact of the euro on the home bias. The euro was introduced in 2002, therefore they did research in the years 2001 and 2004. They found in both years that European investors prefer European securities over US securities. So in their case, they did not look at the home country, but rather at the continent level. For us, this could also be very interesting, as we could also test for this effect. Would an European voter maybe be biased towards an European candidate. We thus will test if *voters tend to vote more on players from the same continent*.

Now that we have a good understanding of what the home bias and regional bias are, and how it is mostly researched in the investment world. We will take a look at some papers that investigated the voting process of the Eurovision Song Contest, a voting process that comes close to the one of the Ballon d'Or.

2.3 Voting bias in Eurovision Song Contest

The voting process for the Eurovision Song Contest is something that comes very close to voting process for the FIFA Ballon d'Or. As we also have different countries that are able to divide points over pre-selected candidates. The difference is that in the voting process for

the Eurovision Song Contest you are not allowed to vote for your own country, while you are allowed to vote on your own country (player) in the voting process for the FIFA Ballon d'Or. Ginsburgh & Noury (2004) studied data of the Eurovision Song Contest that covers 29 years with a total of 462 votes. The data consist of judges that cast votes on individuals and therefore makes it easy to isolate the effect. They did not found any evidence for exchanging favours, but they did found evidence for vote trading. This small effect disappears when account is taken of cultural and language. Since this is the case, the data shows that cultural and linguistic proximities play a significant role. So they conclude that judges are inefficient since they should base their vote on quality only.

Yair (1995) made an analysis that was based on 18 years of the Eurovision Song Contest (1975-1992). His analysis is based on the average number of points each nation gave and received over this time period. The findings of this study reveal a three-Bloc political structure consisting of a Western Bloc, a Northern Bloc and a Mediterranean Bloc.

Clerides & Stengos (2006) also analysed the Eurovision Song Contest. In 25 contests, they found strong evidence for the existence of clusters of countries that systematically exchange votes regardless of the quality of their entities. They found that cultural, geographic, economic and political factors all play an important role in exchanging points.

As already said, in the voting process of the Eurovision Song Contest it is not allowed to vote for your own country, where this is allowed in the voting process of the Ballon d'Or. Thus eliminating the home bias gives way for other kind of biases, such as vote trading, bloc trading and the clustering of countries. So just eliminating the ability to vote on your own country will also not give a completely unbiased outcome.

2.4 Voting biases in sports

Coupe et al. (2016) investigated biases in FIFA Best Player award (Ballon d'Or) between 2010 and 2014. They compared the actual chance of being selected as a top player (voted first) to the expected probability. They concluded that a player with the same nationality is three times more likely to be chosen as a top player. This probability is almost identical when the voter and candidate play in the same league. So they did find evidence for the existence of biased voting in the voting process of the Ballon d'Or. This research comes really close to our research. However, we will not only look at the top player (first place), but at the top 3 candidates that has been voted on. Furthermore we will also add more control variables. We will discuss this in more detail in the next chapter.

Besides the paper of Coupe et al. (2016) There has not been done a lot of research about football. However, Garicano et al. (2001) found empirical evidence for home bias in football. Referees have discretion over the addition of extra time at the end of a game. They show that Spanish referees systematically favour home teams by shortening close games when the home team is ahead, and lengthening close games where the home team is behind.

But football is not the only sport where home bias could be present. Campbell & Galbraith (1996) investigated Olympic figure-skating events and found strong evidence for a small national bias. So judges favor skaters from their own country. They also found some small evidence that the bias is more marked for skaters who could win a medal than for less strong competitor. These results thus show us that even if we would appoint an selective jury to choose the winner of the Ballon d'Or, there could still be some bias present, which would also not give us an completely unbiased result.

Popović (2000) studied rhythmic gymnastics at the Olympic Games of 2000, Sydney. His analysis was made within the competition of 24 gymnasts from 19 federations. He found that the judges were indeed biased in their scoring of rhythmic gymnasts. Judges scored rhythmic gymnasts from their own countries higher than the other members of the panels. A negative bias towards gymnasts that were close to their own was not found.

Nationalistic biases were also found by Zitzewitz (2006). He looked in the nationalistic biases in the Winter Olympic sports event, with a focus on the sports which include a jury. Zitzewitz found evidence for the bias in that the judges scored athletes from their own country higher. But this was not the only thing he found. He also noticed that the judges appeared to vary their biases strategically. Skating judges appear to engage in vote trading and bloc trading while ski jumping judges display a taste of fairness in that they compensate for the nationalistic biases of other panel members.

Also in sports where a jury decides the winner, people not always vote for the best candidate, but have other reasons to vote for a particular candidate. Together with the home bias in the world of finance and the existence of biases in the Eurovision Song Contest, we think that we have a good theoretical framework to assume the existence of home bias and regional bias in the voting process of the Ballon d'Or.

2.5 Social relationship

In voting behaviour there could be many biases present. We will thus extend the home bias and the similarity bias more with social relationships, as these could also influence voting behaviour. Jern and Kemp (2014) found this with their study on social choices depending on different relationships between people, as friends, strangers and enemies. They found evidence that the chooser weighs the utility of another person differently based on the different social relationship, where friends assign positive polarity to each other's utility and enemies assign negative polarity to each other's utility. So they can conclude that different social relationships can have influence on the choice. We also have social relationships present in our dataset. Captains and candidates who play for the same team train together every day, play matches together, travel together. We can thus say they go through a lot together. Being a team is important in a sport as football. If you see your teammate almost every day and you have to achieve something together, there is a good possibility of a friendship forming. This friendship might have an influence on the voting behaviour for the Ballon d'Or, as they might want their friend to win the Ballon d'Or more than they want to others to win (thus weigh their utility more of that of a stranger). In other words, voters would be more likely to allocate points to their friends than to the other candidates. For the sake of the contest it would be better if a voter did not look at his friendships and really vote for the best player.

Hughes (2015) measured real-world social connections of more than 4,000 political actors. He found that better socially-connected candidates fare better in the election. These results suggest that social networks play a fundamental role in human actions that extend from our daily lives into political activities. We know teammates have a social relationship (they see each other almost every day). This social relationship can benefit the candidate in the elections of the Ballon d'Or.

So based on those findings, we think that we have sufficient empirical evidence to suggest that a captain would favour his teammate above other candidates. So we will test if *voters (captains) vote significantly more on a player from his team.*

2.6 Ballon d'Or

The most important individual award in football is the Ballon d'Or. The Ballon d'Or has been rewarded since 1956, by France football. In 2010 the Ballon d'Or changed and is since then rewarded by France Football and the FIFA[4]. Since 2010, Lionel Messi and Cristiano Ronaldo dominate the award by winning respectively 4 and 3 times. The winner is the candidate who receives the most points from captains and coaches of national teams and media. All those voters are able to vote for 3 candidates in their preferred order. A voter can only vote for a candidate that is on the shortlist of 23 players.[5] They can reward them by respectively 5, 3 and 1 points.

[4] This will change again in 2017, France Football and FIFA will split up again.
[5] The list with 23 candidates is determined by the FIFA and released at the end of October.

3. DATA

Data was obtained from the FIFA website for the years 2013, 2014 and 2015. These were the most recent years available at the start of our research. The data includes the name of the voters, the type of voter (captain, coach or media) and the points they have assigned to each of the 23 candidates. Furthermore we could see the country the voters represent. For the coach, the country he represents does not have to be his 'home country'. Jurgen Klinsmann e.g. has the German nationality and was in 2015 coach of the USA. In our research, we will see him as a German coach.

To test whether voters voted more on candidates with the same nationality (home bias) and/ or candidates from the same continent (regional bias) we will run a 'probit regression'. We will thus take into account the variables 'Same nationality' and 'Same continent' for our regression. Furthermore we looked up the clubs the captains and candidates were playing for. We were now able to see which captains and candidates were teammates. This was added in our regression as the variable 'Teammates'. With this we could test for social relationships[6]. We also looked up the age of the captains and candidates and created the variable 'Same age'. These variables, teammates and same age, are only applicable for the captain/ candidate relationship. We assumed that if a coach is active for the national team, he does not train any other teams (so he cannot be a teammate of the candidate). To investigate this social relationship, we will test if a voter who has a teammate present on the list of 23 candidates, also has the tendency to favour this candidate (the teammate) over the other candidates. For the ages, we have taken the age of the voters and candidates at the 1st of November.[7]

3.1 Control variables

To explain most of the data we have collected variables that we will use as control variables. With these player characteristics we want to explain the votes that each player received. For example if Messi played really good and is really popular in one year, it makes sense that he

[6] There are two assumptions that we have to make. The first is that teammates do grow an actual friendship, so that we can test if this social relationship has influence on the voting behaviour. The voter sees his teammate more often than the other candidates, so it might be the case that the voter really thinks that his teammate is the best player. But because the top players play against each other in the competition, Champions league and in international games, we make the assumption that voters have the same information about all 23 candidates that are on the list. So they know each candidate well and are informed enough to make a decision.

[7] Voters must submit their choice before half November. So therefore we have chosen to take the ages at the 1st of November.

would get a lot of votes while there would be no biases present. To explain the number of votes/ points each player received, we will use control variables.

We will use two types of control variables, namely 'Performance' variables and 'Popularity' variables. With performance variables you could e.g. think of the average rating a player received in a year. So how well did each candidate perform on average each game. To control for popularity we will only use one variable, Google Trends. Hence, we use these control variables to control for the fact that a good player would get a lot of points, even if there would be no biases present.

For these popularity and performance variables, we will use data from the time range of 1st of January until the 31st of December. All variables are a total number or an average number over this time period. The variables are as follows:

The popularity variable consists of:

1. **Google trends**

To control for popularity, we will use '*Google trends'*. Google trends measures the times a candidate has been searched by any individual on Google. Because this is all measured relatively, we have set the candidate that has been searched the most at 100. In each year Ronaldo is the most searched candidate.

The performance variables consist of:

1. **Total games played**

For each candidate we have collected the '*Total games played'*. We have counted the official games of the national competition, national league[8], international games with their club (Champions league and Europa League) and the international games with their country.
The data is coming from soccerbase.com

2. **Number of trophies**

We also collected the '*Number of trophies'* each candidate has won with their team. So again we will count the trophies of the national competition, the national league, the Champions and Europa League and the different trophies that could be won with the national team[9].

[8] England has multiple leagues, we only counted the most important one, the FA Cup.
[9] FIFA World cup 2014, Africa Cup of Nations 2013, 2014 and 2015, Copa América 2015, World Champions for club teams is in December, after voting.

3. Value of a player

The '*Value of a player*' can say something about his performance. For example, Messi and Ronaldo are chosen as the number one and two players in the world in 2013, 2014 and 2015. In those years they had the highest transfer value as well. For each candidate we collected their *player value* in the year of voting[10]. This value is coming from transfermarket.nl.

4. Average rating

Another variable that we are going to use to control for quality is, '*Average rating*'. After each match a player receives a rating. How well did a player perform in the match. We have taken the average rating of all ratings a player received after each match[11].[12] We have collected these data from whoscored.com.

5. Rating a player received in the game FIFA

As last performance control variable we will use the *'Rating a player received in the game FIFA'*. Each year from 2010 the new FIFA game is released just before the voting takes place, in September or October. These ratings are collected from fifaindex.com

6. Position on the field

To also take into account the distinction between keepers, defenders, midfielders and forwards, we have created the variable *'Position on the field'* to control for the different positions.

We have the following variables with their minimum and maximum values:

- *Nationality* (dummy, 1 if they share the same nationality, 0 otherwise)
- *Continent* (dummy, 1 if they share the same continent, 0 otherwise
- *Teammates* (dummy, 1 if they play for the same team, 0 otherwise)
- *Age* (dummy, 1 if they share the same age, 0 otherwise)
- *Google trends* (1.4-100)
- *Total games played* (26-63)
- *Number of trophies* (0-3)
- *Player value* (10-120)
- *Average rating* (6,8-8,65)
- *Rating game FIFA* (83-94)
- *Position on the field*

[10] The transfer value is measured a couple of times a year, we have taken the value measured in the summer.
[11] Same matches as described in the part of *'Number of trophies'*.
[12] We cannout control for importance, so each game is weighted the same.

3.2 Strategic voting

We have also collected data about strategic voting. Hence, we defined strategic voting as the voting with the intention of maximizing the likelihood of a good election outcome given the expectation of how other voters are voting. Since Messi and Ronaldo dominate the Ballon d'Or in each year of our data, we will test if the 'Messi fan' and the 'Ronaldo fan' vote less on their big rival (than the 'other voter') to maximize the likelihood of their preferred candidate to win. We will show an oversight in which we compare the Messi or Ronaldo fan with the other voter (our control group). We will then see how many times a Messi fan also put Ronaldo in his top 3, compared with how many times an other voter put Ronaldo in his top 3. We will also do this for the Ronaldo fan (so how many times did the Ronaldo fan and the other voter put Messi in the top 3). We will then use an Fisher's Exact test to test whether the Messi/ Ronaldo fan vote less on their rival than the other voter. If this is the case, and the Messi fan did put Ronaldo less in this top 3 than the other voter did, than we can conclude that there is strategic voting present in the voting behaviour. The Fisher's Exact test and the probit regression will be explained in more detail in the next chapter.

4. METHODOLOGY

To test our hypothesis we have chosen to use a probit regression and a Fisher's exact test. In this section we will give some background information about these tests.

4.1 Probit regression

To test for statistical significance we have carried out probit regression. Below we will explain how this model works and how we tackled the problems of independence and fixed effects.

4.1.1 The model

A probit model has, compared to a normal OLS model, a dichotomous dependent variable, this means that it can only take 2 values. In our case, the dependent variable is whether a voter voted for a certain candidate yes (1) or no (0). A probit model estimates the probability that $y = 1$ as a function of the independent variables. We will get the following function:

$$p_i = Pr(y_i = 1|x) = F(x'_i\beta)$$

Where p depends on an index function $x'\beta$, where x is a Kx1 regressor vector and β is a vector of unknown parameters. The function, $F(x'\beta)$ is the cumulative distribution function (cdf) of the standard normal distribution. We will then get the following function:

$$\Phi\,(x'\beta) = \int_{-\infty}^{x'\beta} \Phi(z)dz$$

The predicted probabilities will be limited between 0 and 1. We can interpret the coefficients as follows:

- An increase in x increases or decreases the likelihood that $y = 1$. In other words, an increase in x makes the outcome of 1 more or less likely.
- We can only interpret the sign of the coefficient. We cannot say anything about the magnitude.

To say something about the magnitude we have to estimate the marginal effects as well.
To get the marginal effect we have to use the following function:

$$\frac{\partial p}{\partial x_i} = \Phi\,(x'\beta)\,\beta_i$$

We can interpret the marginal effects as follows:

- We can interpret both the sign and the magnitude of the marginal effects
- An increase in x increases or decreases the probability that $y = 1$ by the marginal effect expressed as a percent.

The marginal effect is expressed in comparison to the base category ($x = 0$) with regards to the independent dummy variables. With regards to the continuous independent variables, the marginal effect is expressed for a one-unit change in x.

Now we have calculated the models, we can predict the probability that $y = 1$ for each observation. So what is the probability that a voter votes for a particular candidate. The formula will then be:

$$\hat{p} = Pr(y = 1|x) = F(x'\hat{\beta})$$

4.1.2 Goodness of fit and prediction

How good is our model in predicting our dependent variable? To evaluate the fit of our models we will compare the predicted outcomes with the actual outcomes. The predicted probability indicate the likelihood that $\hat{y} = 1$. In our case this means the likelihood that a particular voter vote for a candidate. If this probability is higher than 0.5 we will say that $\hat{y} = 1$ and if this probability is lower than 0.5 we will say that $\hat{y} = 0$. The formula will then be:

$$\hat{y} = 1 \ \ if \ \ F(x'\beta) > 0.5 \ \ and \ \ \hat{y} = 0 \ \ if \ \ F(x'\beta) < 0.5$$

We will estimate the percentage of observations that were predicted correctly.

4.1.3 Probit problems

For our probit regression to be reliable we had to tackle a few problems. Here we will discuss these two problems and how we tried to tackle them.

Independence

Each observation in a probit regression must be independent. But more than one decision from the same voter cannot be independent. We will analyse multiple years of voting. Some voters vote in more than just one year (e.g. the captain of Italy, Buffon, who voted in 2013 and 2014) which makes these votes also not independent. So to tackle this problem we are going to cluster the standard errors at the voter level.

Fixed effects

Then we have another problem we have to tackle before we can interpret our results. As already mentioned, we have made control variables (like value of a player) to help make our model so that it will be explaining most of the data. But are these variables really explaining the data? For example, if transfer value is positively significant, does this mean that people tend to vote more on a player with a higher transfer value. Or is it the other way around, people tend to vote more on better players, and better players have higher transfer values. We assume that better players have higher transfer values and thus get more votes, because people vote on the best player. To control for this we will introduce fixed effects.

4.2 Fisher's Exact test

The Fisher's Exact test is a 2x2 design test. This means we have two independent samples ('Messi fans' vs. 'other voters'), which are mutually exclusive (if you have Messi in first place you are a 'Messi fan', if you do not have Messi in first place you are the 'other voter') and two outcome possibilities (voted Ronaldo in top 3 or not). This test will allow you to test if two different samples are evenly distributed. We will use this to test whether the samples 'Messi/ Ronaldo fan' and 'other voter' vote the same or differently on the rival (Ronaldo/ Messi). The Fisher's Exact test will then compare the samples to each other and calculate whether the difference between the samples is significant. The Fisher's Exact test thus works as follows (with the example of Messi fan vs other voter):

	Messi fan	Other voter	
Ronaldo in top 3	a	b	$a+b$
Ronaldo not in top 3	c	d	$c+d$
	$a+c$	$b+d$	n

Using the following formula we will get a p-value to see if the differences are significant.

$$p = \frac{\binom{a+b}{a}\binom{c+d}{c}}{\binom{n}{a+c}} = \frac{(a+b)!\,(c+d)!\,(a+c)!\,(b+d)!}{a!\,b!\,c!\,d!\,n!}$$

4.3 Hypotheses

To answer the main question in this research *'Are there voting biases present in the voting behaviour of the Ballon d'Or?'* we will need hypotheses to test this. In this section we will show why we need these hypotheses in our research.

The first hypothesis states that voters vote significantly more on players with the same nationality. Hence that we want to see if voters indeed have the tendency to over-evaluate players of who share the same country (same nationality). We will test the following hypotheses in which H_0 represents the situation where there is no home bias present, and H_a where there would be home bias present. We will use the variable 'Same nationality' in our probit regression to test for home bias.

H1) H_0: voters do not vote significantly more on players with the same nationality.
H_a: voters do vote significantly more on players with the same nationality.

After we have tested for 'Same nationality', we will see if we can also extend this research to the continent level, as we saw that Schoenmaker and Bosch (2008) found evidence for a regional bias. Here we will make a distinction between the continents, in particularly Europe, South America and Africa (the continents the candidates are from). We are going to test whether the voters from these continents are biased towards players from their own continent. In the second hypothesis the H_0 represents the situation with no regional bias present, and H_a where there would be regional bias present. We will use the variable 'Same continent' in our probit regression to test for regional bias.

H2) H_0: voters do not vote significantly more on players from their own continent.
H_a: voters do vote significantly more on players from their own continent.

After testing for the home and regional bias we are also going to test whether social relationship has influence on the voting process. Hence, friends tend to weigh utility functions higher than they would do for strangers or enemies. In our research, we define a social relationship as being teammates at club-level at time of voting (assuming a friendship will form between teammates). We only take into account the captains, as the other voter groups cannot be teammates of the candidates. To test whether a captain votes significantly more on a teammate we use the H_0 where the captain does not vote more on a player of his team (teammate). The H_a states that there is a difference in voting behaviour of the captain, in favour of his teammate (he will get more votes than a non-teammate). We will use the variable 'Teammates' in our probit regression to test for social relationship.

H3) H_0: A captain does not vote significantly more on a player of his team.
H_a: A captain does vote significantly more on a player of his team.

Next we are going to separate the different voter groups. Hence that the FIFA will only allow media to vote in the upcoming Ballon d'Or voting. This is why we want to find out if they (the media) really differs in the propensity to vote on candidates with the same nationality or who share the same continent. To test this we have run a probit regression (with only similarity variables included) for each voter group as a robustness check. The marginal effects for the variables 'Same nationality' and 'Same continent' did indeed differ between the voter groups. We will discuss a more elaborated probit regression for each of the voter groups in the next chapter. So to recap, we will test this with H_0, which states that voter groups do not differ in their propensity to vote on players with the same nationality/ from the same continent. The H_a states that voter groups differ in their propensity to vote on players with the same nationality/ from the same continent. For this hypothesis we will compare the outcome of the variables 'Same nationality' and 'Same continent' for each of the probit regressions.

H4) H_0: voter groups do not differ in their propensity to vote on players with the same nationality/ from the same continent.
H_a: voter groups differ in their propensity to vote on players with the same nationality/ from the same continent.

With our last hypothesis we will test if there is strategic voting present in the voting process of the Ballon d'Or. Hence, Messi fans could have a motivation to not vote for Ronaldo, so that in the end Messi has a higher chance to win the Ballon d'Or (Messi and Ronaldo dominate the Ballon d'Or in each year of our data). This could also hold for the Ronaldo fans, who would want Ronaldo to win. We will compare both 'Messi and Ronaldo fans' with the 'other voter'. For this hypothesis, H_0 states that there is no strategic voting. Thus, Messi and Ronaldo fans vote the same (or more) on their rival (Ronaldo/ Messi) as the other voter does. H_a states that there is strategic voting present in the voting behavior. Thus Messi/ Ronaldo fans vote significantly less on their rival than the other voter does, maximizing the chances of their candidate to win the elections. To test this hypothesis, we will use a Fisher's Exact test.

H5) H_0: The samples 'Messi/ Ronaldo fan' vote the same or more on Ronaldo/ Messi than the 'other voter' does.
H_a: The samples 'Messi/ Ronaldo fan' vote significantly less on Ronaldo/ Messi than the 'other voter' does.

5. RESULTS

In this chapter we will look at the results. We will begin with discussing four different probit regressions with different variables. After that we will shortly discuss an ordered probit regression (with al variables included). In this part we can already give an answer to our first three hypotheses:

H1: Voters vote significantly more on players with the same nationality.
H2: Voters vote significantly more on players from the same continent.
H3: Voters (captains) vote significantly more on a player from his team.

We will then compare the different type of voters (captain, coach and media) to give an answer to our fourth hypothesis:

H4: voter groups differ in their propensity to vote on players with the same nationality/ from the same continent.

At the end of this chapter we will discuss strategic voting. We will then be able to give an answer to our last hypothesis:

H5: The samples 'Messi/ Ronaldo fan' vote significantly less on Ronaldo/ Messi than the 'other voter' does.

In this paper we will use the following p-values * p<0.10, ** p<0.05, *** p<0.01 (with three stars being highly significant). With regards to position on the field, defender is the omitted variable.

5.1 Probit Regression different models

Table 1 on the next page shows the outcomes of four different probit regressions. In the first model we have run a probit regression with only similarity variables included. In the second model we have added performance variables to the similarity variables. In the third model we have run a probit regression with a combination of similarity and popularity variables. In our fourth and most extensive model we have run a probit regression with al variables (similarity, performance and popularity) included.

The numbers in the brackets behind each variables shows the range of the variable. For each variable we have reported the coefficient and the marginal effect.

Table 1: Probit Regression of being selected in the top 3 - all voters -

	(1) Similarity	***(2) Similarity+ Performance***	***(3) Similarity+ Popularity***	***(4) Similarity+ Performance+ Popularity***
Same Nationality (0,1)	0.955***	1.167***	1.091***	1.205***
Marginal	0.298***	0.262***	0.263***	0.271***
Same Continent (0,1)	0.075***	0.471***	0.366***	0.382***
Marginal	0.016***	0.073***	0.060***	0.056***
Teammates (0,1)	1.033***	1.441***	1.334***	1.432***
Marginal	0.330***	0.350***	0.347***	0.345***
Same age (0,1)	0.097	- 0.100	0.015	- 0.110
Marginal	0.021	- 0.014	0.002	- 0.014
Position Forward		- 0.201***		- 0.039
Marginal		- 0.030***		- 0.005
Position Keeper		0.170***		0.172***
Marginal		0.029***		0.025***
Position Midfielder		- 0.149***		0.053
Marginal		- 0.022***		0.007
Games played (26 - 63)		0.016***		0.018***
Marginal		0.002***		0.002***
Trophies won team (0 - 3)		0.099***		0.155***
Marginal		0.014***		0.021***
Player value (10 - 120)		0.007***		- 0.002***
Marginal		0.001***		- 0.0003***
Average rating (6.8 - 8.65)		0.962***		0.512***
Marginal		0.137***		0.069***

FIFA game rating (83 – 94)		0.150***		0.129***
Marginal		0.021***		0.017***
Google Trends (1.4 – 100)			0.026***	0.017***
Marginal			0.004***	0.002***
Number of observations	36,409	36,409	36,409	36,409
Std. Err adjusted	1,011	1,011	1,011	1,011
Correctly classified	86.96%	91.09%	91.06%	91.17%
Nationality fixed effects	Yes	Yes	Yes	Yes

So we have the outcomes of four different probit regressions. We started with a probit regression with only similarity variables included and added stepwise the control variables (performance and popularity). In the second probit regression we have a combination of similarity and performance variables. In our third probit regression we have a combination of similarity and popularity variables. In our last and most extensive probit regression we have included all variables (similarity, performance and popularity). We will shortly discuss what happens with the similarity variables in our first three models and then elaborate our most extensive model with all variables.

Table 1 shows that the variables 'Same nationality', 'Same continent' and 'Teammates' are positive and highly significant. Only the variable 'Same age' is not significant. We can only interpret the sign of the coefficients of these variables. We will interpret the numbers of the marginal effects to say something about the magnitude of the variables. The marginal effects of 'Same nationality' and 'Teammates' are 0.298 and 0.330 respectively. This means that when the voter and the candidate share the same nationality, the probability of this candidate being selected increases with 29.8%. For teammates, this increase is even higher, namely 33%. The marginal effect of the variable 'Same continent 'is with 0.016 a bit lower.

In the second probit regression we have added performance variables to the first regression. We have added 'Games played', 'Trophies won team', 'Player value', 'Average rating', 'FIFA game rating' and 'Position on the field'. We can see the variable 'Same age' has become a negative number, but this is again not significant. All other variables are positive and highly significant. This means that these variables have a positive effect of a candidate being chosen. We will look at the marginal effects for the interpretation. The importance of sharing the same nationality went down to 0.262. On the other hand the marginal of playing in the same team and sharing the same continent went up to 0.350 and 0.073 respectively.

In the third probit regression we have a combination of similarity and popularity. As popularity measure we have added 'Google trends'. As you can see this popularity variable is positive and highly significant (with a marginal effect of 0.004). When we take a look at the similarity variables, we can see that sharing the same age is again not significant. Sharing the same nationality, continent and team are all highly significant. The marginal effects are almost similar as in the regression with the performance variables included. Sharing the same nationality, continent and team increases the probability of being selected by 0.263, 0.060 and 0.347 respectively.

In our fourth probit regression model we have combined the similarity variables with both performance and popularity variables. This model is thus the most extensive one. The variables 'Same age', 'Position forward' and 'Position midfielder' are not significant. All other variables are highly significant. The marginal effects for sharing the same nationality, sharing the same continent and playing in the same team are 0.271, 0.056 and 0.345 respectively. This means that when a voter and a candidate e.g. share the same nationality, the chance of being selected increases with 27.1%. This percentage is the highest for 'Teammates' (34.5%).

So with regards to our hypotheses we have found supporting evidence for our first, second and third hypotheses. So our data shows that voters did vote more on players with the same nationality, players from the same continent and players who play in the same team.

If we look at the other variables we can see that besides 'Player value' all variables are positive. Thus, an increase in one of the variables means that the likelihood of being selected also increases. The positive performance variables 'Games played', Trophies won team', 'Average rating' and 'FIFA game rating' have a marginal effect of 0.018, 0.021, 0.069 and 0.017 respectively. The variable 'Player value' has with -0.0003 a really small negative influence of being selected. The popularity variable 'Google trends' has a marginal effect of 0.002.

It makes sense that control variables have a positive influence of being selected in the top 3. For example, the higher a player scores for the variable 'Average rating', the better a player performed on average and thus increases the chance of being selected in the top 3 of a voter. Remarkable is the negative coefficient (-0.002) and the negative marginal effect (-0.0003) for the variable 'Player value'. A explanation could be that some older players (older players normally have lower transfer values) still receives a lot of votes. For example, in 2014 Ronaldo was already 29 in 2014 when he won the Ballon d'Or. In that same year Robben ended up as fourth when he was already 30. Furthermore we have collected the

minimum and maximum value of each variable. If we look at 'FIFA game rating' for example, the maximum difference is 11 (94-83). We can interpret this is follows, if two identical players only differ in this variable, the player with 94 as a rate has a 18.7% (11*0.017=0.187) higher chance of being selected.

To evaluate the fit of our models we will compare the predicted outcomes with the actual outcomes. We will use the percentage of correctly classified. In our first model with only the similarity variables 86.96% of the outcomes is predicted correctly. After adding the performance variables, the percentage correctly classified went up to 91.09%. This is just above the percentage that was predicted right when popularity was added to the similarity variables (91.06%). Our last model, when similarity was combined with performance and popularity, has the highest percentage predicted correctly, namely 91.17%.

Furthermore we have run additional analysis in which we used Player fixed effects instead of Nationality fixed effects. These results can be found in Table 7 in the appendix. The main results are in line with the probit regression as shown in Table 1 above. Therefore we will not run another probit regression and only interpret the probit regression with Nationality fixed effects.

5.2 Ordered probit

As an extension of the probit regression we have chosen to conduct an ordered probit regression as well. With the probit regression we were only able to see the difference between voted for a particular candidate, yes or no. With the ordered probit regression we are able to get a more detailed view on the voting behaviour. We are now able to see whether a voter gave 0, 1, 3 or 5 points to a particular candidate.

The outcome of the ordered probit regression is similar to the outcome of the probit regression. Nothing changed fundamentally when we ran the ordered probit. We have therefore chosen to discuss the ordered probit regression in the appendix in more detail. The added value of the ordered probit over the probit regression is that now we are able to see the differences between the number of points. The main outcome of the ordered probit is that as the points are going up (from 0, 1, 3 to 5) the chance of being selected is also going up (with the marginal effect for 0 being negative). So this means e.g. that when a candidate has the same nationality as a voter, the chance of receiving 5 points is higher than receiving 3 points from this voter. Still, the chance of receiving 3 points is higher than the chance of receiving 1 point (this also holds for 0 and 1 point). This effect also holds when a candidate

and voter are from the same continent or when the candidate and voter are playing in the same team.

5.3 Captain vs Coach vs Media

We will shortly discuss what changes in the ranking if only media would be able to vote before. We will than run a probit regression for each of the voter groups to find out if they differ in their propensity to vote on players with the same nationality/ from the same continent.

5.3.1 Analysing points

In 2015, the top 3 for all type of voters is the same (all would have put Messi in first place, Ronaldo second and Neymar third). But, if we look a little bit further, we do see some differences in the rest of the list. If only media would be able to vote, Suárez would be number 4 instead of Lewandowski and Manuel Neuer will fall from the 7th to the 17th place. Also in 2014 we see some changes over the three groups. First, second and third place were Ronaldo, Messi and Neuer, with Neuer only just a few points behind Messi. Both the captains and coaches had voted these three as their top 3. But when we looked at the results when only media were able to vote, there were some changes. Neuer would be number two instead of Messi, with almost double the points of Messi (315 vs 178). In 2013 we saw the biggest change. Ribery ended as third, behind Ronaldo and Messi in overall result. But, if only the media would have voted, Ribery would have won the Ballon d'Or, leaving Ronaldo and Messi behind him.

So we can see that there would be some changes if only the media were able to vote. So the different voter groups (captain, coach and media) do vote differently. We want to know if these changes in the outcome has something to do with biased voting. To test this we will run a probit regression for each of the voter groups.

5.3.2 Probit Regression each group

We are of course interested in the voting behaviour of the different voter groups. Is there a group that is more or less biased than the other groups? To get an answer to this question we will run a probit regression for each of the voter group. The results can be found in Table 2 on the next page.

Table 2: Probit Regression of being selected in the top 3 - each voter group -

	Captain	***Coach***	***Media***
Same Nationality	1.129***	1.184***	1.441***
Marginal	0.251***	0.271***	0.321***
Same Continent	0.467***	0.063***	0.363***
Marginal	0.072***	0.050***	0.049***
Teammates	1.799***	-	-
Marginal	0.471***		
Same age	- 0.076	-	-
Marginal	- 0.010		
Candidate is Forward	- 0.047	0.030	- 0.105
	- 0.006	0.004	- 0.012
Candidate is Keeper	0.047	0.232**	0.231**
	0.007	0.035**	0.032**
Candidate is Midfielder	0.040	0.078	0.038
	0.005	0.011	0.005
Games played	0.017***	0.018***	0.021***
Marginal	0.002***	0.003***	0.003***
Trophies won team	0.113***	0.089***	0.284***
Marginal	0.015***	0.013***	0.035***
Player value	- 0.002**	- 0.002**	- 0.003**
Marginal	- 0.0003**	- 0.0003**	- 0.0003**
Average rating	0.412***	0.434***	0.712***
Marginal	0.056***	0.062***	0.089***
FIFA game rating	0.135***	0.134***	0.119***
Marginal	0.018***	0.019***	0.015***
Google Trends	0.017***	0.015***	0.019***
Marginal	0.002***	0.002***	0.002***

Number of observations	12,144	12,190	12,075
Standard Error adjusted	405	388	218
Correctly classified	86.96%	90.77%	91.34%

Only the group of captains are able to vote for a teammate or have the same age as one of the candidates. Therefore the group of captains has 2 variables more, namely 'Same age' and 'Teammates'. This might influence the variables that the models do have in common. To make sure that the variables 'Same age' and 'Teammates' do not have a big impact, we have run a robustness check. The marginal effects of the common variables are almost identical, therefore we can compare the results above. The results of the robustness check can be found in Table 9 in the appendix.[13]

Table 2 shows that the group of media has the highest marginal effects with regards to nationality bias. With a marginal effect of 0.321 this is 18% higher than the group of coaches (0.271) and 28% higher than the group of captains (0.251). When we look at sharing the same continent, it is the other way around. Now, the captains have the highest marginal effect (0.072), where the effect for the coaches and media is a bit lower (0.050 and 0.049 respectively). Both variables 'Same nationality' and 'Same continent' are highly significant.

So with regards to our hypotheses we have found supporting evidence for our hypothesis that stated that voter groups differ in their propensity to vote on players with the same nationality/ from the same continent. As our results showed, there are differences in the voting behaviour of a captain, coach and media when the candidate has the same nationality or comes from the same continent.

When we tested for home bias, media showed the highest marginal effect. They were more biased toward candidates with the same nationality. Captains however showed the highest marginal effect considering the variable 'Same continent' (regional bias). Although we cannot compare the groups with each other to e.g. find out if one of the groups has significantly more home bias. But what this result do show us is the insight that bias is present in all groups. So even changing the way the voting goes for the Ballon d'Or, will not completely rule out home or regional bias (considering conditions stay the same as in our dataset).

[13] Even though we left two variables out ('Teammates' and 'Same age') of the regression, this would not change the votes. When a captain voted for a teammate, he could not use this vote to vote for i.e. a candidate sharing the same nationality or continent (unless this is also a teammate). So the marginal effect of 'Same nationality' and 'Same continent' would probably be higher when captains were not able to vote for teammates.

If we take a look at the performance variables, we can see that number of 'Games played' is the same for coaches and media (0.003), where the effect is a bit lower for captains (0.002). The group of media shows the highest marginal effect for the variables 'Trophies won Team' and 'Average rating'. The marginal effect for 'FIFA game rating' for the group of captains, coaches and media are 0.018, 0.019 and 0.015 respectively. All groups have the same small negative marginal effect (-0.0003) for Player value. All performance variables (besides 'Player value') are highly significant. 'Player value' is significant at the 5% level (applies for all groups).

With regards to popularity, all groups have the same marginal effect (0.002) for 'Google trends'. This effect is also highly significant.

5.4 Strategic voting

In this part we will discuss strategic voting. As already said, we will compare the 'Messi fans' and 'Ronaldo fans' with the 'other voters'. Table 3 shows how often a Messi fan (so Messi in first place), has also put Ronaldo in his top 3 (second or third), compared to how many times an 'other voter' (so no Messi or Ronaldo in first place) has put Ronaldo in his top 3 (second or third place). These numbers are presented in the first row as a percentage of the total (all Messi fans). The numbers below these percentages (in the brackets) are the absolute number of voters who put Ronaldo in their top 3. The last row (# votes) represents the total number of Messi fans/ other voters in a given year (for example we can see that in 2015 there were 319 Messi fans). Thus we read Table 3 as follows: From the 319 Messi fans, 80.25 percent (256) also voted Ronaldo in their top 3. Only 37.97 percent of the 'other voters' voted for Ronaldo in their top 3.

Table 3: 'Messi fans' and 'other voters'

	2013		***2014***		***2015***	
	'Messi fan'	'Other voter'	'Messi fan'	'Other voter'	'Messi fan'	'Other voter'
Percentage Ronaldo top 3	*76.47%* *(97)*	*60.78%* *(155)*	*69.09%* *(38)*	*53.22%* *(99)*	*80.25%* *(256)*	*37.97%* *(30)*
# votes	*119*	*255*	*55*	*186*	*319*	*79*

Table 4: 'Ronaldo fans' and 'other voters'

	2013		***2014***		***2015***	
	'Ronaldo fan'	'Other voter'	'Ronaldo fan'	'Other voter'	'Ronaldo fan'	'Other voter'
Percentage Messi top 3	*65.27%* *(109)*	*59.22%* *(151)*	*55.45%* *(168)*	*34.95%* *(65)*	*70%* *(70)*	*45.57%* *(36)*
# votes	167	255	303	186	100	79

Table 4 can be read in the same way as Table 3, but with the only difference that we now look at the Ronaldo fans (people who voted Ronaldo in first place) instead of the Messi fans. For example in 2013 we can see that there were 167 'Ronaldo fans'. From these Ronaldo fans 65.27 percent (109 voters) also voted Messi in their top 3. From the voters who did not vote Messi or Ronaldo in first place (other voters), 59.22 percent (151 voters) did still vote for Messi in their top 3. The percentages 'Messi fans' and 'Ronaldo fans' will be compared to the 'other voters' in a Fisher's Exact test.

So in each of the years, Messi fans and Ronaldo fans voted relatively more on their rival than the other voters did. This is something really surprising, because if they would exhibit strategic voting, they would have voted less on their rival. To test if the samples of the 'Messi fan' and the 'Ronaldo fan' differ significantly from the 'other voter' we will do a Fisher's Exact test. The results of this test are shown in Table 5.

Table 5: Fisher's Exact test strategic voting

	2013		***2014***		***2015***	
	Messi fan-other voter	Ronaldo fan-other voter	Messi fan-other voter	Ronaldo fan-other voter	Messi fan-other voter	Ronaldo fan-other voter
One sided p-value	*0.002*	*0.125*	*0.026*	*0.000*	*0.000*	*0.001*

Because strategic voting would only be present if the Messi/ Ronaldo fans would put Ronaldo/ Messi less in their top 3 than the other voters, we will look at the one-sided Fisher's Exact test. For each year we have compared both Messi fans and Ronaldo fans to the other voters. So for each year we thus have two outcomes. Six times out of these six outcomes (3 years, 2 outcomes), the other voters voted less on Ronaldo/ Messi than the Messi and Ronaldo fans did. In four occasions this result is highly significant. Only once (Ronaldo fan vs other voter, 2013, where the p-value is 0.125) the difference was not significant.

So the outcomes do differ significantly (5 out of 6 times), but not in the direction we thought they would. Thus we did not find supporting evidence to suggest that there is strategic voting present in the voting process of the Ballon d'Or.

7. CONCLUSION

To give an answer to our main research question: *'Are there voting biases present in the voting behaviour of the Ballon d'Or?'* we will give a short summary of our main result. Furthermore we will discuss recommendations for further research and the limitations of our research.

H1: Voters vote significantly more on players with the same nationality.

We started with a probit regression with only similarity variables. In this regression, the variable 'Same nationality' showed a marginal effect of 0.298. When also the performance and popularity variables were included, the marginal effect went down to 0.271. In both probit regressions this effect was highly significant. This means that when a voter and a candidate share the same nationality, the chance of being selected is 27.1% higher than when a voter and a candidate do not share the same nationality. After running the ordered probit regression we saw that this effect was getting stronger as the points were going up (from 0 , 1, 3 to 5). This effect was also highly significant. *So with regards to our hypothesis we have found supporting evidence that voters tend to vote more on candidates with the same nationality.*

H2: Voters vote significantly more on players from the same continent.

The marginal effect of the variable 'Same continent' went up from 0.016 in the probit regression with only similarity variables included, to 0.056 in the probit regression with all variables (similarity, performance and popularity) included. Both effects were highly significant. This means that when a voter and candidate are from the same continent, the chance of being voted on is 5.6% higher than when a voter and a candidate are not from the same continent. After running the ordered probit regression we found that this effect was the lowest for 0 (negative), the same for receiving 1 or 3 points, but even higher for receiving 5 points. The effect, again, was highly significant. *So with regards to our hypothesis we have found supporting evidence that voters tend to vote more on candidates from the same continent.*

H3: Voters (captains) vote significantly more on a player from his team.

For this hypothesis we used the group of captains. The marginal effect of playing in the same team was 0.330 in our first probit regression (only similarity variables). For the probit regression with the performance and popularity variables included, 'Teammates' had a marginal effect of 0.345. Both times this effect was highly significant. This means that when

a voter and candidate play for the same team, the chance of being selected is 34.5% higher than when a voter and candidate do not play for the same team. In the ordered probit regression we saw that as the points were getting higher, the chance of being selected is also getting up. So also here the chances of being rewarded with 5 points is higher than being rewarded with 3, 1 or 0 points. *So with regards to our hypothesis we have found supporting evidence that voters tend to vote more on candidates that play for the same team.*

> *H4:* V*oter groups differ in their propensity to vote on players with the same nationality/ from the same continent.*

We have run a probit regression for each individual voter group (captain, coach and media). With regards to the variable 'Same nationality', the marginal effects were 0.251, 0.271 and 0.321 for the group of captains, coaches and media respectively. All effects were highly significant. As we can see, the home bias is most present in the group of media. The chance of being selected is 32.1% higher for a candidate that shares the same nationality as the media voter (hence, the effects were 25,1% and 27,1% for the captains and coaches respectively).

If we take a look at the variable 'Same continent', we then see that the group of media has the smallest marginal effect (0.049) of the three groups (captains had a marginal effect of 0.072 and the group of coaches had a marginal effect of 0.050). Again all effects were highly significant. *So with regards to our hypothesis we have found supporting evidence that voters differ in their propensity to vote on players with the same nationality/ from the same continent*[14]*.*

> *H5: The samples 'Messi/ Ronaldo fan' vote significantly less on Ronaldo/ Messi than the 'other voter' does.*

We compared the 'Messi and Ronaldo fans' with the 'other voters' to find out if there was evidence for strategic voting. We saw that five out of six times the Messi fans or Ronaldo fans differ significantly in distribution compared to the 'other voter'. But this is not as we expected, 'Messi and Ronaldo fans' voted more on their rival (Ronaldo or Messi) than the other voter. For strategic voting to be present, they should have voted less on their rival, which thus is not the case. *So with regards to our hypothesis we did not find any evidence of strategic voting of the 'Messi and Ronaldo fans' present in our data.*

[14] We cannot conclude that one group showed more 'home bias' or 'regional bias' than the other group as we are not allowed to interpret the results this way

After all these tests we are finally able to give an answer to our main question:
'Are there voting biases present in the voting behaviour of the Ballon d'Or?

We found supporting evidence for the existence of the home bias and the regional bias. Chances of being selected were 27.1% higher when the candidate shared the same nationality as the voter. For the regional bias we also saw a higher chance (5.6%) to get the vote when voter and candidate came from the same continent. Being teammates also had a positive effect on the chance of getting the vote. The candidate namely had 34.5% more chance of getting the vote from a teammate than a non-teammate would have. We saw the same effects in the ordered probit, where the chance of being selected went up with the number of points (sharing the same nationality, continent or team gave you a higher chance on a higher score). When we separated the different voter groups, we also saw home and regional bias present in the voting behaviour of the different groups. We thus have found supporting evidence to suggest that there are voting biases present in the voting behaviour of the Ballon d'Or. However, we did not find any evidence of strategic voting.

To summarize, we did find statistical evidence for several biases being present in the voting behaviour. We saw that home and regional bias were present in the overall results (also for the groups apart). This would mean that even changing the voting process to only media (what happens November 2017) is not going to eliminate the biases, based on our findings. Further testing of different voting mechanisms might be needed to really get as close to the situation where there is would be no bias present. But still, we will probably never reach the state where there are no biases present. However, we can still try and approach this as far as we can.

6.1 Limitations & Recommendations

We were not able to test for heteroskedasticity in our data. So to interpret our results we had to make the assumption that there is no heteroskedasticity present in our data. For further research we would recommend to test for heteroskedasticity.

To test if social relationship influences the voting behaviour, we assumed that a voter and a candidate that play in the same team developed a friendship. Not all teammates have to be friends, and not all friends have to be teammates. Nationality and the continent a candidate is from, can be easily verified. Best case scenario would be that the link between all voters and candidates would also be this clear.

Thus, we made the assumption that captains vote more on teammates because they are friends. We did find a positive effect, but this effect could also be present for the simple reason that the vote results will be made public right after voting. This way, a captain can feel pressured to vote for his teammate as otherwise he did not help his teammate to win. It would be interesting to test whether the voting would be different when the votes stay anonymous. This would be hard to test, as the FIFA would probably not change the public voting process to an anonymous one. Still, if this ever becomes a possibility, a comparative research for that year and previous years would be really interesting.

Also, we only tested for social relationships between voter and candidate using our probit regression, as we only had 'static data' (we were not able to collect our own data). If we would have collected our own data, e.g. have interviews with the voters on why they voted a certain way, we could do a completely different analysis. This would probably not be a realistic scenario in the near future, but if this would be possible, we would get much more insights into why people vote the way they do. We could then even do a research like Jern and Kemp (2014) to test if captains also weigh the utility function of their teammate differently in comparison to a non-teammate (hence, they researched how people weigh the utility functions of friends, strangers and enemies). This could be a next step in the research of social relationships in voting processes.

Another limitation of this research is that we were not able to really compare the different voter groups (captain, coach and media) to each other. We did find different marginal effects for the different voter groups, but we were not able to conclude that one group suffers significantly more from the home and regional bias than the other groups. We do not have a solution right now on how this can be tested. So to find out if the different voter groups differ significantly, we recommend to do a more in depth research.

For all variables that we included in our research, we used the time range of the 1st of January until the 31st of December. This can lead to some problems. For some variables we have calculated the total number in a particular year (e.g. number of games played), but for some other variables we calculated the average over a year (e.g. average rating). In this average, we were not able to control for importance. So when a player played really good in an unimportant game, and scored a 9, it will have the same impact as when a player played really good (and scored a 9) in the final of the Champions League. It might be better to use some sort of weighted average. People (and thus also the voters) will remember the Champions League finale better than they will remember just a 'normal' game.

We concluded that there are biases present in the voting behaviour of the Ballon d'Or 2013-2015. We came up with similarity and control (performance and popularity) variables that we thought would explain our data in the best possible way. So our conclusions are based on the data we used in our research. But there might be other data recourses that could explain the data even further. Ginsburgh & Noury (2004) for example found that cultural and linguistic proximities play a significant role in the voting process of the Eurovision Song Contest. Clerides & Stengos (2006) also found that cultural, geographic, economic and political factors all play an important role in exchanging points. So we would recommend to extend our existing model and add more variables to test if the biases would still be present in our data.

6.2 Further research

In the voting process of the Ballon d'Or 2017, only the media will be able to vote. It would be a good idea to repeat this research with the dataset of next year Ballon d'Or. This result could then be compared to data from previous years (as a total, or only take the votes of the media as a comparison). So we predicted that there would probably still be home and regional bias present in the data (as we also found home and regional bias in just the media group). As we do not know this for sure, we would recommend to do repeat this research next year, or maybe even after some years (to get more data).

To tackle the problem of the home bias the organisation of the Ballon d'Or could choose to not let voters vote for candidates with the same nationality, like in the Eurovision Song Contest. This would solve the problem of home bias (hence, there could be no home bias if you cannot vote on your own country). But then again other biases could arise, like we saw with the Eurovision Song Contest. The limitation here is then also that we do not know for sure what the impact of the other biases, like vote trading and bloc trading, would have on the results. Again, this is probably not going to happen any time soon, but still, if this would ever happen, it would be good to research the Ballon d'Or voting data again.

Another option is to leave out the whole voting process for the Ballon d'Or. They can choose to do something similar as what happens in tennis. In tennis players can earn a certain amount of points by winning different tournaments (based on relevance). In the end, the player with the most points is the best player of that season. It might be a bit more difficult to place this concept in the world of football, as you win with your team, or you lose with your team. So measuring performance of a single player might be difficult (also taking into account different positions). Then again, players also receive gradings after each match. And

also, data becomes more and more important in the world of football. Memphis Depay even decided to go from Manchester United to Olympique Lyon based on data of Sci Sports (a company specialised in football data). Thus, it would probably be possible to develop a model which includes performance, but still, some qualities can still not be measured. Coming up with a good type of performance measure would be a hard task, but definitely an option that needs to be considered.

7. REFERENCES

Campbell, B., & Galbraith, J. W. (1996). 'Nonparametric tests of the unbiasedness of Olympic figure-skating judgments.' *The Statistician*, 521-526.

Clerides, S., & Stengos, T. (2006). 'Love thy neighbor, love thy kin: voting biases in the Eurovision Song Contest' (No. 1-2006). *University of Cyprus Department of Economics*.

Coupe, T., Gergaud, O., & Noury, A. (2016). 'Biases in Voting-The Case of the FIFA Best Player Award' (No. 57).

French, K. R. & Poterba, J. M. (1991). 'Investor diversification and international equity markets' (No. w3609). *National Bureau of Economic Research.*

Garicano, L., Palacios-Huerta, I., & Prendergast, C. (2005). *Favoritism under social pressure.* Review of Economics and Statistics, 87(2), 208-216.

Ginsburgh, V. A., & Noury, A. (2004). *Cultural voting: The Eurovision song contest*. Available at SSRN 884379.

Hietala, P.T. (1989). Asset pricing in partially segmented markets: Evidence from the Finnish market. *The Journal of Finance,* 44(3), 697-718.

Hodson, G., Olson, J.M. (2005). *Testing the generality of the name letter effect: Name initials and everyday attitudes.* Personality and Social Psychology Bulletin, (33-7)

Investopedia. (2015). Home Bias. Retrieved June 7, 2017 from http://www.investopedia.com/terms/h/homebias.asp

Jern A. & Kemp, C. (2014). *Reasoning about social choices and social relationships*. Cognitive Science Society

Lütje, T. & Menkhoff, L. (2007). 'What drives home bias? Evidence from fund managers' views'. *International Journal of Finance & Economics*, 12(1), 21-35.

Nuttin, J.M. (1985). *Narcissism beyond Gestalt and awareness: The name-letter effect.* Europeaon Journal of Social Psychology. 15(3), 353-361.

Popović, R. (2000). *International bias detected in judging rhythmic gymnastics competition at Sydney-2000 Olympic Games*. Facta universitatis-series: Physical Education and Sport, 1(7), 1-13.

Schoenmaker, D. & Bosch, T. (2008). 'Is the home bias in equities and bonds declining in Europe?' *Investment Management and Financial Innovations,* 5, 90-102.

Tesar, L. L. & Werner, I. M. (1992). 'Home Bias and The Globalization of Securities Markets'. *National Bureau of Economic Research,* No 4218.

Yair, G. (1995). *'Unite Unite Europe' The political and cultural structures of Europe as reflected in the Eurovision Song Contest.* Social Networks, 17(2), 147-161.

Zitzewitz, E. (2006). *Nationalism in winter sports judging and its lessons for organizational decision making.* Journal of Economics & Management Strategy, 15(1), 67-99.

8. APPENDIX

Table 6: robustness check for each voter group (only similarity variables included)

	Captain	Coach	Media
Same Nationality (0,1)	0.967***	0.923***	1.057***
Marginal	0.302***	0.193***	0.341***
Same Continent (0,1)	0.115**	0.041**	0.014
Marginal	0.025**	0.020**	0.003
Teammates (0,1)	1.262***		
Marginal	0.419***		
Same age (0,1)	0.122*		
Marginal	0.027		
Number of observations	12,144		12,075
Std. Err adjusted	405		218

First we ran a robustness check to test if there are signs of differences between the different voter groups. Both 'Same nationality' and 'Same continent' are positive and highly significant for each group. The marginal effects are also positive and highly significant. We see that the marginal effects of the groups do differ. The marginal effects of 'Same nationality' are 0.302, 0.193 and 0.341 for captain, coach and media respectively. So we do have reason to suggest that there might be a difference between the groups. Because of this we decided to do a more detailed research. These results can be found in Table 2.

Table 7: Robustness check with Player fixed effects

	Nationality fixed effects	***Player fixed effects***
Same Nationality	1.205***	1.038***
Marginal	0.271***	0.215***
Same Continent	0.382***	0.131***
Marginal	0.056***	0.018***
Teammates	1.432***	1.293***
Marginal	0.345***	0.292***
Same age	- 0.110	- 0.058
Marginal	- 0.014	- 0.008
Nationality fixed effects	*Yes*	*No*
Player fixed effects	*No*	*Yes*
Popularity variables	*Yes*	*No*
Performance variables	*Yes*	*No*
Number of observations	36,409	36,409
Std. Err adjusted	1,011	1,011
Correctly classified	91.17	91.31%

As additional analyses we have ran a probit regression with 'Player fixed effects' instead of 'Nationality fixed effects'. To not run into multicollinearity we had to exclude all other variables besides similarity. We can see that the marginal effects of 'Same nationality', 'Same continent' and 'Teammates' are still positive and highly significant. The marginal effects in the probit regression with 'Player fixed effects' are lower than with the 'Nationality fixed effects'. The changes are not dramatically different and therefore we can still use our probit regression with Nationality fixed effects and all performance and popularity variables as stated in Table 4.

Table 8: Ordered Probit Regression of receiving 0, 1, 3 or 5 points respectively.

For each variable we can see the coefficient and Marginal 1 to 4. The Marginal 1 is the marginal effect of receiving 0 points, Marginal 2 is the marginal effect of receiving 1 point, Marginal 3 is the marginal effect of receiving 3 points, Marginal 4 is the marginal effect of receiving 5 points.

	(1) Similarity	***(2) Similarity+ Performance***	***(3) Similarity+ Popularity***	***(4) Similarity+ Performance+ Popularity***
Same Nationality				
Coefficient	0.825***	1.201***	1.146***	1.265***
Marginal 1	- 0.249***	- 0.275***	- 0.287***	- 0.291***
Marginal 2	0.043***	0.061***	0.066***	0.069***
Marginal 3	0.065***	0.081***	0.087***	0.089***
Marginal 4	0.141***	0.133***	0.135***	0.133***
Same Continent				
Coefficient	0.008	0.467***	0.319***	0.360***
Marginal 1	- 0.002	- 0.073***	- 0.053***	- 0.053***
Marginal 2	0.0004	0.021***	0.016***	0.016***
Marginal 3	0.0005	0.022***	0.016***	0.016***
Marginal 4	0.0007	0.030***	0.021***	0.021***
Teammates				
Coefficient	0.818***	1.340***	1.258***	1.365***
Marginal 1	- 0.247***	- 0.320***	- 0.327***	- 0.325***
Marginal 2	0.042***	0.066***	0.070***	0.072***
Marginal 3	0.064***	0.092***	0.097***	0.098***
Marginal 4	0.140***	0.161***	0.160***	0.154***
Same age				
Coefficient	0.117*	- 0.085	0.016	- 0.099
Marginal 1	- 0.026*	0.012	-0.002	0.013
Marginal 2	0.006*	- 0.003	0.0007	- 0.004
Marginal 3	0.008*	- 0.004	0.0007	- 0.003
Marginal 4	0.012*	-0.005	0.0009	- 0.005

2. Position name (Forward)		
Coefficient	- 0.188***	- 0.040
Marginal 1	0.0275***	0.005
Marginal 2	- 0.008***	- 0.002
Marginal 3	- 0.008***	- 0.002
Marginal 4	- 0.011***	- 0.002
3. Position name (Keeper)		
Coefficient	0.202***	0.228***
Marginal 1	- 0.035***	- 0.034***
Marginal 2	0.010***	0.010***
Marginal 3	0.011***	0.010***
Marginal 4	0.015***	0.013***
4. Position name (Midfielder)		
Coefficient	- 0.105	0.102*
Marginal 1	0.016	- 0.002***
Marginal 2	- 0.005	0.004*
Marginal 3	- 0.005	0.004*
Marginal 4	- 0.006	0.006*
Games played		
Coefficient	0.016***	0.017***
Marginal 1	- 0.002***	- 0.002***
Marginal 2	0.0007***	0.0007***
Marginal 3	0.0007***	0.0007***
Marginal 4	0.0009***	0.0009***
Trophies won team		
Coefficient	0.125***	0.185***
Marginal 1	- 0.018***	- 0.002***
Marginal 2	0.005***	0.008***
Marginal 3	0.006***	0.008***
Marginal 4	0.007***	0.010***

Player value				
Coefficient		0.006***		- 0.003***
Marginal 1		- 0.0009***		0.0004***
Marginal 2		0.0002***		- 0.0001***
Marginal 3		0.0002***		- 0.0001***
Marginal 4		0.0003***		- 0.0002***
Average rating				
Coefficient		0.944***		0.548***
Marginal 1		- 0.136***		- 0.076***
Marginal 2		0.040***		0.023***
Marginal 3		0.042***		0.023***
Marginal 4		0.054***		0.030***
FIFA game rating				
Coefficient		0.152***		0.127***
Marginal 1		- 0.022***		- 0.018***
Marginal 2		0.006***		0.005***
Marginal 3		0.007***		0.005***
Marginal 4		0.009***		0.007***
Google Trends				
Coefficient			0.025***	0.0169***
Marginal 1			- 0.004***	- 0.002***
Marginal 2			0.001***	0.0007***
Marginal 3			0.001***	0.0007***
Marginal 4			0.001***	0.0009***
Number of obs	36,409	36,409	36,409	36,409
Std. Err adjusted	1,011	1,011	1,011	1,011

With the probit regression we were only able to see the difference between voted for a particular candidate yes or no. With the ordered probit regression we are able to get a more detailed view on the voting behaviour. We are now able to see whether a voter gave 0, 1, 3 or 5 points to a particular candidate.

We will start with a model with only similarity variables and stepwise add performance and popularity. So again we will have four different ordered probit regressions. We will discuss the most extensive model with similarity, performance and popularity variables included. We can say something about the sign of the coefficients of the variables, but to interpret the numbers we have to interpret the marginal effects.

The coefficients of the similarity variables 'Same nationality', 'Same continent' and 'Teammates' are all positive and highly significant. The sign of the marginal effects is the same for these three similarity variables (all positive). The marginal effect of receiving 0 points is negative. This means that when a voter and a candidate share the same nationality or continent or play in the same team, the chance of receiving 0 points goes down. On the other hand we can see that the chance of receiving 5 points is higher than receiving 3 points and the chance of receiving 3 points is higher than receiving 1 point (these effects are the same for 'Same continent'). The variable 'Same age' is not significant.

We see this phenomenon also with the variables 'Games played', 'Trophies won team', 'Average rating', 'FIFA game rating' and 'Google trends'. The chance of receiving 0 points is negative. The chances of receiving 5 points is again higher than the chance of receiving 3 points. For receiving 1 or 3 points the chances are the same for most of these control variables. All these marginal effects are highly significant.

With the variable 'Player value' it is working the other way around. When the value of a player is getting up, the chance of receiving 0 points is getting higher. The chance of receiving 5 points is now lower (negative) than receiving 3 or 1 points (also negative). However these effects are all really small, but still significant.

Table 9 : Robustness check probit regression for captains

		Including variables	***Excluding variables***
Same Nationality		1.129***	1.118***
Marginal		0.251***	0.253**
Same Continent		0.467***	0.451***
Marginal		0.072***	0.071***
Teammates		1.799***	x
Marginal		0.471***	
Same Age		-0.076	x
Marginal		-0.010	
Position	Forward	-0.047	-0.069
	Keeper	0.047	0.041
	Midfielder	0.040	0.024
Marginal	Forward	-0.006	-0.009
	Keeper	0.007	0.006
	Midfielder	0.005	0.003
Games Played		0.017***	0.017***
Marginal		0.002***	0.002***
Trophies won team		0.113***	0.111***
Marginal		0.015***	0.015***
Player value		-0.002**	-0.002**
Marginal		-0.0003**	-0.0003**
Average rating		0.412***	0.427***
Marginal		0.056***	0.059***
FIFA game rating		0.135***	0.129***
Marginal		0.018***	0.018***

Google Trends	0.017***	0.017***
Marginal	0.002***	0.002***
Number of obs	12,144	12,144
Std. Err adjusted	405	405
Correctly classified	86.96%	91.22%

The voter group of captains is the group that can play in the team or have the same age as the candidates. Therefore this group has two variables more than the other groups (coach and media). With this robustness check we want to test what happens if we leave these two variables out of the regression.

As Table 9 shows the variables are almost identical, therefore we can use our probit regression with all variables included.