Divisionsforeningen

League structure optimization

DIVISIONSFORENINGEN

HYPERCUBE
BUSINESS INNOVATION

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Executive summary

Divisionsforeningen presents the outcome of their project upon the possible changes in the formats of Danish professional football to the Danske Boldspil Union. The project has been supported by Hypercube, an international agency with a wide range of practical experiences in the European professional football arena.

Danish football has seen a downward trend in the past couple of years. Sporting results on the international stage have fallen. While Denmark was listed 12th on the UEFA Country Ranking in 2010/11[1], it currently resides on the 19th position, and is still falling. Divisionsforeningen wants to improve the Danish position on this ranking by returning (at least) to the top 15. This should be achieved by increasing the strength of the (clubs in the) Superliga and 1. Division, both with respect to sports and finances Not that an increase in finances, e.g., due to additional attendance, TV audience, and therefore sponsors, will in turn increase sporting quality as well. There are several instruments to increase the performance of the league. We would like to mention the following four categories:

- Improve the league structure.
- Increase revenues of professional football;
- Better allocation of money to the cost departments;
- Alter the licensing criteria at different levels;

This report describes the project that investigated the first category: which competition formats are best the Superliga and 1. Division in Denmark?

Danish football stakeholders

This project is commissioned by Divisionsforeningen, the body in which all the clubs on the two highest tiers are represented. A working group, consisting of representatives from the Divisionsforeningen and supported by Hypercube, is responsible for the process of the project, which, e.g., includes collecting the input from the clubs and the external stakeholders and experts, and the processing of this input afterwards.

Much valuable input has come from these conversations with stakeholders and experts. We interviewed many people about their perception of the current state of Danish football, and on their ideas for improvement. There appears to be a broadly shared feeling that the competition format could be improved, so as to create more interesting matches and give Danish football new spirit.

Calendar

Based on the interviews with all the stakeholders a number of matches between 30 and 36 will be suitable for Superliga.

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[1] The spot in the UEFA Country Ranking is based on the average score of the past five seasons and gives access rights for the following season.

The economics of Danish football

In general, sporting quality on the pitch is rewarded by higher attendance and TV audience. This in turn drives up (sponsor) revenues, and this money can then be invested in the squad, so as to sustain or enhance the sporting quality. By means of data analysis, the specifics of these dynamics, the trends and the critical success factors have been explicated for Danish football. The output of these analyses, e.g., with respect to the fact that both stadium attendance and TV audience are positively affected by an increase in sporting quality and tension in Denmark, have been used both to create and to evaluate the alternative competition formats.

Result dimensions

The result dimensions are those aspects of a competition format on which it is evaluated. All Danish clubs form the Superliga and 1. Division have been consulted about what they think is important to take into account. The sporting (29,5%) and financial (27.0%) aspects are the most important. The other result dimensions are attendance (14.3%), TV (12.3%), fairness (10.0%), and calendar (6.8%).

Evaluation of the current competition format

The current competition format is a triple round-robin with 12 teams: each team meets every other team three times. The strengths of this competition format are the number of teams, a relatively small difference in sporting strength between the teams, and the fact that the team with the most points over the total season wins the championship. The weaknesses of this format are the fact that teams meet each other either two times at home and one time away or two times away and one time at home. The 33 rounds with only one price giving ceremony at the end bears the risk in it that there are too many matches with nothing at stake for either one or both teams. Finally due to two direct relegation spots not necessarily the twelve strongest teams are in the Superliga.

**Evaluation of alternative competition formats**

The drawbacks of the current league format bring the need for a change in which the tension in the competition increases. Based on the input from the stakeholders the minimum number of teams in the league was set on 10, while the maximum number was set on 16. However, with only 10 clubs in the Superliga large areas of Denmark are without Superliga football, while a problem with formats of 16 teams is that a double round-robin already consists of 30 matches, which makes the possibilities for a second stage limited. Reduction to 10 teams would also violate the existing broadcasting contracts that, lasting for six more years, do require six matches per match day. Hence, competition formats with 12 or 14 teams are the best fit for Denmark.

To increase the tension, a second stage needs to be introduced. We have chosen to carry over all the points obtained in the first stage to this second stage. The most important reason in general to reduce points is to make sure that in this second stage not everything is already decided. However, due to a limited number of matches in the first stage and a small difference in playing strength, in Denmark this is not necessary, and it is even undesirable as it significantly diminishes the importance of the matches in the first stage.

Finally, a second stage with a top group of 6 or 8 ensures that a fair amount of matches is played in this second stage. This has the positive side effect on the tension in this second stage. Moreover, this

number of teams is a good fit with respect to the number of prizes (one champion and ticket for the UEFA Champions League Qualifications, and two (due to the cup possibly three) tickets for the UEFA Europa League Qualifications) that can be obtained via the league. If Denmark climbs the table in European football to the 15th spot an extra ticket for the UEFA club competitions will be available.

There were ten formats left for Superliga with the above characteristics. These formats were extendedly discussed upon during the meetings on June 3 and June 10. After these meetings the viable options were limited to three formats, which are presented in the graph below.
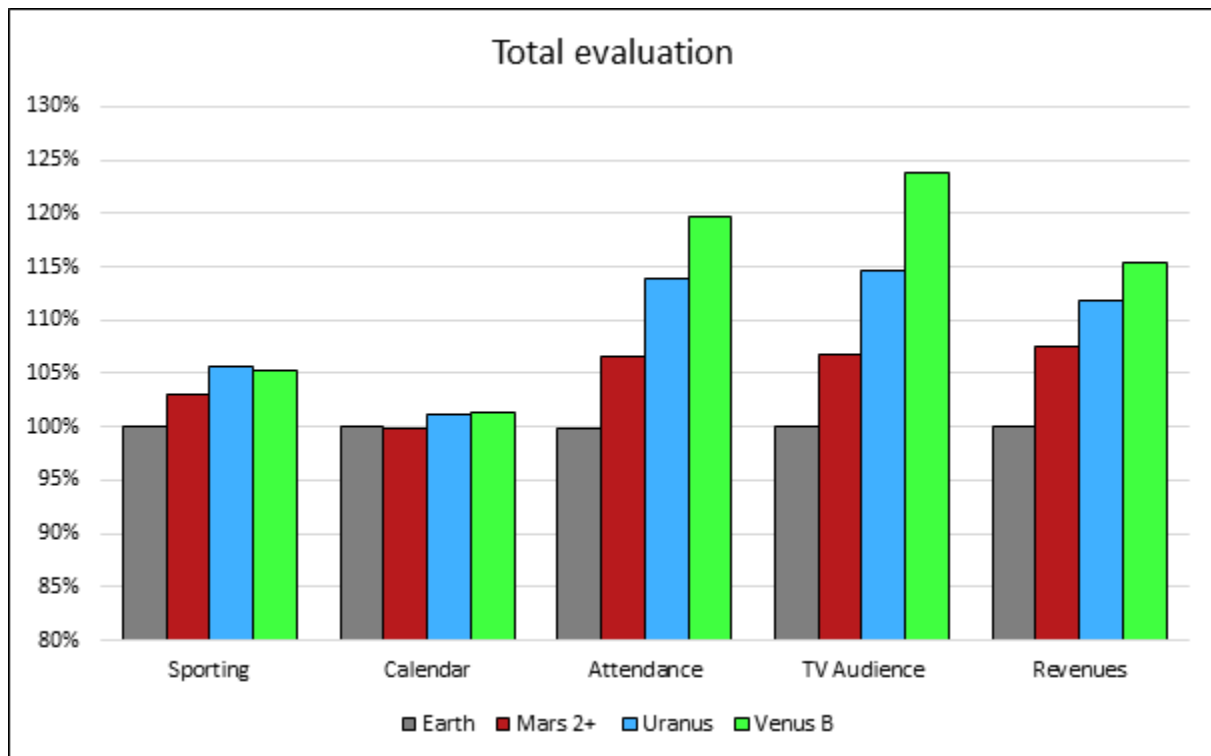
The quantitative analysis indicates that the Venus formats score best. Venus is also the preferred format for the broadcasters, financial & commercial experts, fans, and players. An important advantage of this format, with a double round-robin of 14 teams in the first stage and double round-robin group of 6 combined with two double round-robin groups of 4 in the second stage, comes from the bottom group. In the Venus formats there is still the possibility of a prize (a European ticket) for the clubs that did not qualify for the top group, which makes these formats attractive for both stadium and TV audiences, which increases revenues, and therefore, sporting quality.

Though the Uranus format is evaluated quantitative rather positive on the result dimensions, this format has two substantial negative characteristics:

- The second group where each club plays four times in the final 12 matches against the three other clubs leads, in combination with two confrontations between the same teams in stage 1, to an, in the whole of Europe, unprecedented six times per season. In these final matches in the bottom group the stadiums could be rather empty and will thus be detrimental to the sales tasks of the commercial department to extend the relationship with both sponsors and season ticket holders.

- The teams that have to play in this group have, even in comparison with the present 3 x 12, a downward risk of 5%.

The last serious candidate is Mars 2+, with a double round-robin of 12 teams followed by two double round-robin groups of 6 and concluded with a knock-out play-off for the final European ticket. However this format results in only 32 match dates for most clubs. Furthermore, the clubs that don't have to play for the final European ticket finish their competition one or two weeks earlier, which cut out one or two beautiful match dates in May.

For the top clubs Uranus and Venus B are the best option, while for the others the increase of the Superliga to 14 clubs is the best option. The origin lies within the fact that in that case they are more often represented in Superliga, play more matches that on top of that also have more at stake. Overall, the Venus formats score best, with Uranus and Mars 2+ as viable alternatives.

Note that the formats with 14 teams have the advantage of enlarging the impact in society of the league by increasing the number of matches at Superliga level from 198 up to around 250. In comparison Mars results in less than 200 matches. Formats of 14 will also spread the Superliga over a larger number of catchment areas bringing the highest level of Danish professional football. Note that a competition format with 14 teams does require a transition season.

The innovation of the format of Superliga has the following benefits in comparison to the continuation of the existing format of a triple round-robin competition with 12 teams. These benefits should materialize within five years after introduction, with a significant contribution of the first season.

- The sporting performance of the top 16 teams will increase with an average of about 100 ECI points.
- The sporting performance will lead to a climb of the UEFA County Ranking for club teams with 5 to 8 spots.
- Total revenues will increase up to about 225 million Danish Kroners.
- Match attendance will increase up to Benchmark A 9%, Benchmark B 28%.
- League attendance will increase up to 35%.
- Match TV audiences will increase up to Benchmark A 7%, Benchmark B 30%.
- League TV audiences will increase up to 25%.

For 1. Division Uranus and the Venus formats have not been taken into account. The total evaluation of the formats is given in the following figure.
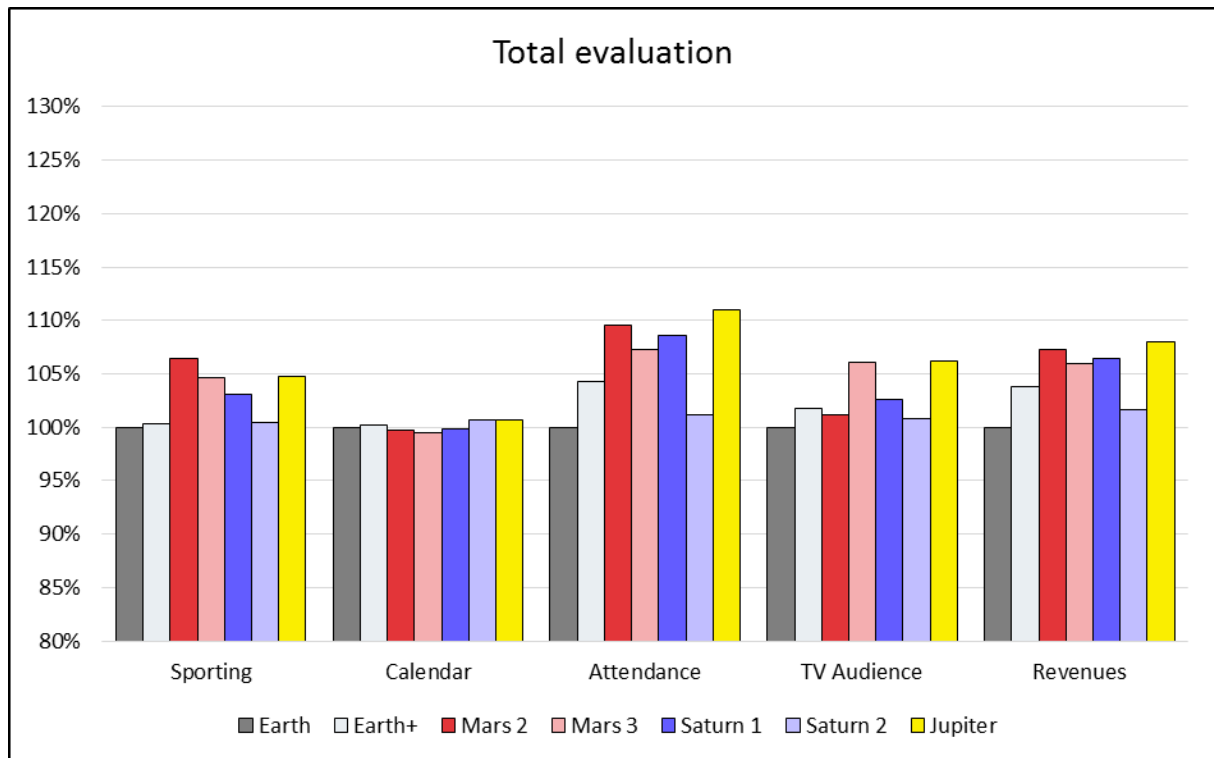
Total evaluation

On the different result dimensions we can conclude the following. All alternatives outperform the current format on all result dimensions. On sporting, attendance, and revenues Mars 2 and Jupiter score best, while Mars 3 and Jupiter score best with respect to TV audience. Saturn 1 also scores well on all result dimensions. Overall, the differences between the alternatives Mars 2, Mars 3, Saturn 1, and Jupiter are small, especially for the top clubs in 1. Division. For these clubs Mars 2 is the overall winner, while for the bottom clubs Jupiter is a little better. Jupiter is also the overall winner. Note that these results are based on the current competition format in the Superliga. If the number of teams in the Superliga goes to 14, then a format with also 14 teams in 1. Division might not be the best fit.

The discussion with the 1. Division upon the final formats resulted in these conclusions:

- Independent of the final decision on the Superliga format, the 1. Division must contain 12 teams
- The existing format is preferred, Mars 2 is the only viable alternative
- If the Superliga will consist of 12 teams, 1. Division want 2 direct promotion spots
- If the Superliga will consist of 14 teams, 1. Division accepts 1 direct and 1 or 2 indirect promotion spots

1

1 Introduction

1.1 Danish football: current state and objectives

Danish football has seen a downward trend in the past couple of years. Sporting results on the international stage have fallen. While Denmark was listed 12th on the UEFA Country Ranking in 2010/11, it currently resides on the 19th position, and is still falling. Divisionsforeningen wants to improve the Danish position on this ranking by returning (at least) to the top 15. This should be achieved by increasing the strength of the (clubs in the) Superliga and 1. Division, both with respect to sports and finances (which in turn can be invested in sporting quality as well).

A change of the league structure is characterized as one of the ways to obtain this. Hypercube is asked to guide this process, and this report describes both the process and the outcomes of our analyses.

1.2 The importance of the league structure

A new league structure is an element that could give new impetus to Danish football, and help to bend the curve on the sporting dimension. A good league structure ensures that the matches are attractive, that there are as few dead matches as possible (with nothing at stake for one or even both teams), and many tensed matches (instead of very predictable matches) between rival clubs.

A proper league structure will draw more people to the stadiums, will draw more media attention, which in turn gives a boost to sponsorships and income, and so helps clubs to improve the strength of their squad.

If a transformation of the Superliga and 1. Division is successful, it will also be more attractive for young talented players to stay longer in the Danish league before transferring abroad. Their prolonged stay in Denmark gives their teammates the possibility to learn more from them. Consequently, this may improve the Danish performance on the international podium. Moreover, the transfer values of the players will increase due to the improvement of their personal sporting quality.

1.3 Research questions and scope

Our task is to come up with a proposal for a new league structure, comprising of Superliga and 1. Division. Due to promotion/relegation 2. Division has, to a limited extent, to be taken into account as well. The aim is to implement the new structure in the season 2015/16. If the number of teams in the new league structure for the Superliga and/or 1. Division will differ from the current number, then a transition season may be necessary in 2015/16, with the new league structure starting in 2016/17.

1.4 Structure of the report

This document reports the result of the process leading up to a proposal for a new league structure, the analysis of Danish football, and the outcomes of the analysis of several competition formats for both the Superliga and 1. Division.

In Chapter 2 we describe the project organization and the major threads with respect to the league structure that have come to the surface in interviews with all the stakeholders. In Chapter 3 we give an overview of the Danish football calendar and the bounds within which a new league structure should be scheduled.

In Chapter 4 we analyze Danish football, both with respect to its sporting performance and with respect to its economics, and we determine the trends, correlations, and critical success factors. It is worth noting that in Section 4.5 the division of the Danish clubs into benchmark groups is presented. These benchmark groups are relevant as a particular league structure may be beneficial for one benchmark group, but not for another, which should be taken into account when evaluating alternative structures.

Then in Chapter 5 we give an overview of the result dimensions, which will be the measuring rods for our evaluation of the alternative competition formats. In Chapter 6 we discuss the current league structure, while in Chapter 7 we discuss the analysis of the alternative competition formats for both the Superliga and 1. Division.

In Chapter 8 the conclusions are presented and we provide our recommendations with respect to the implementation of the new league structure, comprising of a competition format for the two highest tiers in Danish football.

2

2 Danish football stakeholders

2.1 Project organization

This project is commissioned by Divisionsforeningen, the body in which all the clubs on the two highest tiers are represented. The project owner is Claus Thomsen, who is head of the working group. This group is responsible for the process of the project, which, e.g., includes collecting the input from the clubs and the external stakeholders and experts, and the processing of this input afterwards. The working group consists of representatives from Divisionsforeningen and is supported by Hypercube. The working group members are:

- Claus Thomsen (Head, Divisionsforeningen);
- Peter Ebbesen (Divisionsforeningen);
- Katrine Mønsted (Divisionsforeningen);
- Pieter Nieuwenhuis (Hypercube);
- Erik van Spanje (Hypercube).

2.2 Stakeholders and experts

A lot of valuable input has come from the conversations with stakeholders and experts. Below we recapitulate the most important threads. We start by the perception of these stakeholders and experts of the current state of Danish football. Subsequently, we address their opinions on the direction in which Danish football in general and the league structure in particular should be taken.

Note that some of the observations are not directly relevant for the setup of the league structure. Moreover, what is stated in this chapter are perceptions and opinions, and not facts. Nevertheless, since people act on their perceptions and opinions it is worthwhile to capture them, even when they are not necessarily confirmed by data-analysis.

Most statements can be checked by looking into the data. For example, if one claims that a kick-off time in the evening is preferred over a kick-off time in the afternoon, this statement can be verified with data about the number of spectators in both the stadium and TV. It might then turn out that there is a greater interest in matches scheduled in the afternoon, even though people advocate something else. In the following section we simply mention all the input from the stakeholders and experts. In Chapter 4 we report the results of the data-analysis.

The stakeholders that were consulted in the process include all the clubs on the two highest levels, broadcasters (Viasat (TV3 Sports) and SBS/Discovery), coaches, DBU representatives, FA board of region directors, fans, financial and commercial experts, journalists, Morten Olsen, players and the police.

2.3 Perception of the current state of Danish football

The general perception among stakeholders and experts is that the time is right for a change in Danish football. It is, however, important to get a proper sense of the underlying reasons for this feeling. There are actually a number of different reasons, which are described below.

Number of matches and teams

First of all, most stakeholders want to get rid of the unequal amount of home and away matches in the current system. The absolute maximum number of matches possible is 36 and the minimum number should be at least 30. There are several possibilities to extend the number of match dates in case the number of league matches per teams increases from the current 33 to, e.g., 36:

- Start earlier in July (beginning of the season) or in February (beginning of the second half);
- End later in December (end of the first half);
- Reduce the semi-final of the cup to one match;
- Play more midweeks and/or on UEFA club competitions match dates.

While increasing the number of league matches is a possibility, we have to be aware that increasing the number of matches between the same clubs bears the risk of saturation.

The number of teams in the Superliga should be between 10 and 16.

Interesting matches

There is the observation that there need to be more matches with something at stake. Hence, introducing a second stage in the competition in which the teams are divided into groups based on their rank after the first stage could be a good solution to achieve this. Fairness is, however, considered to be highly important as well. Consequently, there is the preference of not reducing the points obtained in the first stage. If such a second stage is introduced, the opinion is that the best players should be able to play in this stage, which means that yellow cards would have to be dropped after the first stage to prevent suspensions.

Sporting quality

The sporting quality of Danish football is under pressure. It is an autonomous trend that the quality of Danish football is decreasing. The major clubs do not deliver, which shows most prominently in the European club competitions.

Another observation with respect to sporting quality is that the risk of being relegated is too big, with two direct relegation spots in a competition with 12 teams. A possible solution to this problem is to add promotion/relegation matches between Superliga and 1. Division instead.

2.4 Objectives and how to get there

How to improve Danish football? Given the above observations, the following means and ends have been suggested:

- The major task is to strengthen the sporting quality in the Superliga. Ideally, this will improve the performance of the big clubs in the European club competitions as well. One question is whether the aim should be to have an even improvement for all clubs, or whether a steeper gradient is the only way to achieve this goal, so as to allow for greater difference in sporting strength between the clubs at the top and at the bottom ranks;
- It is also necessary to create more interesting matches;
- The number of matches per club has to be between 30 and 36;
- The number of teams in the Superliga should be between 10 and 16.

We have taken the above notions into consideration in our analysis, and while not all of the above points are directly influenced by a change in league structure we have aimed for changes that support these concepts.

3

3 Calendar

In the present format each club plays 33 matches. Changing the format will influence this number either to a smaller or a greater number. There are several possibilities to extend the number of match dates in case the number of league matches per teams increases from the current 33 to, e.g., 36:

- Start earlier in July (beginning of the season) or in February (beginning of the second half);
- End later in December (end of the first half);
- Reduce the semi-final of the cup to one match;
- Play more midweeks and/or on UEFA club competitions match dates.

An additional benefit of starting earlier in July and/or after the winter break is that clubs that have to perform in the UEFA club competitions are better prepared.

When the number of matches per club will be less than the 33 matches that are played now, the option is available to expand the cup competition, e.g., by also playing the quarter finals over two matches, by playing a full cup round (in the beginning of the competition) in a weekend instead of midweeks. Note that the first option only results in more matches for a limited number of clubs.

The maximum available number of match dates is considered to be 36. In Table 3.1 the calendar for 2015 until 2018 is shown with 33 match dates for the Superliga. Not all cup matches are shown, since some rounds are played on UEFA club competition dates. The white spots are available as extra match dates (e.g., July 12 in 2015 or February 21 in 2016).

Legend: Superliga | DBU Pokalen | UEFA CL | UEFA EL | National team | FIFA WC / UEFA EC | IOC Olympics

Table 3.1 Football calendar

4

4 Analysis of Danish football

In this chapter we analyze Danish football, both with respect to its sporting performance and with respect to its economics, and we determine the critical success factors. We start by discussing the sports economics cycle in Section 4.1. Section 4.2 contains a first overview of the relation between the economics and the football performance of Denmark (and other European countries). In Section 4.3 we analyze the sporting performance of the Danish clubs and the national team in more detail, both in the long-run and in the short-run. There is also an analysis on player level. In Section 4.4 we illustrate the clubs' catchment areas, while in Section 4.5 we divide the Danish clubs into three benchmark groups based on their sporting quality and finances. In Sections 0 and 0 we determine the explanatory variables for stadium attendance and TV audiences, respectively. Then, in Sections 4.8 and 0 we focus on the revenues and costs of the clubs, concluding this chapter with an indication in Section 0 of the impact of a new competition format on the sporting quality of the Danish clubs.

4.1 The sports economics cycle

In order to be able to make reliable predictions in sports, it is essential to capture the sports economics cycle (Figure 4.1.1). The underlying idea is that by improving upon sporting strength, a club attracts more fans to the stadium and increases the number of followers on TV and online, which automatically makes the club more attractive for sponsoring. Hence, an improvement in sporting strength results in additional revenues, from both fans and sponsors. These additional revenues enable a club to invest in sporting strength, which in turn results in additional stadium attendance, TV audiences, and online followers, etc. Or the other way around, a decline in sporting strength will make a club perform worse in the other dimensions as well, which will then have a negative impact on sporting strength. See Appendix IV for more substantiation of this cycle.
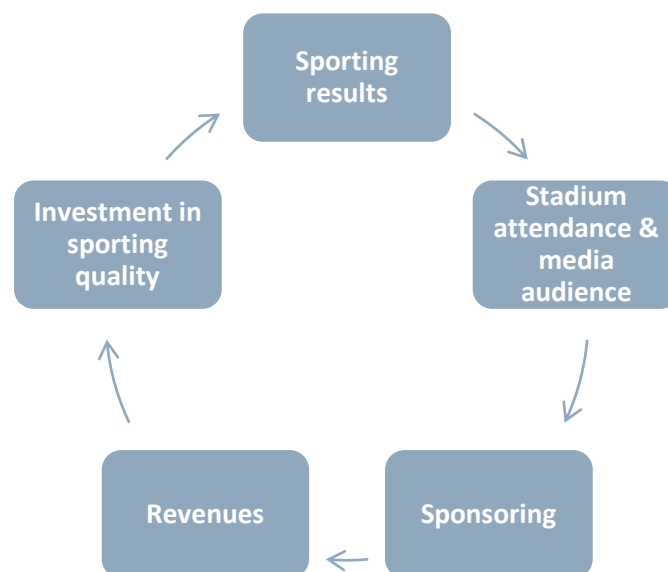
Figure 4.1.1 The sports economics cycle

Although this sports economics cycle may seem like a virtuous or vicious circle, either taking a club through the roof or down the drain, there are limits. The graph in Figure 4.1.2 shows the basics of a football club as it plots its costs and revenues in relation to its sporting strength. The area where revenues exceed costs is where a football club can have a profitable existence.
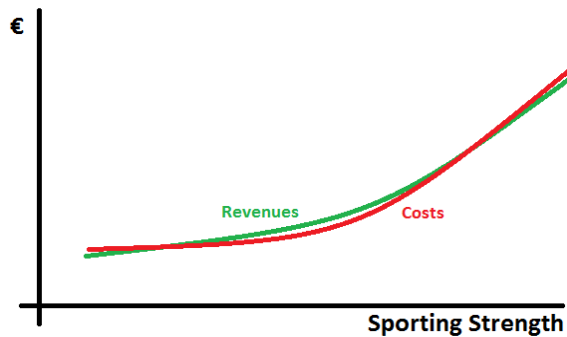
Figure 4.1.2 Revenues and costs of a football club

The cost curve can be explained in the following way. Playing at a higher level requires investments in the squad. As in any other industry, quality is expensive and outstanding quality even more. Hence, a club that is already very strong, can improve only by hiring exceptionally talented players, and has to pay them accordingly. Therefore, the cost curve gets steeper as sporting strength increases.

For the revenues it holds that by playing at a higher level a club also attracts more fans and sponsors. Thus, quality enhances revenues. However, the economic resources of the club's catchment area, which is the area from which a club can draw (the main part of) its stadium attendances and sponsors, are not inexhaustible. And while enlargement of the catchment area is possible with a strong long-term sporting performance, in the end football is quite a local business: Real Madrid will never have many fans in Barcelona. This means that there is an upper limit to the club's revenues. Hence, at some point, even though the club is still making progress on the sporting dimension (and costs are rising), revenues will not increase accordingly. Therefore, the revenue curve gets flatter as sporting strength increases.

Hence, there are limits to a club's ambitions, and not only an upper limit. There is also a lower limit, below which the club's performance is so poor that it loses too many fans and sponsors to cover the fixed costs, e.g., stadium and organization costs. The boundaries between which a club can be profitable are determined by critical success factors, some of which can be influenced in either the short- or long-run, others not.

The catchment area of a club is very important for a club's limits. A London based club, for instance, can draw from better resources than a club from Swansea. However, given that there are more than five major clubs based in London, they have to share these great resources. By improving its sporting quality, a club can increase its attractive power and therefore increase its catchment area. Obviously, a club cannot influence the attractive power of its competitors. A club can, however, in the long-run change its own geographical position. Of course moving the club to another city is likely to result in major negative sentiment and the loss of many supporters. A club can, however, move its stadium within the city limits in order to increase its attractive power with respect to particular parts of the city or surrounding regions.

Besides the location of the stadium, also its capacity, atmosphere and facilities have a major effect on the club's ability to draw fans and sponsors. A club can also increase its revenues by proper marketing and sales: a good team targets its potential fans and sponsors in the right way to maximize the return. Finally, the clubs can collectively decide on the right competition format: a format with lots of tension such that spectators are drawn to the stadiums and TV. In such a way the clubs increases their revenues, both directly, and indirectly via additional sponsors.

4.2 The economics and sporting strength of Danish football

The sporting quality of a club is for a large part determined by its finances. Hence, the sporting quality of a country with respect to clubs is in general highly correlated with the size of the football economy of a country. If we consider the national teams, then next to football economy, there are two other major factors that determine the quality. First of all the size of the population. Football draws its resources (players) from all the inhabitants. Evidently, a country that has more inhabitants, has a higher probability of having talents among them. Of course, population is not the only factor, as the country's youth development is important as well. In general, the development of players is better in the countries that are more prosperous. Hence, the GDP of a country (or GDP per capita) is the second major indicator for the quality of a national team.

In Table 4.1 the top 30 of the different socio-economic rankings in 2012 are given, where the football economy shows the total revenues of the top flight clubs.

Rank	Population x 1,000		GDP x 1mln		GDP per capita		Football economy x 1 mln	
1	Russia	143.170	Germany	€ 2.666.400	Liechtenstein	€ 123.731	England	€ 2.780
2	Germany	82.800	France	€ 2.032.297	Luxembourg	€ 81.944	Germany	€ 1.944
3	Turkey	73.997	England	€ 1.667.164	Norway	€ 77.873	Spain	€ 1.860
4	France	65.911	Russia	€ 1.579.790	Switzerland	€ 61.426	Italy	€ 1.720
5	Italy	60.885	Italy	€ 1.567.010	San Marino	€ 46.155	France	€ 1.160
6	England	52.741	Spain	€ 1.029.002	Denmark	€ 43.781	Russia	€ 896
7	Spain	46.755	Turkey	€ 613.528	Sweden	€ 42.862	Turkey	€ 558
8	Ukraine	45.530	Netherlands	€ 599.338	Faroe Islands	€ 38.042	Netherlands	€ 432
9	Poland	38.211	Switzerland	€ 491.246	Austria	€ 36.272	Portugal	€ 288
10	Romania	21.755	Sweden	€ 407.674	Netherlands	€ 35.858	Belgium	€ 256
11	Netherlands	16.714	Norway	€ 388.888	Ireland	€ 35.826	Ukraine	€ 208
12	Kazakhstan	16.271	Poland	€ 381.249	Finland	€ 35.600	Switzerland	€ 190
13	Greece	11.125	Belgium	€ 376.229	Belgium	€ 34.017	Norway	€ 176
14	Belgium	11.060	Austria	€ 307.004	Iceland	€ 32.432	Greece	€ 160
15	Czech Republic	10.660	Denmark	€ 245.076	Germany	€ 32.203	Denmark	€ 156
16	Portugal	10.604	Greece	€ 193.749	Andorra	€ 32.005	Austria	€ 150
17	Hungary	9.976	Finland	€ 192.541	England	€ 31.611	Sweden	€ 128
18	Sweden	9.511	Israel	€ 187.622	France	€ 30.834	Scotland	€ 120
19	Belarus	9.405	Portugal	€ 165.107	Scotland	€ 28.640	Kazakhstan	€ 112
20	Azerbaijan	9.309	Ireland	€ 163.938	Italy	€ 25.737	Romania	€ 108
21	Austria	8.464	Kazakhstan	€ 157.726	Israel	€ 24.545	Poland	€ 96
22	Switzerland	7.997	Czech Republic	€ 152.893	Northern Ireland	€ 22.803	Czech Republic	€ 80
23	Israel	7.644	Scotland	€ 149.753	Spain	€ 22.009	Israel	€ 56
24	Bulgaria	7.278	Ukraine	€ 137.220	Wales	€ 21.791	Cyprus	€ 56
25	Serbia	7.242	Romania	€ 131.840	Cyprus	€ 20.596	Belarus	€ 44
26	Denmark	5.598	Hungary	€ 96.976	Greece	€ 17.416	Hungary	€ 37
27	Slovakia	5.446	Slovakia	€ 71.096	Slovenia	€ 17.081	Croatia	€ 36
28	Finland	5.408	Wales	€ 65.639	Malta	€ 15.966	Azerbaijan	€ 36
29	Scotland	5.229	Azerbaijan	€ 53.490	Portugal	€ 15.571	Bulgaria	€ 27
30	Norway	4.994	Belarus	€ 49.234	Czech Republic	€ 14.343	Serbia	€ 21

Table 4.1 The top 30 of different socio-economic rankings in 2012

It follows from this table that Denmark is quite prosperous. Moreover, the football economy is in accordance with the GDP as on both lists Denmark is on position 15. However, since in Denmark the top flight consists of 12 teams, whereas Greece and Norway have 18 and 16 teams on the highest level, respectively, the football economy per club is even a little better.

Rank	UEFA National Team Ranking		UEFA Country Ranking		Euro Club Index	
1	Spain	41.872	Spain	97,715	Spain	3.425
2	Germany	41.365	England	84,750	England	3.281
3	Netherlands	38.541	Germany	81,645	Germany	3.081
4	Italy	35.093	Italy	66,940	Italy	2.932
5	England	34.885	Portugal	62,300	France	2.698
6	Portugal	34.448	France	56,505	Russia	2.667
7	Greece	33.674	Russia	47,000	Portugal	2.532
8	Russia	32.946	Netherlands	44,315	Ukraine	2.380
9	Bosnia & Herzegovina	31.416	Ukraine	40,970	Netherlands	2.377
10	France	31.152	Belgium	36,305	Turkey	2.376
11	Croatia	30.785	Turkey	34,205	Czech Republic	2.238
12	Ukraine	30.635	Greece	33,605	Switzerland	2.207
13	Sweden	30.245	Switzerland	33,230	Belgium	2.189
14	Denmark	29.660	Austria	30,930	Romania	2.113
15	Switzerland	29.572	Czech Republic	29,355	Greece	2.023
16	Belgium	28.732	Romania	27,260	Israel	1.990
17	Czech Republic	28.234	Israel	26,880	Denmark	1.985
18	Hungary	27.802	Cyprus	23,255	Sweden	1.878
19	Ireland	26.733	Denmark	21,305	Cyprus	1.874
20	Serbia	25.985	Croatia	19,630	Bulgaria	1.868
21	Turkey	25.955	Poland	18,880	Austria	1.835
22	Slovenia	25.835	Belarus	18,630	Norway	1.831
23	Israel	25.442	Scotland	16,570	Scotland	1.683
24	Norway	25.341	Sweden	16,330	Poland	1.658
25	Slovakia	25.333	Bulgaria	15,630	Hungary	1.610
26	Romania	25.171	Norway	14,280	Bosnia & Herzegovina	1.575
27	Austria	24.572	Serbia	14,130	Slovakia	1.558
28	Montenegro	22.991	Hungary	11,630	Azerbaijan	1.467
29	Armenia	22.861	Slovakia	11,005	Serbia	1.416
30	Poland	22.464	Slovenia	11,005	Belarus	1.403

Table 4.2 The top 30 of different sporting rankings in June 2014

By considering the sporting strength of Denmark, both with respect to the national team and with respect to the clubs we can see if they are in accordance with the socio-economic factors. Table 4.2 shows the top 30 of the UEFA national team ranking[2], the UEFA country ranking[3] and the Euro Club Index[4]. The Euro Club Index (ECI) column shows the average ECI of the top 8 teams on the highest level.

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[2] The UEFA National Team Ranking is a ranking of countries based on the performance of the national teams in the last three tournament qualifications and the last two tournaments. The ranking is used to seed the countries for the draws of these qualifications and the UEFA European Championship itself. See http://www.uefa.com/.

[3] The yearly UEFA Country Ranking is a ranking of countries based on the performances of the countries' clubs in the UEFA Champions League and the UEFA Europa League. The UEFA Country Ranking then averages the performances over the last five years and determines the number of places allocated to an association (country) in the forthcoming UEFA club competitions. See http://www.uefa.com/memberassociations/uefarankings/country/.

[4] The Euro Club Index (see Appendix III and http://www.euroclubindex.com/) shows the sporting strength of all the European clubs on the highest level and is updated, on the basis of the relative performance, after each match.

In general the correlation between the socio-economics rankings and the sporting rankings in strong. And while the Danish national team seems to perform in accordance with the population and GDP of Denmark, the Danish clubs clearly underperform as the 15th football economy (and per club even a little higher) is translated into the 19th position on the UEFA country ranking and the 17th position on the ECI.

4.3 Sporting strength

4.3.1 Long-term performance

In the season 1995/96 the current league structure, in which twelve teams play each other three times a season, was introduced in the Danish Superliga. This was during quite a strong period in Danish football. The national team had won the UEFA European Championship in 1992 and although Denmark did not qualify for the FIFA World Cup of 1994 the national team was in the top 10 of the FIFA World Ranking[5] and the Country Index[6]. In Figure 4.3.1 the Country Index from 1990 to 2015 (for each year on March 1) is shown for Denmark and some other countries.
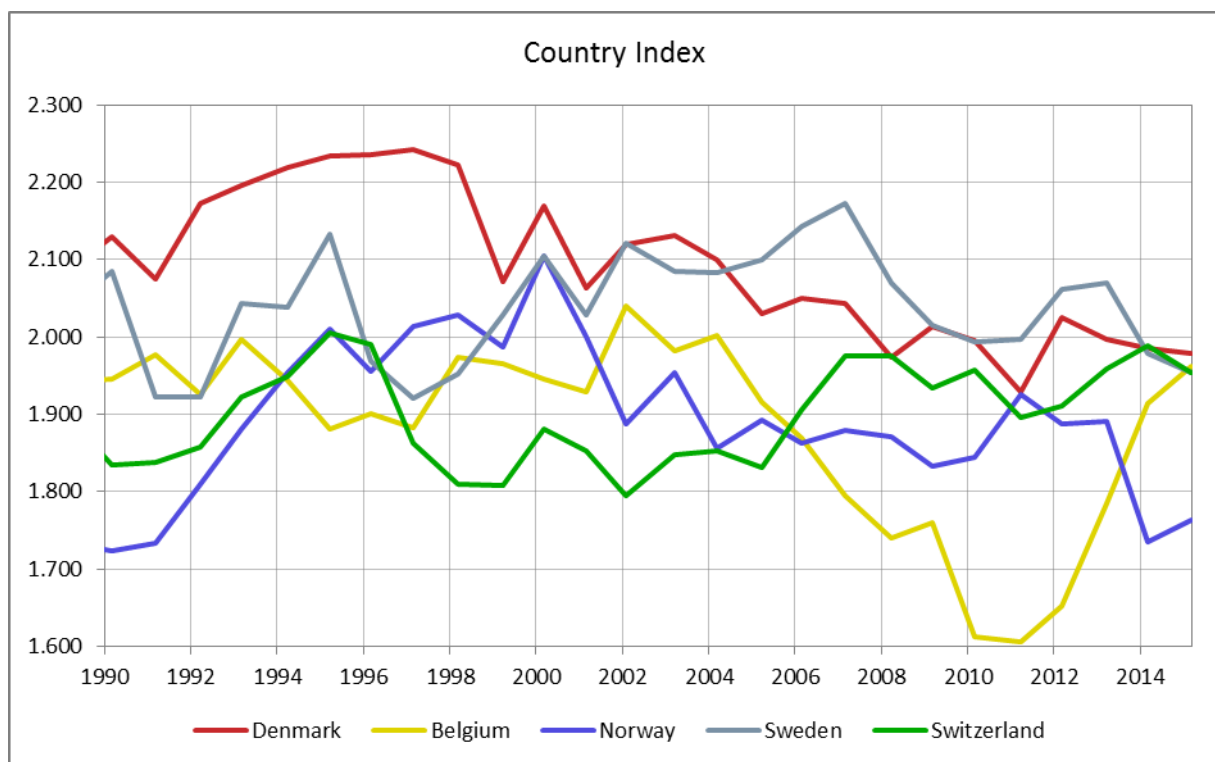
Figure 4.3.1 Country Index

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[5] The FIFA World Ranking is a ranking of all the national football teams by FIFA, where a team's total number of points over a four-year period is determined by adding the average number of points gained from matches during the past 12 months and the average number of points gained from matches older than 12 months (depreciates yearly). See http://www.fifa.com/fifa-world-ranking/ranking-table/men/index.html.

[6] Similar to the Euro Club Index, Hypercube developed a Country Index. This index shows the sporting strength of national teams and is updated, on the basis of the relative performance, after each match.

Danish club football also flourished in the middle of the nineties with an almost structural top fifteen position for Denmark on the yearly UEFA Country Ranking between 1990/91 and 1996/97. In Figure 4.3.2 the yearly Country Ranking of Denmark since 1990/91 is shown.
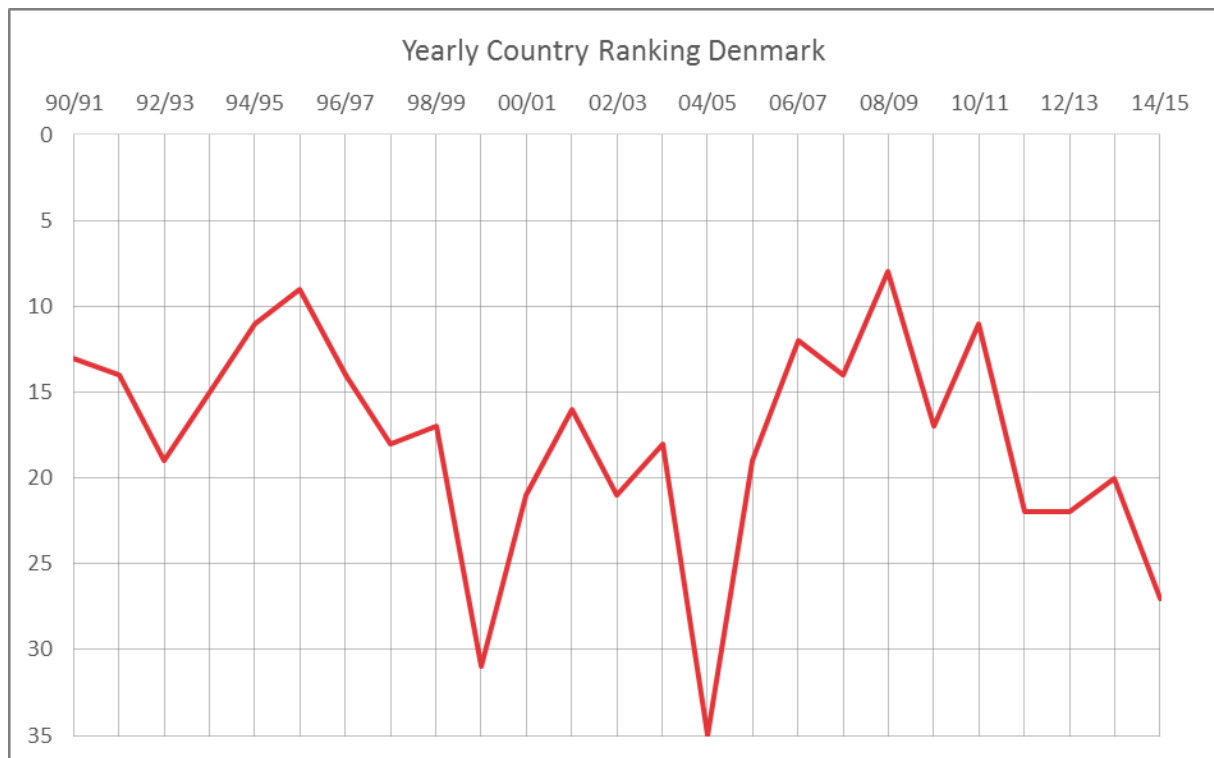
Figure 4.3.2 Yearly UEFA Country Ranking

However, in 1999 the Danish national team dropped out of the top 10 of the Country Index and has been slowly diminishing in strength ever since, with a position between 15 and 20 on the Country Index the last couple of years. Currently, their strength is comparable with countries such as Belgium, Sweden, and Switzerland. (See again Figure 4.3.1.)

The performance of the Danish clubs follows a somewhat similar pattern. Between the seasons 1997/98 and 2005/06 Denmark never reached the top 15 on the yearly UEFA County Ranking, with an average below position 20. Between 2006/07 and 2010/11 Danish club football had a temporary peak with an average of position 12 (and a top ten position in 2008/09), before dropping again to positions of 20 and below in the last few years. (See again Figure 4.3.2.)

On the UEFA Country Ranking itself, which averages the countries' clubs performances over the last five years, Denmark is obviously on a downward trend as well. Denmark is currently behind Belgium and Switzerland, but (still) ahead of its neighbors Sweden and Norway. See Figure 4.3.3 for the UEFA Country Ranking of the last ten seasons.
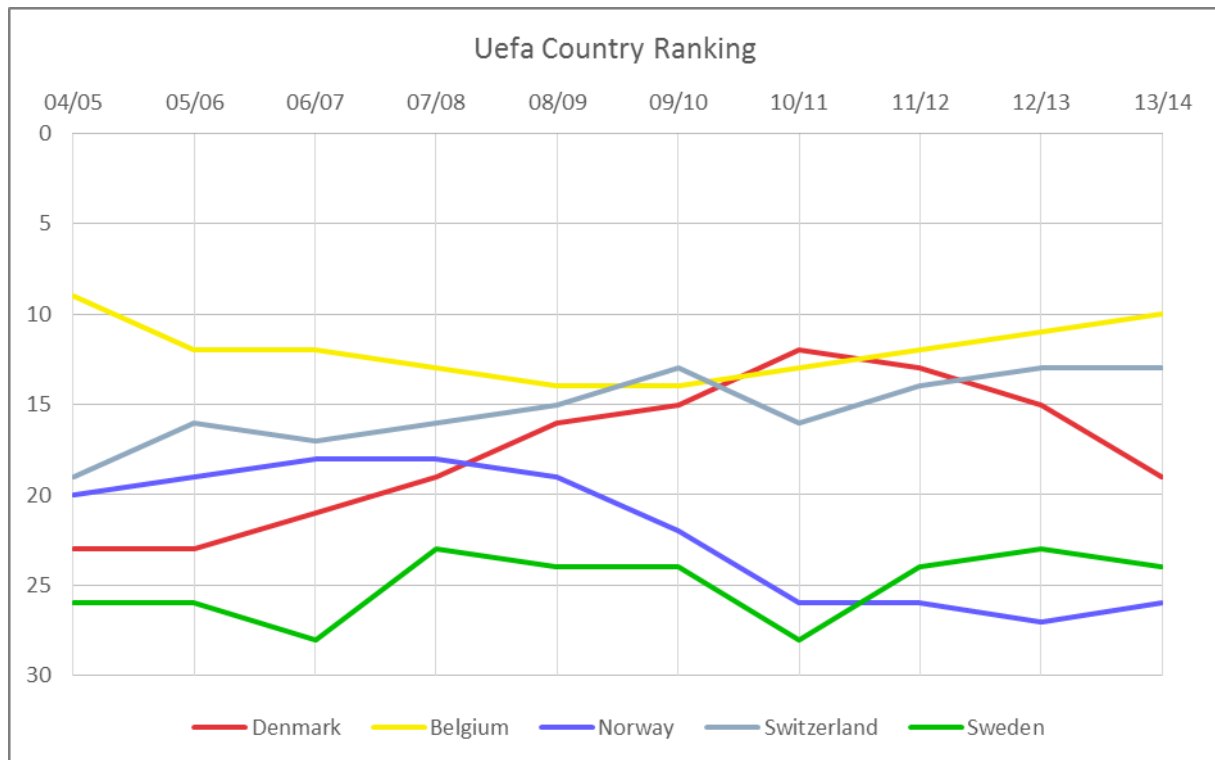
Figure 4.3.3 UEFA Country Ranking

The UEFA Country Ranking is important, because it determines the access list for the UEFA Champions League and the UEFA Europa League. Given the 2014 position (19th), the champion of the Superliga enters the 2nd Qualifying Round of the UEFA Champions League, the cup winner enters the 2nd Qualifying Round of the UEFA Europa League, and the Danish numbers 2 and 3 enter the 1st Qualifying Round of the UEFA Europa League. Making progress on this ranking has major benefits. A top 15 position enables also the runner-up of the league to enter the UEFA Champions League qualifications, while the number 4 of the league enters the UEFA Europa League qualifications. A top 12 position even gives a direct ticket to the group stages of the UEFA Champions League and UEFA Europa League for the Superliga champion and cup winner, respectively.

4.3.2 Short-term performance

Our main analysis focusses on the last five/six seasons, starting in the season 2009/10. In Paragraph 4.3.1 it is shown that the performance of the Danish clubs in Europe has worsened in the last seasons. This is also reflected in their strength, measured by the ECI, where the general trend is clearly downwards. The average ECI of the top 12 Danish clubs on the ECI in 2009/10 was 1.942, while this is 1.785 in the current season (up to May 11).

What is even worse, is that the main drop in points is in the top of the league. The first Danish club is FC København, placed 120th with 2.210 points (May 11, 2015), who reached their top in 2011 at place 32 with 2.800 points. They have lost 340 points since 2009/10. The Danish number 2 in 2009/10, OB Odense, even lost almost 750 points since then.

In Figure 4.3.4 the average ECI of the top 1, top 3, top 6, and bottom 6 per season of the Danish clubs on the ECI ranking is given.
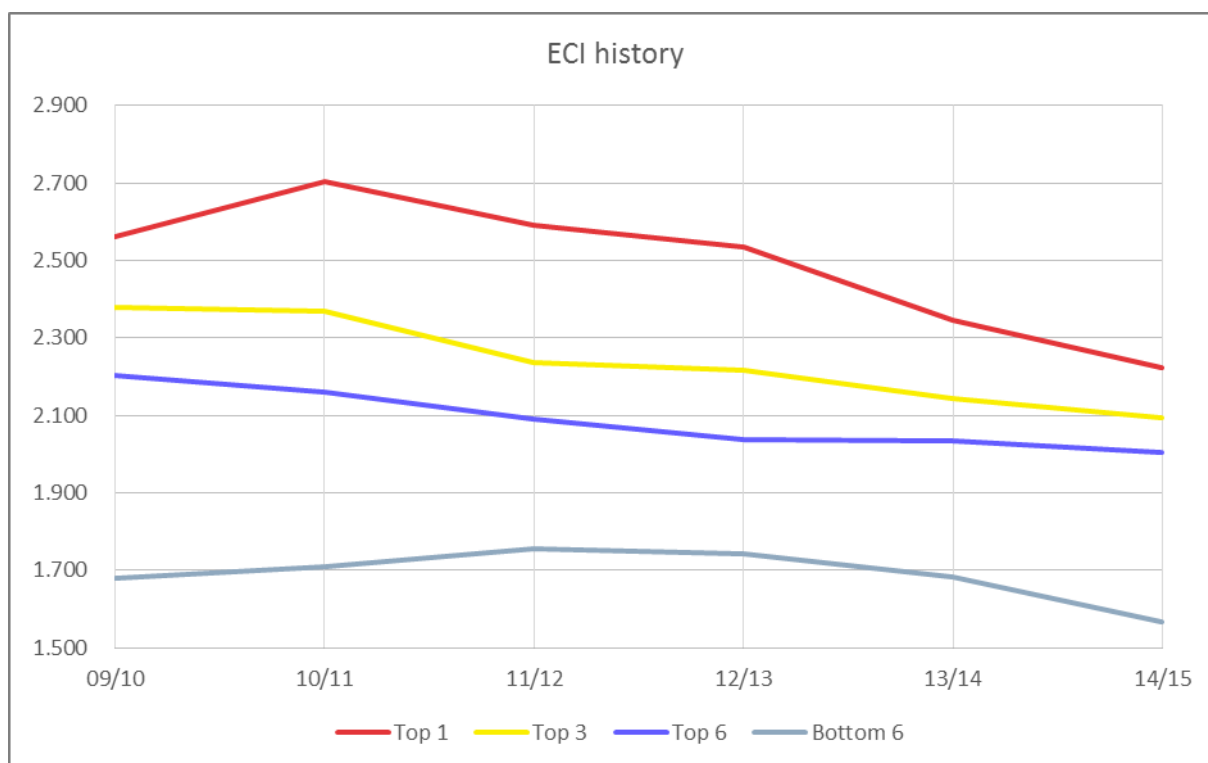
Figure 4.3.4 Average ECI history of top 1, top 3, top 6, and bottom 6 of Danish clubs

Since points for the UEFA Country Ranking are obtained by the top clubs of the league, it is in particular worrisome that since 2009/10 the top 6 has lost 200 ECI points on average. The current ECI scores of the Danish teams unfortunately indicate that the chance to achieve good results in European competitions is very small.

This is also illustrated by Figure 4.3.5 and Figure 4.3.6 in which the distribution of the ECI is given of the clubs in different stages of the UEFA Champions League and UEFA Europa League, respectively, between seasons 2009/10 and 2014/15 (not including the finals). For each stage a boxplot is given, which divides the clubs of a particular stage into four groups. The worst 25% (in terms of ECI) are represented by the beginning of the boxplot up to the blue rectangle. The blue rectangle itself is the second 25%. The green rectangle is the third 25%, while the top 25% is represented from the end of the green rectangle onwards.

Hence, between 2009/10 and 2014/15 the club with the lowest ECI in the UEFA Champions League Group Stage had an ECI of approximately 1.900, 50% of the clubs in the final of the UEFA Champions League had on ECI of at most 3.550, and the club with the highest ECI participating in the UEFA Europa League had an ECI of approximately 3.800. Note that for the qualification rounds of the UEFA Champions League the two different routes are not distinguished.

In both figures there is a red line that indicates the ECI of the current Danish leader on the ECI (FC København). In Figure 4.3.6 the second red line indicates the ECI of the current Danish number 4 on that list (Esbjerg fB).
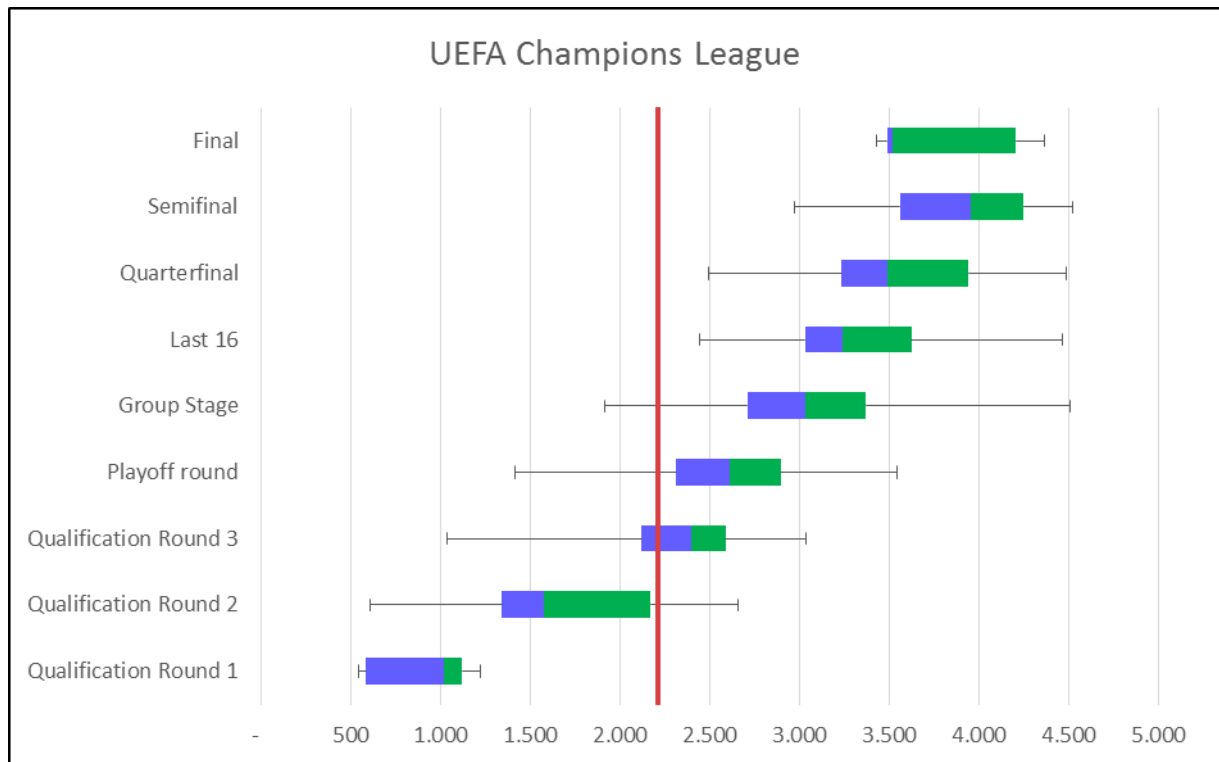
Figure 4.3.5 The ECI distribution of clubs in the UEFA Champions League between 2009/10 and 2014/15
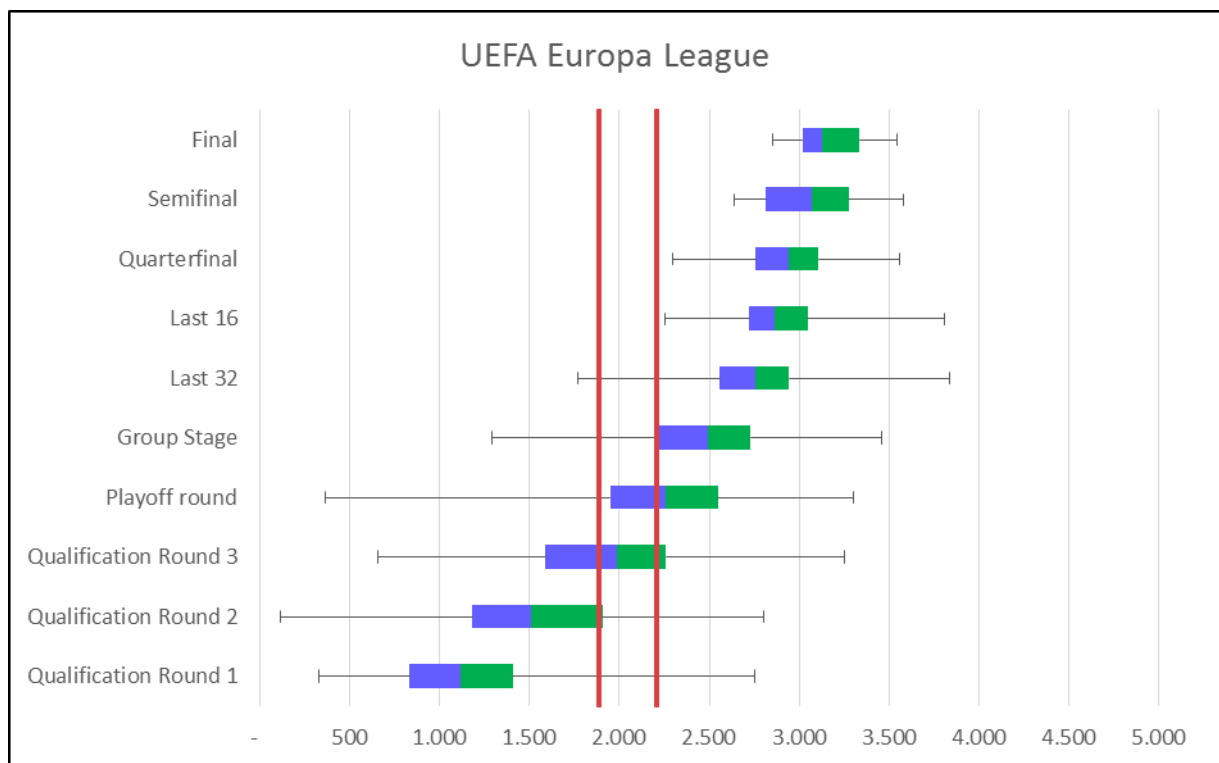
Figure 4.3.6 The ECI distribution of clubs in the UEFA Champions League between 2009/10 and 2014/15

From these figures it follows that the participation of a Danish club in the UEFA Champions League Group Stage is currently highly improbable and that an increase in sporting quality is necessary. The current sporting quality is even insufficient for an over 50% chance to reach the UEFA Europa League Group Stage given that the play-off round is reached at all.

In Figure 4.3.7 the ECI history of the current Danish top 6 clubs on the ECI is given.
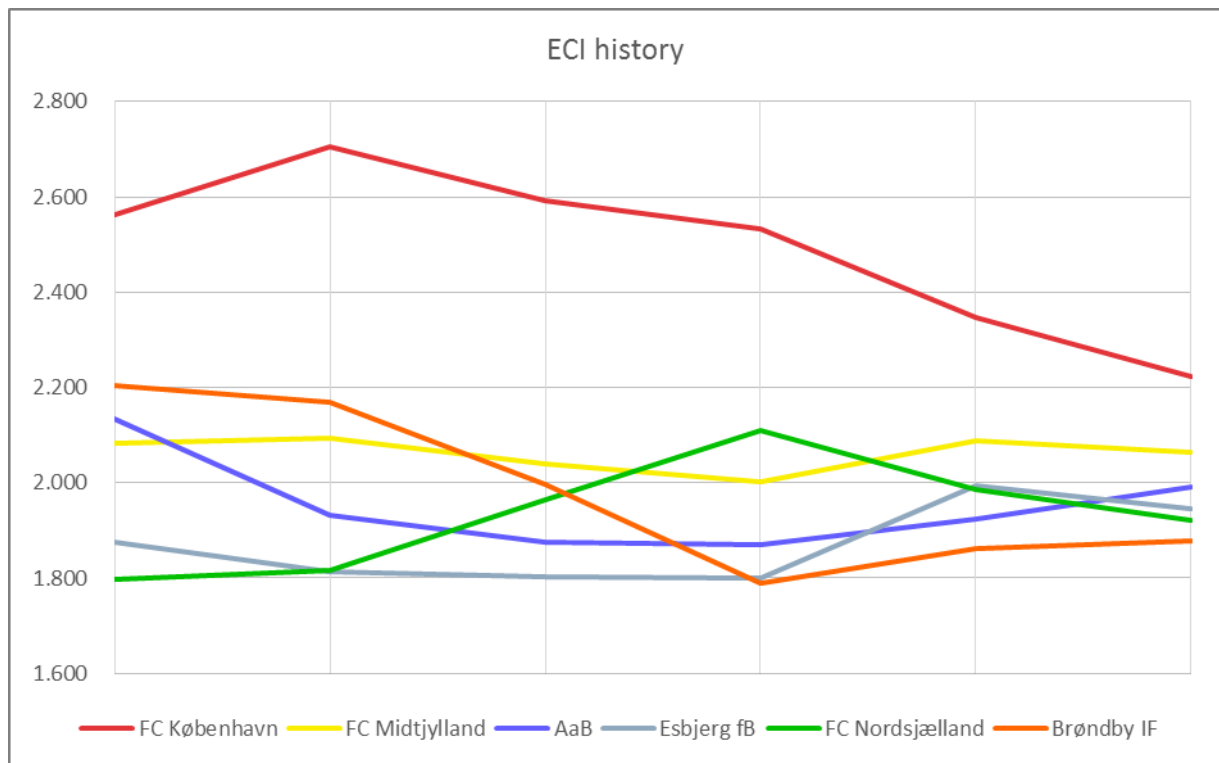
Figure 4.3.7 ECI history of the current top 6 clubs in Denmark

Note that only Esbjerg fB and FC Nordsjælland have (slightly) improved their ECI scores in recent years, but given the fact that a typical UEFA Europa League contender has 2.500 points it becomes clear that the strength of the Danish top clubs has to increase in order to improve their results in Europe.

4.3.3 Players

In this paragraph we make an analysis on player level. In Table 4.3 and Table 4.4 there is an overview of the transfers from Denmark to foreign (European) competitions since the summer season 2009[7]. The first column gives the season in which the transfer took place. The second column gives the number of transfers from Denmark (by both Danish and foreign players), where a transfer between seasons belongs to the coming season. The third column gives the average age of the transferred players. The fourth column denotes the average ECI points difference between the new foreign club of a player and his former Danish club. The fifth and sixth column give the percentage of minutes played by the transferred player in the league for his new club in the season of the transfer and his old club in the season before the transfer, respectively. For season 2014/15 the analysis takes into account matches up to May 11, but as a percentage of the full season.

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[7] Not included in this analysis is the second tier of Norway. Since 2011 eight players have made a transfer from Denmark to Norway's second tier, but we lack numbers for the previous seasons.

Season	transfers	age	ECI difference	played old	played new
2009	27	26.00	-237	27%	42%
2010	20	27.81	-189	29%	52%
2011	11	26.89	-251	31%	51%
2012	15	27.61	-288	31%	59%
2013	15	28.99	-410	27%	67%
2014	8	25.67	-166	19%	26%

Table 4.3 Transfers to summer competitions

Season	transfers	age	ECI difference	played old	played new
2009/10	21	25,99	-11	46%	36%
2010/11	19	25,55	47	55%	51%
2011/12	23	26,16	-19	55%	47%
2012/13	20	25,55	78	51%	34%
2013/14	24	24,72	-101	49%	35%
2014/15	34	26,28	-7	54%	37%

Table 4.4 Transfers to winter competitions

The most popular summer competitions are Norway and Sweden with a total of 47 and 35 transfers, respectively, since 2009. Most transfers to winter competitions are to Germany (27) and The Netherlands (26). Note also that although the level of the Danish teams has been diminishing in recent years, the ECI difference does not have a clear trend. Hence, on average, players also transfer to clubs of lower sporting quality.

There is an interesting difference between transfers to summer and winter competitions. Players that transfer to a summer competition are older (27.2 on average, as opposed to 25.7 on average for players that transfer to a winter competition), go to clubs with a lower ECI, but increase their playing time significantly. Hence, it seems that a typical player that transfers to Norway or Sweden does so to increase his time on the field, while among the players that transfer to a winter competition many move on to a club to move their career forward. However, the played percentage for players that transfer to a winter competition drops from 51% to 41% (excluding 2014/15) on average over the years, which might indicate that for some players the step forward comes too soon. A quality boost of the Danish Superliga might have the result that (young) players stay somewhat longer in Denmark, which in turn improves the quality of the Superliga and that of the players themselves.

Table 4.5 gives an overview with respect to the internationals playing for the Danish national team in the last ten years. A cycle consists of all the qualification matches and the tournament (if qualified) of the denoted year, and does not include friendly matches. Minutes by players from Denmark and from outside Denmark indicate the number of minutes played during those matches by players that were under contract in either Denmark or abroad at the time of the match by the Danish national team.

Cycle	2006	2008	2010	2012	2014	2016
Minutes by players from Denmark	1179	3358	2680	2665	2760	276
Minutes by players from outside Denmark	10641	8753	10190	8228	7141	3684
Percentage of minutes by players from Denmark	10%	28%	21%	24%	28%	7%

Table 4.5 Internationals from inside and outside Denmark from 2006 to 2016

Note that the percentage of minutes played by players from Denmark is rather constant since cycle 2008. (Since the cycle 2016 only consists of only four matches, it is too soon to draw any conclusions on the basis of that cycle.) From Table 4.3 and Table 4.4 it follows that the number of transfer from Denmark has remained quite constant over the last six years. From Table 4.5 we learn that also the number of Danish top players in Denmark has remained approximately the same.

4.4 Catchment areas

A catchment area is the area from which a club draws the majority of its spectators and sponsors. Although the catchment areas with respect to stadium attendance and sponsors overlap each other (and are therefore mostly combined into one concept), in general the sponsor catchment area is somewhat larger. In

 and Figure 4.4.3 the attendance catchment areas are given for each of the 24 clubs on the two highest levels in Danish football. Football is for the most part a local business and we take this into account by limiting the attendance catchment area to a 25 kilometer radius from the stadium. Moreover, the size of a club's attendance catchment area depends on the (historic) sporting quality of the club and that of the clubs in the neighborhood.

The size of a club's attendance catchment area is important. However, just as important is the population density in that attendance catchment area. Therefore,

 and Figure 4.4.4 show the population density in Denmark. From these figures it follows, that although the size of FC København's attendance catchment area is rather small, the population in this area vastly exceeds all other.
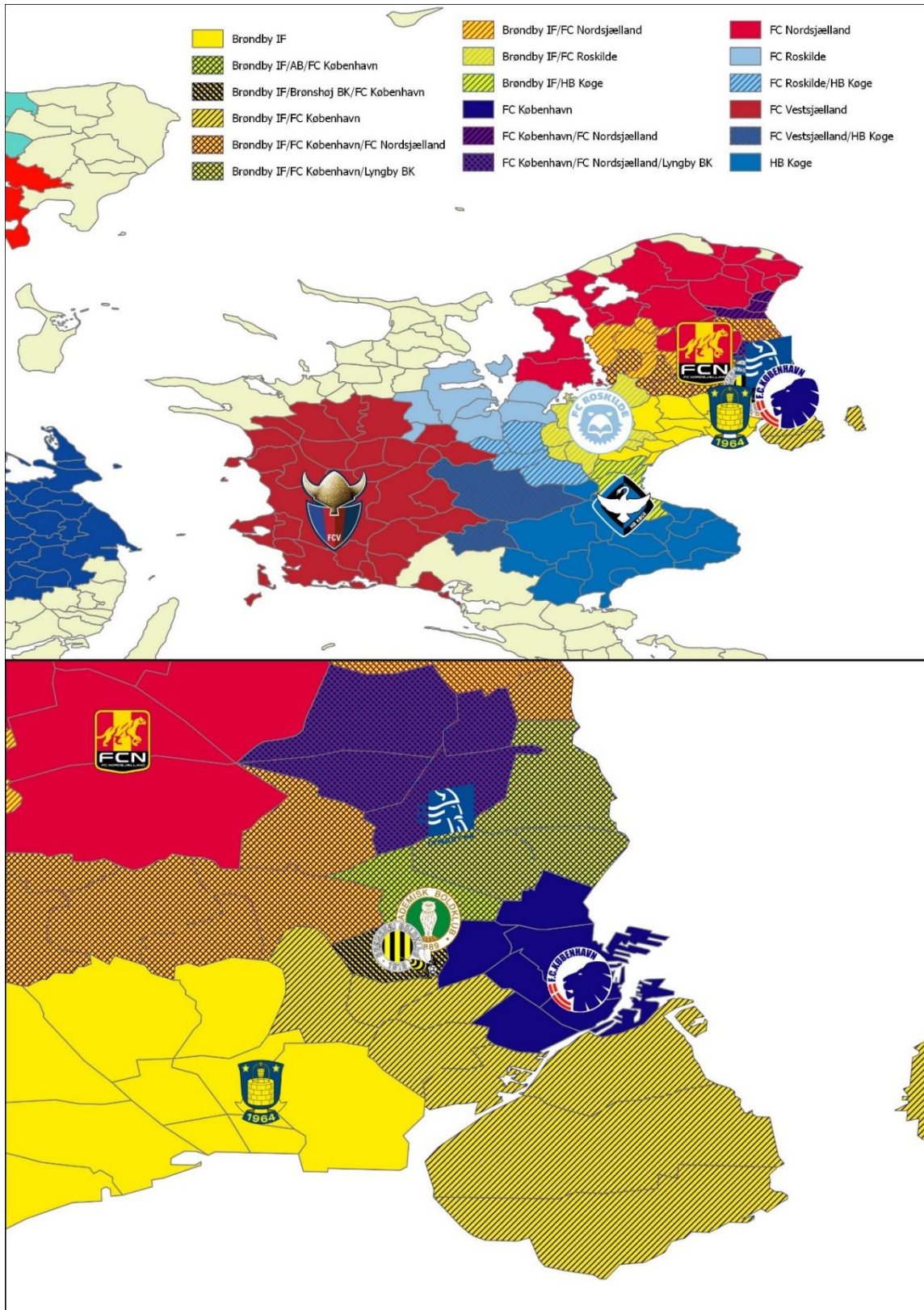
Figure 4.4.1 Attendance catchment areas of Denmark (East)

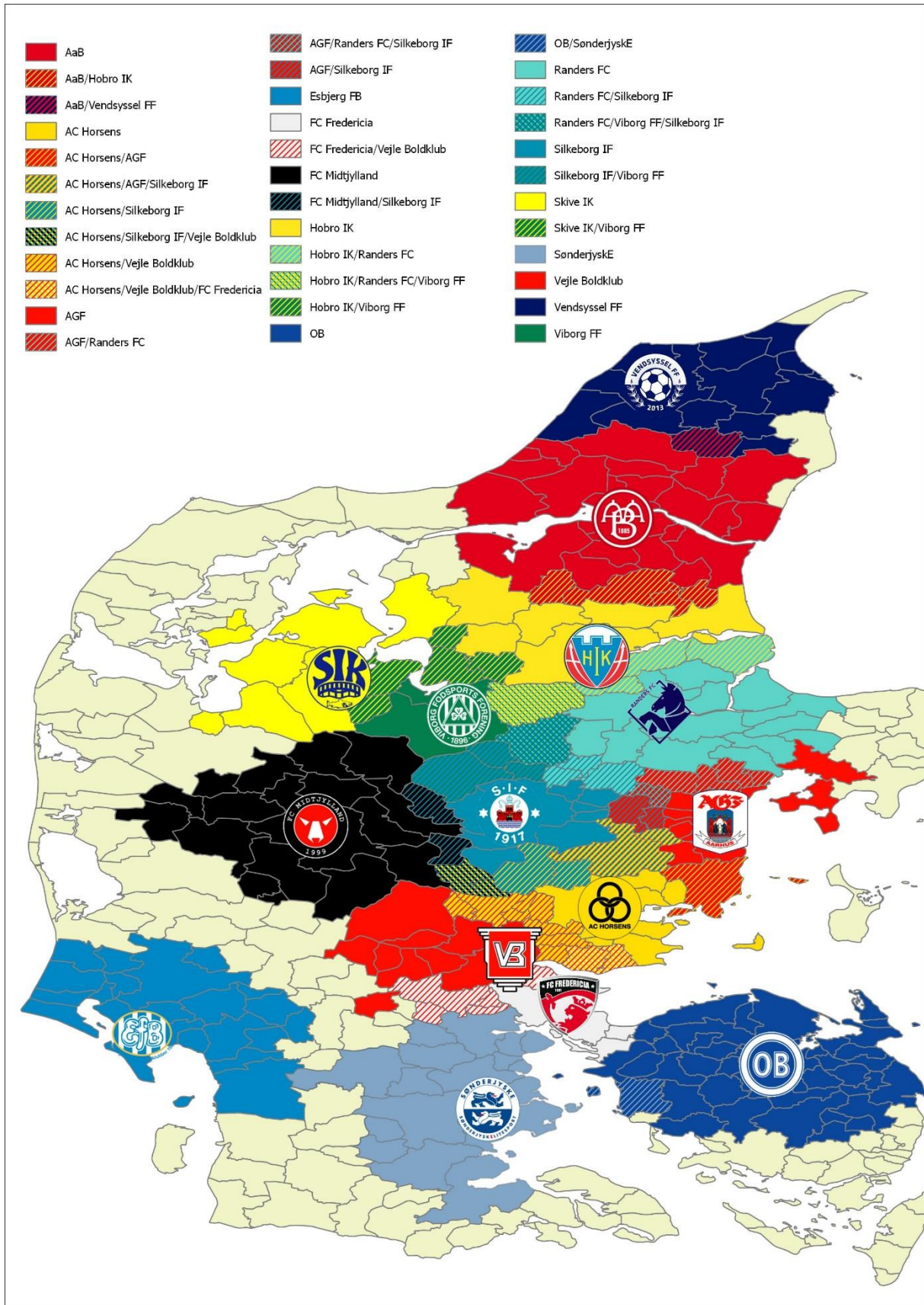*Figure 4.4.2 Population density Denmark (East)*

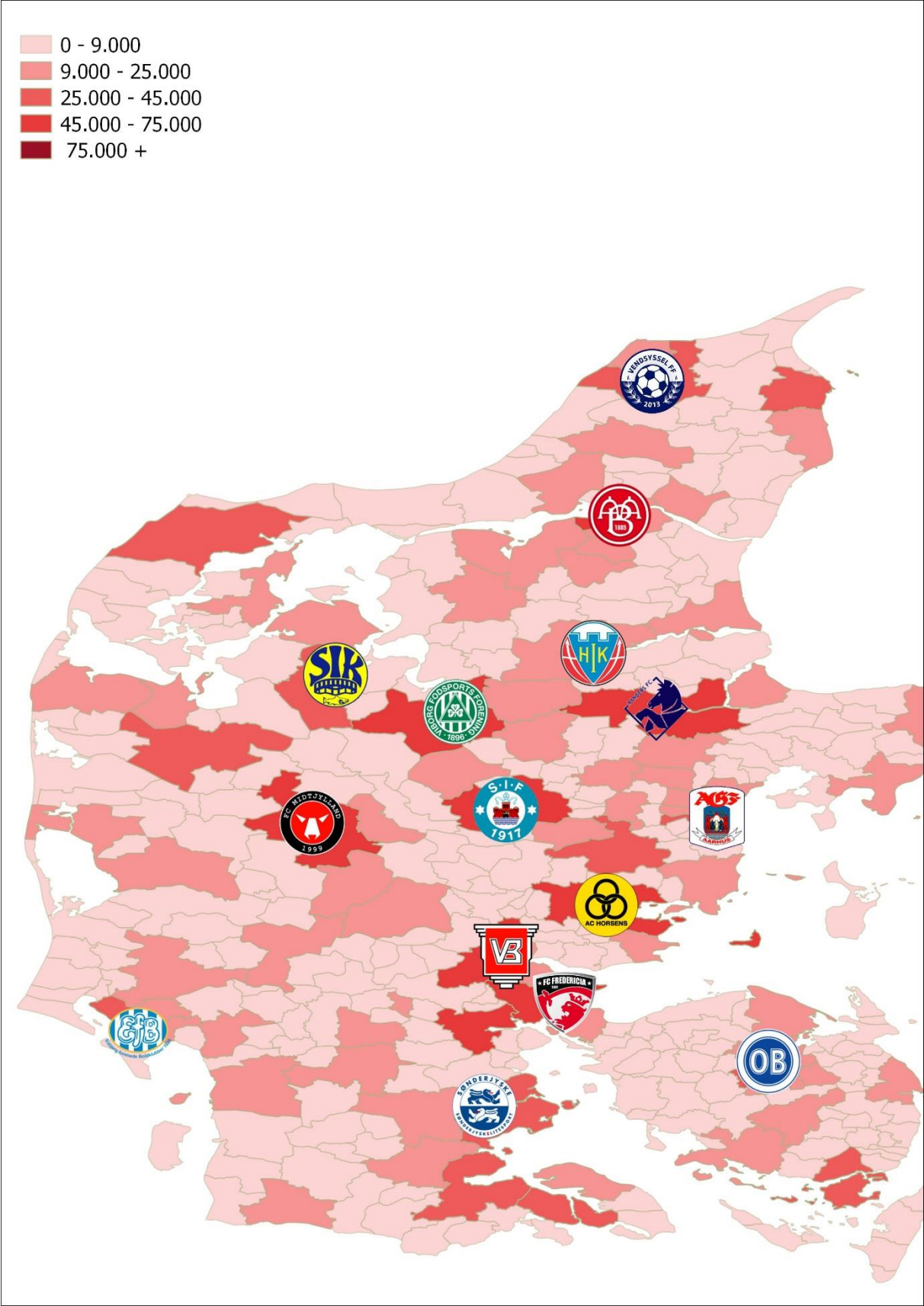*Figure 4.4.3 Attendance catchment areas of Denmark (West)*

Figure 4.4.4 Population density Denmark (West)

Considering both attendance catchment areas and population density, overall the clubs are quite evenly spread out over the country. The main rivalry over supporters is between the traditional top clubs FC København and Brøndby IF, but they do so in a densely populated area.

A number of clubs might be able to extend their attendance catchment area by significantly increasing their sporting quality. OB for instance, might be able to expand to the South, which contains some populated areas. SønderjyskE can also expand to the South, while Esbjerg FB can increase its catchment area in the East. FC Midtjylland has room to increase in the South and, in particular, the West.

Benchmarking on the basis of population, GDP, and sporting quality shows that in Denmark there is room for at most 30 professional football clubs. Denmark is in that sense comparable to counties such as Belgium, Greece, Norway and the Czech Republic. Based on population, economy, football mindedness, and competitors we have specified, in Table 4.6 Areas for professional football in Denmark in which areas these 30 clubs could best exist. Note that this table is strongly related to the attendance catchment area figures, another indication that currently the clubs are distributed properly over the country. Only in the areas Holstebro, Svenborg and Naestved none of the 24 Danish clubs on the two highest tiers resides.

Nordjylland	3
Aalborg	1
Hobro	1
Hjørring	1
Midtjylland	**8**
Aarhus	1
Randers	1
Horsens	1
Silkeborg	1
Herning	1
Viborg	1
Holstebro	1
Skive	1
Syddanmark	**7**
Odense	2
Vejle	1
Svendborg	1
Esbjerg	1
Fredericia	1
Kolding/Haderslev	1

Sjaelland	4
Roskilde	1
Køge	1
Slagelse	1
Næstved	1
Hovedsteden	**8**
København	2
Gladsaxe area	2
Brøndby area	1
Taarbaek area	1
Hillerød area	1
Helsingør	1
Total	**30**

Table 4.6 Areas for professional football in Denmark

4.5 Benchmark groups

On the basis of sporting quality and financial data (revenues and costs), all Danish clubs have been divided into benchmark groups. This is important for two reasons. First of all, trends and characteristics may differ between benchmark groups. For instance, while the development of top clubs has stalled, the clubs in the second benchmark group have actually improved in recent years. Secondly, a particular league structure is bound to have a different impact on clubs from different benchmark groups. It may be beneficial for the top teams, but much less so (or even disadvantageous) for lower-ranked teams, or the other way around. In order to make a well-informed decision, a benchmark group specific analysis is required.

The allocation of the clubs to the benchmark groups is based on five factors, based on the sporting situation of 2014/15, the financial data of 2013/2014, and the catchment area:

- Sporting strength (ECI);
- Sporting level (1 or 2);
- Total revenues;
- Total costs;
- Catchment area.

In Table 4.7 these benchmark groups are given.

Benchmark group A	Benchmark group B	Benchmark group C
FC København	SønderjyskE	AC Horsens
FC Midtjylland	Silkeborg IF	HB Køge
FC Nordsjælland	FC Vestsjælland	FC Fredericia
AaB	AGF	AB
Esbjerg fB	Viborg FF	Brønshøj BK
Brøndby IF	Lyngby BK	Vendsyssel FF
Randers	Hobro IK	Skive IK
OB	Vejle Boldklub	FC Roskilde

Table 4.7 Benchmark groups in Danish football (for season 2014/15)

4.6 Attendance

In this section we analyze the stadium attendance in Denmark. Figure 4.6.1 shows the model prediction in Denmark for the number of spectators for a given ECI (for both the Superliga and 1. Division), and for each club the combination of the average number of spectators and the average ECI in the season 2014/15 after each team playing every other team once at home. Also the averages per benchmark group are given.
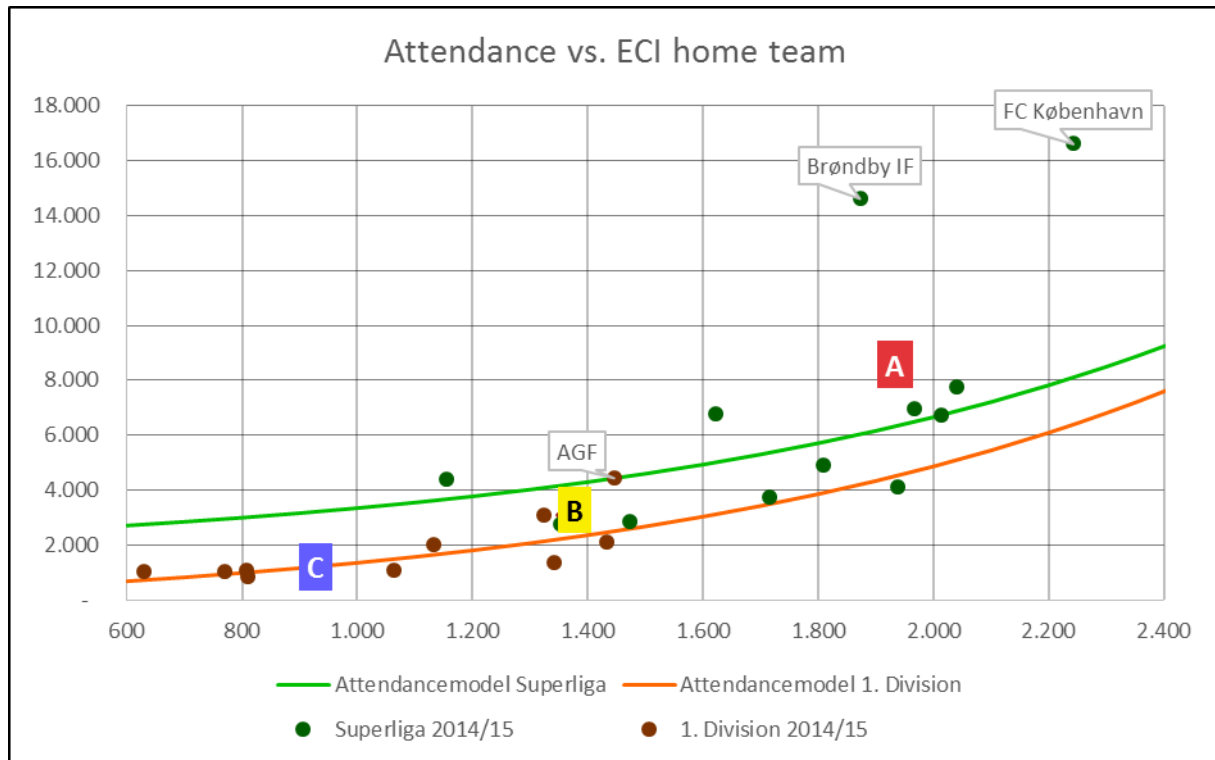
Figure 4.6.1 Attendance and ECI home team

It follows that two Superliga clubs tend to attract substantially more spectators than their ECI would predict: Brøndby IF and FC København. Also due to their history, these clubs have a large catchment area and are therefore able to draw spectators even when they underperform. A similar argument holds for 1. Division club AGF. Although they are currently on the second level their stadium attendance matches the model prediction for the Superliga.

In the Superliga sporting strength and catchment area of the home team explain 63% of the differences in match attendance, with AGF, Brøndby IF, and FC København indeed attracting additional spectators. This follows from Figure 4.6.2 in which the explanatory variables for attendance in the Superliga are given.

Figure 4.6.2 Explanatory variables for attendance in the Superliga

The model with the underlying variables denoted in Figure 4.6.2 correlates well with the actual data (R^2 = 0.78). However, both the catchment area and the ECI of the home team cannot be directly influenced (by a change of the competition format). So, given these notions, how can a team attract more spectators? It follows that the strength of the opponent (ECI away) is relevant. However,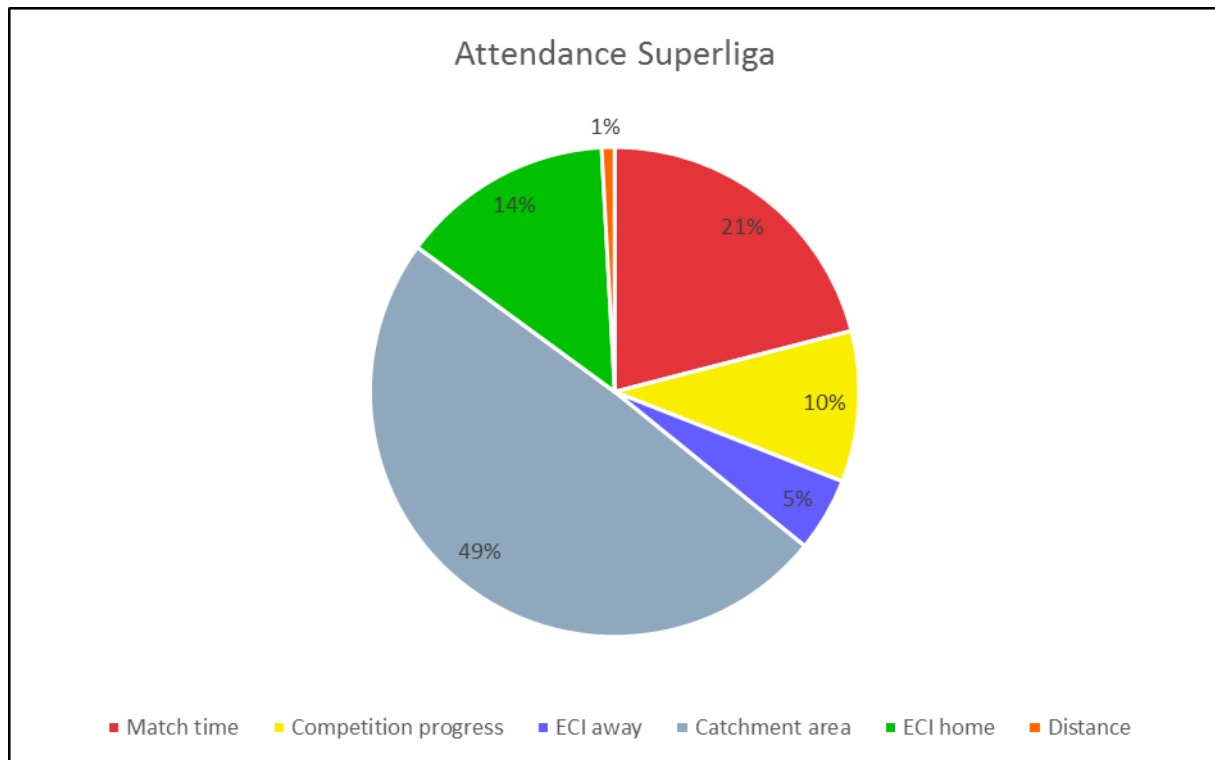 match time and competition progress are the most important factors. A match with a high impact on the probability of obtaining a critical position (1, 3 and 10) by the home team can attract up to 6.000 additional spectators when compared to an irrelevant match.

The match time analysis shows that attendance is positively affected by good weather. The sole impact of playing a match in either April or May as opposed to November or December account for approximately 2000 spectators. Analysis also shows that a Sunday attracts about 1.000 spectators more than any other day, and that stadium attendance increases with kick-off time.

The distance between the two competing teams has a small negative effect (maximum of approximately 500 supporters), which is either explained by away supporters being less likely to support their team if the travel distance increases and/or by the concept that teams from further away have less appeal to the home supporter.

In 1. Division sporting strength and catchment area of the home team explain 59% of the differences in match attendance. This follows from Figure 4.6.3 in which the explanatory variables for attendance in 1. Division are given.
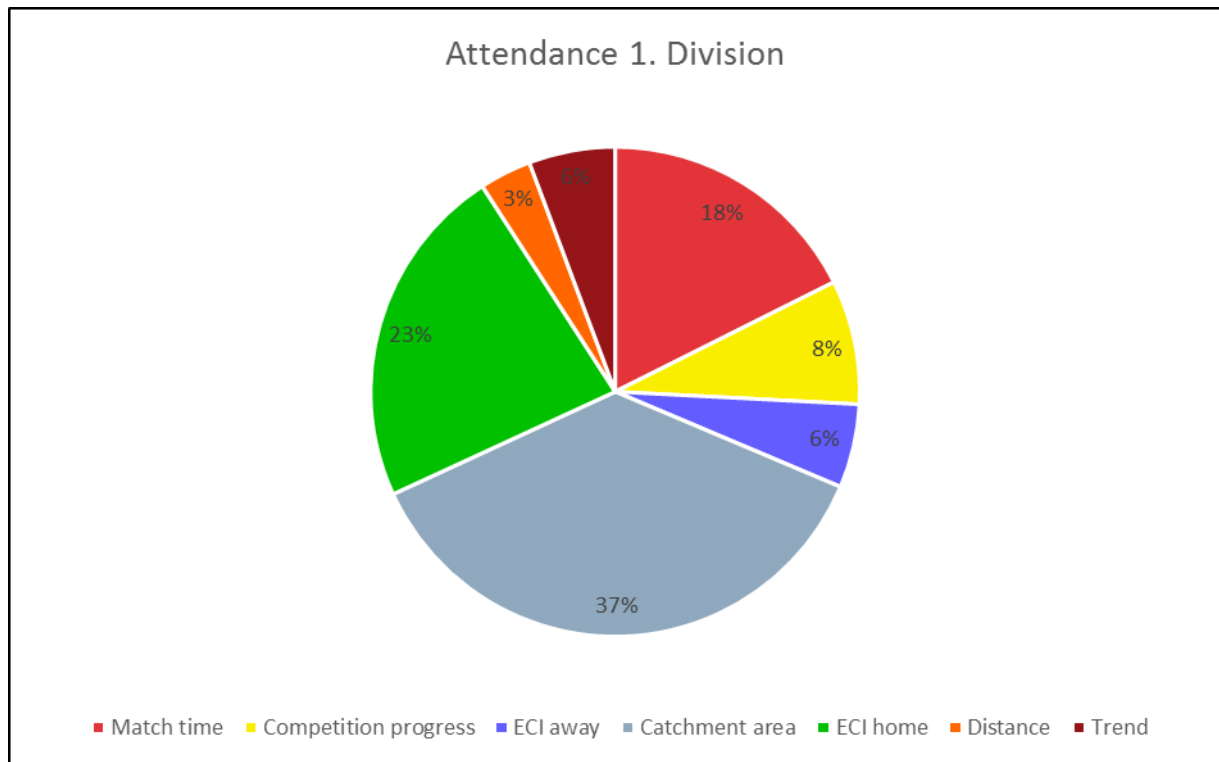
Figure 4.6.3 Explanatory variables for attendance in 1. Division

The model with the variables denoted in Figure 4.6.3 correlates well with the actual data (R^2 = 0.72). The explanatory variables for attendance in 1. Division are quite similar to those for the Superliga, but also here catchment area and ECI of the home team cannot be influenced directly. This also holds for the trend that indicates that the average match attendance has been diminishing with approximately 75 spectators per match each season between 2009/10 and 2013/14 in 1. Division.

The explanatory variables that can be affected are match time, competition progress, ECI away, and distance. Competition progress is a little less important in 1. Division than in the Superliga, but also here highly relevant matches attract up to 900 additional spectators. Furthermore, a stronger oppo-nent attracts more spectators.

The distance between the two competing teams is relatively more relevant in 1. Division than in the Superliga, but still the effect is small with a maximum of 300 spectators less for teams on opposing sides on the country. Contrary to the Superliga, in 1. Division Friday is the most popular day, with 200 additional spectators, while Wednesday and Saturday draw less spectators, 300 and 175 respectively. In March and June the attendance is positively affected by over 400 additional spectators.

4.7 TV audience

In this section we analyze the TV audience in Denmark. In Denmark the broadcasters have a major impact on the league schedule as they pick the matches in order, where each pick corresponds to a specific time slot. The last few seasons two broadcasters had the TV rights for the Superliga: Viasat holds the rights for pick 1, 3, 4, and 6, which correspond to Sunday 19.00 h, Friday 18.30 h, Saturday 17.00 h, and Monday 19.00 h, while SBS/Discovery has pick 2 and 5, which correspond to the Sunday time slots 17.00 h and 14.00 h, respectively. In 1. Division each round one match is picked by Viasat to be broadcasted on Sunday at 15.30 h. Broadcasters pick their matches at least five weeks in advance and are able to interchange between their own picks. External factors like safety and European or cup matches might limit or affect the possibilities.

Figure 4.7.1 shows the model prediction for the number of TV viewers for a given ECI (for the Superliga and 1. Division combined), and for each club the combination of the average number of TV viewers and the average ECI in the season 2014/15 after each team playing every other team once at home. Also the averages per benchmark group are given.
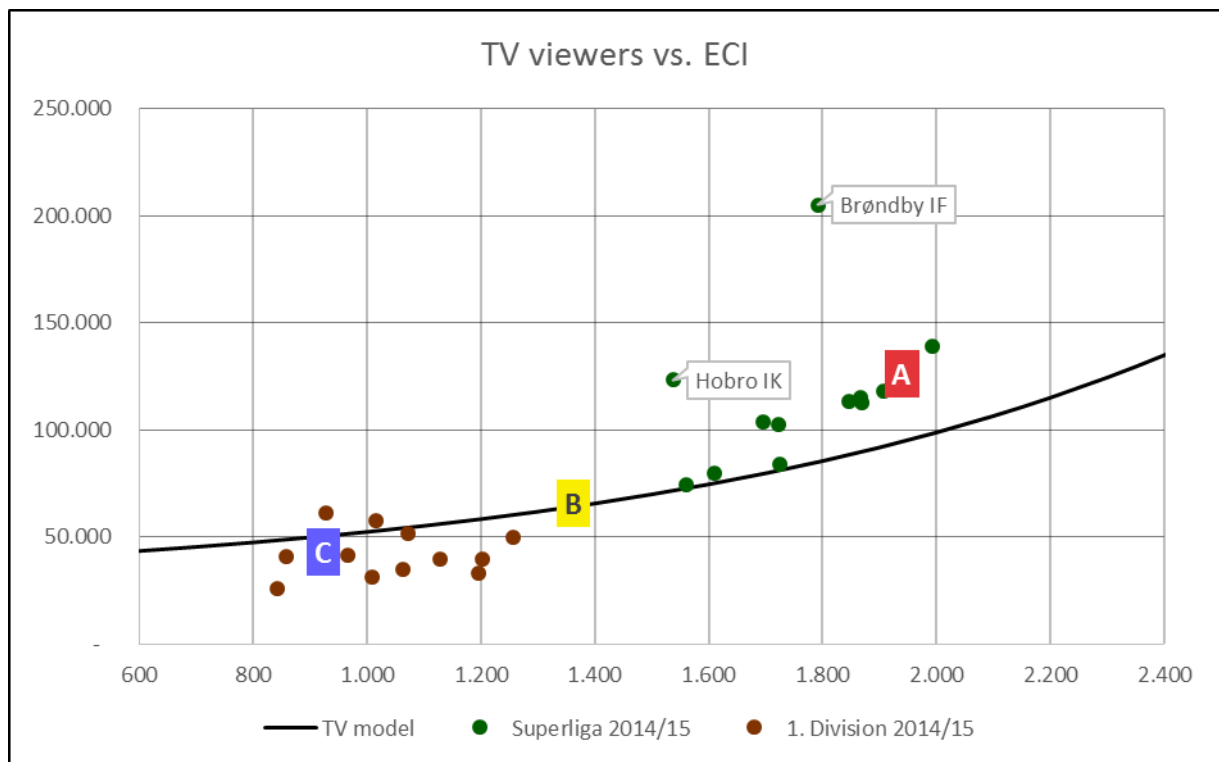
Figure 4.7.1 TV viewers and ECI

It follows that two clubs attract substantially more TV viewers than their ECI would predict: Brøndby IF and Hobro IK. Note that Brøndby IF also attracts more fans to the stadium. FC København on the other hand is not a real outlier with respect to TV audiences. The additional interest in Hobro IK could be explained by the fact that 2014/15 is the first season ever in which Hobro IK plays in the Superliga. Hence, there could be additional interest in the club. Besides, since the ECI of a club is not only determined by their recent results, it is possible that their ECI does not fully reflect their current strength.

Channel and match time explain 63% of the differences in TV viewers. This follows from Figure 4.6.2 in which the explanatory variables for TV viewers are given.

Figure 4.7.2 Explanatory variables for TV viewers (Superliga and 1. Division combined)

The model with the underlying variables denoted in Figure 4.7.2 correlates well with the actual data ($R^2 = 0.77$). Due to the fact that all matches are picked in order by the various broadcasters and then displayed in specific time slots on specific channels, the variables channel and match time incorporate implicitly also sporting quality and brand. Here brand is the additional appeal of a club that is not explained by their current sporting quality.
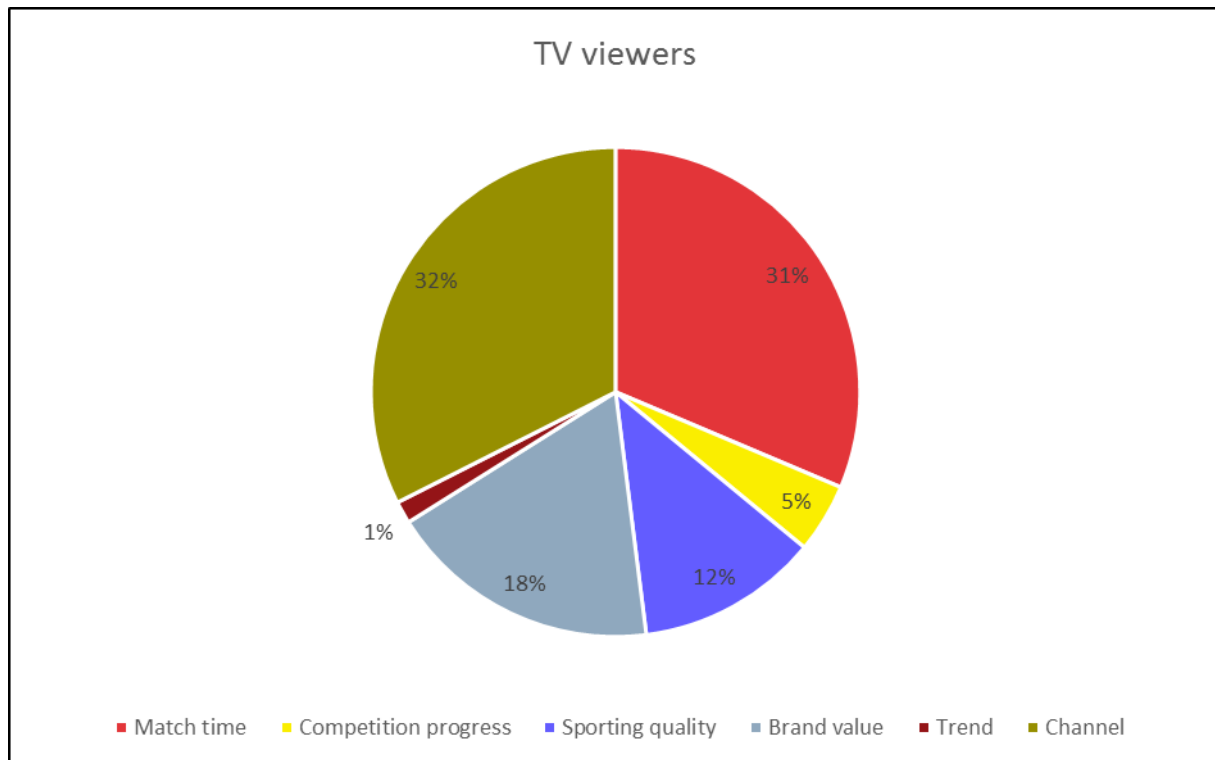
Because channel and match time incorporate these other components, it is impossible to distinguish between the effects of match time and channel on the one hand, and the effect of sporting quality, brand and competition progress on the other. Hence, the question remains to what extend more viewers watch a match between top teams on a Sunday at 19.00 h because it is an attractive match or because it is an attractive time slot on a widely available channel. However, on top of channel and match time the variables sporting quality and brand do have their own impact on the TV viewers, which implies that the number of TV viewers of a match does not only depend on its pick. Analysis shows that Brøndby IF and AGF (currently in 1. Division) attract significantly more TV viewers.

TV viewers are also sensitive to competition progress; a match with something a stake can attract up to 25.000 additional TV viewers. Analysis does, not surprisingly, also show that a comparable match attracts over 20.000 TV viewers less in July, while also August and September attract less TV viewers. For TV viewers the later timeslots are more preferable, as the audience increases with 6.000 viewers per hour.

There is a positive trend the last five seasons in the sense that each season the number of TV viewers per match increases by approximately 1.300. The fact that a match is in the Superliga as opposed to 1. Division attracts 25.000 additional TV viewers.

4.8 Revenues

The revenues of the clubs are decomposed into revenues out of gate receipts, sponsorship, broadcasting, commerce (which consists of commercial income from national competitions, merchandising and non-match day usage of facilities), and other (see Figure 4.8.1). These figures are based on the financial data in the period 2009-2013 for the Superliga clubs and for 2012-2013 for 1. Division clubs. In 1. Division commercial and UEFA revenues were not reported separately.
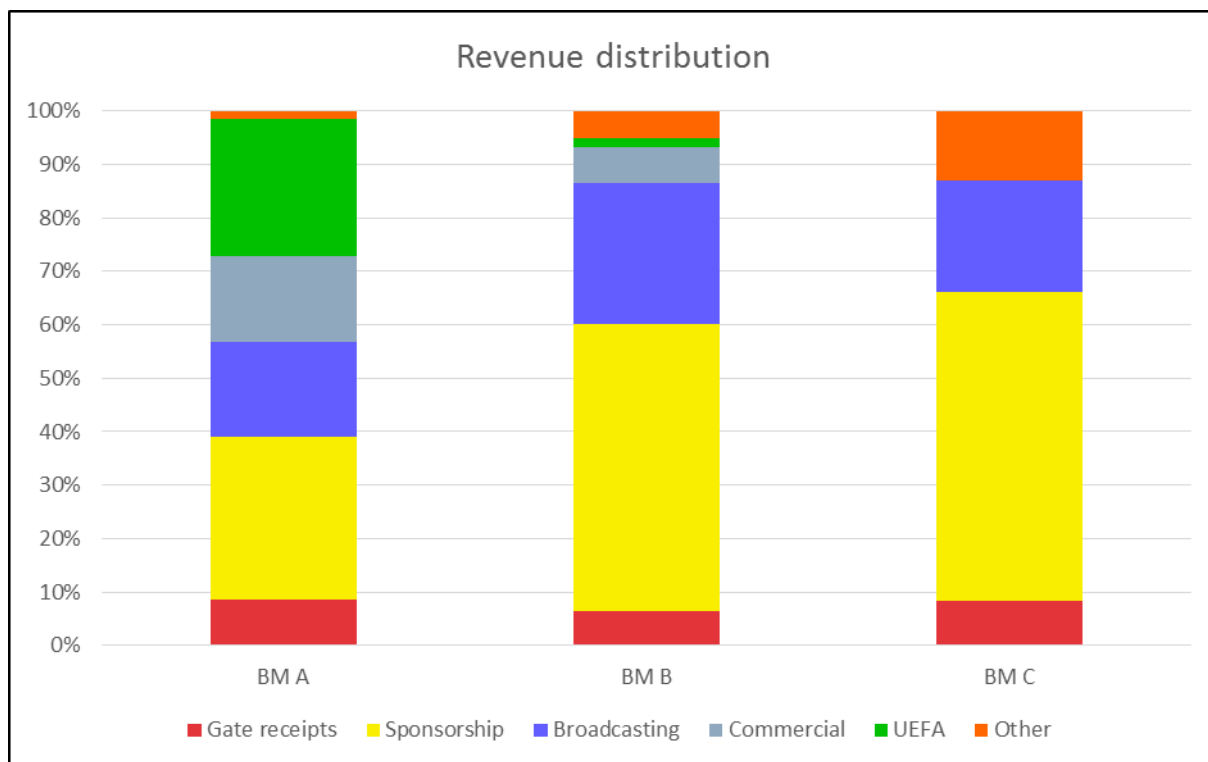

Figure 4.8.1 Revenue distribution for the benchmark groups

It follows that the revenues out of sponsorship are more relevant for lower-ranked teams, as they form 30% of the revenues of benchmark A clubs, while for a benchmark C club revenues from sponsors account for 58% of total revenues. The importance of strong performances in Europe becomes clear as even the last few seasons in which the performance of Danish clubs in Europe was poor, the European revenues formed a quarter of the total revenues for benchmark A clubs. Since a proportionally large part of broadcasting revenues are distributed from Superliga to 1. Division, the relative contribution of broadcasting for benchmark B clubs (27%) is larger than for benchmark A clubs (18%), although more benchmark B clubs have been 1. Division in the period under consideration.

The income of a football club is mainly dependent on two factors: the sporting quality and the catchment area. In fact, the catchment area alone often is a good indicator of the size of a club (on any dimension). In the end this catchment area should be exploited into quality on the pitch. From its sporting quality a club can generate more money, although the catchment area puts a limit to this.

The relationship between 'the points in' and 'the coins out' in Denmark for the Superliga clubs is shown in Figure 4.8.2. The correlation is high ($R^2 = 0.85$), which indicates that 'the points in' and 'the coins out' are strongly related, which is also visible in the figure.
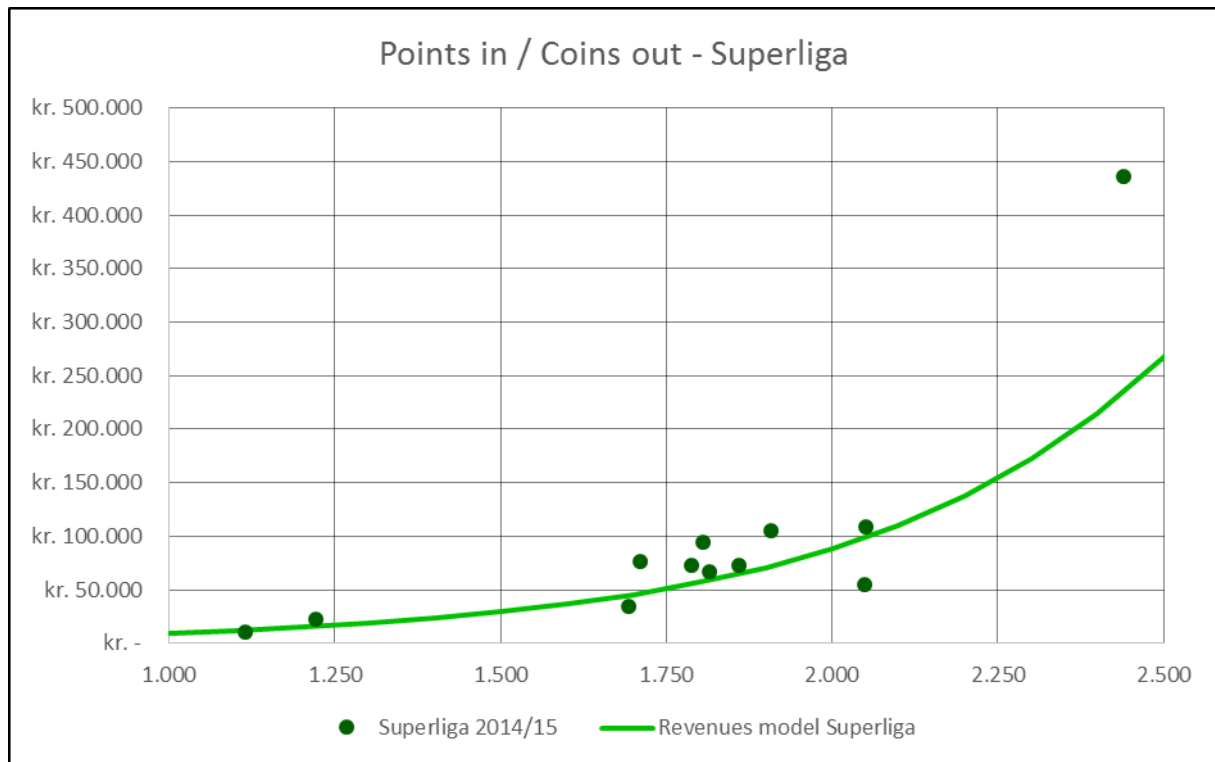
Figure 4.8.2 The relation between the ECI of a club and their revenues (x 1.000 Danish Kroner)

Using the notion of the sports economic cycle it follows that we can see Figure 4.8.2 as the way Danish clubs generate money from their ECI. It follows that one club generates significantly more money than their ECI predicts.

4.9 Costs

The cost of the clubs are decomposed into player salaries, other salaries, sales, depreciation, and other (see Figure 4.9.1). These figures are based on the financial data in the period 2009-2013 for the Super-liga clubs and for 2012-2013 for 1. Division clubs. In 1. Division the costs were only decomposed into staff costs and other costs. We have used the ratio between player salaries and other salaries in the Superliga to split staff costs into two for 1. Division. Similarly, we have split the other costs into three (sales, depreciation, and other).
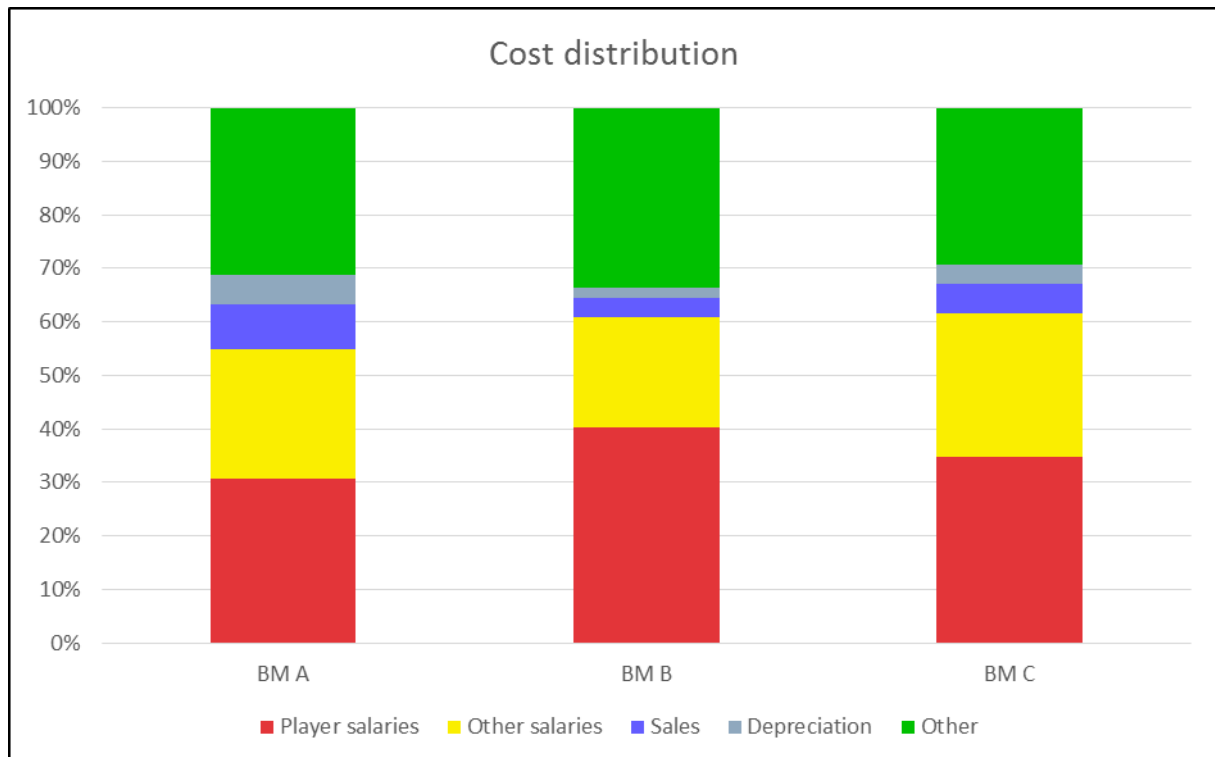
Figure 4.9.1 Cost distribution for the benchmark groups

Expenditures are of course largely dependent on income. Football clubs do not have the goal to make a profit, except for some clubs that have investors as shareholders, but cannot afford structural losses either. However, expenditures, and in particular player salaries, are in turn a critical success factor for sporting quality (see Section 4.1). Indeed, football is a highly capitalist business in the sense that if a club performs better than expected given its expenditures on player wages, then other clubs will try to lure its players into a transfer with higher salaries. Other factors, like a good trainer, a good atmosphere, or a relatively young squad might cause a club to outperform. But in the long-run the most important factor for sporting quality turns out to be player salaries.

The relationship between 'the coins in' and 'the points out' is shown in Figure 4.9.2. The correlation is high ($R^2 = 0.72$). The graph shows the ECI of a club given its total players salary.

Figure 4.9.2 The relation between the player salaries of a club (x 1.000 Danish Kroner) and their ECI

It follows that player salaries are a good measure for sporting quality as the model fits the clubs, as there is only one real outlier that underperforms given their player salaries.

4.10 Impact of improving sporting performance

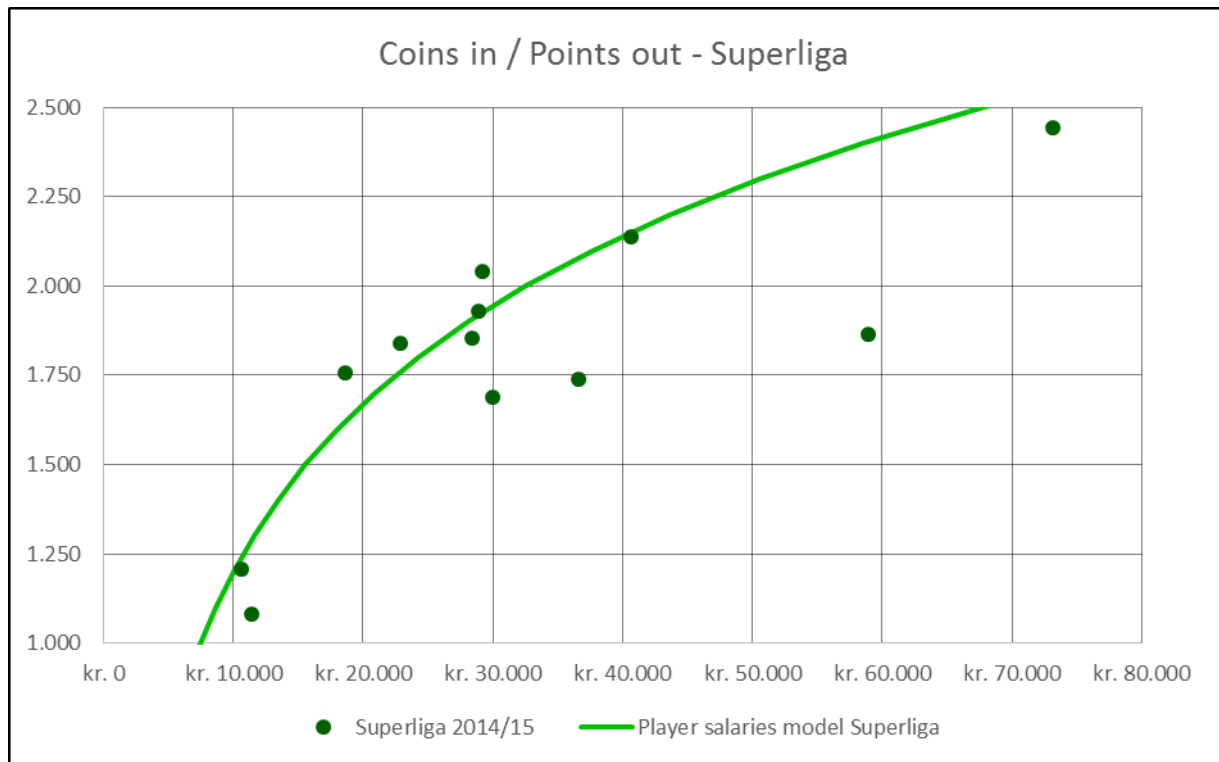As the cycle of sports economy predicts, an improvement on one aspect will lead to improvements on other dimensions, which will give yet an extra boost to the first aspect. The graphs 'points in / coins out' (Figure 4.8.2) and 'coins in / points out' (Figure 4.9.2) indicate when this self-reinforcement tampers out and a new balance is found.

In order to gain 100 points on the Euro Club Index, the players' budget needs to increase by approximately 14%. Moreover, an additional 100 ECI points results in approximately 20% revenue growth, depending on the size of the catchment area.

But a better competition format increases club revenues too, up to approximately 10% initially. And then, this provides new impetus to the cycle of the clubs' sports economy. These extra revenues will lead to an increase in sporting performance, estimated at 70 ECI points on average. Given the increased sporting performance, more revenues can be created. So this secondary effect will result in further growth in sporting quality, which will be realized more gradually, over the span of a couple of years.

The total increase in sporting strength is then about 100 ECI points, which corresponds to a rise of 5 to 8 spots on the UEFA Country Ranking. Hence, a top 15 position, which enables also the runner-up of the league to enter the UEFA Champions League qualifications, while the number 4 of the league enters the UEFA Europa League qualifications, is realistic. And even a top 12 position, which gives a direct ticket to the group stages of the UEFA Champions League and UEFA Europa League for the Superliga champion and cup winner, respectively, is possible.

5

5 Result dimensions

The data analysis presented in Chapter 4 provides the guidelines for the critical success factors of the different aspect of Danish football. The alternatives for a new competition format have to be measured using these success factors. The result dimensions and their weights are decided upon by the Danish clubs. The alternative competition formats are evaluated against these result dimensions.

An explanation of all the result dimensions can be found in the glossary in Appendix I. Table 5. 1 shows the average value from the response of the clubs

	Categories						
	Sporting	Calendar	Attendance	TV	Finance	Fairness	Total
Result dimensions	29,5%	6,8%	14,3%	12,3%	27,0%	10,0%	100,0%
Sporting Quality	39%						11,5%
Competitive Balance	31%						9,3%
Competition Progress	30%						8,8%
Players Congestion		37%					2,5%
Calendar Utilization		63%					4,3%
Match Attendance			32%				4,5%
Club Attendance			42%				6,1%
League Attendance			26%				3,7%
Match TV audience				30%			3,7%
Club TV audience				38%			4,6%
League TV audience				32%			4,0%
Match Day Revenues					20%		5,4%
TV Revenues					31%		8,4%
Commercial Revenues					34%		9,3%
European Revenues					15%		4,0%
Fairness principle						100%	10,0%
Total							100,0%

Table 5.1 The result dimensions with the average value given by the Danish clubs

The Danish clubs have given the most weight to the sporting and the financial result dimensions. The calendar result dimensions are of least importance.

6

6 The current competition format

In this chapter we discuss the current competition format for both the Superliga and 1. Division. In Section 6.1 we first describe the competition format. Then in Section 0 we discuss the strengths and weaknesses of the format. Finally, in Section 0 we consider some general notions with respect to (alternative) competition formats.

6.1 Triple round-robin with 12 teams

Currently, the competition format of both the Superliga and 1. Division is a triple round-robin with 12 teams, resulting in 33 matches for each team. In the first 22 matches each teams meets every other team once at home. The distribution of home and away matches in the last 11 matches is determined before the start of the season by chance, where the distribution of last season is taken into account.

In the Superliga the champion qualifies for the UEFA Champions League, and the runner-up and 3rd team qualify for the UEFA Europa League. The other European ticket can be obtained via the cup. If the cup winner is already amongst the top 3 of the league, then the number 4 of the league gets the final ticket. The teams on position 11 and 12 relegate to 1. Division. Figure 6.1.1 displays this competition format graphically. The number of matches in this format is 33 for each team, 198 in total.

Stage 1
33

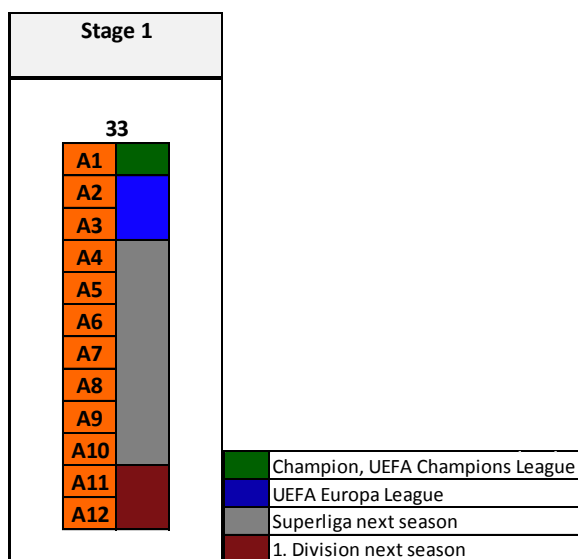|	
■	Champion, UEFA Champions League
■	UEFA Europa League
■	Superliga next season
■	1. Division next season

Figure 6.1.1 Current competition format Superliga

In 1. Division the numbers 1 and 2 promote to the Superliga. The teams on position 11 and 12 relegate to 2. Division.

6.2 Strengths and weaknesses

The current competition format has its strengths. First of all, the number of teams is well chosen. Based on the fact that the number of professional clubs in Denmark should be at most 30, a Superliga with 10 to 16 clubs makes perfect sense. Secondly, the competitive balance in the Superliga is good, in the sense that the difference in sporting quality between the clubs is not tremendous. Of course, this is also related to the first point. And finally, due to the rather straightforward setup of a round-robin tournament there is a sense of fairness as all teams play 33 matches, and the team with most points wins the championship.

There are, however, also some obvious weaknesses. Due to the fact that teams meet each other an odd number of times, the home matches versus the away matches are not balanced between teams, and half of the teams even have one more home match than the other half. In that sense the competition is certainly not unbiased.

More importantly, the straightforward setup of the competition also has the effect that there is only one stage with one apotheosis. Hence, the competition progress in this format is limited. For instance, after a regular round-robin competition one could add play-offs or divide the clubs into smaller groups, which either play for the championship, European tickets, or fight against relegation. Such a setup creates multiple 'moments of truth', as first, a club will have to qualify for a certain group, while in the second stage of the season it is actually determined which teams win the prizes. Towards the end of the season, in particular the midrange clubs have nothing play for anymore in the current format. They are (almost) certain that they will not relegate, but (almost) certain as well that they will not be the champions or win a European ticket. Consequently, there are a quite a number of dead matches.

Finally, since promotion and relegation are direct, and not after playoffs in which the stronger teams from 1. Division compete with the weaker teams from the Superliga, the 12 teams in the Superliga are not necessarily the 12 strongest teams in the country. Hence, competitive balance could be improved by introducing such promotion/relegation playoffs.

6.3 Guiding principles for alternatives

The qualitative evaluation of the current format already indicates that there is room for improvement. Hence, for both the Superliga and 1. Division we advise to implement an alternative competition format. And the qualitative evaluation already gives some direction for these alternatives. We sum up some constraints and guidelines for designing a viable alternative.

- Number of teams
  A smaller league in general implies that the teams are closer in terms of sporting quality. This improves competitive balance, which implies that competition progress will be better as well: the lower-ranked teams have a fair chance to beat the top teams and so might improve their rank. The number of teams can, however, also be diminished in a second stage in which sub-groups compete with each other.
- Number of stages
  The current format comprises of only one stage, which is good for fairness. However, the introduction of more stages is likely to improve both competition progress and competitive balance.
- Setup
  Each stage has in general either a round-robin setup or a knock-out setup. In a round-robin setup all teams meet every other team. The number of times they meet can differ. Currently, the Danish teams meet each other three times. Most common is the 'double' round-robin, where every team meets every other team home and away. However, also a single or even quadruple round-robin is possible. In general an odd number has the disadvantage that teams either meet an opponent home or away one time more often. In a knock-out setup each team meets one other team in each round. Over a number of matches (often one or two) it is determined which team wins and moves on to the next stage. In general the impact of each single match is higher in a knock-out setup than in a round-robin setup.

7

7 Alternative competition formats

A great number of alternative competition formats have been under consideration. Based on the input from the clubs in the Superliga and 1. Division four formats (next to the current format and a variant of that format) have made the current selection, and are quantitatively analyzed in great detail. In this chapter we discuss these five formats, of which three have two variants. In Section 0 we describe these formats. The common elements of these models are 12 or 14 teams, even groups in all stages, a full carry-over of all the points obtained to a next stage, and a top group (in a second stage) of at least six. We briefly mention the arguments in favor of formats with such an outline. Note that all the alternatives that have been omitted beforehand can be found in Appendix II, along with a more extensive underlying argumentation for their dismissal.

Based on the input from the stakeholders the minimum number of teams in the league was set on 10, while the maximum number was set on 16. However, with only 10 clubs in the Superliga large areas of Denmark are without Superliga football, while a problem with formats of 16 teams is that a double round-robin already consists of 30 matches, which makes the possibilities for a second stage limited.

A competition itself, or a group in a second stage can consist of either an even or odd number of teams. All formats with an odd number of teams in any stage are omitted as odd groups have major disadvantages with respect to clarity of the league, competition planning, and fairness.

Most formats under consideration have a second stage in which groups play in a round-robin format. In that case the question is to what extend the points obtained in the first stage are carried over. The most important reason in general to reduce points is to make sure that in this second stage the competition progress is still good. However, due to a limited number of matches in the first stage and a small difference in playing strength, in Denmark this is not necessary, and it is even undesirable as it significantly diminishes the importance of the matches in the first stage.

A second stage with a top group of 6 or 8 ensures that a fair amount of matches is played in this second stage. This has the positive side effect on the competition progress of this second stage. Moreover, this number of teams is a good fit with respect to the number of prizes (one champion and ticket for the UEFA Champions League Qualifications, and two (due to the cup possibly three) tickets for the UEFA Europa League Qualifications) that can be obtained via the league.

In Sections 7.2 and 0 all the formats are evaluated for the Superliga and 1. Division, respectively. This is done by simulating a competition 100 times in five consecutive seasons, and then computing their scores on all the result dimensions (see Chapter 5). All computations are based on the econometric models derived from the analysis of the critical success factors of Danish football, as described in Chapter 4. Note moreover, that these simulations of both leagues have been done separately, keeping the other league constant in the current state.

7.1 Alternative formats

In this section we describe the five alternatives: Mars, Uranus, Jupiter, Saturn, and Venus, where all except Uranus and Jupiter have two variants. All these alternatives are under consideration for the Superliga, for 1. Division Uranus and the Venus formats are not taken into account. We point out that minor details of a format, e.g., the number of matches in a final playoff stage, the exact promotion/relegation setup, or how to determine the home/away-schedule for an odd number of matches, is to be determined after a particular league structure is chosen. The formats are simulated with the implementation as given in this section. Note that such refinements of a competition format have an insignificant impact on the results.

If a format with 14 teams is chosen, there is a need for a transition season in which the number of teams is expanded.

7.1.1 Format with 12 teams

The current format has 12 teams. This format is called Earth. A variant of this format is Earth + in which one direct relegation spot is replaced by two relegation playoff spots. In these playoffs the numbers 10 and 11 of the Superliga play playoffs of two matches against the numbers 3 and 2 of 1. Division, respectively, to determine which teams play in the Superliga and which teams play in 1. Division in the upcoming season. Earth + has a total of 202 matches, 33.7 matches on average for each team.

Another format with 12 teams is Mars. Mars has two variants, which are called Mars 2 and Mars 3. In Figure 7.1.1 this format is graphically displayed. Note that the legend is based on the Superliga, where 1D represents teams from 1. Division. For 1. Division, however, this legend has a direct translation: the champion, UEFA Champions League corresponds to promotion to the Superliga; the UEFA Europa League corresponds to promotion/relegation matches to the Superliga; Superliga next season corresponds to 1. Division next season; and 1. Division next season corresponds to 2. Division next season.
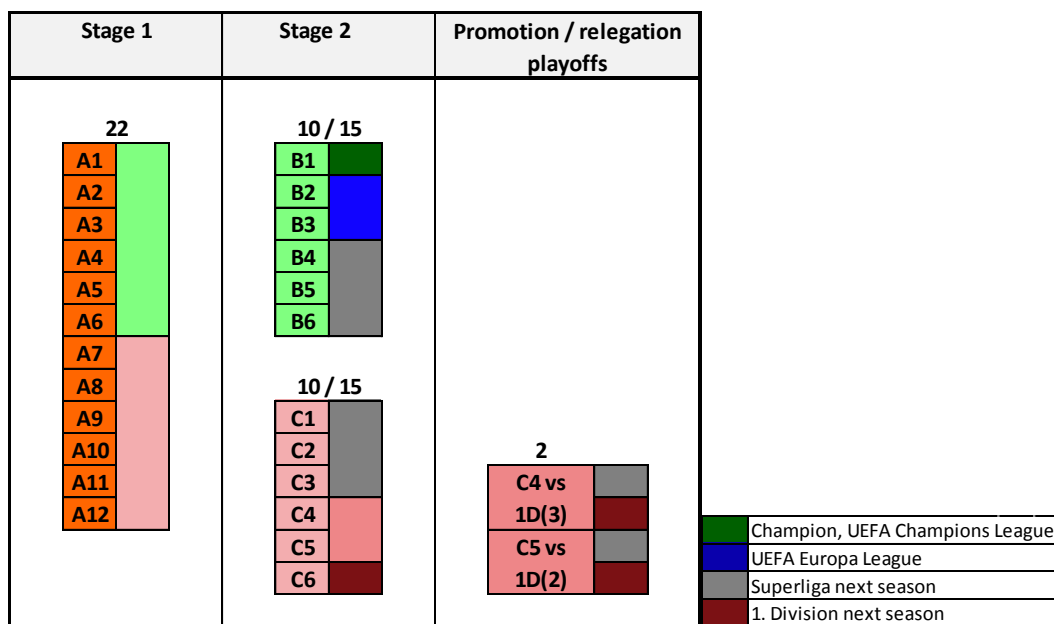

Figure 7.1.1 Competition format Mars 2 and Mars 3

In this format 12 teams play each other two times in the first stage. All the points obtained in the first stage are carried over to the second stage. Then in the Mars 2 variant both the top 6 and the bottom 6 play each other two more times in this second stage. In the Mars 3 variant both the top 6 and the bottom 6 play each other three more times.

The winner of the top group becomes champion and earns a ticket for the UEFA Champions League Qualifications. The numbers 2 and 3 of the top group start in the UEFA Europa League Qualifications. The number 6 of the bottom group relegates to 1. Division, and in turn the number 1 of 1. Division promotes to the Superliga. Furthermore, the numbers 4 and 5 of the bottom group play playoffs of two matches against the numbers 3 and 2 of 1. Division, respectively, to determine which teams play in the Superliga and which teams play in 1. Division in the upcoming season[8].

The total number of matches in Mars 2 is 192, each team plays 32 matches. In Mars 3 the total number of matches is 222, as each team plays 37 matches.

During the discussions on June 3 and June 10 an alternative solution was introduced, called Mars 2+. This format is the same as Mars 2, but has after the 32 matches for each club a knock-out play-off (between numbers 3, 4 and 5 of the top group and number 1 of the bottom group) for the final European ticket. In Figure 7.1. this format is graphically displayed.
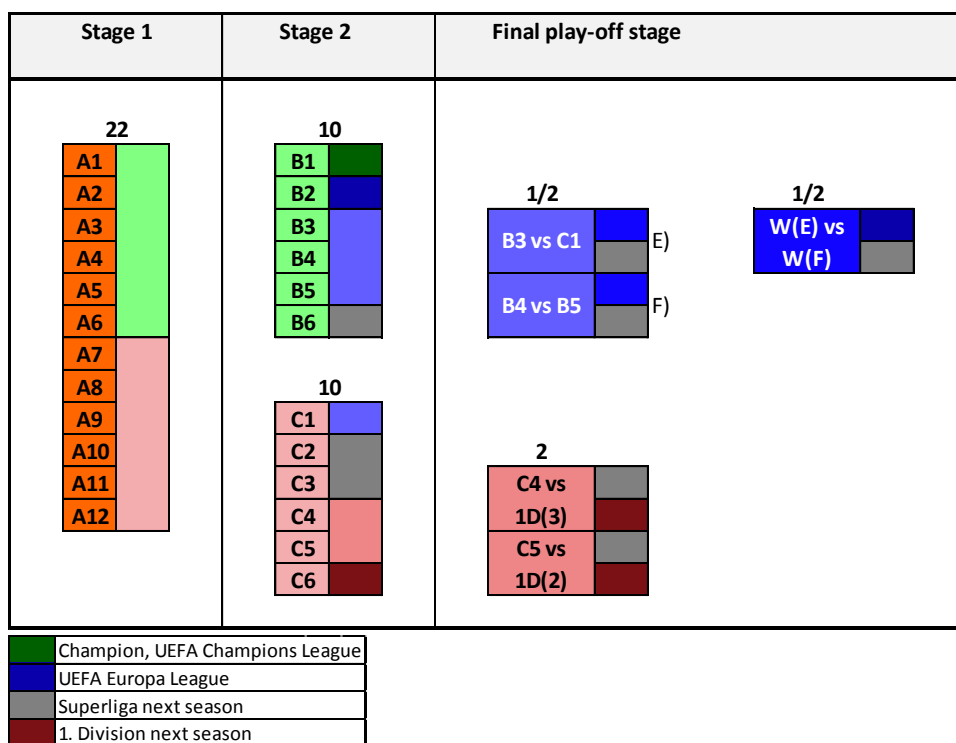

Figure 7.1.2 Competition format Mars 2+

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[8] Note that the exact implementation of the setup for promotion/relegation is typically a point for fine tuning, during which there could be decided, e.g., that there should be two direct relegation spots in the bottom group. Analysis showed that having 1 direct and 1 indirect promotion/relegation leads to 1,45 promotion/relegations on average, 1 direct and 2 indirect leads to 1,8 promotion/relegations on average.

The final format with 12 teams is called Uranus. In this format 12 teams play each other two times in the first stage. All the points obtained in the first stage are carried over to the second stage. Then the table is divided into two groups, a top group of 8 and a bottom group of 4. The top 8 each other two more times in this second stage., whilst the bottom 4 play each other four more times.

The winner of the top group becomes champion and earns a ticket for the UEFA Champions League Qualifications. The numbers 2 and 3 of the top group start in the UEFA Europa League Qualifications. The number 4 of the bottom group relegates to 1. Division, and in turn the number 1 of 1. Division promotes to the Superliga. Furthermore, the numbers 2 and 3 of the bottom group play playoffs of two matches against the numbers 3 and 2 of 1. Division, respectively, to determine which teams play in the Superliga and which teams play in 1. Division in the upcoming season.

The total number of matches in Uranus is 212, each team in the top group play 36 matches and in the bottom group 34. In Figure 7.1.3 this format is graphically displayed.
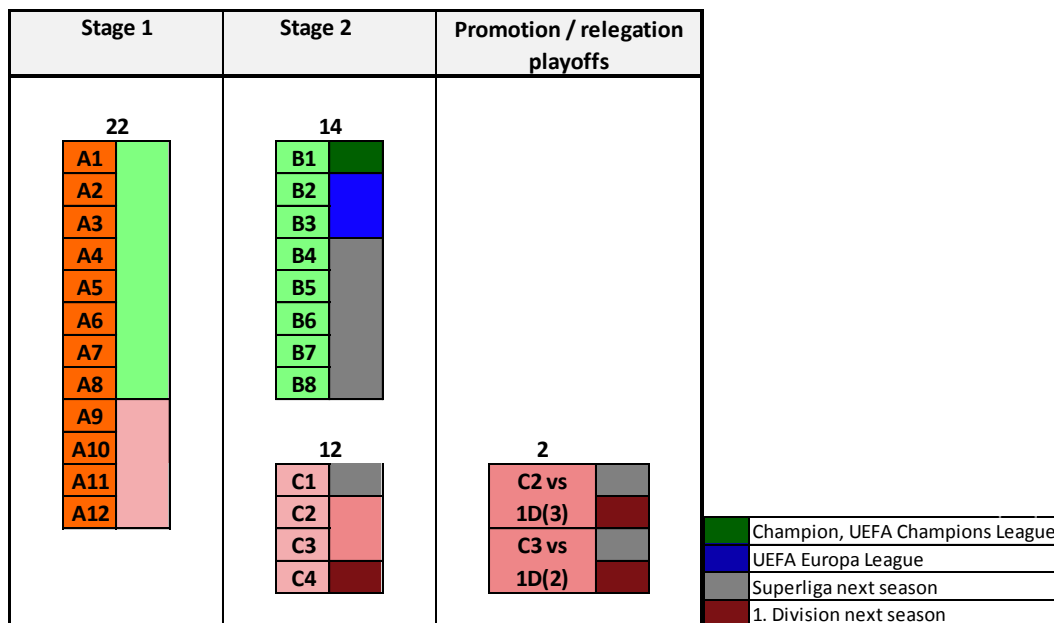

Figure 7.1.3 Competition format Uranus

7.1.2 Formats with 14 teams

Three formats with 14 teams are take into account: Saturn, Jupiter, and Venus.

The competition format Saturn has two variants: Saturn 1 and Saturn 2. In Figure 7.1.4**Fout! Verwijzingsbron niet gevonden.** the competition format Saturn is graphically displayed.
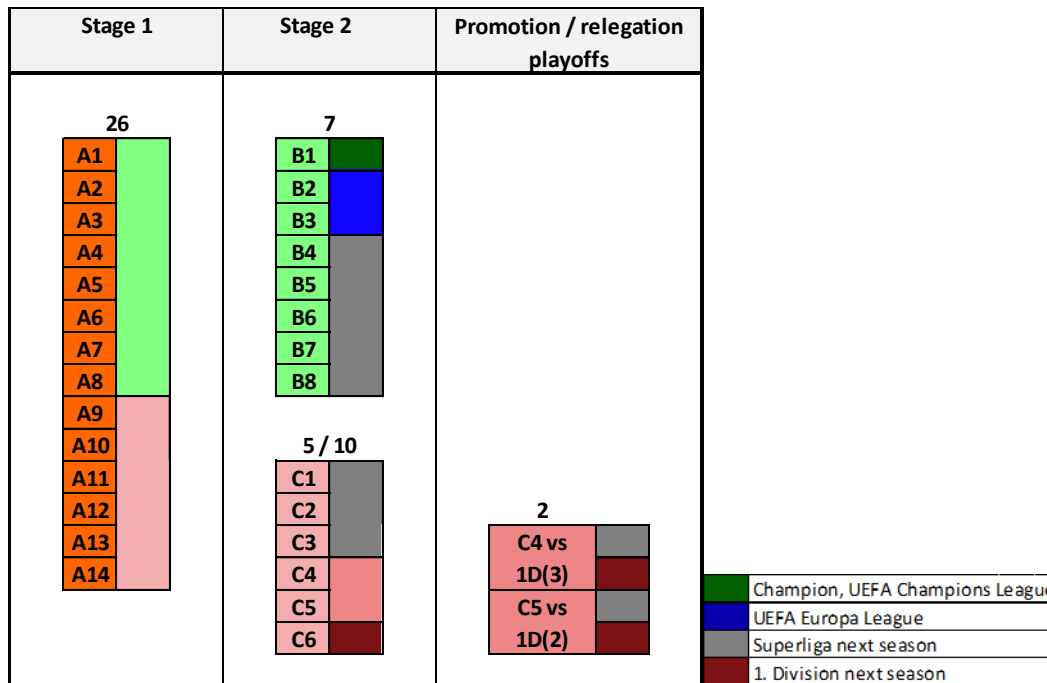

Figure 7.1.4 Competition formats Saturn 1 and Saturn 2

In this format 14 teams play each other two times in the first stage. All the points obtained in the first stage are carried over to the second stage. In this second stage the top 8 play each other one more time. The winner of the top group becomes champion and earns a ticket for the UEFA Champions League Qualifications. The numbers 2 and 3 of the top group start in the UEFA Europa League Qualifications.

In Saturn 1 the bottom 6 play each other once in the second stage, while in Saturn 2 they play each other twice. The number 6 of the bottom group relegates to 1. Division, and in turn the number 1 of 1. Division promotes to the Superliga. Furthermore, the numbers 4 and 5 of the bottom group play playoffs of two matches against the numbers 3 and 2 of 1. Division, respectively, to determine which teams play in the Superliga and which teams play in 1. Division in the upcoming season.

The total number of matches in Saturn 1 is 225, an average of 32.1 matches per team. In Saturn 2 the total number of matches is 240, which gives an average of 34.3 matches per team.

In Figure 7.1.5 competition format Jupiter is graphically displayed. In this format 14 teams play each other two times in the first stage. All the points obtained in the first stage are carried over to the second stage. In this second stage the top 6 play each other two times. The winner of the top group becomes champion and earns a ticket for the UEFA Champions League Qualifications. The numbers 2 and 3 of the top group start in the UEFA Europa League Qualifications.
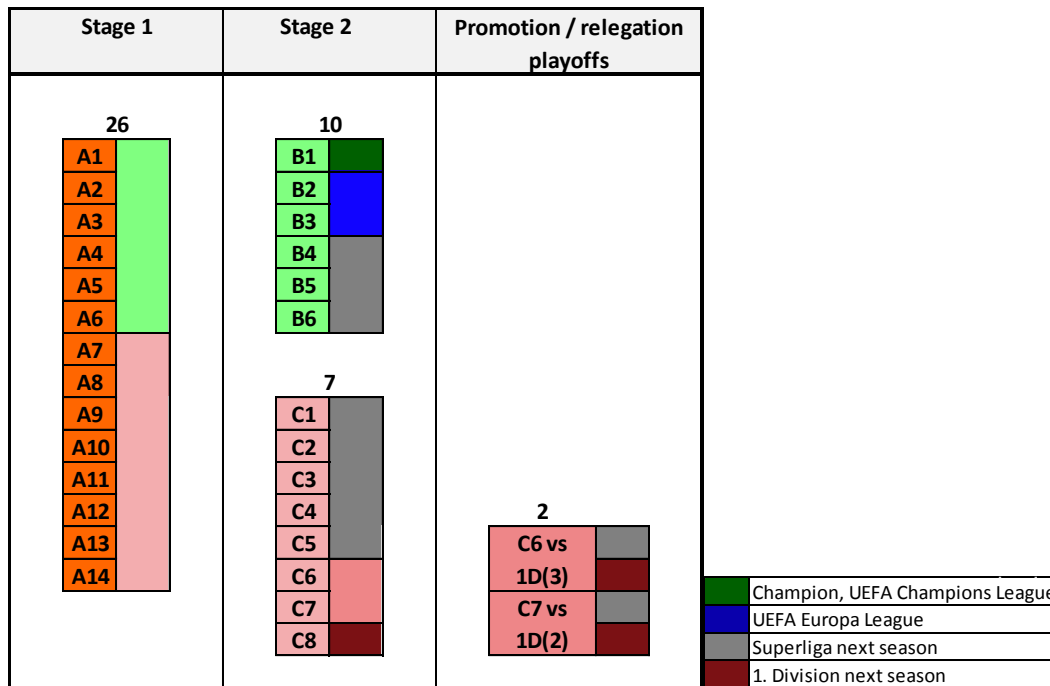
Figure 7.1.5 Competition format Jupiter

The bottom 8 play each other once in the second stage. The number 8 of the bottom group relegates to 1. Division, and in turn the number 1 of 1. Division promotes to the Superliga. Furthermore, the numbers 6 and 7 of the bottom group play playoffs of two matches against the numbers 3 and 2 of 1. Division, respectively, to determine which teams play in the Superliga and which teams play in 1. Division in the upcoming season.

The total number of matches in Jupiter is 240, an average of 34.4 matches per team.

The competition format Venus has two variants: Venus A and Venus B. In Figure 7.1.6 the variant Venus A is graphically displayed, in Figure 7.1.7 variant Venus B.

In this format 14 teams play each other two times in the first stage. All the points obtained in the first stage are carried over to the second stage. In both variants the top 6 play each other two more times in the second stage. The winner of the top group becomes champion and earns a ticket for the UEFA Champions League Qualifications. The number 2 of the top group starts in the UEFA Europa League Qualifications, while the number 3 of the top group plays a playoff of one home match against the winner of the bottom 8 of the first stage for the final UEFA Europa League Qualifications ticket.

The difference between the two variants is with respect to the bottom 8 of the first stage. In Venus A there is a middle group of 4 and a bottom group of 4 that play each other two more times. The winner of the middle group plays a playoff match against the number 3 of the top group. The number 4 of the bottom group relegates to 1. Division, and in turn the number 1 of 1. Division promotes to the Superliga. Furthermore, the numbers 2 and 3 of the bottom group play playoffs of two matches against the numbers 3 and 2 of 1. Division, respectively, to determine which teams play in the Superliga and which teams play in 1. Division in the upcoming season.

In Venus B the bottom 8 of the first stage are split into two equivalent groups of 4. In each group the teams play each other two times. The numbers 1 and 2 of each group determine via a knock-out tree

which team has the right to play the playoff against the number 3 of the top group. The numbers 3 and 4 of each group determine via a knock-out tree which team plays in the Superliga next year, which team relegates directly, and which teams play play-offs of two matches against the numbers 3 and 2 of 1. Division, respectively, to determine which teams play in the Superliga and which teams play in 1. Division in the upcoming season.

The total number of matches in Venus A is 241, an average of 34.4 matches per team. In Venus B the total number of matches is 249, which gives an average of 35.6 matches per team.
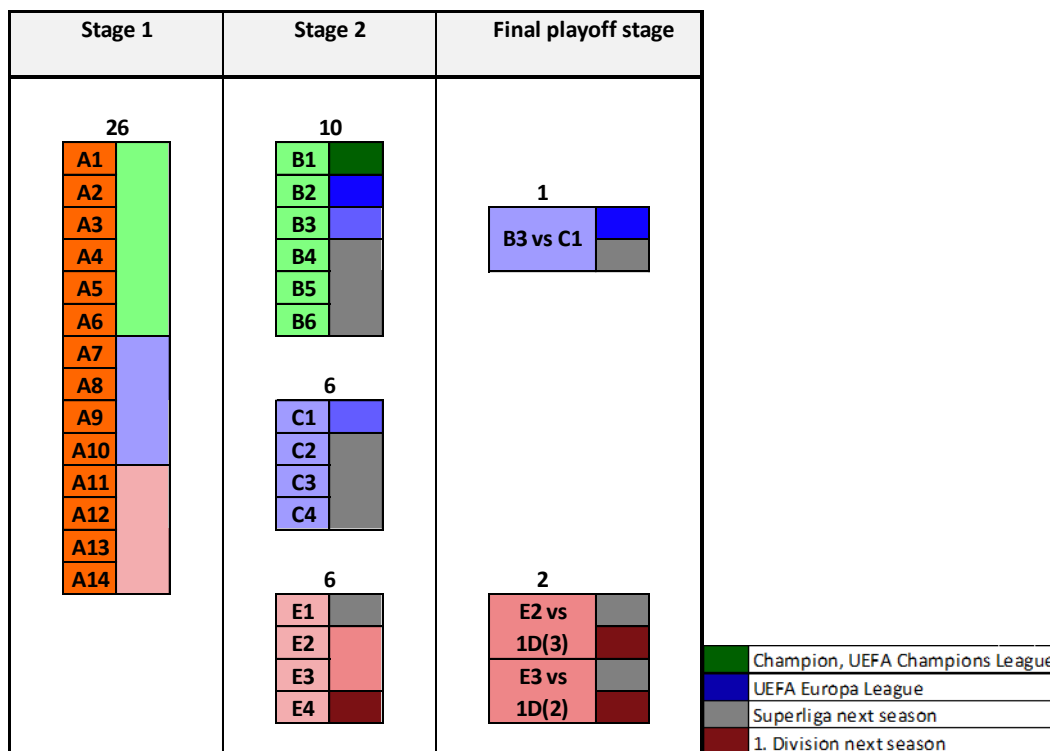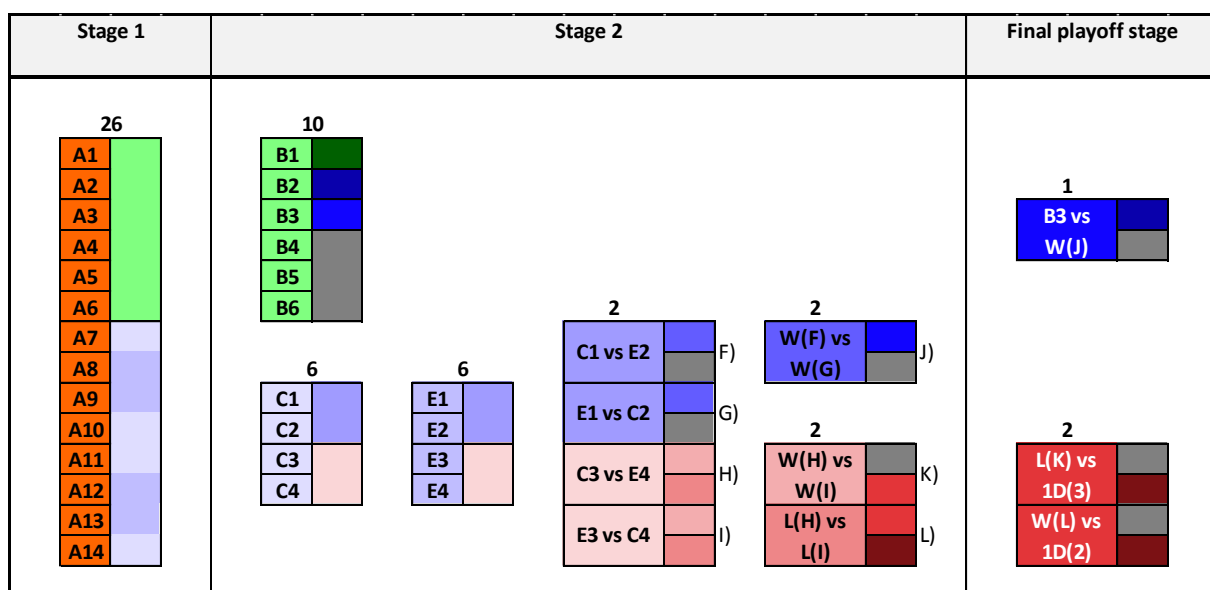

Figure 7.1.6 Competition format Venus A

Figure 7.1.7 Competition format Venus B

7.2 Results Superliga

In this section all formats in all variants are compared to each other on the different result dimensions for the Superliga. All results are with a time horizon of five seasons with respect to the valuation of the continuation of current format, which means that the current format is on 100% for each result dimension. Note that for all simulations the format of 1. Division is assumed to be constant to the current league structure.

In the following paragraphs the outcomes for each of the result dimensions are explained. The weighting of the results is based on the input of the individual clubs (Chapter 5). The results are measured for the clubs in Benchmark groups A and B, which are 16 clubs in total. On the basis that only half of the benchmark B clubs are currently in the Superliga, the total score is calculated by weighting the scores of the benchmark groups with respective weights of 2 and 1.

7.2.1 Sporting

The sporting result dimension consists of three components:

- Sporting quality;
- Competitive balance;
- Competition progress.

In Figure 7.3.1 these three components are displayed for the formats under consideration.
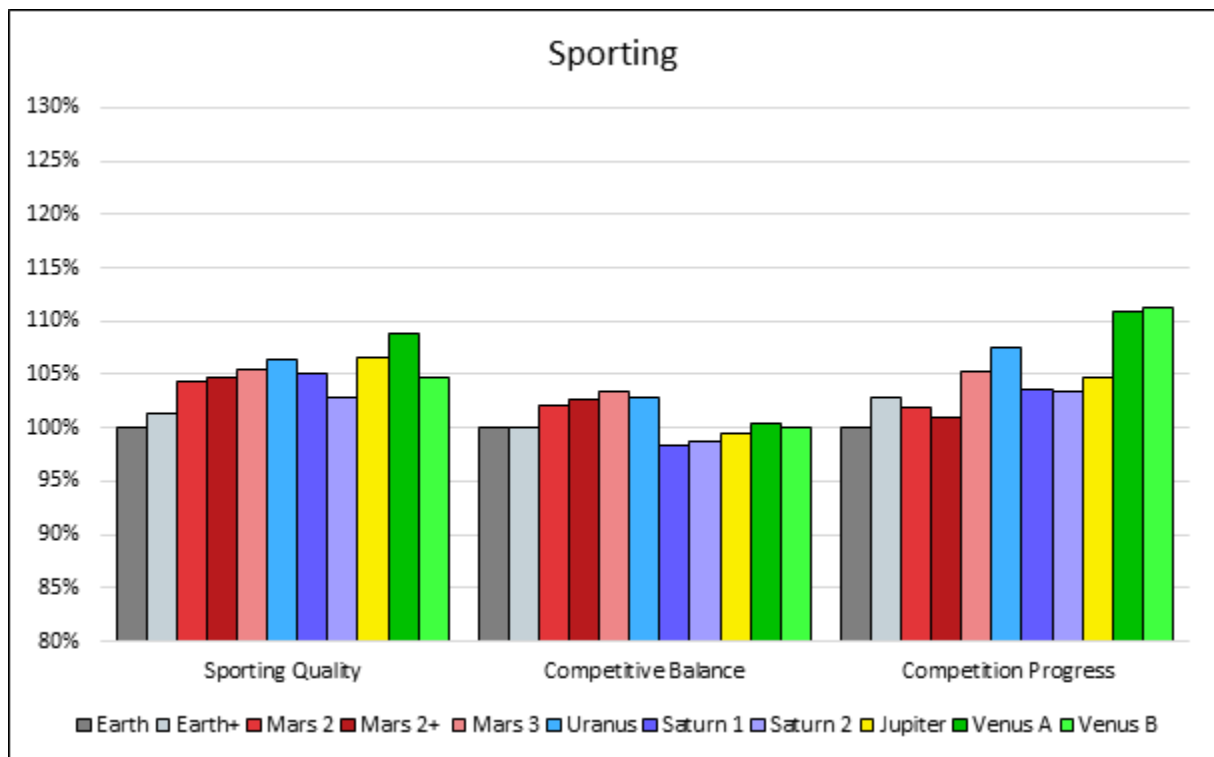

Figure 7.2.1 The sporting result dimension components

The sporting quality of the clubs in the Superliga increases for all alternatives. There are two main drivers for this increment. First of all, the additional revenues that the several formats incur can be invested in the sporting quality. Secondly, since the top clubs meet each other (on average) more often

in all these formats they are able to increase their sporting quality in these matches. In Appendix V an overview is given that shows which teams meet each other in each format. Moreover, for the 14 formats it holds that the sporting quality of the benchmark B clubs increases as two more enter the Superliga. In these formats the sporting quality of the opponents for the benchmark A clubs decreases somewhat, but since the probability of relegation to the 1. Division is also severely decreased, these expansion is also in their favor.

The competitive balance measures the difference in quality for teams in a match. The expansion of the league to 14 teams in itself obviously has a negative effect on this component. However, the introduction of a second stage, resulting in the fact that teams of similar quality meet each other more often, has a positive effect on this component. It turns out that for the 14 formats these two factors cancel each other out. The 12 format Mars therefore, performs best on competitive balance.

With respect to competition progress all alternative are a significant improvement to the current format. A somewhat hidden effect that has a positive impact on competition progress of these alternatives is best illustrated by comparing the situation for the numbers 1 and 2 in the league after 22 matches, in both Mars 2 and Earth. In Earth the numbers 1 and 2 of the league meet each one more time after that, and many of the other matches are against relatively weaker opponents, which makes the probability of losing points for both teams small. In Mars 2 the numbers 1 and 2 meet each other two more times, and moreover, the other eight matches are against strong teams, which makes the probability of losing points higher for both teams. Hence, due to the increase in variability, the chances for the number 2 to overtake the number 1 are much better in Mars 2 than in Earth, which has a positive impact on competition progress. The Venus formats score the best on this component. The main difference with respect to the Jupiter format is the additional tension in the second stage of the bottom group.
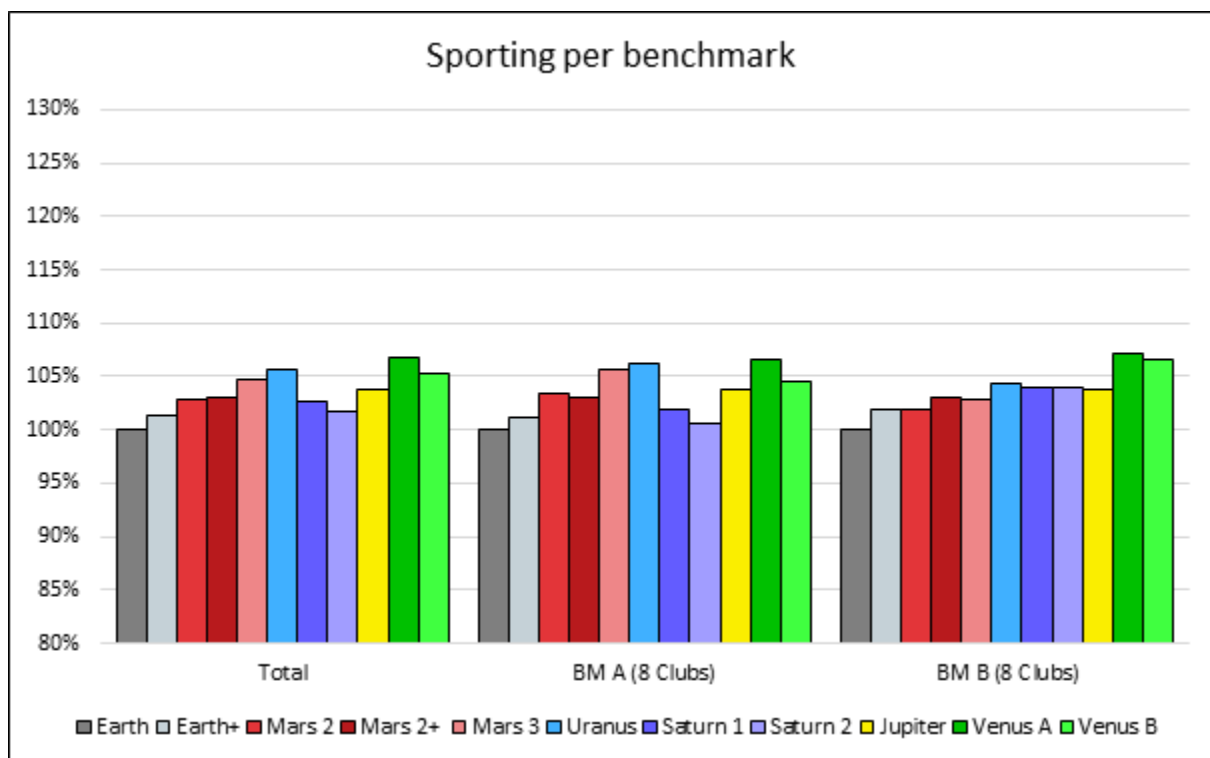

Figure 7.2.2 The sporting result dimension for the benchmark groups

In Figure 7.2.2 the sporting result dimension components are given for benchmark A and B. For benchmark A the Venus formats and Mars 3 perform best on the sporting result dimension, while for benchmark B the setup in the bottom group in the Venus formats makes that are the sole winner. The overall top 3 is formed by Venus A, Venus B, and Uranus.

7.2.2 Calendar

The calendar result dimension consists of two components:

- Players congestion;
- Calendar utilization.

Both concepts are measured as the difference between the number of matches per club in a format and the ideal number of matches per club with respect to a component, which is 30 and 36, respectively. In Figure 7.2.3 these two components are displayed for the formats under consideration.
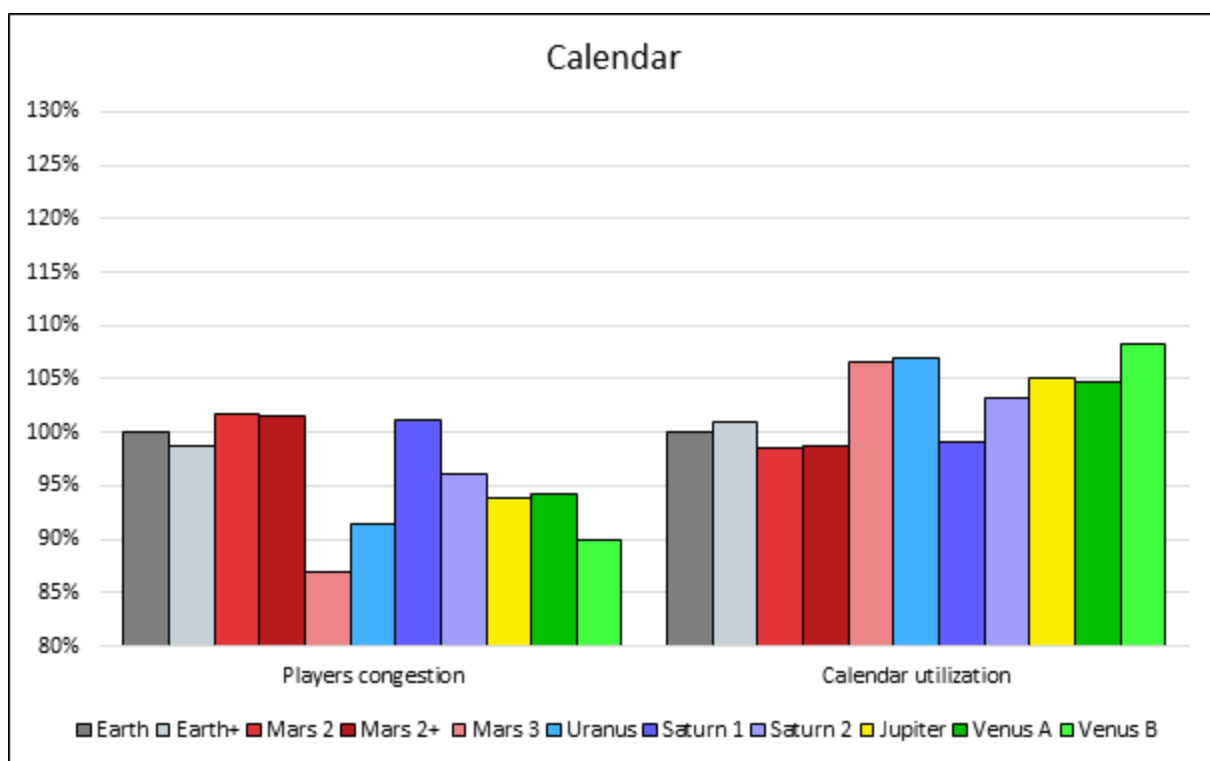

Figure 7.2.3 The calendar result dimension components

Since the number of matches in Mars 3 is 37, this format does perform poorly on players congestion. Also in Saturn 2, Jupiter, and both Venus variants the average number of matches per team increases with respect to the current format. Consequently, these formats also score under 100% for player congestion. Not surprisingly, the (almost) reversed image is shown when comparing the formats with respect to calendar utilization. There Mars 2 and Saturn 1 are worse than the current format as the average number of matches decreases to (about) 32 for these formats.

Overall, the impact, displayed in Figure 7.2.4, on the calendar result dimension is very limited for both benchmark groups, and hence, also for the weighted average of the two. Venus B is, however, the winner by a small margin.
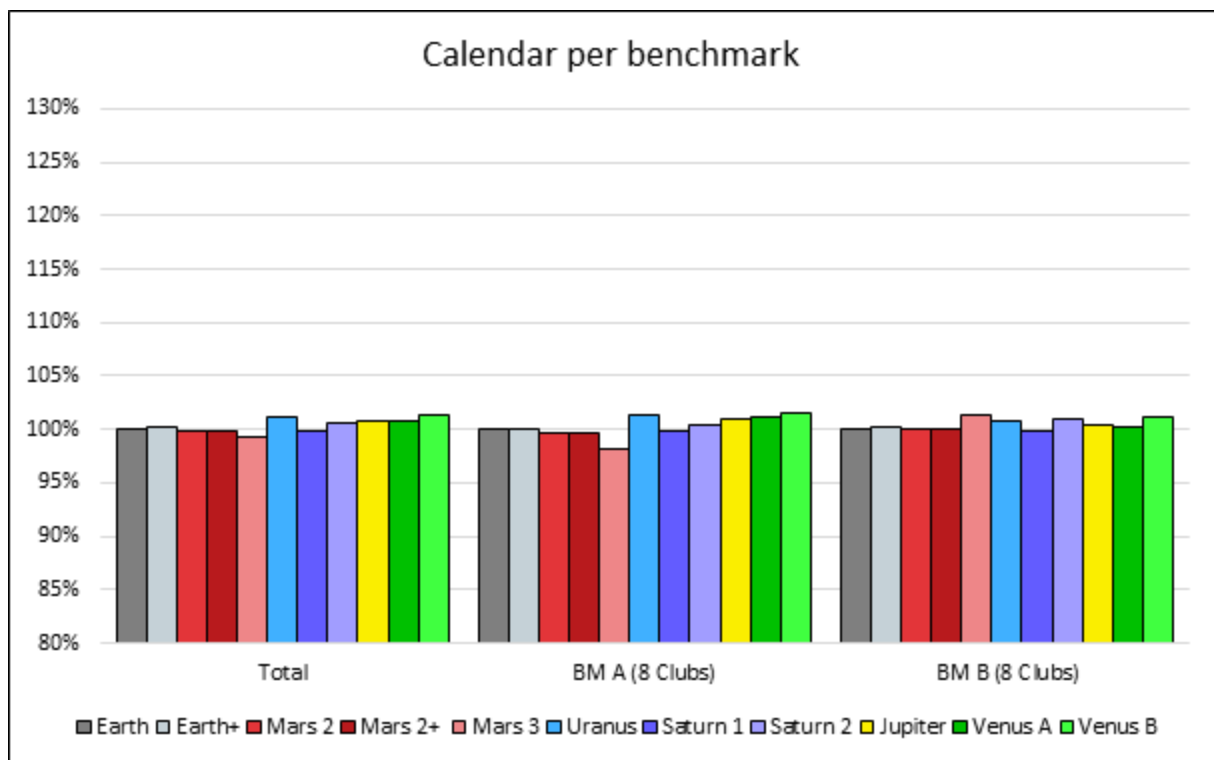
Figure 7.2.4 The calendar result dimension for the benchmark groups

7.2.3   Attendance

The attendance result dimension consists of three components per club:

- Match attendance;
- Club attendance;
- League attendance.

For match attendance we consider the average attendance per home match, for club attendance the total attendance per club per season, and for league attendance over all matches in the league. In Figure 7.2.5 these three components are displayed for the formats under consideration.

In all alternative formats the match attendance increases, because in these alternatives there are more interesting matches and sporting quality is higher. For the formats with an increase in the number of matches per team, the club attendances increase even more. Then for the formats in which the number of teams is increased to 14, this effect is even strong for the league attendances.
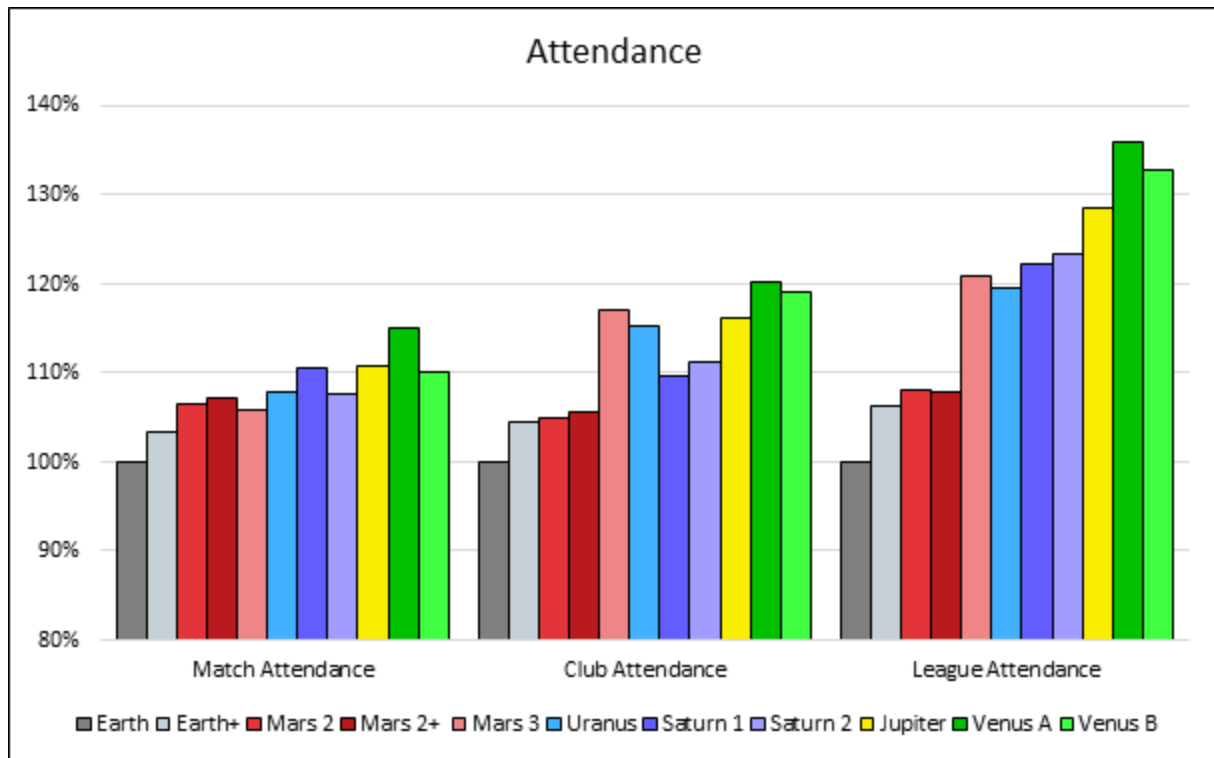
Figure 7.2.5 The attendance result dimension components

In Figure 7.2.6 the attendance result dimension components are given for benchmark A and B. For both benchmark groups Venus A and B are the clear winners. Hence, overall either Venus A or B is the best option with respect to attendance.
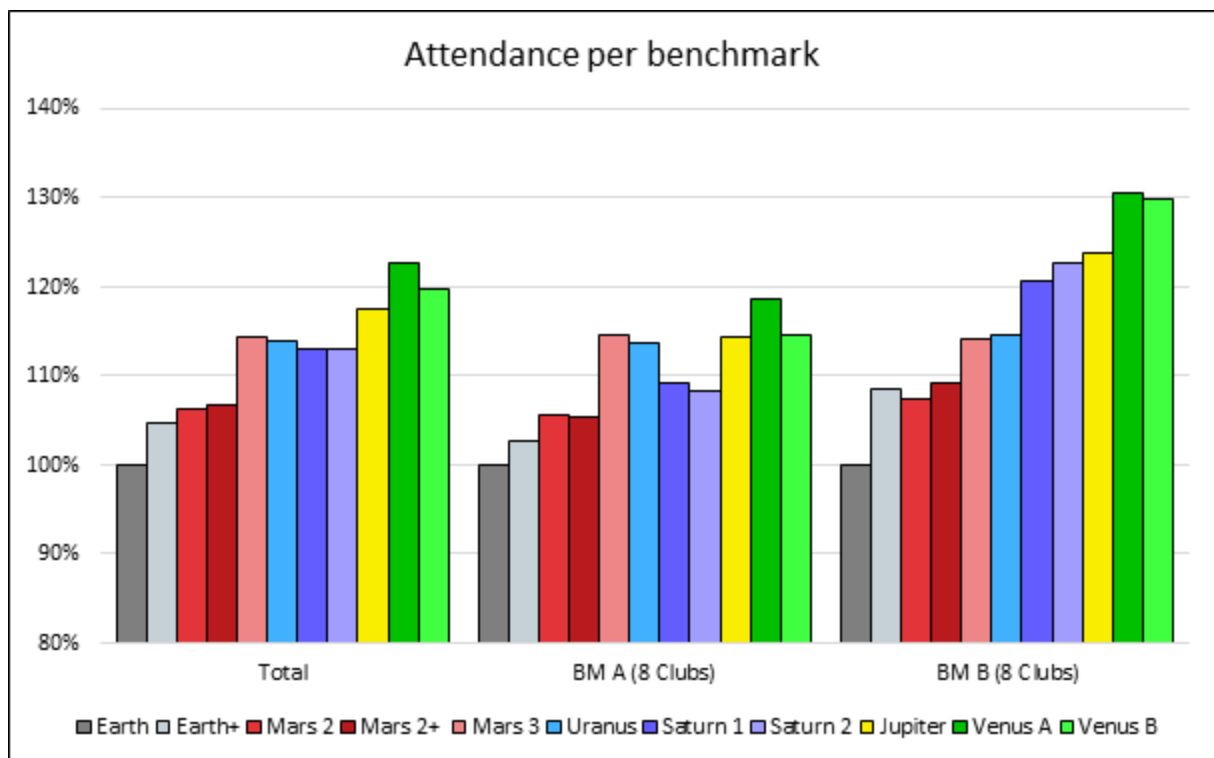

Figure 7.2.6 The attendance result dimension for the benchmark groups

7.2.4 TV audience

The TV audience result dimension consists of three components per club:

- Match TV Audience;
- Club TV Audience;
- League TV Audience.

Similar to attendance, for match TV audience we consider the average TV audience per home match, for club TV audience the total TV audience per club (home) per season, and for league TV audience the total TV audience over all matches in the league. Note that all matches in the Superliga are broadcasted. In Figure 7.2.57 the three TV audience result components are displayed for the formats under consideration.
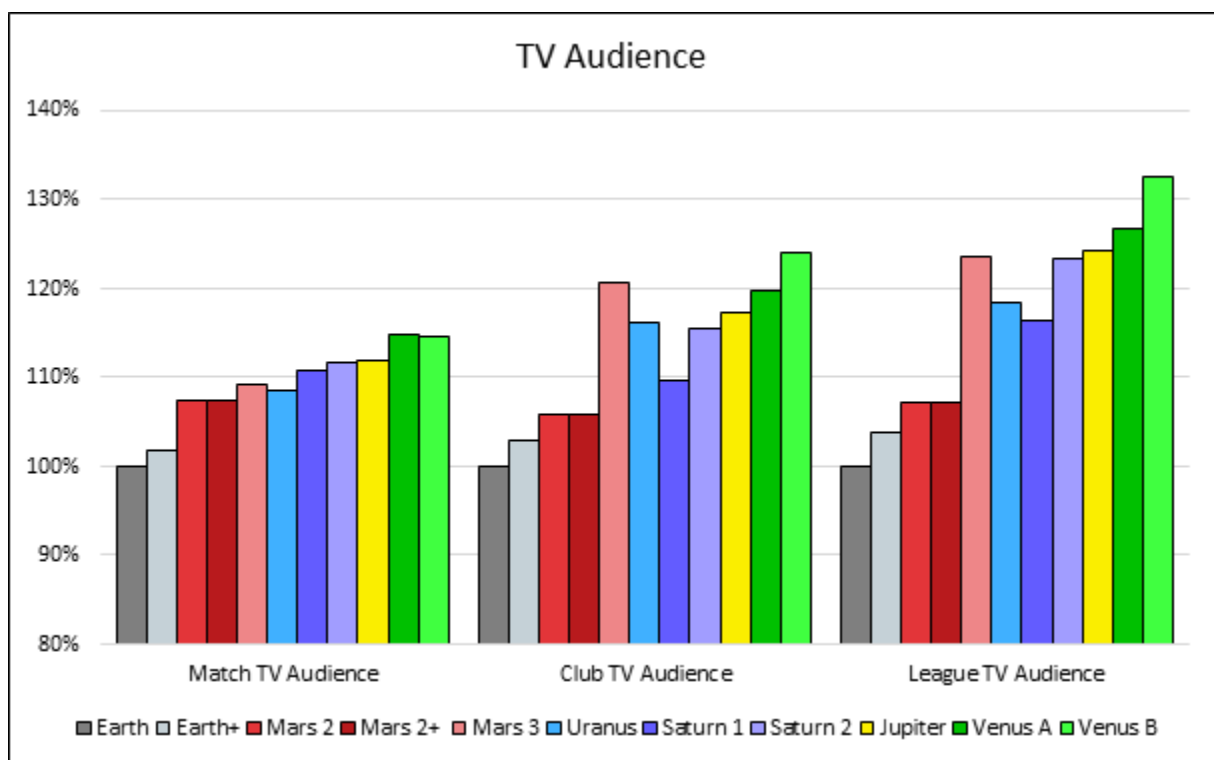
Figure 7.2.7 The TV audience result dimension components

The results are fairly similar to the results with respect to attendance. However, since the relative impact of sporting quality on TV audience is less than on attendance, the effect of the greater number of matches in Venus B than in Saturn and Venus A, makes Venus B the best option with respect to league TV audience.

In Figure 7.2.8 the TV audience result dimension components are given for benchmark A and B. For benchmark A both Mars 3 and Venus B are the best options, while for benchmark B Venus B is clearly the overall winner. This results in Venus B is the best option with respect to TV audiences.

Figure 7.2.8 The TV audience result dimension for the benchmark groups

7.2.5 Revenues:

The revenue result dimension consists of four components per club:

- Match day revenues;
- Potential TV revenues;
- Commercial revenues;
- European revenues.

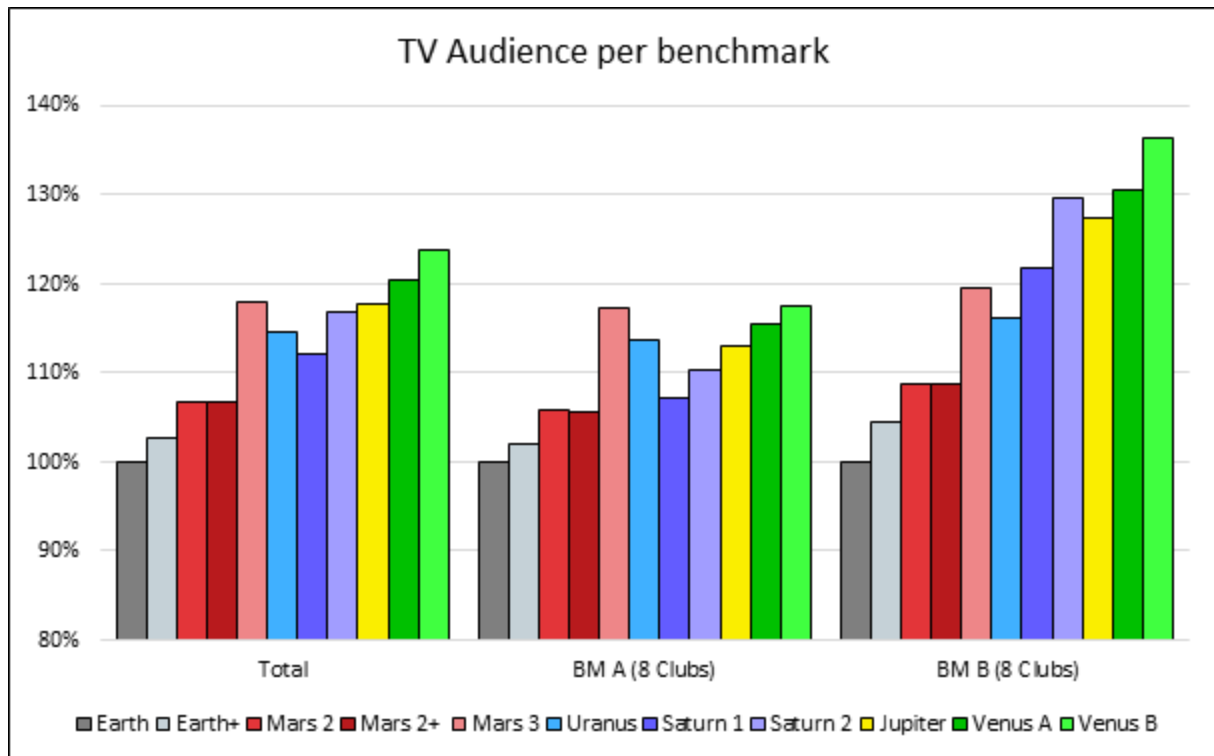Note that a change in competition format has a direct impact on match day revenues. The commercial revenues from sponsors follow after a short while when attendances. An increase in European revenues can be established in the longer run when the Danish clubs improve their sporting quality and as a result improve their results in Europe. The TV revenues are fixed for the coming six seasons. However, this does not mean that we should not take effects on these revenues into account. First of all, we consider the potential TV revenues in the long run. The current contract does not affect this potential. Secondly, since we have a time horizon of five years, negotiations with respect to a new TV contract are due at the end of this horizon, and the potential of the league at that moment will have a major impact on the new contract. In Figure 7.2.9 the four revenues result components are displayed.
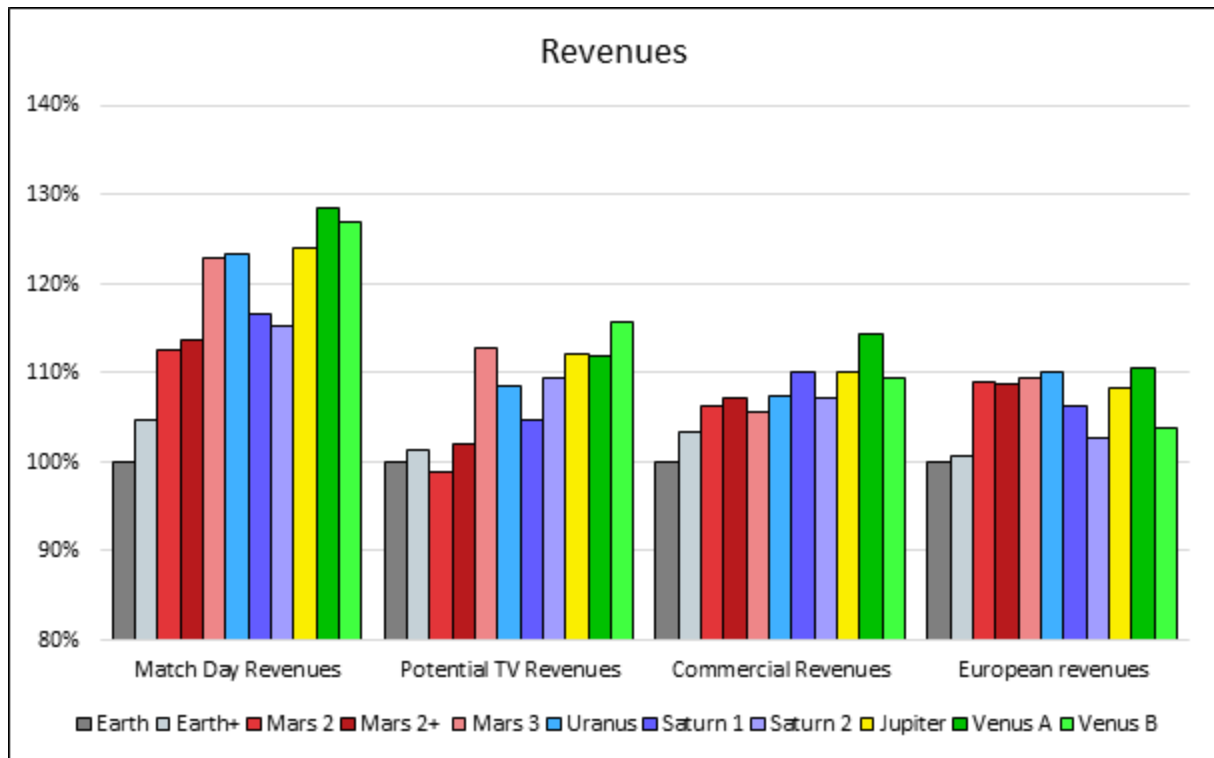
Figure 7.2.9 The revenues result dimension components

Based on the simulation results, these figures were modelled and calculated using sporting strength, attendance and TV audience as key drivers. The potential TV revenues were calculated using the indicated media value of a football viewer and the current distribution mechanism among the clubs.

All alternatives result in an increase in match day revenues. This is due to an increase in the number of matches, an increase in sporting quality, and an increase in competition progress. The percentage increase in potential TV revenues is similar, but less severe. Since the commercial revenues are mainly a result of the attendance, TV audiences, and sporting quality, these revenues increase as well. For the European revenues it is, next to an overall improvement of sporting quality, of course also important which teams qualify for the European tournaments. Hence, the Venus formats in which a team from the bottom group is able to qualify for the European tournaments via a playoff, do not score as good on that component as on others.

In Figure 7.2.10 the revenues result dimension components are given for benchmark A and B. For both benchmarks all alternatives are an improvement of the current situation. For benchmark A Mars 3, Uranus, Jupiter, and both Venus formats are the best options. For benchmark B the expansion of the league to 14 teams has more impact, which is shown by the fact that the revenues for this benchmark are the best for these formats, with the Venus formats as the supreme option.
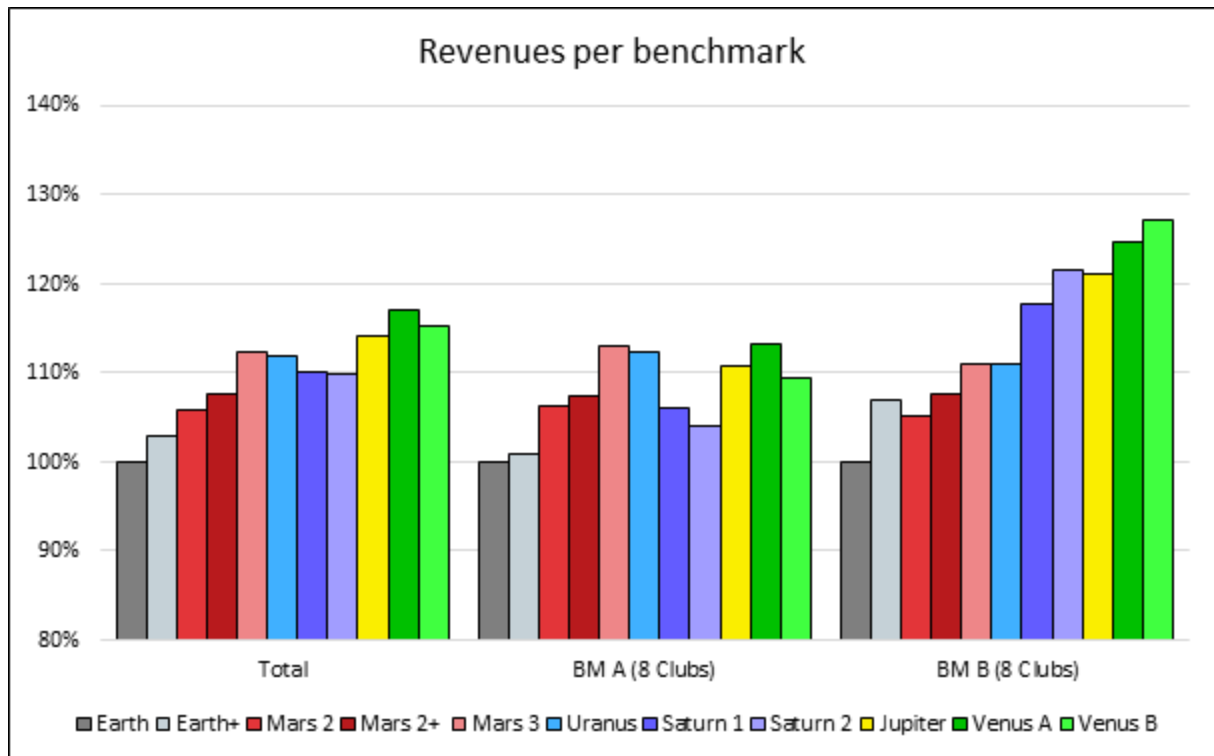
Figure 7.2.10 The revenues result dimension for the benchmark groups

7.2.6   Fairness

All formats are fair in the sense that the team with the most points summed over all stages of the competition is the champion. Some aspects of a format can, however, be considered unfair. In the current format, e.g., the uneven distribution of home and away matches results in a bias, in particular as this distribution is not based on results, but is determined by draw.

The introduction of promotion/relegation playoffs in Earth + makes that the number 10 of the league might relegate, and the number 11 not. This can be considered unfair. On the other hand, the fact that the numbers 10 and 11 have the chance to compete with the numbers 3 and 2 of 1. Division for a spot in the Superliga increases the fairness as the strongest of these teams are able to play in the Superliga next season.

It is also the case that the relation between the final league table and the sporting quality of the teams increases when teams play each other more often. In that sense, Mars 3 will have less surprises than Mars 2, and the same holds for comparing Saturn 2 with Saturn 1.

On the other side of the spectrum are knock-out matches in which chance plays a bigger role. As a consequence, such matches can be considered unfair. In the Venus formats teams that do not belong to the top group are still able to qualify for a European ticket via a final knock-out match with the number 3 of the top group. In Venus B there are also knock-out matches to determine the relegation to 1. Division. Hence, Venus A, and in particular Venus B might be labelled less fair than the other formats.

7.2.7   Total evaluation

In Figure 7.2.11 the five result dimensions (excluded is fairness) are displayed for the different competition formats.
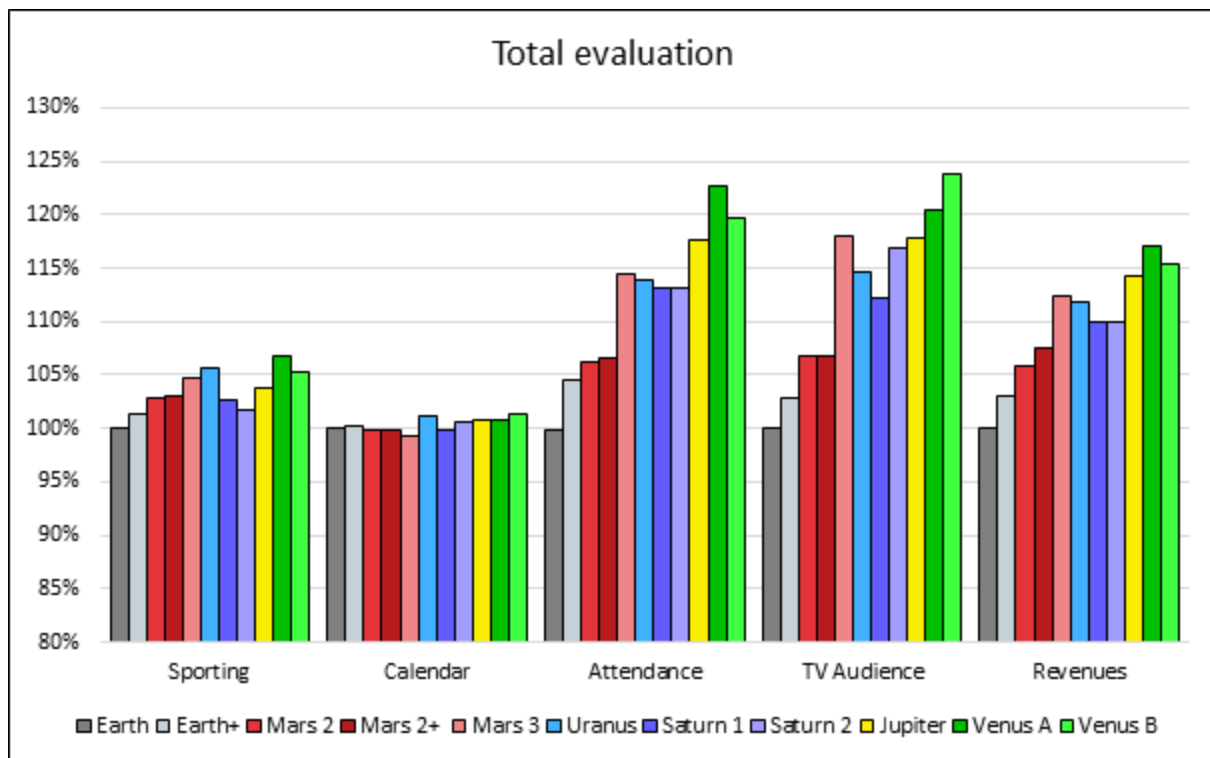

Figure 7.2.11 The result dimensions

Except for the calendar result dimension, which has a minor impact, all the alternatives outperform the current format on all result dimensions. Moreover, the quantitative analysis indicates that the Venus formats score best on all result dimensions. An important advantage of this format comes from the bottom group. The fact that there is still the possibility of a prize (a European ticket) for the clubs that did not qualify for the top group makes these formats attractive for both stadium and TV audiences, which increases revenues, and therefore, sporting quality.

The Jupiter format performs less because of the single rounded group, bringing in 7 games with only the avoidance of relegation as prize. It also will lack competition progress in the latter stages for the teams that have saved themselves.

Though the Uranus format is evaluated quantitative rather positive on the result dimensions, this format has two substantial negative characteristics:

- The second group where each club plays four times in the final 12 matches against the three other clubs leads, in combination with two confrontations between the same teams in stage 1, to an, in the whole of Europe, unprecedented six times per season. In these final matches in the bottom group the stadiums could be rather empty and will thus be detrimental to the sales tasks of the commercial department to extend the relationship with both sponsors and season ticket holders.
- The teams that have to play in this group have, even in comparison with the present 3 x 12, a downward risk of 5%.

The last serious candidate is Mars. However, playing twice (Mars 2 and Mars 2+) results in only 32 match dates, whilst playing thrice (Mars 3) will bring the number of matches to a somewhat undesirable number of 37, and will moreover, incur that teams meet each other 5 times per season on both halves of the table. It also keeps the current unequal number of home and away games, though the number of home games will be decided upon by performance (1 till 3 after 22 rounds will win the extra home match) instead of the outcome of a draw.

The Saturn models will not bring in much improvement for the top teams since they, coming from earth, drop games in the 3rd round against 9 thru 12 and they get four games against 13 and 14 in return.

In Figure 7.2.12 the total evaluation is given for benchmark A and B. It shows that for benchmark A Mars 3, Uranus, Jupiter, and both Venus formats are the best options, while for benchmark B the increase of the Superliga to 14 clubs is the best option. The origin lies within the fact that in that case they are more often represented in Superliga, play more matches that on top of that also have more at stake. Overall, the Venus formats score best, with Mars 3, Uranus and Jupiter as viable alternatives.
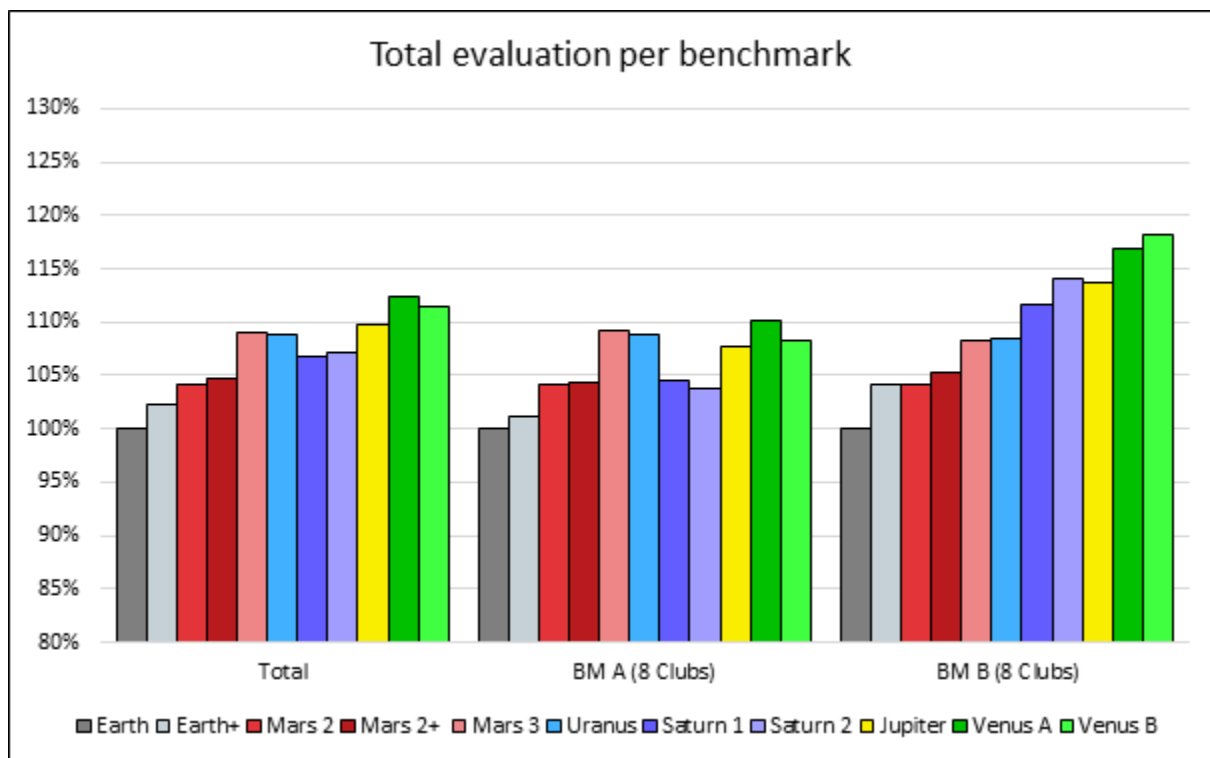
Figure 7.2.12 The result dimensions for the benchmark groups

On June 3 and June 10 the quantitative conclusions were discussed and it was concluded that the only acceptable solutions are Mars 2+, Uranus and Venus B.

7.2.8   Risk management financial

Since introduction of a second stage introduces a risk to the extent that the financial deviation from the average increases due to at a season by season level you either are in the prosperous top group or you are not.

To visualize the impact we have compared the financial performance resulting from a sporting performance between a new format and the present format.

Thus we show the upward potential (right hand side of the green area) the downward risk (left hand side of the red area) and the average (where red meets green). Graph 7.2.13 shows the result for benchmark group A and Graph 7.2.14 shows the result for benchmark group B,

The size of the red area represents the likelihood of being part of the top group and the size of the green area represents the likelihood of not being part of the top group. So the larger the red area the more likely it is that the club participates in the top group.
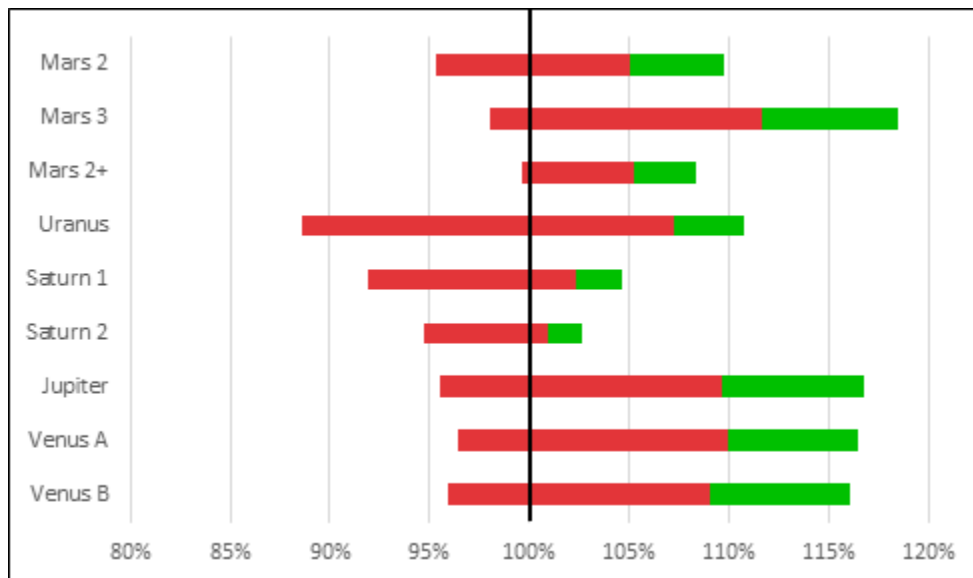

Figure 7.2.13 The deviation in financial result around the averages per format for benchmark A
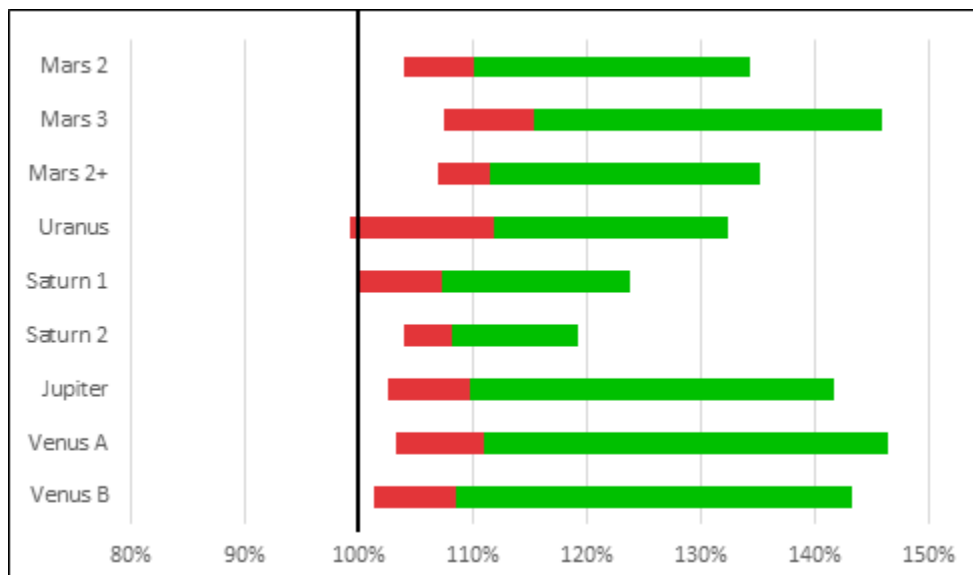
Figure 7.2.14 The deviation in financial result around the averages per format for benchmark B

7.2.9   Risk management sporting

7.2.9.1   The last European ticket

Since introduction of a prize for the second group introduces a risk to have Denmark represented suboptimal from a sporting perspective. We therefore analyze the difference in chances between Earth and Venus-B for the top-6 teams to represent Denmark as either third or fourth ranked team within the European club competitions.
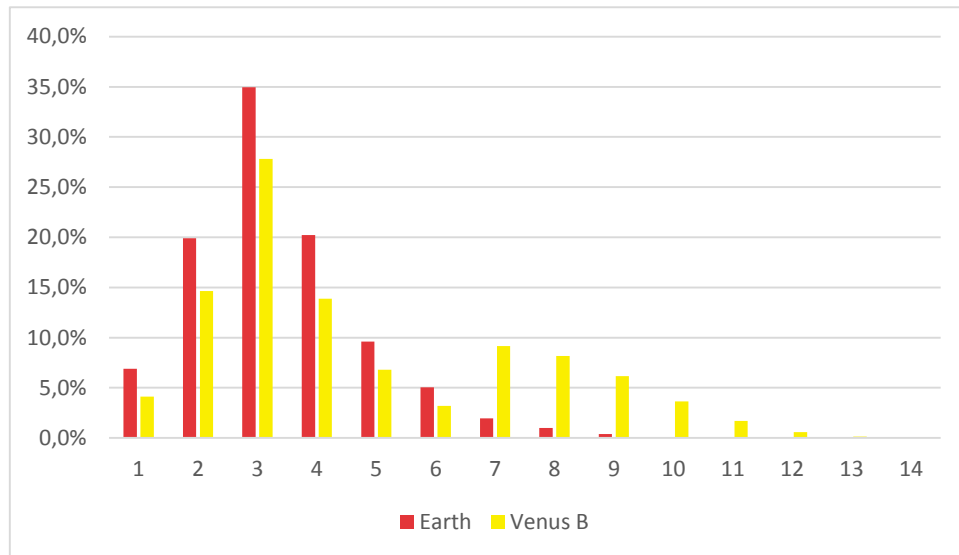
Figure 7.2.15 The chances for qualification as 3rd for Europe for each of the spots after 2 cycles.
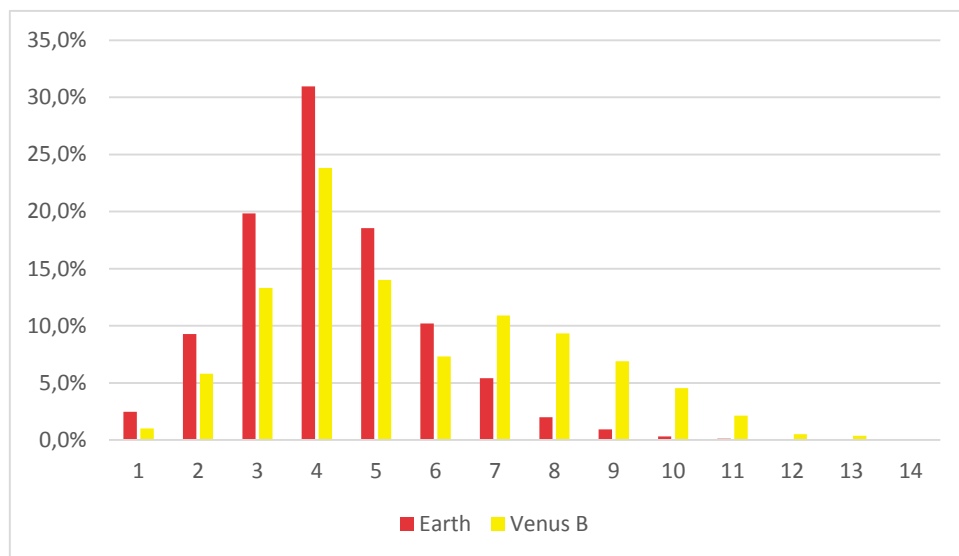
Figure 7.2.16 The chances for qualification as 4th for Europe for each of the spots after 2 cycles.

This reveals a significant increase for the last eight compared to the top six. For the 3rd spot European qualifier on Earth the chances are 97% for top six against 3% for the next eight. On Venus-B the chances are 70% for top six against 30% for the next eight. Thus a shift of 27%. For the 4th spot European qualifier on Earth the chances are 91% for top six against 9% for the next eight. On Venus-B the chances are 65% for top six against 35% for the next eight. Thus a shift of 26%.

If you analyze it on a club by club basis however it turns out to be the case that the winner of the second group taking the last European ticket is a member of the top six teams coincidentally being a member of this second group. For the 3rd spot European qualifier on Earth the chances are 77% for top six against 23% for the next eight. On Venus-B the chances are 70% for top six against 30% for the next eight. Thus a shift of only 7%. For the 4th spot European qualifier on Earth the chances are 70% for top six against 30% for the next eight. On Venus-B the chances are 64% for top six against 36% for the next eight. Thus a shift of just 6%.

Thus we conclude that in four out of five cases a winner coming from the bottom group will be a team from the top six clubs in terms of sporting strength (ECI). Thus once in every sixteen years Venus-B delivers a weaker participant in Europe.

7.2.9.2 Promotion / relegation

The system based upon a knock out stage to decide on relegation or play-out matches against the numbers two and three of 1. Division introduces a risk to have an unjust relegation out of the Superliga from a sporting perspective. We therefore analyze the difference in chances between Earth and Venus-B to be relegated.
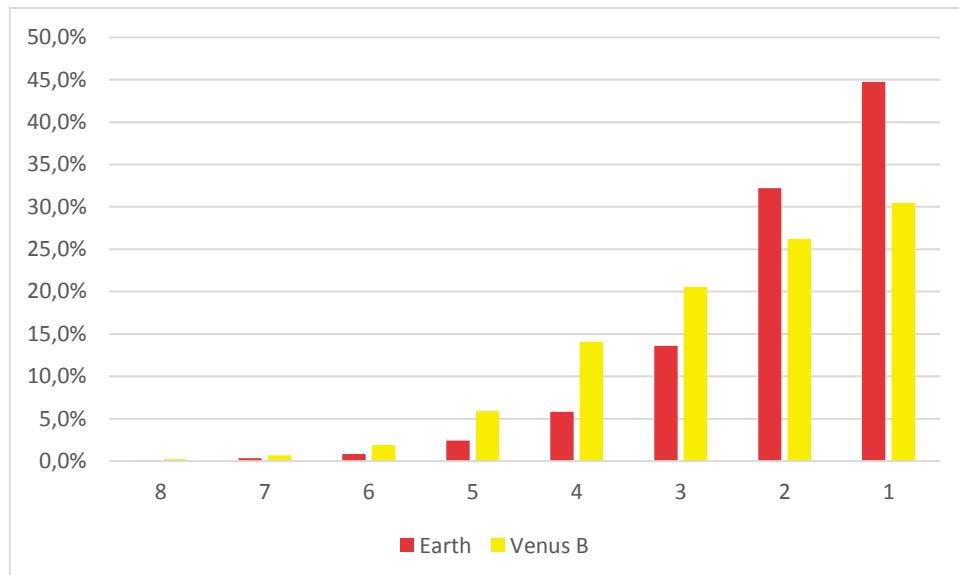
Figure 7.2.17 The chances for relegation for each of the spots counting from the last after 2 cycles.

This reveals a significant higher risk on Earth to get relegated for the last two compared to the other six. For the last two spots on Earth the chances are 77% for last two against 23% for the other six. On Venus-B the chances are 57% for last two against 43% for the other six. Thus a shift of 20%.

If you analyze it on a club by club basis however it turns out to be the case that the numbers last and penultimate that escape via the knock-out are the stronger teams from a sporting perspective (ECI). The ones that relegate on Earth are in 64% of the cases the two weakest participants. On Venus-B the relegates are in 56% of the cases the two weakest participants. Thus a shift of just 8%.

Thus we conclude that in three out of five cases the club that escapes from relegation using the play offs is the better team in terms of sporting strength (ECI). Thus once in every twelve years Venus-B delivers a stronger team as relegate.

7.3 Results 1. Division

In this section all formats in all variants are compared to each other on the different result dimensions for 1. Division. Similar to the results for the Superliga, we use a time horizon of five seasons with respect to the valuation of the continuation of current format, which means that the current format is on 100% for each result dimension.

In the following paragraphs the outcomes for each of the result dimensions are explained. The weighting of the results is based on the input of the individual clubs (Chapter 5). The results are measured for the clubs in Benchmark groups B and C, which are 16 clubs in total. On the basis that only half of the benchmark B clubs are currently in 1. Division, the total score is calculated by weighting the scores of the benchmark groups with respective weights of 1 and 2. The explanation of the different result dimension components is omitted in this section, we refer to the specific paragraphs of Section 7.2 for this.

7.3.1 Sporting

In Figure 7.3.1 the three sporting result dimension components are displayed for the different competition formats.
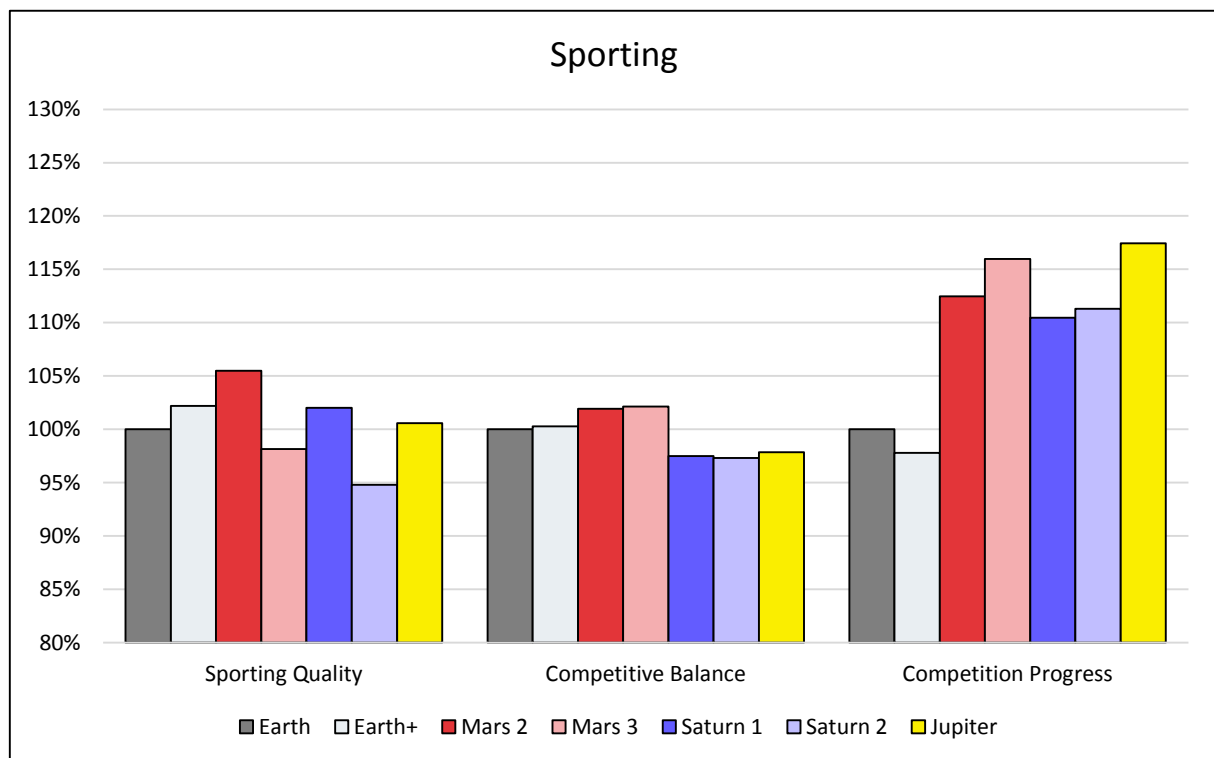
Figure 7.3.1 The sporting result dimension components

Note that all alternative formats are a major improvement with respect to competition progress. Hence, the introduction of additional stages and playoffs really add to the tension in 1. Division. However, on sporting quality and competitive balance not all these alternatives outperform the current format. With respect to sporting quality Mars 3 underperforms due to the great number of matches

of relatively low quality in the bottom group, while Saturn 2 underperforms due to a significant amount of matches between teams of even lower quality. Moreover, the addition of two additional teams ensures a decrease in competitive balance, as is shown by the fact that all 14 formats score under 100% on that aspect.

The three sporting result dimension components are combined to a total score per benchmark group in Figure 7.3.2. For both benchmark group B and C, Mars 2 is the best alternative, beating Mars 3 and Jupiter with a narrow margin.
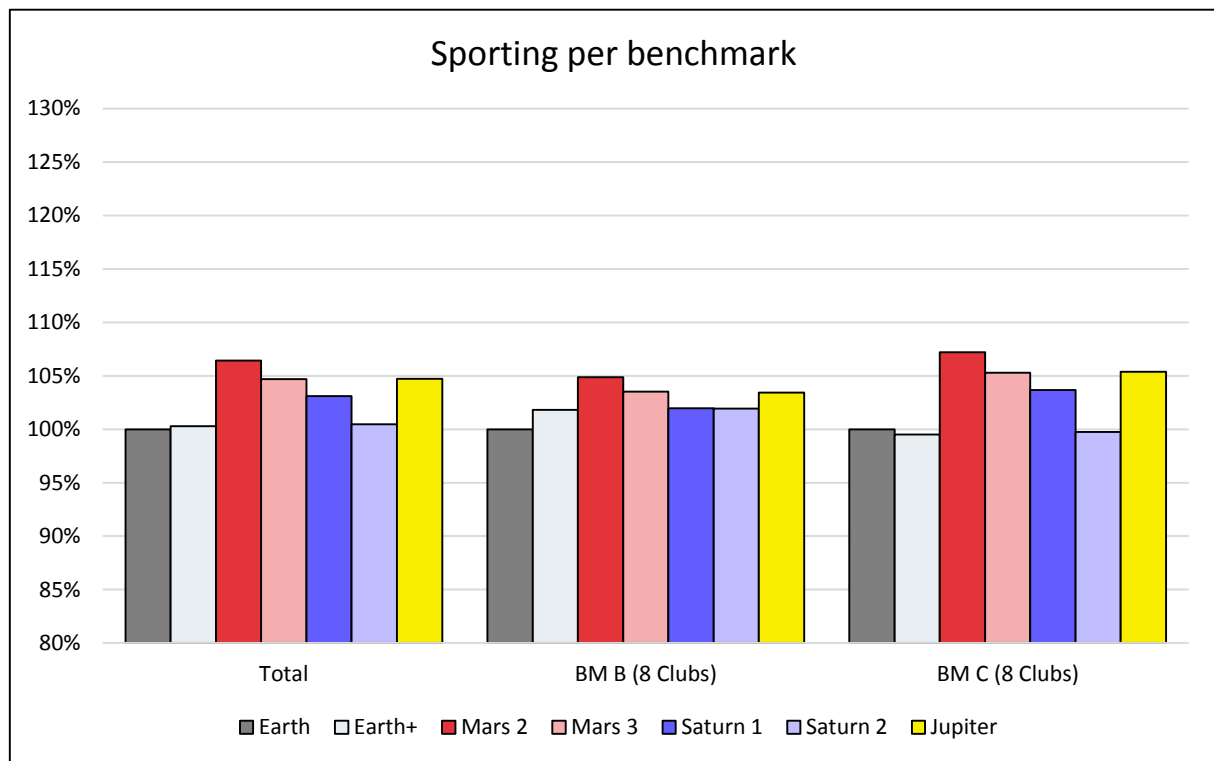
Figure 7.3.2 The sporting result dimension for the benchmark groups

7.3.2 Calendar

In Figure 7.3.3 the two calendar result dimension components are displayed for the different competition formats.
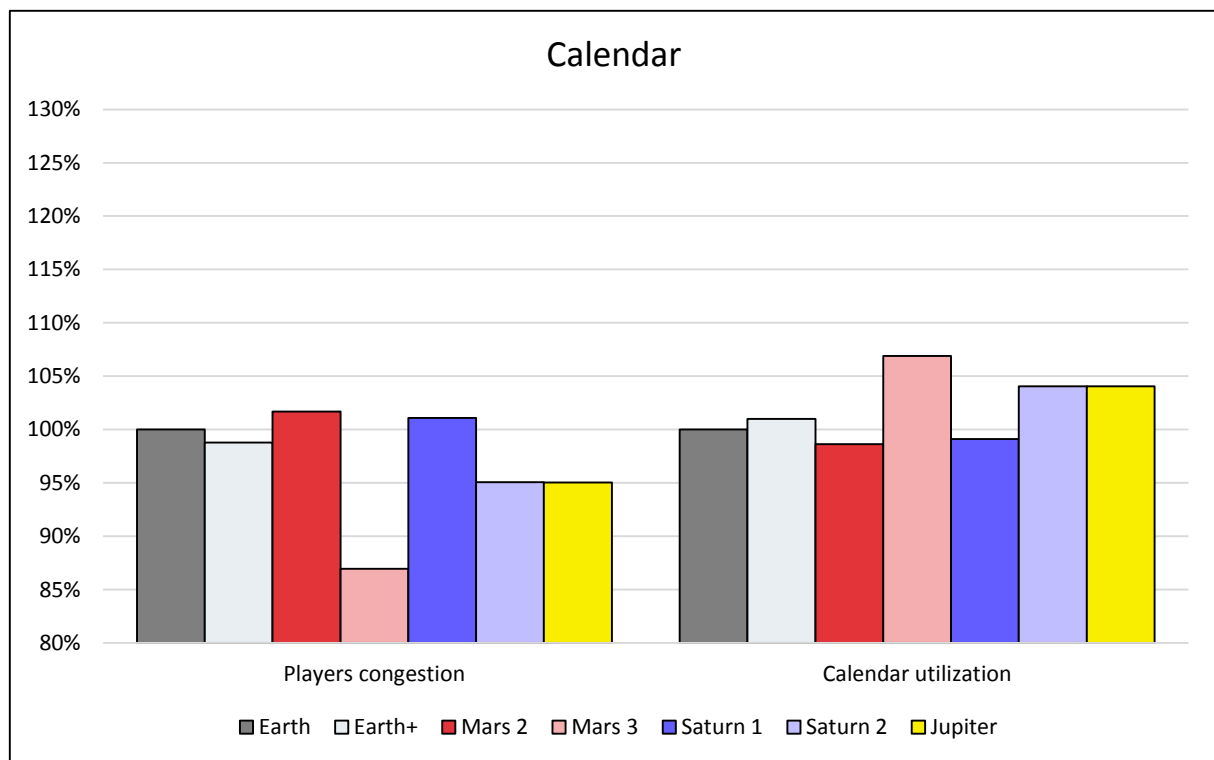
Figure 7.3.3 The calendar result dimension components

The results here equivalent to those for the Superliga. Hence, since the number of matches in Mars 3 is 37, this format does perform poorly on players congestion. Also in Saturn 2 and Jupiter the average number of matches per team increases with respect to the current format. Consequently, these formats also score under 100% for player congestion. Not surprisingly, the reversed image is shown when comparing the formats with respect to calendar utilization. There Mars 2 and Saturn 1 are worse than the current format as the average number of matches decreases to (about) 32 for these formats.

Overall, the impact, displayed in Figure 7.3.4, on the calendar result dimension is very limited for both benchmark groups, and hence, also for the weighted average of the two.
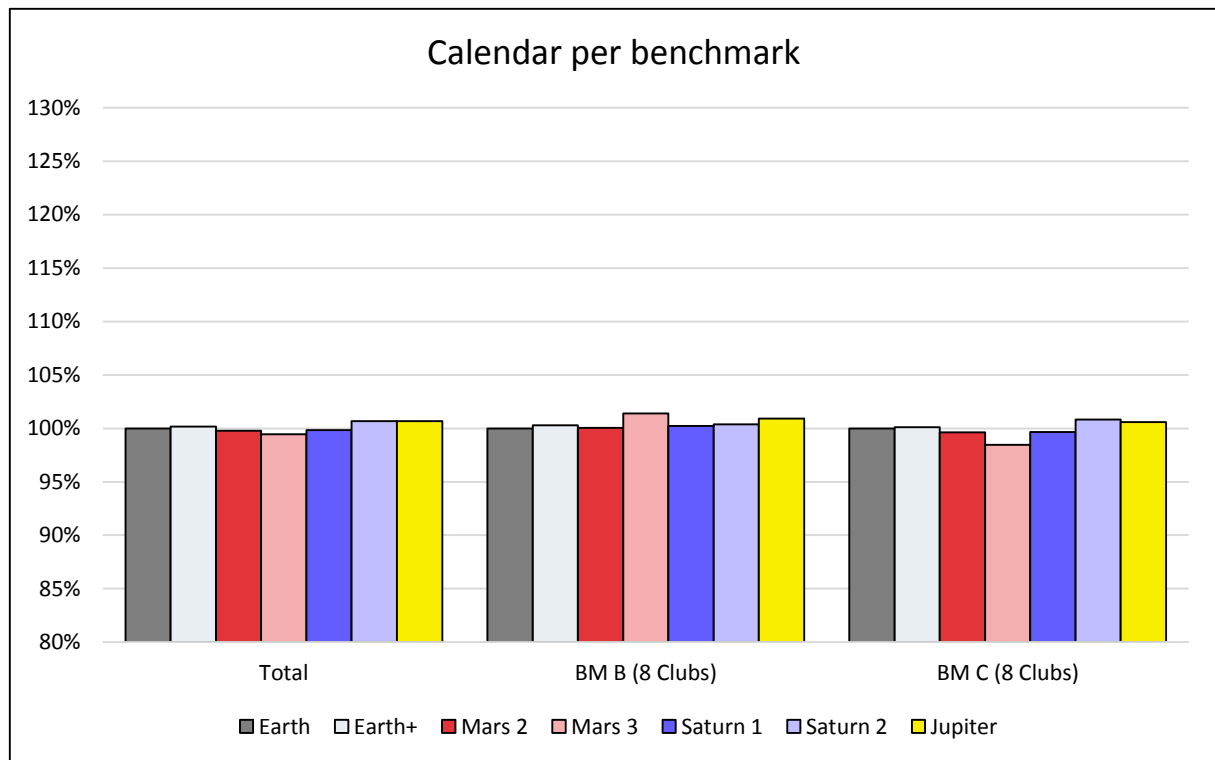
Figure 7.3.4 The calendar result dimension for the benchmark groups

7.3.3   Attendance

In Figure 7.3.5 the three attendance result dimension components are displayed for the different competition formats.
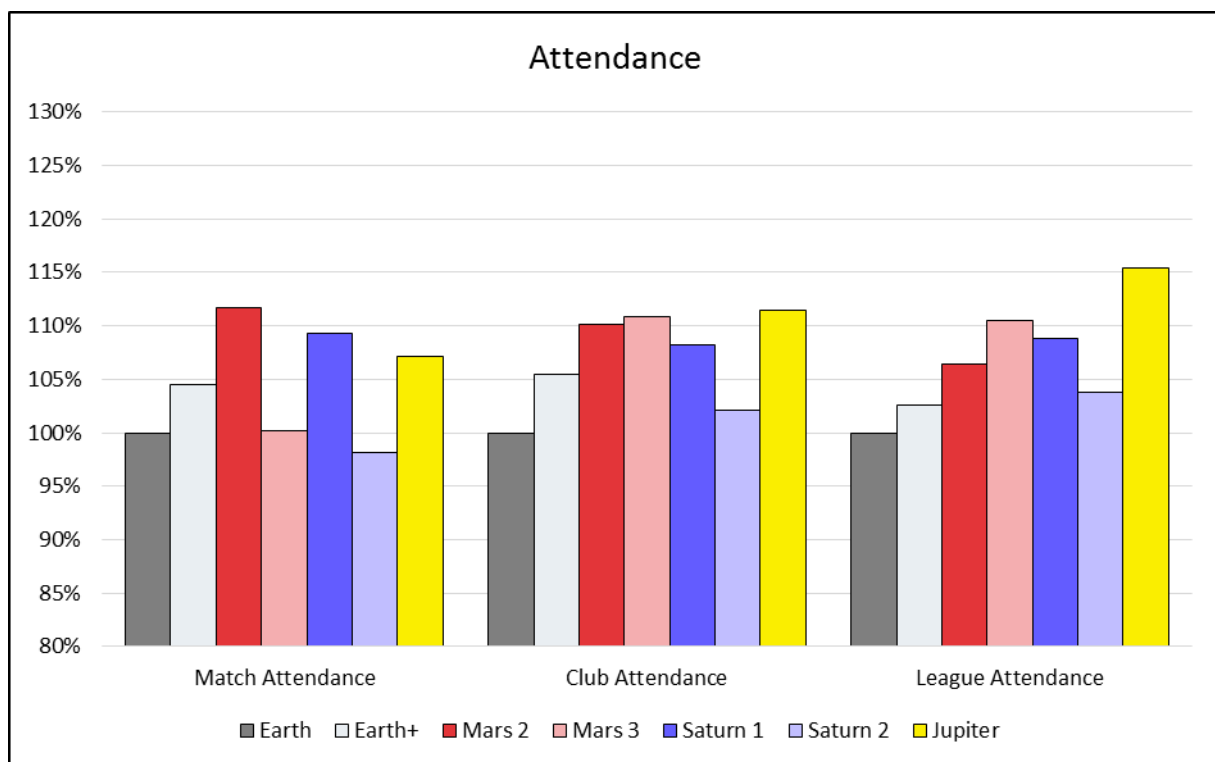
Figure 7.3.5 The attendance result dimension components

Since Mars 3 contains a great number of matches for each club, both club attendance and league attendance are high. The match attendance is, however, not that great due to the fact that many of these matches have a limited amount of tension and are played by teams of lower quality. Mars 2 and Saturn 1 score much better on match attendance, and also perform well on club attendance. However, the number of matches in these formats is relatively small, which makes League attendance low. Jupiter performs well on all attendance components, which is due to a combination of 14 clubs with many matches of which a good portion is played by the better teams in the league.

In Figure 7.3.6 the attendance per benchmark group is given. This figure shows that Jupiter is also the overall winner, although Mars 2 is slightly better for the benchmark B clubs. For them the addition of two teams to the league does not have a positive total effect on attendance.
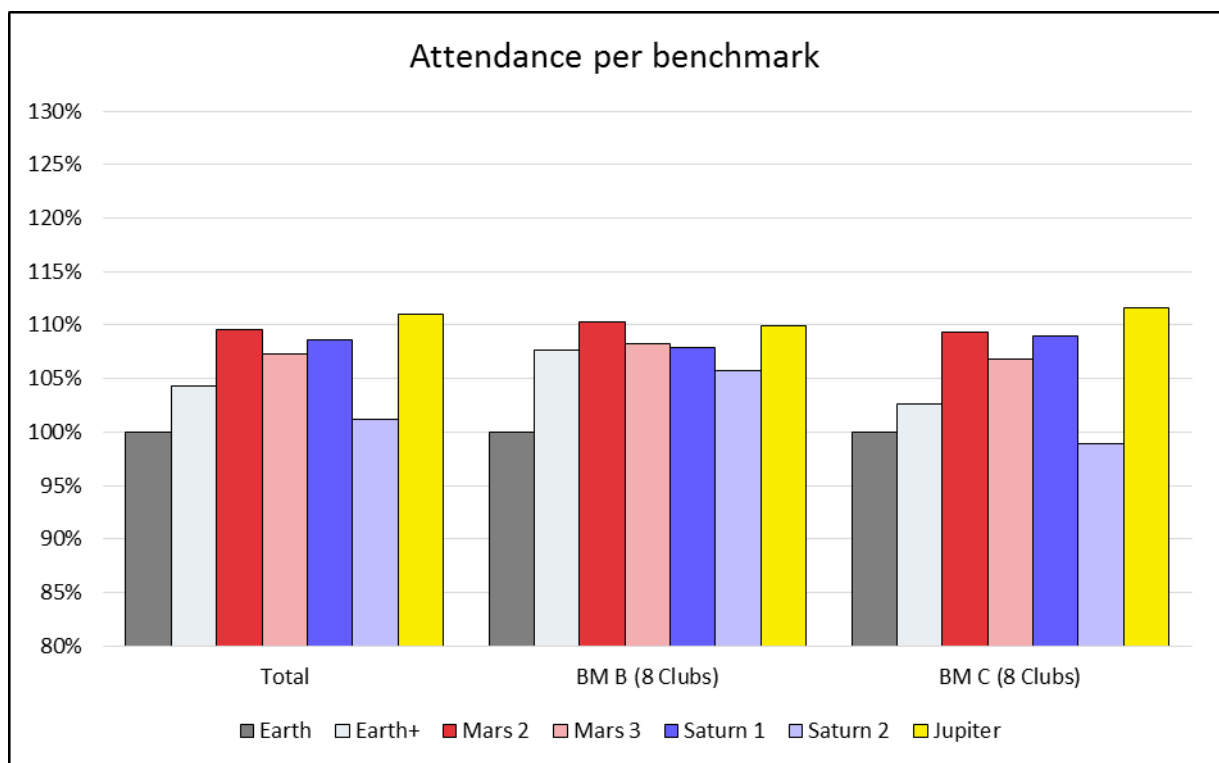
Figure 7.3.6 The attendance result dimension for the benchmark groups

7.3.4   TV audience

In Figure 7.3.7 the three TV audience result dimension components are displayed for the different competition formats.
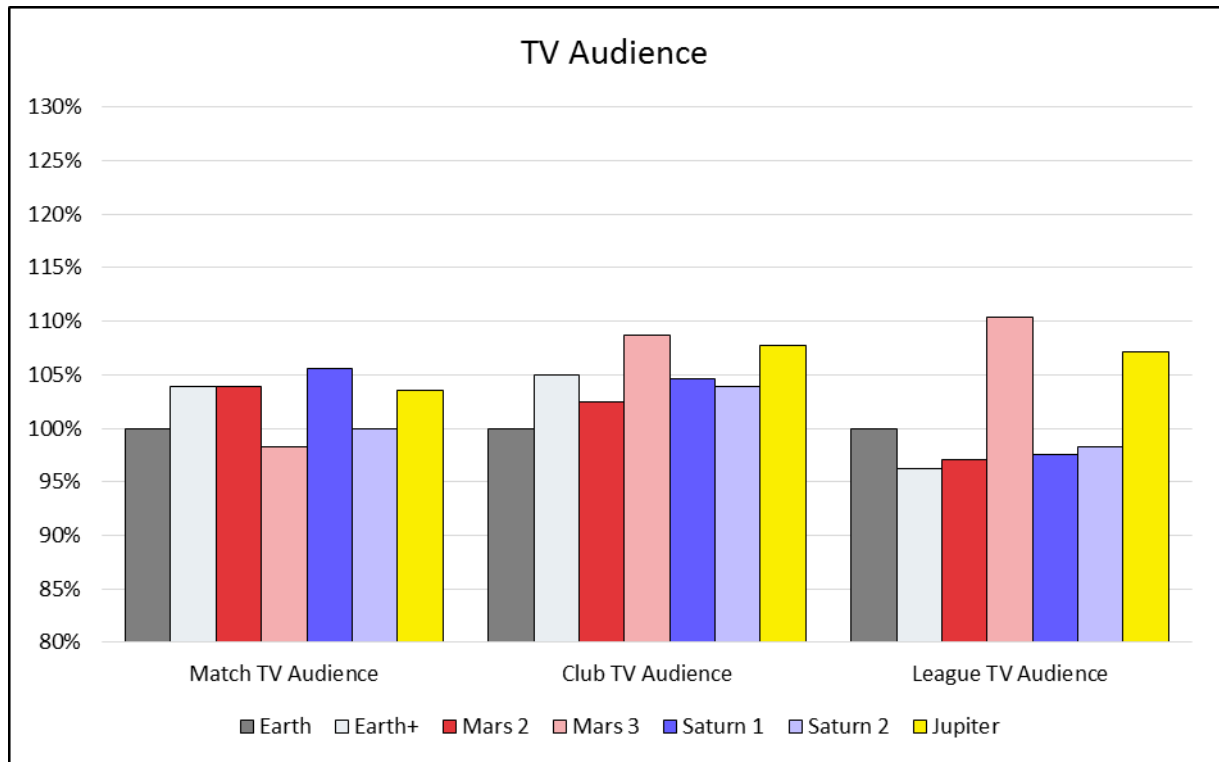
Figure 7.3.7 The TV audience result dimension components

A similar pattern as for attendance is visible here. Since in Mars 3 the number of league rounds is 37, both club TV audience and league TV audience are high. The match TV audience is, however, worse than the current format, which is mainly due to the fact that the clubs in benchmark C have less exposure in the second stage of the league. This is of course due to the fact that in 1. Division only one match is broadcasted each round. This decrease of exposure in the second stage is not compensated by an increase in TV audience in the first stage, which is the case for Mars 2, as tension in the first stage is somewhat decreased by the longer second stage. Mars 2 and Saturn 1 score much better on match TV audience, and also perform well on club TV audience. However, the number of matches in these formats is relatively small, which makes League TV audience low. Jupiter performs well on all TV audience components, which is due to a combination of many rounds in combination with a fair number of top matches.

In Figure 7.3.8 the TV audience per benchmark group is given. Overall, Mars 3 and Jupiter score best for both benchmark B and C, which in a large part is due to the fact that the formats have 37 and 36 rounds (for the top 6), respectively. And contrary to attendance, the TV audience in 1. Division is only related to the top match of each round.
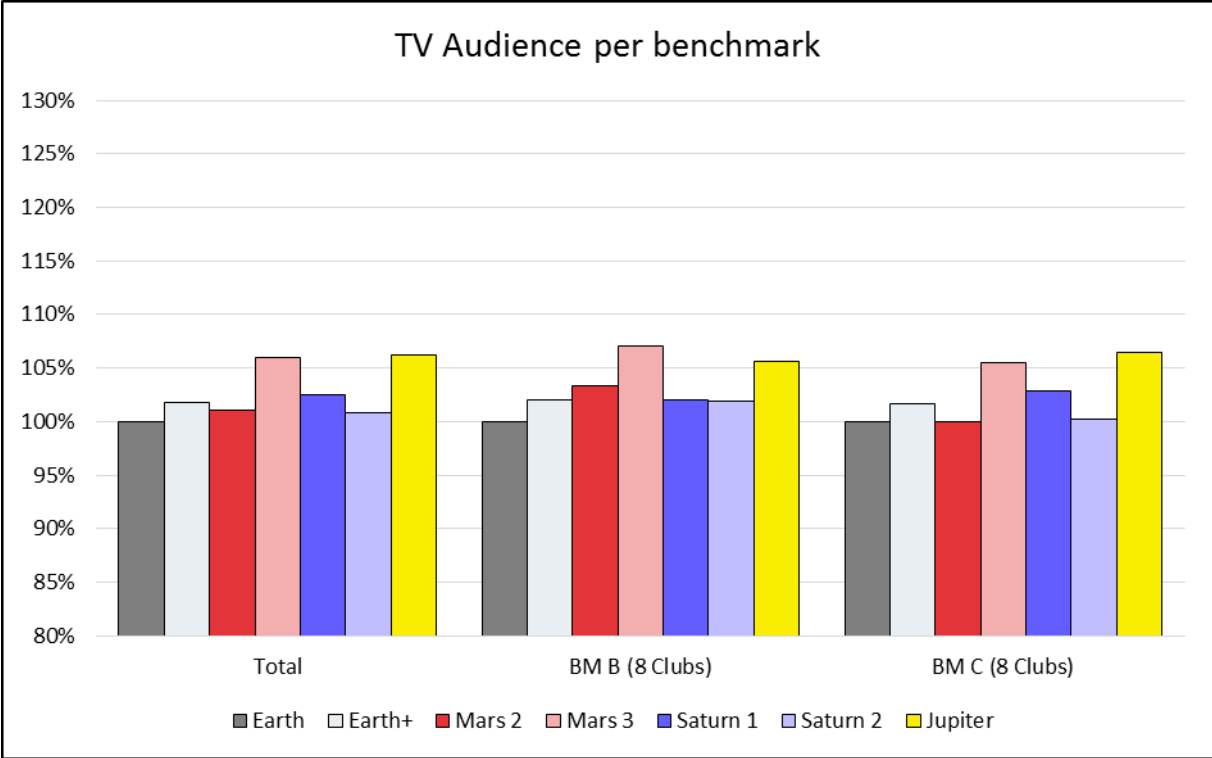
Figure 7.3.8 The TV audience result dimension for the benchmark groups

7.3.5   Revenues

In 1. Division European revenues are not taken into account, so what remains is match day revenues, (potential) TV revenues, and commercial revenues, displayed in Figure 7.3.9 for all competition formats.
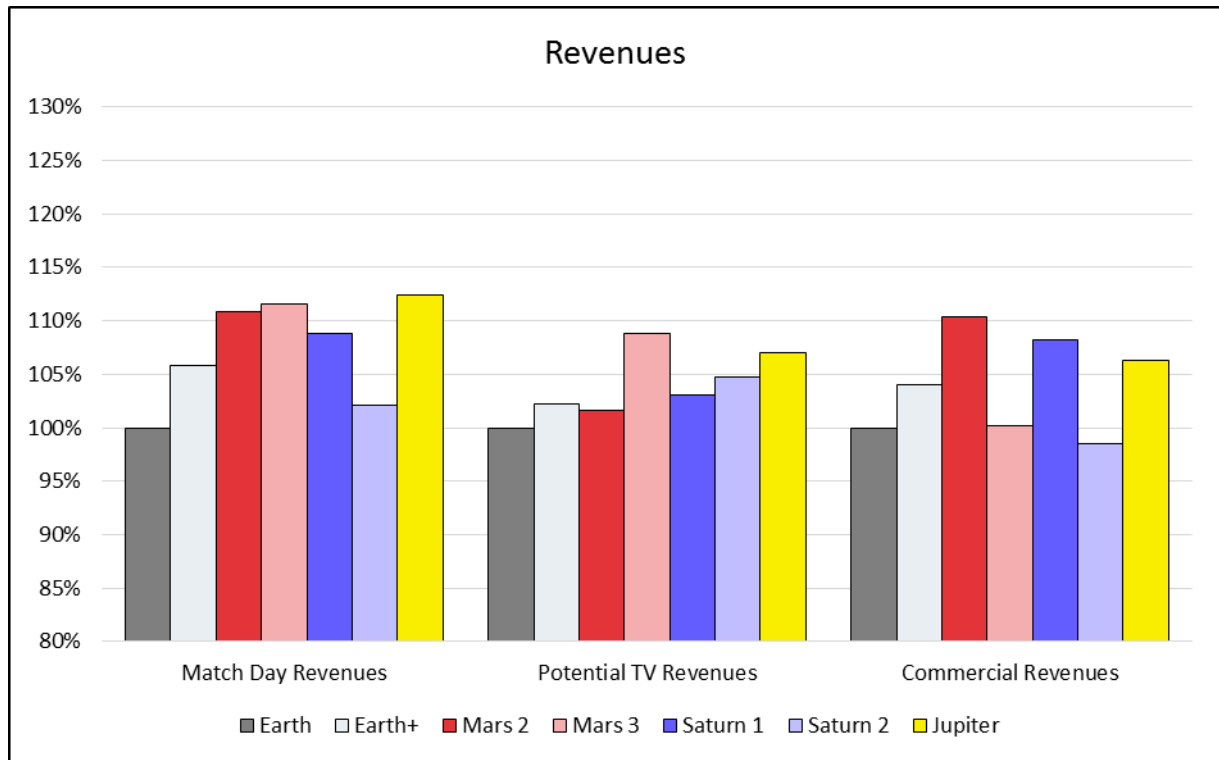
Figure 7.3.9 The revenues result dimension components

The formats with a great number of matches (for the top 6), e.g., Mars 3 and Jupiter, perform well with respect to all three revenue components.

In Figure 7.3.10 the revenues per benchmark group are given. Note that all alternatives yield more revenues than the current format. This is a consequence of the fact that the result dimension sporting improves. As a result, the attendance and TV audience will increase as well. Therefore, finally revenues from ticketing and the sponsoring value will also increase. Overall, the difference between the formats Mars 2, Mars 3, Saturn 1, and Jupiter is limited, where Mars 2 is best for the benchmark B clubs, and Jupiter for the benchmark C clubs.
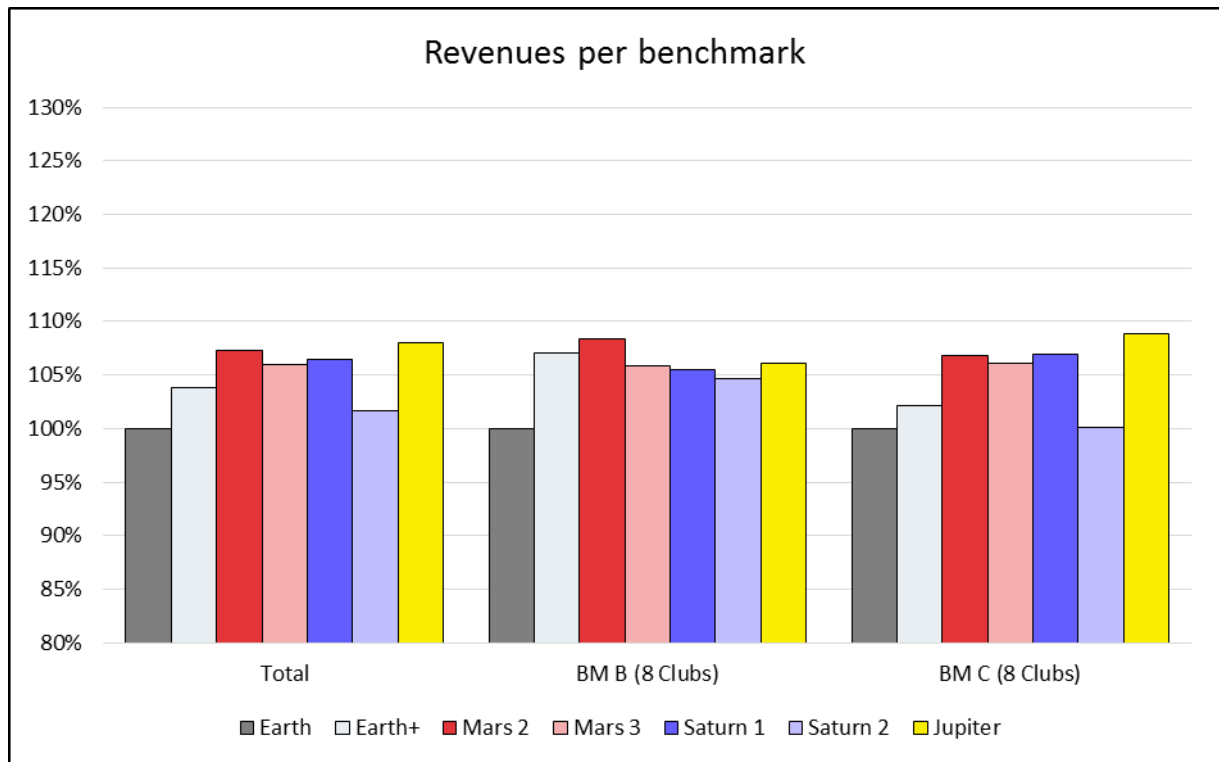
Figure 7.3.10 The revenues result dimension for the benchmark groups

7.3.6   Fairness

For a discussion of the fairness of the several formats we refer to Paragraph 7.3.6 in which this is discussed with respect to these formats in the Superliga.

7.3.7 Total evaluation

In Figure 7.3.11 the five result dimensions (excluded is fairness) are displayed for the different competition formats.
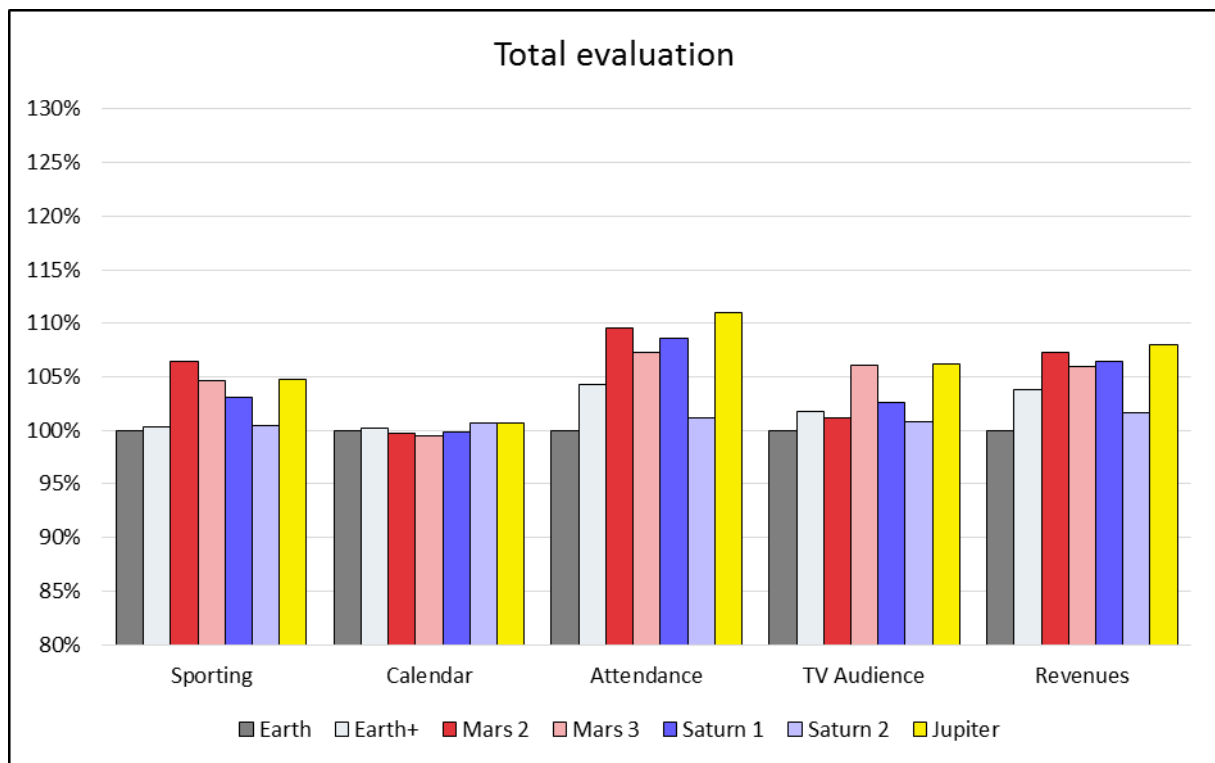
Figure 7.3.11 The result dimensions

On the different result dimensions we can conclude the following. All alternatives outperform the current format on all result dimensions, except on calendar where Mars 3 shows a minor decrease to the fact that the number of matches exceeds 36. Overall, the result dimension calendar does, however, only show minor differences between the formats. On sporting, attendance, and revenues Mars 2 and Jupiter score best, while Mars 3 and Jupiter score best with respect to TV audience. Saturn 1 also scores well on all result dimensions. Note also that Saturn 1 clearly outperforms the Saturn 2 variant.

All five result dimensions are weighted to a total evaluation score, which is presented in the Figure 7.3.12. From this figure we conclude that the differences between the alternatives Mars 2, Mars 3, Saturn 1, and Jupiter are small, especially for benchmark B clubs. For these clubs Mars 2 is the overall winner, while for benchmark C Jupiter is a little better.

The total score is calculated by weighting the scores of the benchmark groups B and C with the respective weights 1 and 2. Hence, the impact of the benchmark C clubs is greater on this total score. Consequently, Jupiter is also the overall winner. Note that these results are based on the current competition format in the Superliga. If the number of teams in the Superliga goes to 14, then a format with also 14 teams in 1. Division might not be the best fit.
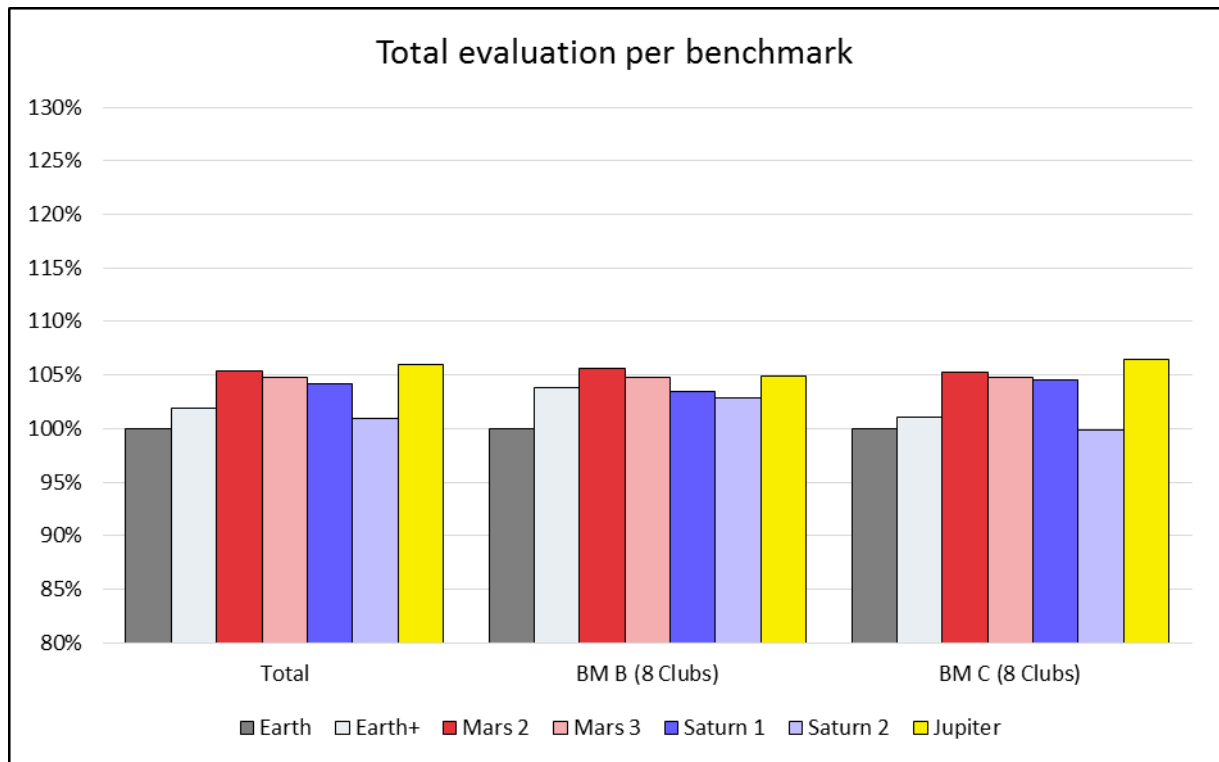
Figure 7.3.12 The result dimensions for the benchmark groups

The discussion with the 1. Division upon the final formats resulted in these conclusions:

- Independent of the final decision on the Superliga format, the 1. Division must contain 12 teams
- The existing format is preferred, Mars 2 is the only viable alternative
- If the Superliga will consist of 12 teams, 1. Division want 2 direct promotion spots
- If the Superliga will consist of 14 teams, 1. Division accepts 1 direct and 1 or 2 indirect promotion spots

8

8 Conclusions and recommendations

The central question of this project has been to come up with a proposal for a new league structure, comprising of Superliga and 1. Division. The current competition format has the two major disadvantages. First of all, there is an unequal amount of home and away matches. Secondly, there is only one stage with one apotheosis. As a consequence, many of the interviewed stakeholders have expressed their readiness for change. At this stage of the project we are looking for the level of acceptance that can be achieved for the better evaluated formats.

In this section we start by discussing the competition format for the Superliga in 8.1. Then in Section 8.2 we consider the competition format in 1. Division. We conclude this chapter with Section **Fout! erwijzingsbron niet gevonden.** on the process towards decision making.

8.1 Competition format for the Superliga

Based on econometric analysis, taking into account both the history and culture of Danish football, there are several good solutions available. Based on the input from the stakeholders the minimum number of teams in the league was set on 10, while the maximum number was set on 16. However, with only 10 clubs in the Superliga large areas of Denmark are without Superliga football, while a problem with formats of 16 teams is that a double round-robin already consists of 30 matches, which makes the possibilities for a second stage limited. Hence, competition formats with 12 or 14 teams, as odd groups have major disadvantage, are the best fit for Denmark.

To increase the tension, a second stage needs to be introduced. We have chosen to carry over all the points obtained in the first stage to this second stage. The most important reason in general to reduce points is to make sure that in this second stage not everything is already decided. However, due to a limited number of matches in the first stage and a small difference in playing strength, in Denmark this is not necessary, and it is even undesirable as it significantly diminishes the importance of the matches in the first stage.

Finally, a second stage with a top group of 6 or 8 ensures that a fair amount of matches is played in this second stage. This has the positive side effect on the tension in this second stage. Moreover, this number of teams is a good fit with respect to the number of prizes (one champion and ticket for the UEFA Champions League Qualifications, and two (due to the cup possibly three) tickets for the UEFA Europa League Qualifications) that can be obtained via the league.

From the alternatives with these specifics, the qualitative analysis indicates that the Venus formats score best. An important advantage of this format, with a double round-robin of 14 teams in the first stage and double round-robin group of 6 combined with two double round-robin groups of 4 in the second stage, comes from the bottom group. The fact that there is still the possibility of a prize (a European ticket) for the clubs that did not qualify for the top group makes these formats attractive for both stadium and TV audiences, which increases revenues, and therefore, sporting quality.

The Jupiter format has a double round-robin with 14 teams followed by a double round-robin group of 6 and a single round-robin group of 8. It performs less because of the single rounded group, bringing

in 7 games with only the avoidance of relegation as price. It also will lack competition progress in the latter stages for the teams that have saved themselves.

Though the Uranus format is evaluated quantitative rather positive on the result dimensions, this format has two substantial negative characteristics:

- The second group where each club plays four times in the final 12 matches against the three other clubs leads, in combination with two confrontations between the same teams in stage 1, to an, in the whole of Europe, unprecedented six times per season. In these final matches in the bottom group the stadiums could be rather empty and will thus be detrimental to the sales tasks of the commercial department to extend the relationship with both sponsors and season ticket holders.
- The teams that have to play in this group have, even in comparison with the present 3 x 12, a downward risk of 5%.

The last serious candidate is Mars, with a double round-robin of 12 teams followed by two double round-robin groups of 6. However, playing twice results in only 32 match dates, whilst playing thrice will bring the number of matches to a somewhat undesirable number of 37, and will moreover, incur that teams meeting each other 5 times per season on both halves of the table. It also introduces the unequal number of home and away games, though the number of home games will be decided upon by performance (1 till 3 after 22 rounds will win the extra home match) instead of the outcome of a draw.

The Saturn formats, which are double round-robins with 14 teams followed by a single round-robin group of 8 and a either single or double round-robin group of 6, will not bring in much improvement for the top teams since they, coming from earth, drop games in the 3rd round against 9 thru 12 and they get four games against 13 and 14 in return.

For benchmark A Mars 3, Uranus, Jupiter, and both Venus formats are the best option, while for benchmark B the increase of the Superliga to 14 clubs is the best option. The origin lies within the fact that in that case they are more often represented in Superliga, play more matches that on top of that also have more at stake. Overall, the Venus formats score best, with Mars 3 and Jupiter as viable alternatives.

On June 3 and June 10 the quantitative conclusions were discussed and it was concluded that the only acceptable solutions are Mars 2+, Uranus and Venus B.

Note that the formats with 14 teams have the advantage of enlarging the impact in society of the league by increasing the number of matches at Superliga level from 198 up to around 250. In comparison Mars results in less than 200 matches. Formats of 14 will also spread the Superliga over a larger number of catchment areas bringing the highest level of Danish professional football. Note that a competition format with 14 teams does require a transition season.

The innovation of the format of Superliga has the following benefits in comparison to the continuation of the existing format of a triple round-robin competition with 12 teams. These benefits should materialize within five years after introduction, with a significant contribution of the first season.

- The sporting performance of the top 16 teams will increase with an average of about 100 ECI points.
- The sporting performance will lead to a climb of the UEFA County Ranking for club teams with 5 to 8 spots.
- Total revenues will increase up to about 225 million Danish Kroners.
- Match attendance will increase up to Benchmark A 9%, Benchmark B 28%.
- League attendance will increase up to 35%.
- Match TV audiences will increase up to Benchmark A 7%, Benchmark B 30%.
- League TV audiences will increase up to 25%.

This comparison depicts the relative impact of the innovation. The absolute values are dependent on many exogenous factors influencing Danish professional football. Note that although the TV revenues are fixed for the coming six seasons, they are included in the analysis for two reasons. First of all, we consider the potential TV revenues in the long run on which the current contract does not affect this potential. Secondly, since we take into account a time horizon of five years, negotiations with respect to a new TV contract are due at the end of this horizon, and the potential of the league at that moment will have a major impact on the new contract.

8.2 Competition format for 1. Division

Also for 1. Division all the alternative competition formats outperform the current format on all result dimensions. On sporting, attendance, and revenues Mars 2 and Jupiter score best, while Mars 3 and Jupiter score best with respect to TV audience. Saturn 1 also scores well on all result dimensions.

In the end the differences between the alternatives Mars 2, Mars 3, Saturn 1, and Jupiter are small, especially for benchmark B clubs. For these clubs Mars 2 is the overall winner, while for benchmark C Jupiter is a little better. Also in total the Jupiter model wins by a small margin. These outcomes are, however, based on the current competition format in the Superliga. If the number of teams in the Superliga goes to 14, then a format with also 14 teams in 1. Division might not be the best fit.

The discussion with the 1. Division upon the final formats resulted in these conclusions:

- Independent of the final decision on the Superliga format, the 1. Division must contain 12 teams
- The existing format is preferred, Mars 2 is the only viable alternative
- If the Superliga will consist of 12 teams, 1. Division want 2 direct promotion spots
- If the Superliga will consist of 14 teams, 1. Division accepts 1 direct and 1 or 2 indirect promotion spots

Appen-
dices

Appendix I. Glossary

In this appendix we describe some important notions used in the report in alphabetical order.

Attendance:

- **Club attendance:** The home attendances for a club summed over all matches that the club plays in a season.
- **League attendance:** The club total attendance in the league under consideration (i.e., Superliga or 1. Division).
- **Match attendance:** The average home match attendance over all matches played in the competition.

Example: Let us consider a club A in the Superliga in two fictional competition formats. Format I is a round-robin competition with 16 teams. Suppose all 15 home matches of club A attract 15.000 spectators. Then match attendance = 15.000, while club attendance = 15 * 15.000 = 225.000. Suppose, the average match attendance in the league is 12.000. Then league attendance = 16 * 15 * 12.000 = 2.880.000.

Format II is a round-robin competition with 14 teams. Suppose all 13 home matches of club A attract 18.000 spectators. Then match attendance = 18.000, while club attendance = 13 * 18.000 = 234.000. Suppose, the average match attendance in the league is 13.000. Then league attendance = 14 * 13 * 13.000 = 2.366.000. So in Format II match attendance is higher (+20%), club attendance is higher (+4%), but league attendance is lower (-17%) than for Format I.

Benchmark group: On the basis of sporting quality, financial data (revenues and costs), and size of the catchment area all Danish clubs have been divided into benchmark groups. The allocation of the clubs to the benchmark groups is based on the sporting situation of 2014/15 (sporting strength (ECI), sporting level (1 or 2)), the financial data of 2013/2014 (revenues and costs), and the catchment area.

Calendar utilization: A result dimension indicating the difference between the number of matches in a competition format and the ideal number of matches with respect to the utilization of the calendar. Based on the input of the Danish clubs the ideal number of matches with respect to calendar utilization is decided to be 36.

Note that not all clubs necessarily play the same number of matches in a competition.

Competition progress (CP): The significance of a single match for the outcome of the competition (or a relevant stage in the competition). For instance, if on the last match day nr. 1 is 4 points ahead of nr. 2, then the competition progress for the championship is 0. Yet, if they have an equal amount of points, the competition progress is maximal. Competition progress also shows up in the fight against relegation, for European tickets, and for qualifying for a next stage in the competition.

For each game the competition progress of each team indicates to what extend the outcome of the game influences whether or not the team reaches a critical spot. Whether or not a particular position in the league table is critical depends on the format of the competition. For instance, in the current

format the critical positions are 1 (=champion), 3 (=EL ticket) and 10 (=avoid direct relegation). For each of these critical spots we determine the weight of the position, e.g., champion=10, EL ticket=4, No relegation=4. Then for both teams in each game we determine the odds of at least ending up in each critical spot, before the match, after a win and after a loss. With these odds and the weight of the critical positions we determine the competition progress of each team for each match.

Usually, competition progress is low early in the season and steadily increases, before collapsing in the final rounds for most teams and reaching an ultimate high for a few others. In the current format, once it is clear that a team will end up somewhere between the 4th and the 10th spot, there is nothing at stake anymore for them. Introduction of play-offs is likely to affect this.

The idea that competition progress effects stadium attendance is for instance supported by Késenne (2007). He mainly focusses on the top position: "The winning percentage of a team should not become too high. If a team becomes too strong compared with its opponents so that the probability of winning approaches unity, there is no longer any uncertainty of the outcome in the league championship."

Competitive balance (CB): The difference in sporting strength between the teams on the pitch. If both teams are of equal strength, the balance is optimal, and the outcome of the match is highly unpredictable.

Competitive balance is a feature that translates easily from a single match to a competition as a whole. A balanced competition is one with minor variety in sporting strength between the participating teams, and a balanced competition is also an unpredictable one.

Euro Club Index (ECI): A proxy for sporting strength. See Appendix III for more details.

Fairness principle: The fairness principle indicates the probability that the team that collected the most points during the whole season is indeed the champion. Note that with, e.g., a knock-out system this is not necessarily the case.

Players congestion: A result dimension indicating the difference between the number of matches in a competition format and the ideal number of matches with respect to the congestion of the players. Based on the input of the Danish coaches the ideal number of matches with respect to player congestion is decided to be 30.

Note that not all clubs necessarily play the same number of matches in a competition.

Result dimension: An aspect of a competition format that determine on which the format is evaluated. The importance (weight) of each result dimension is indicated by the stakeholders, and are therefore the guiding principles for determining the quality of a competition format.

Revenues

- **Match day revenues:** The revenues out of ticketing per season for a club.
- **TV revenues:** The potential revenues from TV contracts per club. Since we know the explanatory variables of TV audience from statistical analysis, we can give a reasonably good estimate. Of course, the actual revenues depend on the terms of the contracts.
- **Commercial revenues:** The revenues from sponsoring per club.

- **European revenues:** The revenues from the performance in the UEFA Champions League and UEFA Europa League per club.

Sporting quality: We use the Euro Club Index to measure a team's sporting quality. For a competition format, the integral sporting quality is built up from:

- the average ECI's of all matches of the home team,
- the average ECI's of all matches of the away team,
- and the average ECI's of all matches of the best team on the pitch (for the neutral football supporter)

TV audience:

- **Club TV audience:** (similar to club attendance) The match TV audience for a club summed over all matches that the club plays in a season.
- **League TV audience:** (similar to league attendance) The club TV audience in the league under consideration (i.e., Superliga or 1. Division). A club might not always play its matches in that league, by promotion/relegation it might also play in another league. In League TV audience we only take into account the matches played in the specific league under consideration.
- **Match TV audience:** (similar to match attendance) The average TV audience over all home matches played in the competition.

Appendix II. Formats

The competition formats discussed in the report are selected from a wide group of alternatives that have been under consideration. In this appendix we review the alternatives that did not make the final cut, and the underlying reasons. We start off with some general arguments for dismissal before we discuss the formats, sorted by the number of teams in the format, in more detail.

Odd groups

A competition itself, or a group in a second stage can consist of either an even or odd number of teams. All formats with an odd number of teams in any stage are omitted as odd groups have several disadvantages. First of all, the fact that in each round one team is idle makes that supporters of a team cannot see their team in each round. Secondly, since in each round one team is idle, the number of matches played by the teams is (almost) never the same, which makes the league table confusing. Thirdly, competition planning becomes rather difficult with an odd number of teams, as more match days are needed for the same number of matches per team. Fourthly, in particular close to the end of the competition a situation in which the number of matches played by the teams is unequal can be quite unfair.

Reducing the points

Several formats under consideration have a second stage in which groups play in a round-robin format. In that case the question is to what extend the points obtained in the first stage are carried over. In general we consider either formats with a 50% or 100% carry-over of points. The most important reason in general to apply a 50% carry-over is to make sure that in this second stage the competition progress is still good. However, in Denmark this is not necessary. First of all, in the competition formats under consideration the first stage has relatively few matches. (The first stage consists of either 22 or 26 matches, while in Belgium, e.g., the number of matches in the first stage is 30.) Secondly, the difference in playing strength in Denmark is relatively small. (The difference in ECI-value between the numbers 1 and 6 on the ECI-ranking in Denmark is approximately 350, while in Belgium, e.g., this is over 500.) Due to these two factors the teams are generally still in close range after the first stage. Consequently, in Denmark a 50% carry-over is not only unnecessary, but even undesirable as it significantly diminishes the importance of the matches in the first stage. Consequently, the additional competition progress in the second stage is less than the diminished competition progress in the first stage.

Top groups of 4

Several formats have a second stage in which a top group of 4 teams play for the prizes (champion and a ticket for the UEFA Champions League Qualifications, and the tickets for the UEFA Europa League Qualifications). Groups of 4 are, however, not a good fit for the Danish competition. In all the formats in which in the second stage there is a top group of 4, these 4 teams meet each other twice, resulting in 6 additional matches per team. The impact of these six matches on the final outcome is in general

limited. Moreover, the additional focus for this final stage then only extends to six matches. Furthermore, currently three teams can earn a European ticket via the Superliga. This means that the competition progress in the second stage for this top group is likely to be poor. This problem even increases when Denmark is able to rise on the UEFA Country Ranking and a fourth European ticket is available via the league. Even in case after this second stage a playoff between the loser of the top group and the winner of a middle group determines which team gets the final European ticket, the competition progress in the top group is far from optimal.

Formats with 10 teams

Three formats with 10 teams have been under consideration, but are all dismissed. A general problem with these formats is that with a Superliga of only 10 teams, large areas of Denmark are without Superliga football. Also based on the analysis that in Denmark there is room for 30 professional football clubs, a competition format with only 10 teams is not a good fit.

The three formats are briefly explained below with additional arguments for their dismissal.

4 x 10
In this format 10 teams play each other four times.

This format is also excluded on the basis that a quadruple round-robin still consists of only one stage. Therefore, the problem of many dead matches still exists, and hence, competition progress is poor.

2 x 10 + 4 x 5
In this format 10 teams play each other two times in the first stage. In the second stage the top 5 play each other 4 times, while the bottom 5 play each other 4 times as well.

This format is also excluded on the basis of odd groups in the second stage. Moreover, teams playing each other six times a season is undesirable.

2 x 10 + (4 x 4 and 2 x 6)
In this format 10 teams play each other two times in the first stage. In the second stage the top 4 play each other 4 times. The bottom 6 play each other 2 times in the second stage.

This format is also excluded on the basis that the number of matches for the teams in the bottom group is only 28, where the minimum number is 30. Moreover, it is excluded as in the second stage there is a top group of 4, and teams play each other six times.

Formats with 16 teams

Two formats with 16 teams have been under consideration, but are all dismissed. A general problem with these formats is that 16 teams is generally considered too much for the Danish leagues. Additional problem of formats with 16 teams is that a double round-robin already consists of 30 matches, which makes the possibilities for a second stage limited.

The two formats are briefly explained below with additional arguments for their dismissal.

2 x 16

In this format 16 teams play each other two times.

This format is also excluded on the basis that a double round-robin still consists of only one stage. Therefore, the problem of many dead matches still exists, and hence, competition progress is poor.

2x16-(4/8/4)

In this format 16 teams play each other two times in the first stage. In the second stage the 16 teams are split up into 3 groups. The top group of 4 play each other two more times. The middle group of 8 determine via a knock-out tree which team competes with the number 3 of the top group for the third European ticket. The bottom group of 4 play each other two more times to determine which teams stays in the Superliga and which teams relegate to 1. Division.

This format is also excluded on the basis that in the second stage there is a top group of 4.

Formats with 12 teams

Due to the previous arguments, only formats with 12 or 14 teams remain. However, one format with 12 teams is also dismissed.

Capacent model

In this format the 12 Superliga teams play each other two times in the first stage, while the 12 teams in 1. Division do the same. The second stage consists of three groups of 8 teams: the top 8 of the Superliga form the top group, the bottom 4 of the Superliga combined with the top 4 of 1. Division form the middle group, and the bottom 8 of 1. Division form the bottom group. In this second stage all teams within a group play each other two times. Then the top group, combined with the top 4 of the middle group forms the Superliga in the upcoming season. The numbers 7 and 8 of the bottom group relegate to 2. Division, while the bottom 4 of the middle group, the top 6 of the bottom group and two teams from 2. Division form 1. Division in the upcoming season.

This format was suggested in 2009 by Capacent. Back then it did not have enough support to be implemented, and now, 6 years later, this has not changed. Besides, this model has some clear disadvantages. First of all, the carry-over of points is impossible for the middle group, as the teams come from different leagues. Consequently, the end of the first stage is likely to have a relatively great number of matches where for (at least) one of the teams there is nothing at stake. Secondly, in the second stage, the tension in (especially) the bottom group is limited, as 8 teams play each other twice, only in order to avoid the bottom two positions.

Formats with 14 teams

The following 14 formats have not made the final cut.

2 x 14 + promotion/relegation playoffs

In this format 14 teams play each two twice after which there are promotion/relegation playoffs.

This format is excluded on the basis that the total number of matches for most teams is 26, where the minimum number is 30.

2 x 14 + (1 x 6 and 1 x 8)

In this format 14 teams play each other two times in the first stage. In the second stage the top 6 play each other one more time. The bottom 8 play each other once as well in the second stage.

This format is excluded as it evaluates worse than the format Jupiter, in which the top 6 play each other two times instead of one. These additional five matches for each team in the top group fit within the limits of the total number of matches (36) and have great benefits as these matches are between top teams with (in general) something at stake. Hence, they have a positive impact on the sporting quality of the teams and are highly interesting to the public. Consequently, the format in which the top 6 play each other twice is preferred over this format in which they only play each other once in the second stage.

2 x 14 + (2 x 6 and 2 x 8)

In this format 14 teams play each other two times in the first stage. In the second stage the top 6 play each other two times. The bottom 8 play each other two more times as well in the second stage.

This format is excluded on the basis that the total number of matches for the bottom group is 40, where the maximum number is 36.

2 x 14 + (2 x 8 and 2 x 6)

In this format 14 teams play each other two times in the first stage. In the second stage the top 8 play each other two times. The bottom 6 play each other two more times as well in the second stage.

This format is excluded on the basis that the total number of matches for the top group is 40, where the maximum number is 36.

2x14-(4/8/2)

In this format 14 teams play each other two times in the first stage. For the second stage the 14 teams are split up into 3 groups. The top group of 4 play each other two more times. Two middle groups of 4 play each other two more times as well and the winners of both groups determine in a playoff which team competes with the number 3 of the top group for the final European ticket. The losers of the middle groups determine in a playoff which team competes with the winner of the bottom group which team has to fight against relegation against a team from 1. Division.

This format is excluded on the basis that in the second stage there is a top group of 4.

2x14-(6/6/2)

In this format 14 teams play each other two times in the first stage. For the second stage the 14 teams are split up into 3 groups. The top group of 6 play each other two more times. The middle group of 6 play each other two more times as well. After this second stage the winner of the middle group plays a playoff of one away match against the number 3 of the top group for the final European ticket. Finally, there is a bottom group of 4, formed by the numbers 13 and 14 from the Superliga first stage and the numbers 2 and 3 from 1. Division who fight for one Superliga ticket for next season. (The other ticket is for the champion of 1. Division.)

This format is excluded as it evaluates worse than the Venus A format. The main reason is that the competition progress in the second stage for the middle group is poor, as there is only one critical position (the first) to play for with 6 teams over 10 matches.

2x14-(6/6/2)

Appendix III. Euro Club Index

A healthy sports organization ensures that its sporting ambitions and finances are balanced out. The interaction between those dimensions can only be brought to the surface if you have a reliable proxy for sporting quality. To this end, Hypercube developed such a ranking, called the Euro Club Index (or ECI: www.euroclubindex.com). It ranks more than 700 European professional football clubs from 52 countries.

How does it work? A club's sporting strength is determined on the basis of only its results, since 2004, where recent results carry more weight than older ones. The cornerstone of the ECI is the difference between the actual match result and the expected match result. The latter is deduced from the ECI-value of the competing teams. If the actual result is better than expected, a club earns points on the ECI; if worse, it will lose some.

When a strong team plays against a weaker team, the expected result is close to a win. Then, with an actual win, the strong team gains only a few points on the index. Yet if a relatively weak team beats others against the odds, a lot of points are gained on the index by this weak team.

The fact that in the ECI recent results are given more weight and that it differentiates between matches against stronger and weaker opponents makes the ECI a much more reliable proxy for sporting strength than any other ranking, e.g., the league table. As a result the ECI correlates very well with the clubs' financial figures such as turnover and team costs, and it is an excellent predictor of match results.

Some rules of thumb may be useful for interpretation of the ranking. A typical UEFA Champions League winner has over 4.000 points, and a typical UEFA Europa League contender 2.500. The 1st on the ECI ranking has about 4.300 points, the 25th 3.000 and the 100th 2.300.

Objective

The ECI is a ranking of all the football teams in the highest division of all European countries that shows their relative playing strengths at a given point in time. The ECI makes it possible to calculate the probabilities of different match results (win, draw, loss) for football matches in the near future.

Concept

The ECI-value of a team represents the expected level of sporting success. The ECI-values are derived from (historical and recent) sporting results: in league matches, in national cup matches and in Champions League, Europa League and Super Cup matches.

Reliability

The ECI-values are calculated, based on all relevant match results from several recent seasons, using statistical methods. The impact of more recent matches on the ECI-value is higher than that of older matches. The ECI is constructed in such a way, that its predictive force is maximized.

Application

European ranking

The weekly published ECI-ranking for all the teams in the highest division of all European countries reflects the actual playing strengths in Europe. Biannual reports show the development of playing strengths for teams and countries.

National ranking

For each country a national ranking is published weekly, as a subset of the ECI. The impact of the match results of the previous week on the ECI-values is shown. Biannual reports show the development of playing strengths of the teams.

Match prediction

The actual ECI-values will be used to give the probabilities of the different match results for upcoming matches. This is interesting for the general public, for the media, for the clubs and for betting purposes.

Method

Start values of ECI

Based on the sporting results of three consecutive seasons, the relative playing strengths are calculated of all relevant teams within each country on the start date (i.e., July 1, 2007). Also the relative strengths are calculated of the teams that have represented their country in the Champions League, Europa League and Super Cup. The result is an ECI-value for all relevant teams on the start date.
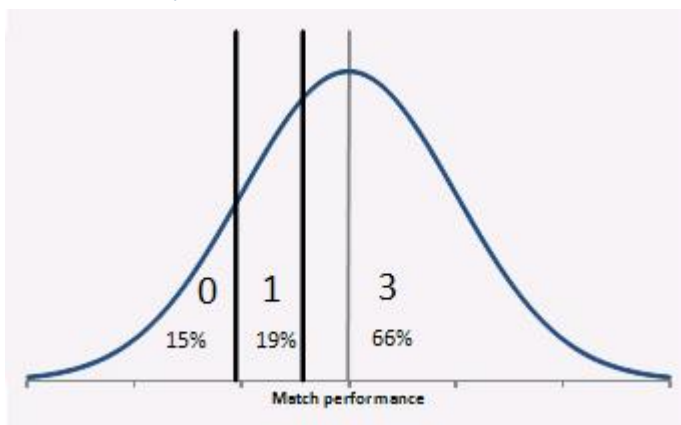
Match result probabilities

Figure III.0.1 Example of the probability on home win/draw/away win

The expected result of a football match depends on the playing strength of the teams, the home advantage and the match performance of the teams. The playing strength is given by the ECI-values. The match performance will vary according to a normal distribution. This way it is possible to calculate the probabilities of the different match results (win, draw, loss). Example: the ECI-value of the home team is 500 points higher than the ECI of the away team, which results in a probability of a home win of 66% (area 3 in the Figure VIII.1).

Actual values of ECI

After the start date, the result of every match will change the ECI-value of both teams that played. The estimated outcome of the match (a real number between -1 and 1) is compared with the real outcome of the match (1 for home win, 0 for draw, and -1 for away win). The difference between the two numbers is multiplied by a constant, the k-factor, which depends on the competition in which the match is played. The result is added to the home team ECI and subtracted from the away team ECI. Example: a match between team X with ECI_X = 2,400 and team Y with ECI_Y = 1,900 has an expected result of: 1 x 66% + 0 x 19% - 1 x 15% = 0.51. Table VIII.2 shows the changes in ECI based on the match result (in this example the k-factor = 35).

Match Result	ECI-increment	ECIX	ECIY
Home team win	35 x (1 − 0.51) = 17	2,400 + 17 = 2,417	1,900 − 17 = 1,883
Draw	35 x (0 − 0.51) = -18	2,400 − 18 = 2,382	1,900 + 18 = 1,918
Away team win	35 x (-1 − 0.51) = -53	2,400 − 53 = 2,347	1,900 + 53 = 1,953

Table III.0.2 Example of the probability on home win/draw/away win

The updated ECI-values reflect the changes in playing strength. The team that performs better than expected will go up on the ECI, the team that performs worse than expected will go down on the ECI.

League Odds

After each round in a league, the odds for the championship of the league are calculated, based on the actual standing and the match result probabilities for all remaining matches. For each team the expected number of points at the end of the competition is calculated, with the corresponding bandwidth. Also for each team the chance to become champion is calculated.

Sometimes it happens that a team with a smaller number of expected points has a higher chance of winning the championship, which is due to the bandwidth in the remaining schedule. For example if team A has an expected number of points of 75 +/- 2 and team B has 74 +/- 4 it is possible for team B to have higher championship chances.

Appendix IV. Sports economic cycle

In this appendix we discuss the underlying notions of the sports economic cycle in more detail, which is based on (scientific) literature and supported by our own analyses. Here we first focus on the cost or expenditures side of the cycle, then on the revenues side. References are at the end of the appendix.

Expenditures

The sports economics cycle has the underlying assumption that player salaries are the most important determinant of field performance, which follows, e.g., from Késenne (2007): "The players are the most important labour input in the industry of professional team sports." Hall et. Al (2002) add: "The common-sense view is that you get what you pay for. Teams compete in the market for playing talent, bidding up salaries to the point where wages equal marginal revenue products, and therefore total payroll is a perfect predicator of performance." Moreover, in their paper they specifically examine the relationship between pay and performance in English football in the period 1974-1999 and conclude that Granger causality tests affirm that the causality runs from payroll to performance.

Our previous studies, e.g., for Dutch professional football, also show a higher correlation between total players salary and sporting performance (ECI), than between total expenditures and performance. Therefore, we use total player salary as the 'coins in' that result in the 'points out'.

Revenues

On the revenues side the assumption of the sports economics cycle is that the better the sporting performance of a club (measured by ECI), the more income the club can generate. First of all, stadium attendance will grow with an increase of the sporting quality. This notion is supported by Késenne (2007): "A second variable (the first one is what we call 'catchment area') that is considered very important for club attendance is the performance of the team on the field or its playing success." Also "Besides the relative quality of a team, its absolute playing quality can also affect a club's attendance. It makes a difference to fans if their home team is the best in a high-quality league or the best in a low-quality league. Spectators like to watch the spectacular performances of the star players."

Another source to support this concept is García and Rodríguez (2002), who consider the determinants of football match attendance in Spain the period 1992-1996. Since they do not have a specific indicator for sporting quality, like the ECI, they introduce all kinds of variables to capture the quality level of a team, both in the long run (e.g., budget, the number internationals) and in the short run (e.g., the number of home wins in the last three games and the result in the most recent game). Nevertheless, they find that all variables that proxy long run quality have a positive sign, as do most of the short run variables (some are not significant). The ECI is a long run indicator of sporting quality that incorporates also the short run performances. The results by García and Rodríguez (2002) therefore support our assumption that a club generates attendance from its sporting quality.

And while attendance is one way to obtain revenues, there are of course more. However, as stated by Késenne (2007): "Stadium attendances determine a club's gate receipts. Broadcasting rights and commercial income, such as sponsorship, merchandising and licensing, have gradually taken over. Nevertheless, there seems to be a positive correlation between the sum of the commercial revenues on the one hand and stadium attendance on the other." Hence, the sporting quality of a club directly influences stadium attendance, which then influences (all) other revenues.

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Appendix V. Opponents in the league

In this appendix we show the rank of the opponents in the league for the several competition formats from the perspective of several specific ranks. We start by the opponents of the number 1 of the league in Table V.0.1. On the horizontal axis the several competition formats are given. On the vertical axis the number of home and away matches, not including knock-out matches are stated. Where all teams from the top 6 are given a green color, the next 6 (numbers 7 – 12) have the orange color and the following 6 (numbers 13 – 18) have the red color.
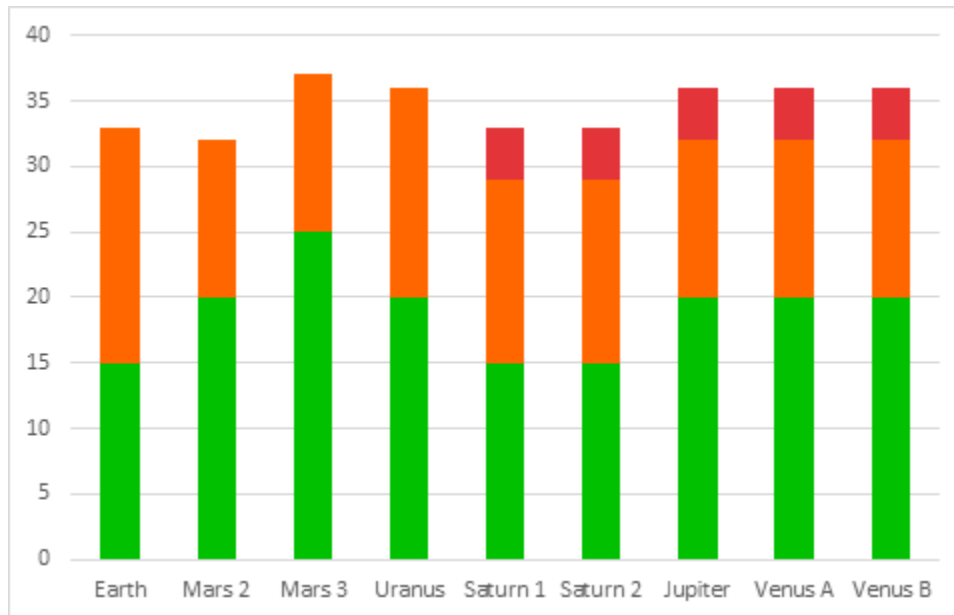
Table V.0.1 The opponents of the number 1

Note that in all alternatives the number of matches that the number 1 plays against top 6 teams is at least the same as in the current format, both absolute and relative. Moreover, the number 1 plays most often against top 6 teams in format Mars 3.

Note also that Table V.0.1 also represents the ranks of opponents for the other teams in the top 6, as in all formats the top 6 are in the same group. A similar argument holds for other equivalent positions. Consequently, we only display these rank of opponents tables for positions 1, 7, 9, and 13.
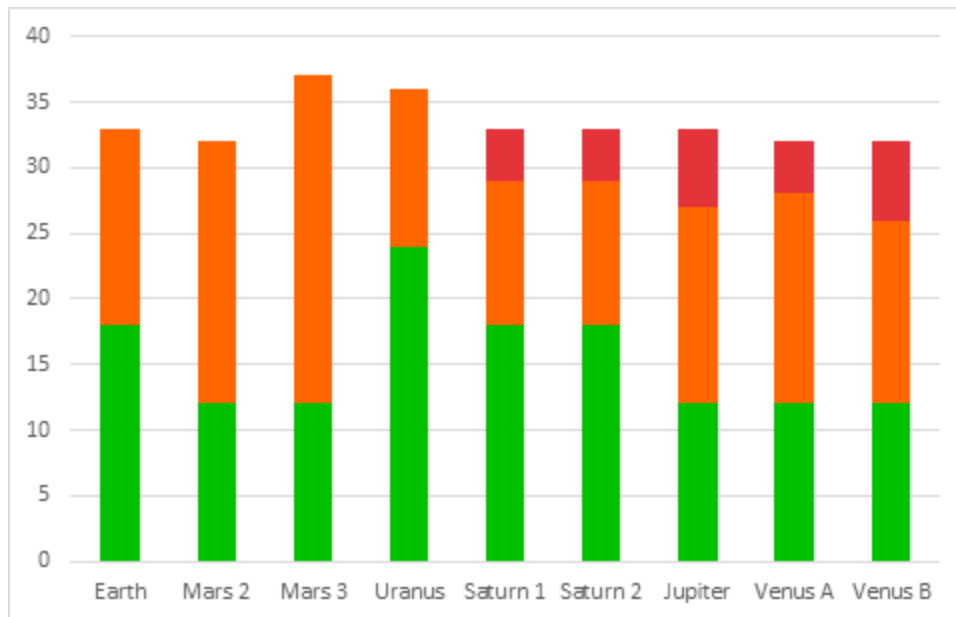
Table V.0.2 The opponents of the number 7

For the number 7, formats with a top 6 obviously imply that that team will meet the top 6 teams less frequent than in the current format. As Uranus and the Saturn formats have a top 8, the number of matches against top 6 teams is at least the same for the number 7 as in the current situation.
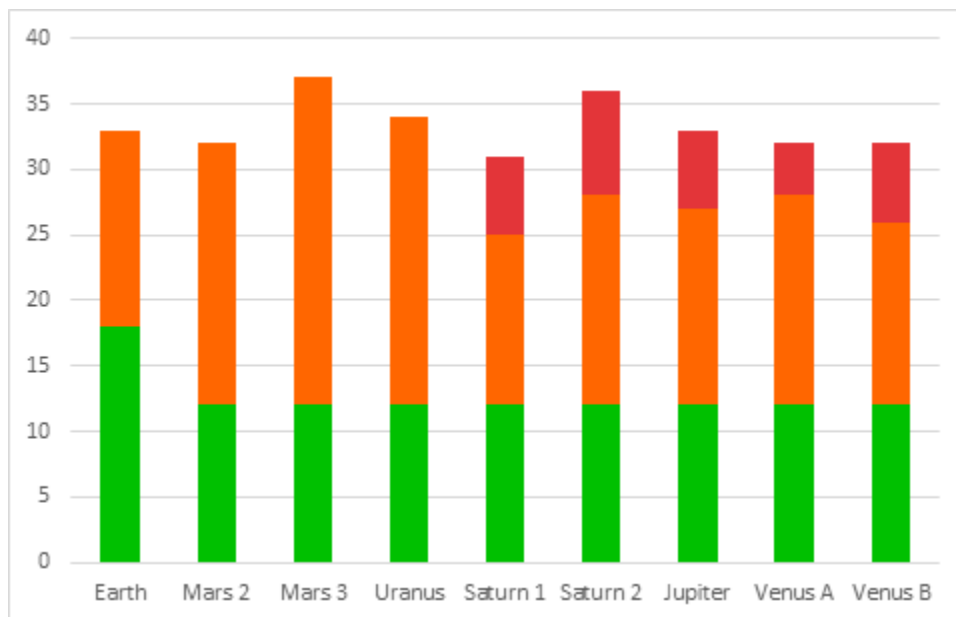

Table V.0.3 The opponents of number 9

In the current format the number 9 meets all teams from the top 6 exactly 3 times. In all the alternatives the number 9 will not be part of the top group. Consequently, the number 9 will meet the top 6 only in the first stage of the competition. For Uranus and the Saturn formats, the number 9 will not meet the numbers 7 and 8 anymore either. For the other formats the number 9 will meet those teams in the second stage.
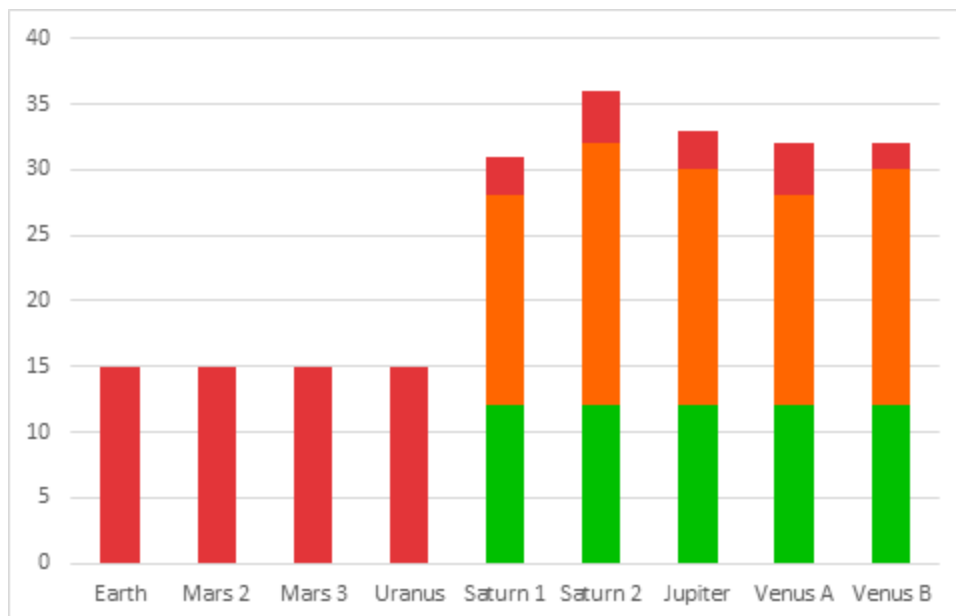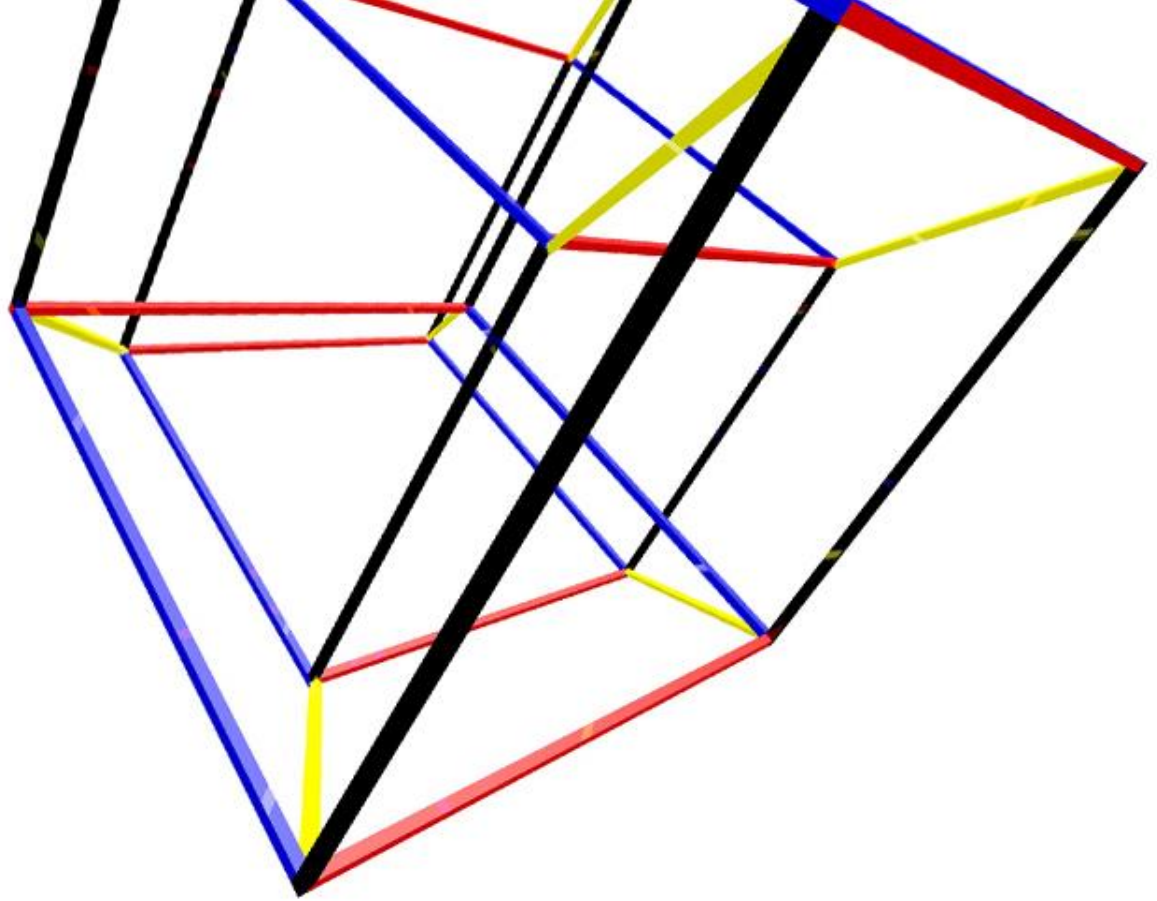
Table V.4 The opponents of the number 13

Since the number 13 is not part of Superliga in the 12 formats, including Earth, number 13 does not meet any of the top 6 teams in those formats. In the 14 formats, the number 13 meets the top-6 in the first stage and the second 6 both in the first as in the second stage.

Hypercube Business Innovation
P.O. Box 692
3500 AR Utrecht
The Netherlands

Telephone: +31 30 233 80 80
E-mail: info@hypercube.nl
Chamber of commerce: 30160715

www.hypercube.nl

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