University of Duisburg-Essen
Faculty of Business Administration and Economics
Chair of Economeics

What if they had played?

Predicting the Outcome Kreisliga A Reklinghausen Season 2019-2020

Working Paper

Submitted to the Faculty of
Economics
at the
University of Duisburg-Essen

from:

Nils Paffen, David Schulze

Reviewer: Prof. Dr. Christoph Hanck

Deadline:

Name:	David Schulze	Nils Paffen
Matriculation Number:	–	3071594
E-Mail:	david.schulze@rgs-econ.de	nils.paffen@stud.uni-due.de
Study Path:	–	M.Sc. Economics
Semester:	5th	2nd
Graduation (est.):	–	Winter Term 2021

Contents

List of Figures

List of Tables

List of Abbreviations

1 Introduction

The Covid-19 epidemic forced sports leagues in Germany to suspend championships that were already in full swing. For example, the Kreisliga Herren Klasse 2 in Recklinghausen finished around 150 games, before the rest were canceled starting from Sunday 2020-03-12, leaving around 90 games left unplayed until the last planned day of the tournament on Sunday 2020-05-24. Given the distinct possibility that there won't be a chance to make up those games later, a burning question for many players and fans is naturally: What if they would have played those games? We attempt to use data on games already played from the website fussball.de to answer this question, drawing on established forecasting methods from the literature.

2 Literature

Some difficulties that have to be addressed in predicting outcomes of e.g. the FIFA World Cup, are not relevant to the Kreisliga. For example, the league system in Germany features two rounds per season. Each club plays each other club tiwce: Once in each round, and once on each club's home field. This reduces the uncertainty, when compared with the mode of the World Cup. There, in the group stage groups are determined by luck of the draw, a process known as "seeding". Groups then play a so called round-robin tournament, also known as all-play-all, were every every group member plays each other, which corresponds to the mode in which the Kreisliga plays. The World Cup then continues with single-elimination, or a knock-out stage, which introduces another even more random path dependencies. This implies that the existing literature on forecasting results in the FIFA World Cup group stage is highly relevant for the task at hand, since the game rules are identical.

A natural starting point for forecasting match or season outcomes in football tournaments is using the FIFA points ranking method that is used canonically to evaluate the strength of a team and updated after each game. For example, a recent study by Correa et al. (2018) uses FIFA points to forecast the results of the 2018 FIFA Men's World Cup. This approach has however generated criticism and other methods have been proposed and evaluated. The benchmark study by Laseck et al. (2013) compares established and proposed rankings. They find that FIFA rankings used to perform slightly worse than alternative methods, especially two versions of the Elo rating system originally proposed by Arpad Elo for the United States Chess Federation to rate competitive chess players. We will consider using the FIFA points method or these two alternative candidates.

The first candidate model is published by the anonymous website EloRatings.net (2012), and

FIFA Women's World Rankings, which has been in use since 2003. It is worth noting that the FIFA Men's World Rankings have been adapted in 2018 to also be based on a modification of the Elo ranking.

The website FuPa.net (2020) also publishes detailed statistics as well as a so called "Power-Ranking" to evaluate the "Formkurve", a rough measure of recent performance. Because it is only reflective of very recent games, it is not useful for long term forecasting. Another raw measure would be to calculate the probability of winning by dividing team's current points (victories are 3, draws are 2) by the total of their and their opponent's points, we can call this the "points model".

All these models just use weighted game results or point scores. Another approach would be to use more data, as in Berbée et al. (2015). While this concerns baseball, the principle is not dependent on the rules of the game, but it is based on the influence of individuals' and team's statistics on game outcomes. This is an application of the model proposed by Albert and Bennet (2007). They use the fact that wins and losses appear to be normally distributed in the long run, so chance and skill should both play a role. Team ability is then calculated as the deviation from the average winning probability over time. Very generally, available statistics are then evaluated to find those that matter the most for team performance, measured in runs per game, which would be goals in football. Those candidate factors are then weighted by regressing them on the team performance. The resulting index is then used to calculate a winning probability and this used then to simulate the season outcome by using weighted coin-flips.

While there is not as much individual player data in football on the level of our analysis, the team average is still something that can be calculated. Also, more information on the games, such as location at home or away, could be candidate factors for performance. For example, one team might benefit more from playing at home than it hurts by being away, receiving a net benefit from location, or the other way around. While these data are certainly interesting, we must be aware of the danger of overfitting the model.

Finally the literature contains references to using betting markets as a benchmark, as they perform relatively well as predictors. For the Kreisliga however, we don't expect betting markets to be deep enough to reach this level of accuracy. Otherwise, they would also be an interesting reference point.

3 Data

(Nils: Describe the website and scraping process)

(David: Describe calculating the values needed for the models.)

4 Predictive Model

To predict the outcome of the cancelled games, we calculate the candidate rankings and use them to simulate the end of the 2019/2020 season. Specifically we calculate the EloRankings.net Ranking, the FIFA Women's Ranking, the points model and a version of the Total Team Average incorporating additional information. We discard the classic FIFA Men's Ranking, since it was shown to perform worse than the other candidates and was discarded by the FIFA Men's World Rankings as well in 2018.

Following Correa et al. (2018), we then run the simulation by drawing the results of each game from a binomial distribution. For each game and team, the probability of winning is dividing the ranking points awarded each team by their and their competitors sum of points.

Running this simulation repeatedly should indicate the distribution and expected average of outcomes. Correa et al. (2018) execute 200,000 runs, but because of the relatively low complexity of the Kreisliga's format compared to the World Cup, especially because there are no eleminiation rounds, we expect to need less repetitions.

5 Results

6 Conclusion

References

Albert, J., & Bennett, J. (2007). *Curve ball: Baseball, statistics, and the role of chance in the game.* Springer Science & Business Media.

Correa, M., Barrera-Causil, C., & Marmolejo-Ramos, F. (2018). The next winner of the 2018 fifa world cup will be...: An illustration of the use of statistical simulation to make a prediction in a complex tournament. *Chilean Journal of Statistics (ChJS)*, *9*(1).

Fupa.net [Accessed: 2020-04-16]. (2020).

Lasek, J., Szlávik, Z., & Bhulai, S. (2013). The predictive power of ranking systems in association football. *International Journal of Applied Pattern Recognition*, *1*(1), 27–46.

Lobeck, M., Schulze, D., & Berbée, P. (2015). Can he hit? measuring and prognosis of offensiveperformance by baseball teams and individual teammembers. *Seminar Paper, B.Sc. VWL HU Berlin.*

The world football elo rating system [Accessed: 2012-03-03]. (2012).