IPL Playoffs: Does the best team win?

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1 Introduction

Sports is one of the most popular form of entertainment. Various sporting leagues have come up which are played throughout the world. We will consider one such sporting league for the project. Indian Premier League (IPL) is an annual T20 (20 overs each side) cricket league played in India which was started in 2008. It was played between 8 teams for most of the seasons, however it has been expanded to 10 teams recently. When the tournament was played between 8 teams, the tournament followed a double round robin format where the top 4 teams at the end of league stage play the play-offs to determine the champions.

Figure 1 explains the playoff structure of IPL. The way play-offs are designed, the teams placed 1^{st} or 2^{nd} at the end of league stage get 2 chances to make the final and cannot finish below position 3 at the end of the tournament whereas teams placed 3^{rd} or 4^{th} at end of league stage can finish at any position from 1 to 4 at the end of the the tournament.

Figure 1: IPL Playoff structure

For each of the team which qualified for the play-offs, we would like to determine the chances of finishing at positions 1 to 3 (for teams finishing 1^{st} or 2^{nd} at end of league stage)

2 Data

The data considered for this analysis is available from the league standing table which is commonly referred to as points table (at the end of the league stage). The data is obtained through IPL website for all the years from 2011 upto 2021. Please note that the data for years 2008 upto 2010 is also available but we do not consider it since the league followed the traditional semi finals and final match style which is different from the current playoff structure.

3 Exploratory Data Analysis

We consider the team which finished at the top of the table at conclusion of league stage of the tournament as the 'best' team. Best team in the sense that no team has scored more number of wins than this team and in case of same number of wins, the team finishing at the top of league stage has better net run rate than the team with same number of wins.

We would naturally expect this 'best' team to go on to win the playoffs win the tournament. But let us see it it really is the case. Below table indicates the year, team that topped the league stage and the position it finished at the end of playoff.

Year	Team at 1^{st} position	Result	Team at 2^{nd} position	Result
2011	Royal Challengers Bangalore	Runner Up	Chennai Super Kings	Champion
2012	Delhi Daredevils	Third Place	Kolkata Knight Riders	Champion
2013	Chennai Super Kings	Runner Up	Mumbai Indians	Champion
2014	Kings XI Punjab	Runner Up	Kolkata Knight Riders	Champion
2015	Chennai Super Kings	Runner Up	Mumbai Indians	Champion
2016	Gujarat Lions	Third Place	Royal Challengers Bangalore	Runner Up
2017	Mumbai Indians	Champion	Rising Pune Supergiants	Runner Up
2018	Sunrisers Hyderabad	Runner Up	Chennai Super Kings	Champion
2019	Mumbai Indians	Champion	Chennai Super Kings	Runner Up
2020	Mumbai Indians	Champion	Delhi Capitals	Runner Up
2021	Delhi Capitals	Third Place	Chennai Super Kings	Champion

Table 1: Top two teams of the league stages

The team which finished the league stage at position 1 went on to win the tournament only 3 out of 11 times whereas the team which finished the league stage at position 2 went on to win the tournament 7 out of 11 times. The team which finished the league stage at position 1 went on to finish as runner up 5 times out of 11 and and at third place 3 out of 11 times whereas the team which finished the league stage at position 2 went on to finish as runner up 4 times out of 11 times with no 3rd place finish. This translates to the following probability table for eventual results for the top two teams of the league stage.

Result	Probability (for 1^{st} placed team)	Probability (for 2^{nd} placed team)
Champion	0.2727	0.6364
Runner up	0.4546	0.3636
Third place	0.2727	0

Table 2: Probability of result for top two teams of the league stage

Apparently the 'best' team (of league stage) finishes runner up more often than it goes on to win the league whereas the 'second best' team (of league stage) finishes winner a whopping 63% of the times. The team placed second during the league stages has played the finals every single time. However we have a relatively small sample size of 11 which makes it difficult for us to make strong statements.

4 Methods

We will take the Bayesian approach which might give better insights. We consider the probability of finishing the tournament as winner, runner up and third place are random variables as well. We can pass our belief about these probabilities in the form of prior distribution.

Let Y_i and be the random variable which indicates the position at end of tournament for the team under consideration (top two teams of the league stage) in i^{th} year where $i =$ 1,...,11. Y_i takes value 1, 2 and 3 with probabilities p_1, p_2 and p_3 respectively. Since we are considering the probabilities as random variables, we will consider the Dirichlet(α_1,α_2,α_3) prior. Since we are considering the model for each of the teams independently we will define the common model.

The model we consider for both the teams independently is as follows

$$y_i \overset{i.i.d}{\sim} Categorical(p_1, p_2, p_3)$$
$$p_1, p_2, p_3 \sim Dirichlet(\alpha_1 = 1, \alpha_2 = 1, \alpha_3 = 1)$$

We will choose a non-informative prior such that we believe the team has equal chance of finishing at any position from 1 to 3. This is to ensure the prior does not influence the likelihood (due to low sample size).

5 Results

The data for 11 years (2011 - 2021) was used for the analysis which was run through RJAGS package in R software. We get the posterior probabilities of finishing at each position from 1 to 3 and the corresponding 95% credible intervals for the tp 2 teams of league stage along with the posterior interval plot.

5.1 Team placed first at the end of league stage

The posterior 95% credible intervals for probability of finishing at each position from 1 to 3 obtained from the Categorical-Dirichlet model for team placed second in league stage can be seen in figure 2 and values can be found in table 3

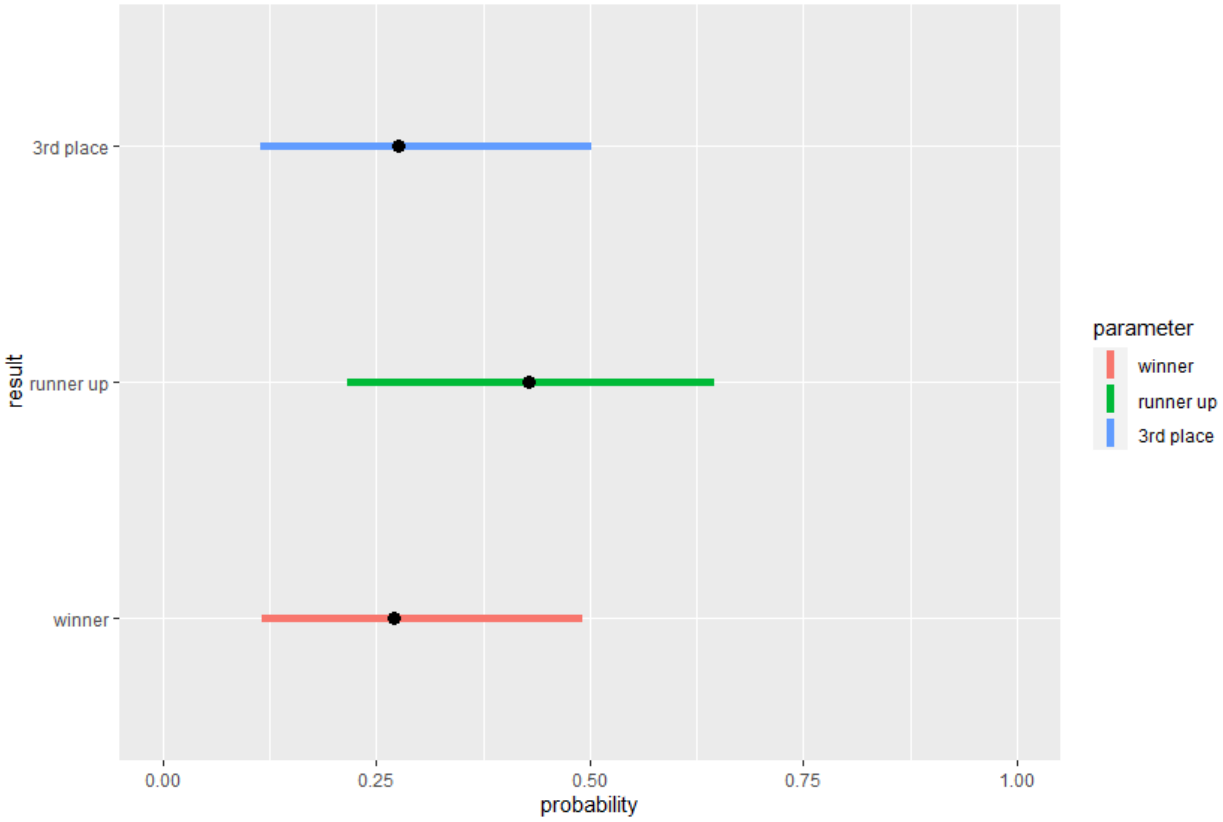

Figure 2: Posterior probability credible interval for team placed 1^{st} in league stage

Result	Probability	95% credible interval
Champion	0.2844	(0.1998 , 0.5387)
Runner up	0.4281	(0.1861 , 0.6813)
Third place	0.2875	(0.0948 , 0.5420)

Table 3: Posterior probability and credible intervals of result for team placed 2^{nd} in league stage

We can say the true value of the probabilities lie withing the credible intervals with 95% probability. For the team placed first at the end of league stage, the probability of finishing the tournament as winner lies anywhere between 0.1998 and 0.5387 with 95% probability.

5.2 Team placed second at the end of league stage

The posterior 95% credible intervals for probability of finishing at each position from 1 to 3 obtained from the Categorical-Dirichlet model for team placed second in league stage can be seen in figure 3 and values can be found in table 4

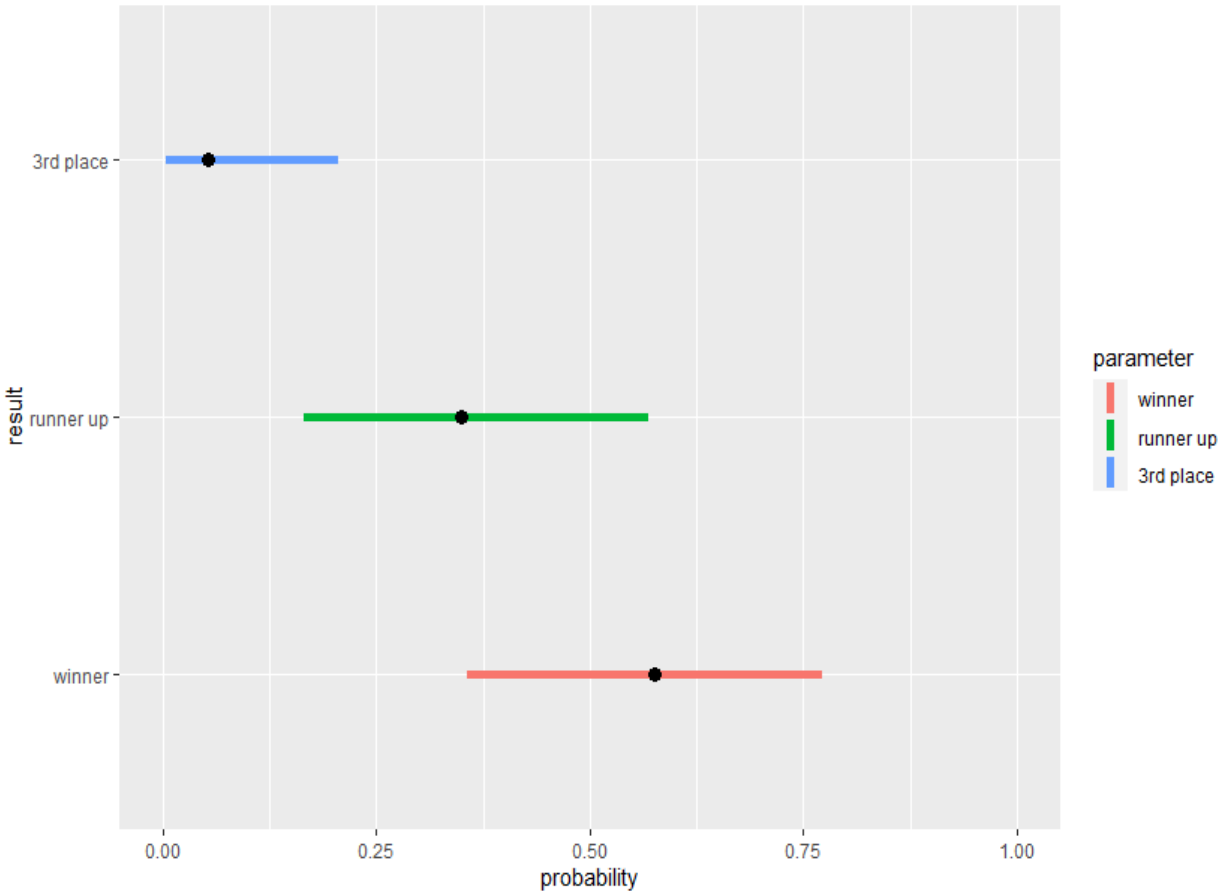

Figure 3: Posterior probability credible interval for team placed 2^{nd} in league stage

Result	Probability	95% credible interval
Champion	0.5733	(0.3148 , 0.8068)
Runner up	0.3542	(0.1344 , 0.6083)
Third place	0.0725	(0.0018 , 0.2439)

Table 4: Posterior probabilities and credible intervals of result for team placed 2^{nd} in league stage

For the team placed second at the end of league stage, the probability of finishing the tournament as winner lies anywhere between 0.3148 and 0.8068 with 95% probability.

6 Conclusion

From the analysis, it seems that the 'best' team (of the league stage) does not have the highest probability of winning the Indian premier league. There might be various reasons to that. It is usually observed that the team which tops the league stage is a team which has performed well in the first half of the league stage whereas the performance starts to get shaky in the second half. Maybe it is the case of 'peaking too early' in the tournament. From the team placed second in the league stage, it might be the added motivation of just missing out on the top spot which migh make them a little more 'desperate' than the first placed team to win the league. It might simply be the case of 'peaking at the right time' in the tournament.

It might be interesting to study this results from the psychological perspective as it is an interesting result.

To conclude, the 'best' team (of the league stage) does not go on to win the Indian Premier League.