Impact of established clubs on probability of survival in top leagues

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ey and Dr Allistair McRobert

INTRODUCTION

Football leagues across the world apply the European promotion-relegation model, where the best teams in the highest-ranking minor league are promoted to the major league from which the worst teams are relegated to the former.

This research proposes a simple statistical model that calculates the probability of non-established clubs avoiding relegation, by assuming the existence of a cohort of established clubs, which rarely if ever are relegated.

The number of established clubs which is critical, rather than which clubs should be so categorised.

MODEL

The statistical model proposed utilises three items of data: T = the total number of clubs in the league in question; E = the number of clubs that are deemed to be members of the Established group; R = the number of clubs that are Relegated from the league in question.

• Assuming that all clubs outside the established group have an equal chance of surviving, it follows that the probability (P) of a non-established club avoiding relegation in a given season is:

\[ P = \left( \frac{T - E}{T - R} \right) \]

• The probability of a non-established club surviving n seasons is therefore P^n.

RESULTS

• Table 1 shows that the model probability for a non-established club not being relegated within eight seasons ranges from 0.04 to 0.12, according to size of cohort of established clubs. Assuming that there are no non-established clubs has a probability of 0.05, which is nearly 100% greater than the probability for a cohort of eleven established clubs. The results suggest that the assumption of cohorts of established clubs is valid in this research.

• Table 2 provides the probabilities of non-established clubs surviving in the EFPL based upon the number of seasons observed in each club’s spell in the league. The first two sets are the observed probabilities with the LOS truncated from 1992/93 onwards (based on A) for the two sizes of established group. The third and fourth sets are the observed probabilities with the full LOS (based on B) for the two sizes of established group. To be consistent with Table 1, Table 2 is also limited to eight seasons.

• Observed probability of club surviving seasons is only 0.09 assuming a full established group of 11 clubs, i.e., odds of almost 10:1 on of a newly promoted club being relegated during this period.

OBSERVED PROBABILITY OF AVOIDING RELEGATION

To calculate the observed probability of non-established clubs avoiding relegation required analysis of the number of seasons in the spells that non-established clubs had spent in the EFPL. To this end, two values of lengths of spells (LOS) were examined:

A. The LOS of non-established clubs truncated from 1992/93 onwards (i.e. the first season of the EPFL); and

B. The LOS of non-established clubs where the full LOS for all clubs (that played in 1992/93) are used, i.e., using the date these clubs entered the English Football League Division One, the forerunner of the EPFL.

The importance of B is illustrated by Nottingham Forest, which was relegated in 1992/93 having been promoted to Football League Division One in 1977; this spell is attributed a LOS of one season for A, but a LOS of sixteen seasons for B.

The results are set out in Table 1, Table 2 and Figure 1.

The number of seasons was limited to eight because the probability for not being relegated within eight seasons, assuming eleven established clubs, was less than 0.05.

The LOS of non-established clubs truncated from 1992/93 onwards (i.e. the first season of the EPFL) affected the probability of a non-established club avoiding relegation for seasons 1 to 8, as seen in Table 1.

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Figure 1: Probability of Non-Elite Group Club Not Being Relegated In First Eight Seasons

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Table 1: Model Probabilities of a Non-Established Club Surviving in EPFL – Clubs Relegated

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<tr>
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<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
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<td>1992/93+</td>
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<td>0.07</td>
<td>0.09</td>
<td>0.11</td>
<td>0.13</td>
</tr>
<tr>
<td>1992/93 Full LOS</td>
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<td>0.03</td>
<td>0.05</td>
<td>0.06</td>
<td>0.07</td>
</tr>
</tbody>
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Assuming that ten established clubs have an equal chance of surviving, it follows that the probability of a non-established club avoiding relegation in a given season is:

\[ P = \left( \frac{T - E}{T - R} \right) \]

The probability of a non-established club surviving n seasons is therefore P^n.

• Some leagues have end-of-season play-offs involving a club, or clubs, from the top-tier, as well as clubs from the next tier. For example, in Germany at the end of a season the 15th-place club in the First Bundesliga plays a two-leg relegation match against the third-place club of the Second Bundesliga for the final spot in the First Bundesliga. If the outcome of such a relegation match was 2:0 to the 15th club, the value of B would be 2.5 on average.

Table 2: Observed Probabilities of a Non-Established Club Surviving in EPFL – Clubs Relegated

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REFERENCES

1. For more information contact: Dr Rob Gandey, Visiting Professor, Liverpool Business School, Liverpool John Moores University Email: R.Gandy@ljmu.ac.uk Phone/Fax: +44 (0)151 334 6160
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FINANCIAL CONSEQUENCES OF RELEGATION

• Relegation from EFPL has had serious financial consequences for a proportion of the 34 non-established clubs that participated in EFPL up to and including 2012/13.

• Eight clubs went into administration within a short period following relegation from the EFPL and several others experienced significant financial difficulties.

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