

# Statistical Analysis of Hornets' Final League Position: 1895/96 - 1999/2000

## 1. Introduction

This note discusses Hornets' final League position in every season since 1895/96. The source of the data is the Unofficial Hornets website (information for 1901/02 is incomplete). In some of the war years, there was either no League at all or Hornets were not in it. Altogether, there is data for 97 seasons.

The number of teams in the League has varied over time, so to make different seasons directly comparable, the data is expressed in the form of the percentage of all other teams finishing *above* Hornets. So in the glorious season of 1918/19, when Hornets won the Lancashire League, this percentage is zero.

The number of divisions has varied, so the following conventions have been used:

- When the League was split into separate Lancashire and Yorkshire Leagues, Hornets' position in the Lancs. League is used
- With more than one division, the following is used: with N teams in total and M in the top division, the top club in the next division finished in (M + 1) place overall, the second in (M + 2) etc.

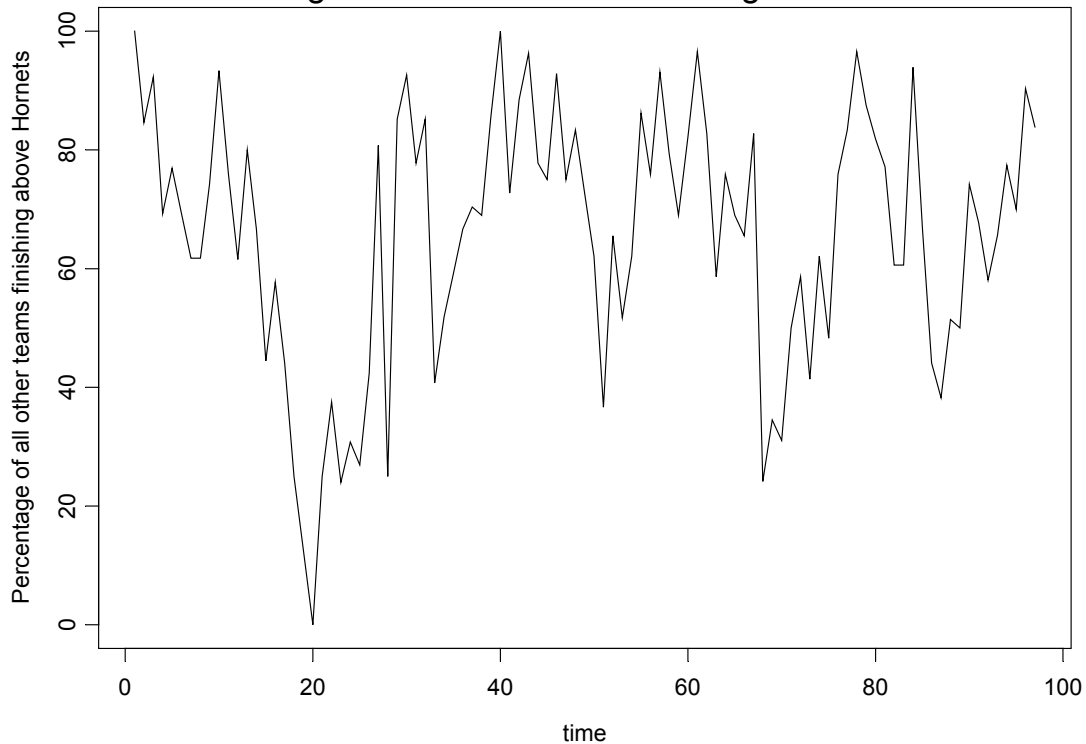
## 2. The results

### 2.1 The basic analysis

On average, 66 per cent of all teams have finished above Hornets. In only 21 seasons did fewer than 50 per cent of teams finish above Hornets. In other words, most of the time (78 out of 97 seasons), Hornets have been in the bottom half of the League.

The experience over time in each season is plotted in Figure 1 below.

Rochdale Hornets Final League Table Performance, 1895/96 - 2000  
Percentage of all other teams finishing above Hornets

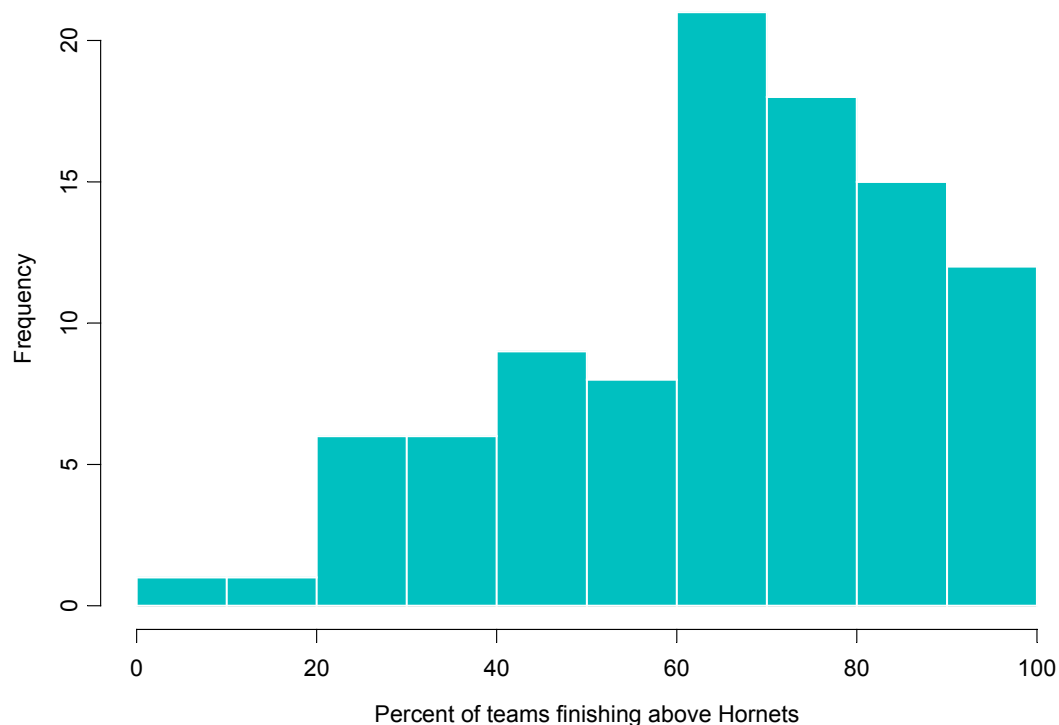


**Figure 1**

The opening season of 1895/96 is the first point on the bottom axis of the chart. Reading up from this, and across to the left-hand axis, we can see that 100 per cent of teams finished above Hornets ie: we were bottom.

The frequency with which these different positions happened is set out in Figure 2 below

## Frequency of the percentage of teams finishing above Hornets seasons 1895/6 - 1999/2000



**Figure 2**

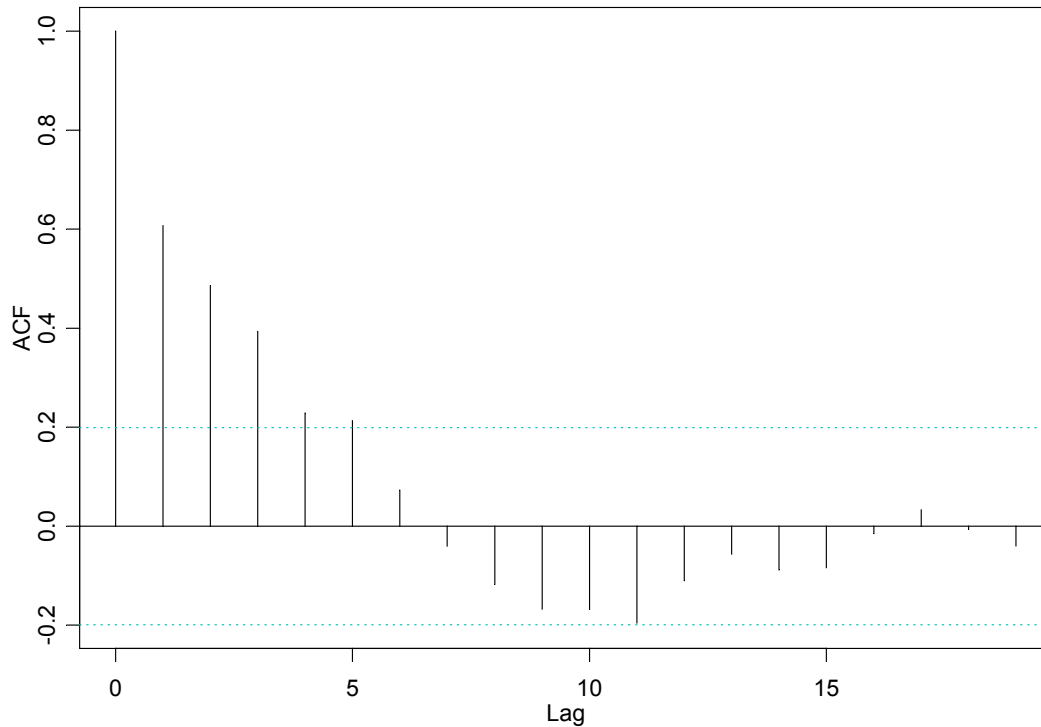
So, for example, the biggest bar occupies the 60-70 per cent region of the bottom axis. This means that, when the data is divided into 10 percentage point bands (0-10,10-20 etc), the single most frequent band in which to find Hornets' position is the one in which 60-70 per cent of teams finished above us. Reading across to the right-hand axis, we see that this occurred 20 times. Looking at the bars on the far left hand side of the chart, they are small. Only once have Hornets finished with 0-10 per cent of teams above them, and only once with 10-20 per cent above.

### **2.2 More advanced analysis**

The time-series properties of the data have some interest. Not surprisingly, there is a fairly strong degree of persistence in performance from season to season. Good or bad performances tend to be followed by other good or bad ones.

Figure 3 plots the autocorrelation function of the data. The dotted horizontal lines represent the approximate standard error of the individual components of the autocorrelation function

### Series : prop

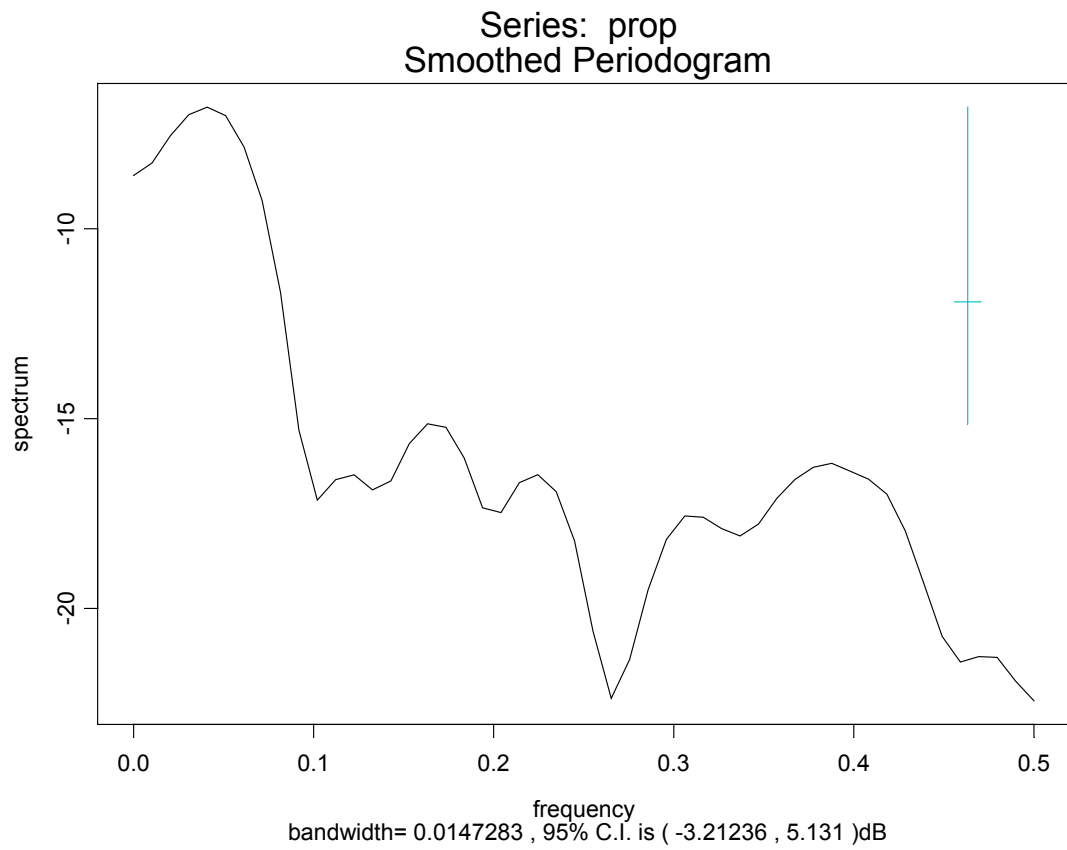


**Figure 3: Autocorrelation function of the proportion of teams finishing above Hornets**

A simple AR(k) model fitted to the data suggest, on the Akaike information criterion, the inclusion of lags 1 and 2 in the model. The estimated coefficients are, respectively 0.494 and 0.186.

The data appear to have the property of mean-reversion, given that a similar model fitted to the first-difference of the data has an estimated coefficient of -0.41 at lag 1.

Spectral analysis of the data suggests a concentration of the power spectrum at very low frequency of some 30-40 years, though this needs to be treated with caution given that there are only 97 data points. However, it suggests that there is a long-term cycle in the data of this periodicity.



**Figure 4**