SOE 27: Sports Studies: Football/Soccer

Time: Friday 12:15–12:45   Location: MA 001

SOE 27.1   Fri 12:15   MA 001

Coping with crises: a quantitative stochastic approach to determine the resilience of soccer teams — •Ralph Stömmer — Private researcher, Ottobrunn, Germany

Resilience is a crucial asset for successfully coping with crises. In the sport context, research on resilience is rather new. A quantitative model is developed to determine the resilience of soccer teams and applied to the German premier league Bundesliga.

The concept of resilience does agree with previous research and implies two conditions: (i) adversity and (ii) positive adaption despite this adversity. The quantitative model to measure resilience is a novel approach. The relative frequency of matches is determined, where a soccer team, which is initially trailing by 2 goals, finally succeeds to win the match or at least to reach a draw. The empirical data are compared with a theoretical model derived from Poisson distributions. The analysis reveals how the resilience values of leading soccer teams differ from the average, which highlights the importance of experience and grit, compared to talent and technique.

In retrospect, the method sheds some new light on the final 3:2 win of the German team in the 1954 FIFA world cup in Bern, Switzerland, generally known as the *miracle of Bern*.

SOE 27.2   Fri 12:30   MA 001

"Expected Goals" and other KPIs to characterize team performance in soccer matches: how to quantify their quality? — •Andreas Heuer[1] and Fabian Wunderlich[2] — [1]Institut für Physikalische Chemie, Universität Münster, 48149 Münster — [2]Institut für Trainingswissenschaft und Sportinformatik, Deutsche Sporthochschule Köln, 50933 Köln

A variety of so-called Key Performance Indicators (KPIs) are available to characterize the performance of teams in soccer matches. A relatively novel and very popular KPI is expected goals (xG), which is derived by weighting each shot with an empirical probability of scoring a goal from that position on the pitch. How informative are KPIs to estimate the team strength and predict future results?

This question is analysed within an appropriate statistical framework aiming to answer two questions: (i) How well does the estimation process work when the statistical noise due to finite information is absent? The associated score directly expresses how well the chosen KPI reflects the underlying team strength. (ii) How much is the estimation process affected by statistical noise? Both pieces of information can be used to construct a normalized score that is a direct measure of the overall forecast quality of a KPI.

This general formalism is applied to the five biggest European leagues for a variety of KPIs. From this analysis, the quality of xG compared to other KPIs as well as possible differences across leagues can be clearly quantified. Implications for the prediction of individual soccer match results are discussed.