Introduction and Literature Review

It is a fundamental proposition of sports economics that, under conditions of free agency, players' labour markets in pro team sports should be highly informationally efficient in setting player salaries. The Moneyball story in Major League Baseball (MLB) seems an obvious exception but, as Hakes and Sauer (2006) demonstrated, market efficiency was quickly re-established when the valuation inefficiency was recognised by other MLB teams, just as the market efficiency hypothesis predicts. However, Gerrard (2017) presented evidence that of a potentially systematic and long-lasting inefficiency in the valuation of attacking and defensive skills in the English Premier League (EPL) soccer players' labour market. The purpose of this presentation is to revisit this inefficiency and to investigate if it still holds when the data set is extended and allowance is made for panel structure of the data.

Goals scored and goals conceded have equal but opposite marginal effects on league performance in soccer. It follows, therefore, that since goals scored and goals conceded have the same marginal productive value, this equality should be reflected in the valuation of attacking and defensive skills in the soccer players' labour market. On this basis, Gerrard (2017) proposed a simple team-level test of market efficiency applied to the EPL players' soccer labour market. Using data over a 20-year period he found that, after adjusting for wage inflation, an estimated regression model for team wage costs showed a premium being paid for attacking quality (i.e. goals scored) compared to defensive quality (i.e. goals conceded), although the difference was not statistically significant.

One possible behavioural explanation of this market inefficiency has been advanced by Anderson and Sally (2013) who consider defensive skills in soccer as an example of the “dogs-that-don’t-bark” phenomenon. Defensive skills are all about preventing an event (goals scored by the opposition) and so by their very nature are much less salient than attacking skills that if effective result in a highly salient, directly observable event, namely, goals scored.

Data and Methods

The empirical context used to investigate the possibilities of inefficiency in the soccer players' labour market is the EPL, the leading domestic soccer league in England and the biggest soccer league globally in revenue size. The data set consists of annual team-level data covering 21 seasons, 1995/96 – 2015/16, with 20 teams competing each season (sample size = 420). The inclusion of data for 2015/16 represents an extension of the data set used by Gerrard (2017) and allows analysis of the case of Leicester City who defied expectations by winning the EPL in 2016 with a relatively small wage budget. Due to promotion and relegation, 45 different teams appeared in the EPL over the sample period. Performance is measured by league points (3 points for a win, 1 point for a draw, 0 points for a loss). Attacking and defensive quality are measured by goals scored and goals conceded, respectively. Wage costs are sourced from the audited annual company accounts of the soccer teams and adjusted pro rata if the reporting period has varied from 12 months. For teams undergoing bankruptcy proceedings during the sample period, wage costs have been sourced from the financial statements published by the court-appointed administrators. Although wage costs include coaches, support staff and those employed in the business, the dominant component is player wage costs and it is widely accepted that total wage costs provide a good proxy for player wage costs (e.g. Szymanski and Smith, 1997). All wage costs are standardised in real terms using a mean adjustment to remove the effects of annual wage inflation with 1995/96 used as the base year. Following Gerrard (2017) regression analysis is used to estimate a basic wage model in which wage costs are modelled as a linear function of goals scored and goals conceded. However, in order to explicitly allow for the panel nature of the data set, fixed-effects models are also estimated initially with a full set of team controls and then re-estimated retaining only significant team controls.

Results and Discussion

1. The estimated basic wage model for the whole sample period yields marginal wage costs of £168.3k for goals scored and £137.5k for goals conceded. Hence there does appear to be some evidence of market inefficiency with
Premiership teams paying a premium for attacking quality over defensive quality although, given the degree of variation in the sample, the premium is not statistically significant.

2. The full fixed-effects model reverses the direction of market inefficiency with the estimated marginal wage costs of £61.0k for goals scored compared to £63.3k for goals conceded. The difference is not statistically significant.

3. Only the seven highest spending teams – Arsenal, Chelsea, Leeds United, Liverpool, Manchester City, Manchester United, and Newcastle United – have significant fixed effects. Re-estimating the fixed-effects model with controls for these teams only, yields slightly higher estimated marginal wage costs of £72.8k for goals scored and £77.5k for goals conceded. Again the difference is not statistically significant.

4. A premium for defensive skills is consistent with the behavioural argument advanced by Anderson and Sally that defensive skills are more difficult to evaluate because restricting goals scored is not directly observable as a salient event in the same way as goals scored (although it does not necessarily follow that the lack of salience should result in over-valuation).

5. Overall there is no statistically significant evidence of a systematic informational inefficiency in the EPL soccer players’ labour market that biases the valuation of attacking and defensive skills in a particular direction.

6. The estimated premium for attacking skills in the basic wage model is entirely due to the biggest spending teams. These teams not only skew the wage distribution but also introduce an asymmetry in the distribution of goals scored compared to goals conceded with the variation in goals scored (st dev = 14.13) much higher than that for goals conceded (st dev = 12.36).

7. Introducing team controls (or, equivalently, truncating the sample to exclude the biggest spending teams) reverses the estimated premium. This reflects the reversal in the variation of the goals scored and goals conceded. If the sample is truncated to exclude the top third of teams by standardised wage costs, goals scored are more concentrated (st dev = 8.53) than goals conceded (st dev 10.42).

8. Hence, it is concluded that if there is inefficiency in the EPL soccer players’ labour market then it occurs within different segments of the market in different directions. Large-market teams who are competing to win the title and qualification for the UEFA Champions League may pay a premium for attacking skills whereas small-market teams more focused on avoiding relegation may bid up the valuation of defensive skills disproportionately.

9. Further research is required using more granular performance data to allow the estimation of hedonic-pricing models for a range of attacking and defensive skills.

10. The estimated fixed-effects model (‘big team’ controls only) provides an estimate of the exceptional sporting efficiency that Leicester City achieved in winning the Premiership title in 2016. Leicester City had the 6th lowest wage costs that season (£80.4m) but ranked third in goals scored (scoring only three goals less than the top-scoring team, Manchester City) and had the third lowest number of goals conceded (equal with Arsenal and conceding only one goal more than Manchester United and Tottenham Hotspur). The estimated model predicts that a small but average-efficient team would have been expected to spend £122.6m to replicate Leicester’s goals scored and conceded.