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Analysing match attendance in the European Rugby Cup

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Analysing Match Attendance in the European Rugby Cup

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Analysing Match Attendance in the European Rugby Cup.

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Analysing Match Attendance in the European Rugby Cup.

Abstract: Using data from 1,226 matches played over 18 seasons, we analyse match attendances in the group stages of the European Rugby Cup (ERC). We find that short-run (match) uncertainty had little effect on attendances. This finding is significant as the ERC has been replaced by a new competition which may be more unbalanced due to differences in the distribution of revenue between the participating teams. Medium-term uncertainty, i.e. the possibility of the home team reaching the knock-out stages, had a significant impact on attendances. Measures designed to make matches more attractive, e.g. bonus points for high scoring, had little effect.

Key Words: Professional team sports, competitive balance, consumer demand.

JEL Classifications: D12, D21, L22, L23, L83.

Analysing Match Attendance in the European Rugby Cup.

1: Introduction.

The present paper analyses the determinants of attendances at group stage matches in rugby union's European Rugby Cup (ERC) using data on results and attendances from 1,226 ERC group matches played between 1995/96 and 2013/14. The paper aims to add to the extensive economics literature on professional sports leagues, which suggests that fans derive utility from identifying with teams and from the quality of contests, where the latter depends on uncertainty of outcome (competitive balance) and the quality of play. (See, for example, Borland and Macdonald, 2003, for a summary). In 2014/15 the ERC was replaced by a new competition - the European Champions Cup (ECC). This change was largely prompted by Anglo-French clubs' dissatisfaction with the distribution of ERC revenue. Teams from the two larger countries (England and France) will receive a larger share of revenue from the ECC than they did from the ERC with potential implications for competitive balance in the new competition. The question of whether competitive balance affects match attendances in multi-national competitions such as the ECC/ERC is therefore particularly relevant.

The paper is structured as follows. Section 2 provides a brief history of the ERC. In section 3 we briefly review the literature on the impact of uncertainty on match attendance in sports leagues. Section 4 describes the uncertainty measures used in our attendance model. The model and results are outlined in section 5. Some conclusions are outlined in section 6.

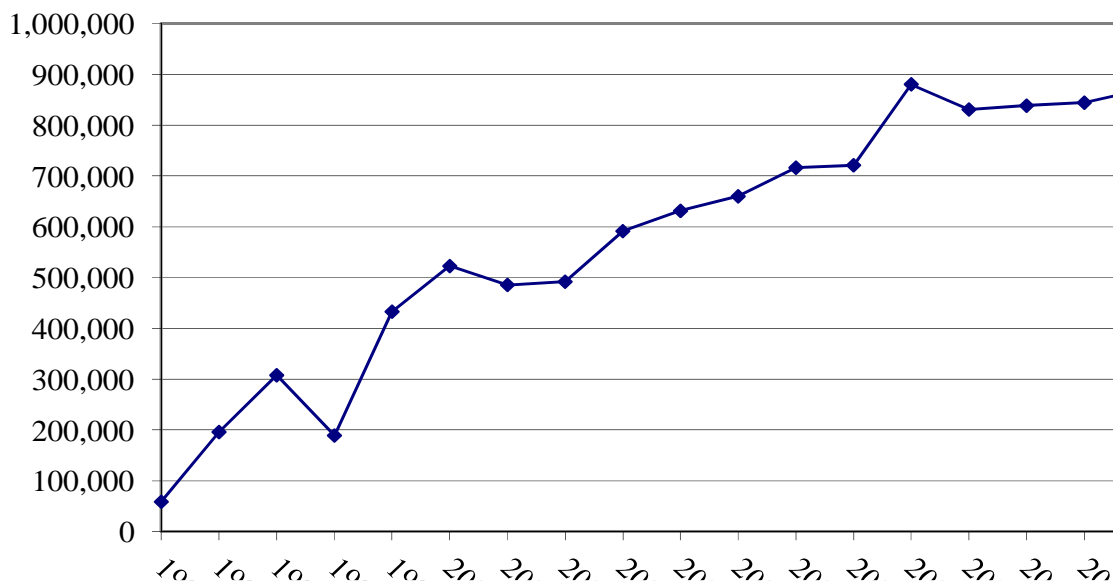
2: The ERC – A Brief History.

The establishment of the ERC in 1995/96 coincided with the introduction of professionalism in rugby union.¹ English and Scottish teams did not participate in the inaugural season of the ERC which involved 12 teams drawn from France, Ireland, Italy, Wales and Romania.² It increased to 20 the following season with the inclusion of English and Scottish teams but dropped to 16 in 1998/99 when English clubs again did not participate. From 1999/00 onwards there were 24 participating teams - six each from England and France, three each from Ireland and Wales and two each from Italy and Scotland.³ The final two ERC places were allocated to the previous season's winners and the winners of the European Challenge Cup, also known as the Amlin Cup, a second tier competition involving teams that had not qualified for the ERC.

The ERC was in some respects similar to soccer's UEFA Champions League. The allocation of ERC places, however, involved a trade-off between having a competition that was confined to the best teams from each of the participating leagues and ensuring that all of the major European rugby playing countries were represented.

The success of the ERC in attracting supporter interest is illustrated in Figure 1 which illustrates aggregate attendances at ERC group stage matches per season. The 12 group stage matches in the inaugural 1995/96 season attracted just 58,000 spectators, an average of 4,800 per match. In 2013/14 the 72 group stage matches attracted 921,000 spectators, an average of 12,800 per match.

Figure 1: Aggregate Attendance at ERC Group Matches | Season



In 2012, the English and French clubs announced their intention to withdraw from the ERC after the 2013/14 season and establish an alternative competition. After lengthy negotiations involving the six participating countries it was agreed that beginning in 2014/15 the ERC would be replaced by the ECC comprising 20 rather than 24 teams with the number of Celtic League participants reduced to seven (from 10), with each of the four Celtic League countries guaranteed at least one representative in the ECC.

3: Uncertainty of Outcome and Match Attendance.

A key theme running through the sports economics literature is that uncertainty of outcome is an essential feature of sport and is key to maintaining supporter interest. This in turn requires a degree of equality between the participating teams.

“In the absence of cross subsidies from strong teams, teams in weak drawing cities lack the incentive to field teams that can compete at the level that would maximise league revenues.” (Fort and Quirk, 1995, p.1265).

Empirical research on the effect of competitive balance on match attendances in various sports has yielded mixed results. (Szymanski, 2003). Most of the literature on competitive balance has focused on competitive balance within individual sports leagues. (See, for example, Garcia and Rodriguez, 2009; Gitter and Rhoades, 2010; King et. al.. 2012; Lenten, 2009a; Paton and Cooke, 2005).

The competitive balance argument has been advanced to justify a variety of arrangements that are commonly found in professional team sports such as salary caps, restrictions on players moving between teams and the collective selling of broadcasting rights by sports leagues and their member clubs. (Rottenberg, 1956, Neale, 1964 and Szymanski and Kesenne, 2004). UEFA advanced the competitive balance argument to justify the joint selling of broadcast rights to the Champions League.

“UEFA considers that the model of financial solidarity helps to maintain a balance between clubs and to encourage recruitment of young players, which serves to promote competition in European football. As a result of the financial policies implemented by UEFA, competition between clubs in Europe is enhanced and the number of competitors on the market is increased.”⁴

We now consider the evidence on competitive balance in the ERC. The literature describes three different concepts of uncertainty.

- Short-run uncertainty of match outcome, i.e. uncertainty regarding the outcome of an individual match which should increase supporter interest in individual matches;

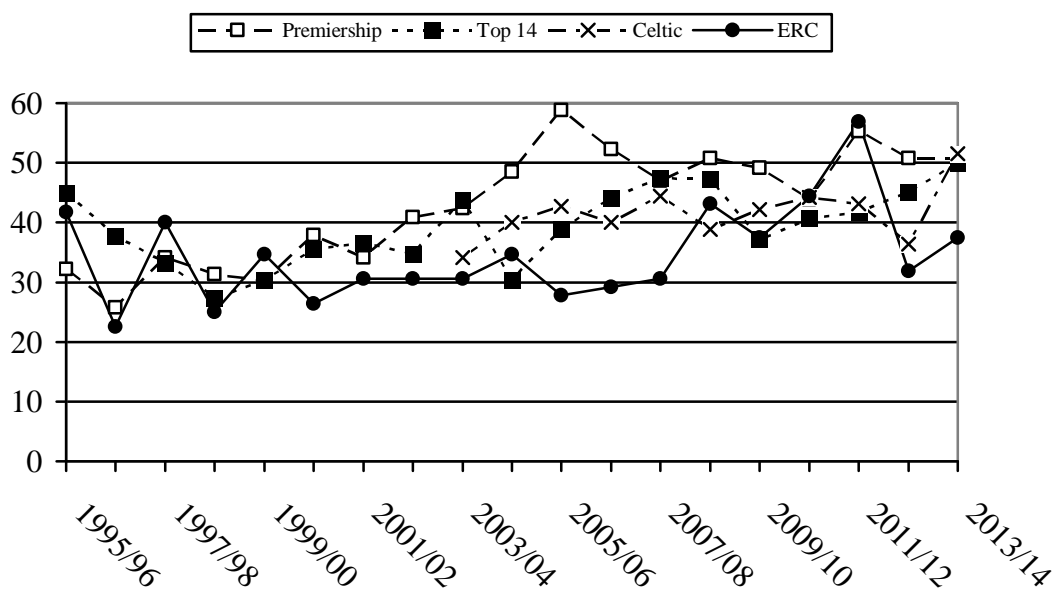
- Medium term or seasonal uncertainty of outcome, i.e. uncertainty over which team will ultimately win the competition, which should serve to maintain supporter interest in matches involving a wider range of teams over the course of the season. In the present case this translates into uncertainty regarding whether or not a team will qualify for the knock-out stages of the ERC;
- Long term uncertainty of outcome, i.e. a lack of domination by one or more clubs over a number of seasons, sometimes referred to as dynamic competitive balance. (Szymanski, 2003)

The most commonly used measure of short-run competitive balance in the literature is the adjusted standard deviation (ASD) of teams' win ratios attributed to Noll (1988) and Scully (1989). The ASD allows comparisons to be made when the number of teams differs between leagues or over time. Humphreys (2002) argues that this ratio is better than other measures of competitive balance, although Lenten (2009b) points out that it is highly sensitive to occasional outliers. The ASD is calculated by dividing the actual standard deviation of teams' win ratios over the course of a season by an idealised standard deviation (ISD) of win ratios. The ISD is the standard deviation that would be generated by a perfectly balanced league and is given by the formula $0.5/\sqrt{n}$ (where n is the number of matches played). There are at least two problems with applying the ASD to a competition such as the ERC. First the teams only play six matches in the group stages and second, and perhaps more significantly, each team only plays against three of the other 23 participating teams.

Instead of the ASD we use the number of close matches to measure short-run competitive balance, where we define close matches as those where a team won a

match by seven points or less. The significance of the seven point margin derives from the fact that this is the number of points awarded for scoring a try (touchdown) and a conversion.⁵ If the winning margin was less than seven points a converted try by the losing side would have reversed the result so that the outcome of the match was technically in the balance right up to the finish. Figure 2 shows the percentage of close matches in the ERC group stages by season. Corresponding data for the three main European rugby leagues – the English Premiership, French Top 14 and Celtic League – is included for comparative purposes. The chart suggests that short-run competitive balance in the ERC was similar to that in the three main European rugby leagues.

Figure 2: % Close Matches in ERC and Various Leagues



Source: Retrieved from http://www.ercrugby.com/eng/13_70.php

The format of the ERC varied in its early years but from 1999/00 onwards the 24 participating teams were divided into six groups of four. Each group was run as a mini-league with each team playing the other teams in its group on a home and away

basis. The top team in each group along with the best two of the six group runners-up qualified for the play-off stages. This format maintained a high degree of medium-term uncertainty as qualification for the play-off stages was often not decided until the final round of matches, thus maintaining supporter interest.⁶

Next we consider the issue of dynamic competitive balance. In its 19 seasons ten different teams won the ERC. The Herfindahl-Hirschman Index (HHI) is widely used to measure market concentration in the industrial organisation literature and can be used to measure dynamic competitive balance in sports. (Leeds and von Allmen, 2005). In this case a team's "market share" can be defined as the number of championship wins over a period of time. Teams' "market shares" are squared and summed to arrive at the HHI. The HHI for the ERC was 0.125 which compares with a maximum value of 1 which would arise if a single team "monopolised" the ERC by winning it every season.

Table 1 looks at the number of championships, quarter-final appearances and percentage wins in group stages of the ERC by teams from each of the participating leagues. Such measures can be seen as providing an indication of dynamic balance between the different leagues from which ERC participating teams were drawn.

Top 14 teams won the ERC seven times while Premiership and Celtic League teams recorded six wins apiece. The number of quarter-final appearances is also quite evenly balanced with English clubs registering slightly fewer appearances than teams from the other two leagues, although this is partly due to the fact that they did not participate in the competition in 1998/99. In terms of win percentages in group stage

matches English and French teams have a very similar record, while in this case Celtic League teams lag somewhat behind. An interesting feature of the table is the fact that Irish teams have outperformed those of the other Celtic League countries. All six Celtic League ERC wins were due to Irish teams, while they have a much higher win ratio and number of quarter final appearances than the Scots or Welsh teams.

Table 1: ERC Performances by League

	Champions	Quarter-Finals	Group Stage Win %
Top 14	7	52 (48)	56.8
Premiership	6	41 (41)	56.5
Celtic League	6	51 (47)	47.4
of which			
Ireland	6	30 (28)	62.6
Scotland	0	2 (2)	31.1
Wales	0	19 (17)	43.8
Italy	0	0 (0)	11.3

Notes: Figures in parentheses exclude 1998/99 as English clubs did not take part in the ERC that year.

Italian teams are not included in the Celtic League total as they only joined the league in 2010/11.

Source: Retrieved from <http://www.ercrugby.com/heinekencup/history/>

Several authors have concluded that revenue accruing to leading European soccer clubs from participating in the Champions League has resulted in a decline in competitive balance in both national leagues and in the Champions League itself. (Noll, 2007; Szymanski, 2007; Vrooman, 2007; Pawlowski et. al., 2010; and Lee and Fort, 2012). In soccer the distribution of Champions' League revenue favours teams from larger countries, based on their larger broadcast markets. In contrast ERC

revenues were more evenly distributed resulting in a transfer from the two larger countries to the smaller ones.

Total ERC revenue for 2013/14 was reported to be in the region of €50 million of which the Premiership and Top 14 each received approximately €10m while the Irish, Scots, Welsh and Italians received approximately €5m each (Thornley, 2014).⁷ Jones (2014) described the ERC arrangements as “preposterously slanted in favour of the Irish and Scottish, despite the fact that through their television and other commercial deals, the Irish provide very little for the community pot.” Dissatisfaction with the distribution of ERC revenues on the part of the Anglo-French clubs was a major factor leading to the winding up of the ERC and its replacement with the ECC.

The ECC arrangements provide that the Premiership, Top 14 and Celtic League will each receive €20m per annum initially. While the Celtic League countries have been guaranteed that their total income will not be less than what they received from the ERC, payments to English and French clubs will be 33% higher than under the ERC and could rise further as future revenue increases are earmarked to go to the Premiership and Top 14. (Thornley, 2014).

4: Modelling Uncertainty.

The evidence outlined in the previous section from a range of different measures indicated that the ERC displayed a reasonably high level of competitive balance. The change in the distribution of revenue between teams in the new ECC may result in the new competition being more unbalanced than the ERC. This begs the question as to whether this is likely to have any impact on attendances.

The short-run uncertainty of outcome hypothesis implies that fans prefer close matches to highly unbalanced matches. On that basis, in deciding whether or not to attend an ERC match, fans have to form some *ex ante* view as to how evenly matched the two participating teams are, bearing in mind that the away team plays in a different league and the two teams may never have played one another previously.

Szymanski (2009) points out that studies of short-run match uncertainty either rely on measures derived from historic performance (which is the approach adopted in this paper) or betting odds and observes that both approaches have shortcomings. In the case of betting odds Szymanski (2009) observes that, in some instances, e.g. English soccer, they may be fixed in advance by bookmakers so that they do not respond to how betting evolves in the lead up to a match. Braun and Kvasnicka (2013) reported that betting odds in European soccer are subject to national bias. If national bias exists, betting odds will not provide an accurate indicator of *ex ante* match uncertainty in a competition such as the ERC.

Studies based on historic performance have relied on teams' relative league positions, points totals or win ratios (King et al. 2012). None of these measures can be easily applied to ERC group matches because teams only play six group matches each season. Instead we used a variant of the ranking points system employed by the ERC to seed participating teams, as a measure of team quality.

ERC rankings were based on cumulative ranking points obtained by teams based on their performances in the ERC and the Challenge Cup over the previous four seasons.

The basis on which ERC ranking points were calculated is described in Table 2.

Table 2: ERC Ranking Points System				
Competition	Team Position	Points		Total Points
ERC	Winner		+2	10/11
	Finalist		+2	8/9
	Semi-Finalist		+2	6/7
	Quarter Finalist		+1	4/5
	Group winner		4	4
	Group 2nd		3	3
	Group 3rd		2	2
	Group 4th		1	1
Challenge Cup		Challenge Cup	ERC	
		Qualifier	Qualifier	
	Winner	+1	+1	6
	Finalist	+1	+1	5
	Semi-finalist	+2	+1	4
Quarter-Finalist	2	3	2/3	

Source: Retrieved from <http://www.ercrugby.com/eng/erc/europeanranking/index.php>

Teams received four points for finishing top of their ERC group, three points for second and so on. They received further points depending on how far they progressed in the knock-out stages. Thus the overall winner received a further seven points, one

for a quarter-final and a further two for each of reaching the semi-final, final and winning. Thus the winning team every season obtained 10 or 11 ranking points depending on whether or not it finished first or second in its group. Teams also obtained ranking points for reaching the knock-out stages of the Challenge Cup with a total of six ranking points for the winner of that competition. A further complication arises because after 2009/10 three of the four second placed ERC group teams that did not qualify for the knock-out stages of the ERC qualified instead for the knock-out stages of the Challenge Cup. Thus the ranking points awarded in respect of the Challenge Cup differ depending on the route by which a team reached the knock-out stages of that competition.

Using the methodology described in Table 2 we calculated the number of ranking points for every team in the three major European leagues from which ERC participating teams were drawn for every season from 1996/97 to 2013/14. While ERC rankings were based on the sum of ranking points accumulated by each team over the previous four years, we weighted the ranking points, with the weighting declining over time, before adding them.⁸ We use the ranking points totals calculated in this way as an indicator of team quality. In our view a measure of teams' performances over a four year period provides a reasonable measure of quality. Using ranking points obtained in the previous season would produce a distorted result as some teams might not have qualified the previous year.⁹

In addition to short-run *ex ante* competitive balance, the other key factor in determining attendance in our model is whether or not the home team is in contention to qualify for the knock-out stages of the competition, which captures the issue of

medium-term uncertainty. King et. al. (2012) point out that the impact of medium-term uncertainty on attendance has received less attention in the literature than short-term uncertainty. In line with the literature we assume that the majority of attendees at a match are home team supporters and, in general, they will be less inclined to go if the home team is effectively out of the competition.

In the literature measures of medium term uncertainty are usually based on the number of games a team is required to win in order to win the championship/ make the playoffs; or; the number of games (wins) or points behind the leading team or the significance of the match for the championship or playoffs. (King et. al., 2012). For example, Kuypers (1996) and Garcia and Rodriguez (2002) both employ a measure which is the product of the number of games left before the championship is decided and the number of points the team trails behind the leader, being equal to zero when there is no possibility of the team's winning the championship. The introduction of bonus points in 2003/04 complicates the likelihood of qualification for the knock out stages of the ERC.¹⁰

We estimate a qualification coefficient (Q_i) for each team prior to each match using the formula:

$$Q_i = 1 + ((P_i - P_q)/P_a), 0 < Q_i < 1$$

$(P_i - P_q)$ measures the number of points team i is behind the qualifying position(s) and P_a is the maximum number of points that could be obtained from its remaining matches, i.e. two per match prior to 2003/04 and five per match thereafter. When qualification is mathematically impossible a team is allocated a value of 0 while teams occupying the qualifying places have a value of 1.

Since 1999/00 the six group winners and the two best of the six group runners-up qualify for the quarter finals. Teams therefore compete within their individual groups for top spot and compete with those in the remaining groups for one of the two best runner-up places. We therefore estimated each teams' qualification coefficient relative to the top team in its own group and relative to the second best of the six second placed teams. The higher of the two values was then used as the qualification coefficient for each team.¹¹

A problem with medium-term uncertainty measures that are based on how far behind teams are is that they do not take account of the relative difficulty of teams' remaining fixtures which arguably affects the probability of qualifying for the play-offs (King et al., 2012). ERC groups varied in team quality and this is difficult to quantify objectively and so we were unable to allow for the difficulty of a team's remaining fixtures in our measure of the probability of qualification.

5: An Econometric Model of Match Attendance at ERC Group Matches.

We now analyse the factors that determine attendances at ERC group stage matches. Our data set comprises attendance data for 1,226 ERC group matches played over 18 seasons from 1996/7 to 2013/4.¹² In particular, we wish to ascertain whether uncertainty of outcome is an important explanatory variable. The ranking points of the two teams involved in each individual match were used as a measure of short-run match uncertainty, while teams' chances of qualifying for the knock-out stages was measured by the qualification coefficient. The calculation of both measures was described in the previous section.

Table 3 shows the results of the analysis. The first column shows the OLS regression of match attendance (measured in thousands) on the various measure of competitive balance. The first two variables are the ranking points of the home team and the away team. Both coefficients are positive. However the coefficient on the home team's rank is an order of magnitude greater than that of the away team. Furthermore the coefficient on the away team rank is not significantly different from zero. Higher ranking for the home team will lead to higher crowds, with each extra ranking point increasing match attendance by 508 individuals on average. The difference in the effect of the home team's from that of the away team's rank is stark and makes clear the extent of home team bias in attendance. As the results indicate that short-run competitive balance had little effect on ERC match attendances, the fact that the new ECC may be more unbalanced than the ERC may have little impact on match attendances in the new competition.

As explained in section 4, we measure medium term uncertainty by including the qualification variable for the home team. Unsurprisingly this is highly significant. If the home team had no chance of qualifying, attendance would be 4,330 lower on average. This is a huge figure given that average attendance in the sample was 9,110. In theory the ECC may increase medium-term balance because there are fewer teams, i.e. 8 out of 20 teams will qualify for the knock-out stages in the ECC compared with 8 out of 24 in the ERC.

Table 3: Econometric Model of Attendance

	(1)	(2)	(3)
	Attendance ('000s)		
Home Rank Points	0.508*** (0.0593)	0.442*** (0.0553)	0.213*** (0.0536)
Away Rank Points	0.0527 (0.0587)	0.0728 (0.0529)	0.0767 (0.0511)
Home Qualification Possible	4.330*** (0.532)	4.281*** (0.479)	2.994*** (0.452)
Home ERC Winner Previous Year	4.012*** (0.953)	3.839*** (0.855)	3.395*** (0.790)
Away ERC Winner Previous Year	0.671 (0.955)	0.586 (0.857)	0.226 (0.791)
Previous ERC Appearances		0.219*** (0.0471)	0.362*** (0.0489)
Bonus Points		0.145 (0.597)	0.776 (0.553)
Trend		0.374*** (0.0635)	0.139** (0.0634)
Match Day Saturday			0.458 (0.308)
Home Team Irish			0.0142 (0.539)
Home Team Welsh			-3.581***

			(0.488)
Home Team French			-0.160 (0.414)
Home Team Italian			-6.337*** (0.616)
Home Team Scottish			-6.093*** (0.614)
Away Team Irish			0.284 (0.505)
Away Team Welsh			-1.004** (0.465)
Away Team French			-0.987** (0.415)
Away Team Italian			-2.650*** (0.590)
Away Team Scottish			-2.105*** (0.586)
Constant	3.801*** (0.489)	-1.108** (0.560)	3.910*** (0.752)
Observations	1,226	1,226	1,226
R-squared	0.166	0.330	0.443

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

While our main concern was analysing whether short- and medium-term uncertainty affected attendances, we also considered a range of other factors which might affect match attendances.

Hogan et al. (2013) reported that winning the ERC had a positive impact on teams' league match attendances the following season. We therefore considered whether winning the ERC would have had a positive impact on a team's ERC attendances the following season and so a dummy variable was included to capture the effect of the home or away teams having won the ERC in the previous year. As with the ranking points, only the home team coefficient is significant and its point estimate is 6 times that of the away team. Once again we see a clear and large home bias, where winning the ERC added 4,012 to attendances the following season. This is a huge effect, equivalent to over 40% of the average attendance at an ERC match.

The introduction of bonus points in 2003/04 can be viewed as a measure to encourage close, high-scoring matches thus making them more attractive to supporters. The second column of Table 3 includes a dummy variable which is set to one if the match took place in a year when bonus points were awarded for tries and/or close losers. We also include a time trend. The trend coefficient is positive and significant indicating that there has been a gradual rise in attendances over time even when controlling for other factors. The bonus variable is insignificant. It turns out that this variable is highly correlated – almost by construction – with the time trend. In the absence of the trend it is both significant and positive. But it is impossible to distinguish its effect (if any) from a secular increase in attendance. This is perhaps a surprising result and may have implications for competition design.

Tradition (habit) affects match attendance in many sports leagues (Noll, 2007; Lenten, 2009a), although Paton and Cooke (2005) found habit had no impact on attendances in English country cricket. Apart from France, ERC participating teams arguably did not have a significant traditional support base.¹³ In column 2, we add variables to measure the number of previous appearances of the home team in the competition to capture whether teams have succeeded in building a committed support base over time. It turns out that this does appear to matter, as the coefficient is positive and significant. With each year in the ERC, attendance increase by 219 spectators on average.

We also analyse whether the day the match is played had any impact on attendance. The third column of table 3 adds a dummy variable, set equal to one if the match is played on Saturday and zero otherwise. Playing a match on Saturday as opposed to other days adds 458 spectators on average.¹⁴ However, the coefficient is insignificantly different from zero. -

We then checked to see if there were any country effects, by including dummies for country of the home and away team (with England the excluded category in both cases). All of these country dummies are negative and/or insignificant, indicating that English teams attract higher attendance at both home and away matches than, controlling for quality, otherwise equivalent teams from other countries. In fact, average attendances in Ireland were higher in absolute terms than in England even though the potential fan base in Ireland is vastly smaller. These two facts can be

reconciled by noting that, while Ireland had fewer teams than England, average team quality appears to be higher (see Table 1).

We do not have data on ticket prices so like many empirical studies of match attendance, ours is a reduced form model (Garcia and Rodriguez, 2002). Most ERC matches were broadcast live with matches scheduled over the weekend from Friday night to Sunday evening with different matches broadcast in different countries to cater for local audiences and so we do not take account of whether or not a match was broadcast live when analysing determinants of match attendance.¹⁵ Unlike some other empirical studies we do not model the impact of weather on match attendance. Paton and Cooke (2005) reported that empirical studies of attendances at soccer and rugby league in England found that rain did not affect attendances. Our model does not take stadium capacity into account. Clubs have frequently switched ERC matches to larger stadia so attendances were arguably not constrained by capacity.

One possible explanation for the low impact of short-run uncertainty on ERC attendances is that supporters regard inter-league competitions as being of higher quality than domestic leagues, i.e. in such competitions quality is more important than uncertainty.

Teams from the same country were generally kept apart in the ERC group stages. Nevertheless, there were a number of matches each season involving teams from the same league playing against one another in the group stages. Such matches provide a natural experiment to test whether ERC group matches attract larger attendances than league matches by comparing attendances at matches between the same two teams in

both competitions. The results of a similar natural experiment comparing soccer attendances at league and FA Cup matches between teams in the same division of English football were reported by Szymanski (2001). If the ERC was perceived as a higher quality competition than the domestic league, ERC matches might be expected to attract higher attendances than league matches. Teams only play six matches in the ERC group stages and because only the top team in the group is certain to qualify for the knock-out stages, every match is vital as long as qualification remains possible. In contrast a team's overall league performance will generally not hinge on an individual league match to the same extent, although individual matches towards the end of the season may have a crucial influence on the final outcome.

We have identified 132 instances of ERC group matches between teams from the same league but were only able to obtain attendance data for 106 of these.¹⁶ The majority of these matches involved teams from the Celtic League as it had a higher number of participating teams than the Premiership or Top 14. There were a small number of ERC group matches between two English or two French teams.

We find in almost all cases that ERC matches had a higher attendance than the corresponding league fixture between the same two teams. (A formal t-test of the null hypothesis that both ERC and league attendances have the same mean can be rejected at the 1% significance level.) This suggests that ERC matches were taken more seriously by fans than the corresponding league match. Admittedly our sample consists largely of Celtic League matches with very few matches between two English or two French teams so it may be that English and French supporters do not share the Celtic nations' view on the relative importance of domestic and European

competition. A further straw in the wind, in this regard, is provided by Hogan et. al. (2013) who found that winning the domestic league and the ERC had a roughly similar impact on teams' league attendances the following season.

6: Conclusions.

We have presented a model of attendance at ERC group stage matches. The most striking result is that there is a substantial home bias effect. This implies that short-run competitive balance is not the main concern of spectators. Larger crowds are drawn to see good home teams, almost regardless of the quality of the away team. Thus an imbalanced match would be a greater draw than a balanced match just as long as the imbalance was in favour of the home team.

Our results also indicate, not surprisingly, that attendance depended on whether or not the home team was still in contention to reach the knock-out stage of the competition, i.e. medium-term uncertainty had a strong impact on attendances. Attendances increased the more often teams played in the competition, while winning the ERC had a very significant impact on attendances the following season.

The introduction of bonus points had no discernible impact on match attendance. The effect, if any, was subsumed into the general trend of increasing attendances that is evident over the life of the ERC. This is perhaps a surprising result and may have implications for competition design. We also identified substantial country effects, with attendance larger (in absolute terms) for English teams, once we control for team quality.

Our results indicate that attendances in the new ECC are unlikely to be adversely affected if the new competition is more unbalanced than the ERC. Szymanski (2001) suggested that there are two types of sports fans. “Hard-core” fans who attend matches and who are more interested in seeing their team win than in seeing a close contest. The second category of fans are those who watch matches on TV and Szymanski (2001) argued that this group were more likely to be interested in seeing a balanced contest. This implies that a more unbalanced competition may prove less attractive to TV fans.

References

- Borland, J. and Macdonald, R., (2003), Demand for Sport, *Oxford Review of Economic Policy*, 19:478-502.
- Braun, S. and Kvasnicka, M., (2013), National Sentiment and Economic Behaviour Evidence from Online Betting on European Football, *Journal of Sports Economics*, 14(1):45-64.
- Fort, R. and Quirk, J., (1995), Cross-Subsidization Incentives and Outcomes in Professional Team Sports, *Journal of Economic Literature*, 33:1265-99.
- Garcia, J. and Rodriguez, P., (2002), The Determinants of Football Match Attendance Revisited: Empirical Evidence from the Spanish Football League, *Journal of Sports Economics*, 3(1):18-38.
- Gitter, S.R. and Rhoads, T.A., (2010), Determinants of Minor League Baseball Attendance, *Journal of Sports Economics*, 11(6):14-27.
- Hogan, V., Massey, P. and Massey, S., (2013): Competitive Balance and Match Attendance in European Rugby Union Leagues, *Economic and Social Review* 44(4):425-46.

- Humphreys, B.R., (2002), Alternative Measures of Competitive Balance in Sports Leagues, *Journal of Sports Economics*, 3:133.
- Jones, S., (2014), Dragons Unbought Fire Doused by a Competition that's All Over the Place, *Sunday Times*, 2.3.2014.
- King, N., Dorian, P.D. and Audas, R., (2012), Playoff Uncertainty, Match Uncertainty and Attendance at Australian National Rugby League Matches, *Economic Record*, 88:262-77.
- Kuypers, T. (1996), The Beautiful Game? An Econometric Study of Why People Watch English Football, Discussion Paper in Economics 96-01, University College London.
- Leeds, M. and von Allmen, P., (2005), *The Economics of Sport (Second Edition)*. Boston, MA: Pearson Addison Wesley.
- Lee, Y.H. and Fort, R., (2012), Competitive Balance: Time Series Lessons from English Premier League Soccer, *Scottish Journal of Political Economy*, 59(3):266-82.
- Lenten, L.J.A., (2009a), Unobserved Components in Competitive Balance and Match Attendance in the Australian Football League 1945-2005: Where is All the Action Happening?, *Economic Record*, 85:181-96.
- Lenten, L.J.A., (2009b), Towards a New Dynamic Measure of Competitive Balance: A Study Applied to Australia's Two Major Professional 'Football' Leagues, 39(3) *Economic Analysis & Policy*, 407-28.
- Neale, W.C., (1964), The Peculiar Economics of Professional Sports, *Quarterly Journal of Economics*, LXXVIII(1).
- Noll, R.G., (1988), *Professional Basketball*, Stanford University Studies in Industrial Economics, 144.

Noll, R.G., (2007), Broadcasting and Team Sports, *Scottish Journal of Political Economy*, 54(3):400-21.

Paton, D. and Cooke, A., (2005), Attendance at County Cricket: An Economic Analysis, *Journal of Sports Economics*, 6(1):24-45.

Pawloski, T., Brewer, C. and Hovemann, A., (2010), Top Clubs' Performance and the Competitive Situation in European Domestic Football Competitions, *Journal of Sports Economics*, 11(2):186-202.

Rottenberg, S., (1956), The Baseball Players' Labor Market, *Journal of Political Economy*, 64:242.

Scully, G.W., (1989), *The Business of Major League Baseball*, Chicago, Chicago University Press.

Szymanski, S., (2001), Income Inequality, Competitive Balance and the Attractiveness of Team Sports: Some Evidence and a Natural Experiment from English Soccer, *Economic Journal*, 111, F69.

Szymanski, S., (2003), The Economic Design of Sporting Contests, *Journal of Economic Literature*, 61(4):1137.

Szymanski, S., (2007), The Champions League and the Coase Theorem, *Scottish Journal of Political Economy*, 54(3):355-73.

Szymanski, S., (2009), *Playbooks and Checkbooks An Introduction to the Economics of Modern Sports*, Princeton, Princeton University Press.

Szymanski, S. and Kesenne, S. (2004), Competitive Balance and Gate Revenue Sharing in Team Sports, *Journal of Industrial Economics*, 52(1):165.

Thornley, G., (2014), IRFU Will Continue to Receive €5.1m, *Irish Times* 11.4.2014.

Vrooman, J., (2007), Theory of the Beautiful Game: The Unification of European Football, *Scottish Journal of Political Economy*, 54(3):314.

¹ The issue of professionalism first surfaced in English rugby in the late 19th century and ultimately led to a group of clubs mainly based in the industrialised North of England breaking away and establishing Rugby League. Rugby Union remained an amateur sport until 1995. (Hogan, et. al, 2013)

² There have been no Romanian participants in the ERC since its first season.

³ England and France have national leagues. The Celtic League, comprising Irish, Scottish and Welsh teams began in 2000/01 and two Italian teams joined in 2010/11.

⁴ EU Commission, Joint Selling of the Commercial Rights of the UEFA Champions League, Decision of 23.7.2003, OJ/L291/25, p.45.

⁵ Five points are scored for a try (touchdown) and a team gets an opportunity to score a further two points by kicking the ball over the crossbar between the uprights. The ERC and the three major European leagues award a losing bonus point when a team loses a match by seven points or less.

⁶ The four play-off qualifiers with the best records in the group stages enjoyed home advantage at the quarter final stage which was played on a one-off basis and not over two-legs as in soccer's Champions League. Therefore, even a team that had already qualified still had a lot to play for in its final group match.

⁷ 85% of revenue was distributed between the three participating leagues with the remaining 15% based on merit payments.

⁸ For the period 1996/97 to 1998/99 we calculated teams' weighted ranking points for each of the previous seasons as we did not have four seasons data, i.e. 1996/97 points are based the previous season while 1997/98 is the weighted sum of ranking points for the two previous years and so on.

⁹ Scottish and Italian teams were assured of at least one ranking point every season because they qualified for the ERC automatically regardless of their final league

placing whereas English or French teams would have no ranking points if they had not qualified for the ERC in the previous season.

¹⁰ Prior to 2003/04 teams got two points for a win and one for a draw. From 2003/04 this was increased to four points for a win and two for a draw with the possibility of additional bonus points if a team scored at least four tries (touchdowns) or lost a match by seven points or less. Bonus points frequently proved decisive in deciding qualification for the knock-out stages of the competition.

¹¹ Suppose, for example, that after four matches the top team in a group had 16 points and the second placed team (team i) had 14 points. Under the bonus point system operated since 2003/04, a team could obtain a possible ten points from its final two matches. Thus our formula would give team i a qualification coefficient of 0.8, i.e. it is 0.2 matches behind the leading team. Suppose, however, that the second best of all the second placed teams had 15 points, i.e. one point ahead of team i. Team i is only 0.1 matches behind this team, i.e. its qualification coefficient is 0.9. Consequently team i is allocated a qualification coefficient of 0.9 in our model. In 1996/97 and 1998/99 the top two teams qualified from each group. The two teams occupying the two qualifying positions in each group were allocated a value of 1 and the remaining teams' qualification coefficient was determined by how far they were behind the second placed team in their group. In 1997/98 there were four groups of five teams with the top team in each group qualifying for the quarter-finals while the five runners-up and the best of the four third placed teams went into a pre-quarter-final round. In that instance we compared teams relative to the second placed team in their group or the best third placed team across all groups allocating the higher of the two values to each team.

¹² 1995/6 is excluded as we have no measure of team quality for the first season of the competition. Our data covers 1,226 of the 1,228 ERC group matches played over the 18 seasons from 1996/97 to 2013/14. The data is published on the ERC website.

¹³ In England a national club league was not established until 1987/88, while in Ireland and Wales national club leagues only began in 1990/91. Prior to this “friendly” or “challenge” matches accounted for a large proportion of clubs’ fixture schedules in all three countries. The introduction of professionalism led to the creation of what were effectively new professional franchises in Ireland, Scotland and Wales. (See, Hogan et al., 2013)

¹⁴ Just over half of matches were played on Saturday, about a quarter each were played on Friday and Sunday with only a few matches played mid week.

¹⁵ In 2012/13, 63 of the 72 group matches were broadcast live. Source: Retrieved from <http://www.ercrugby.com/eng/erc/about/index.php> Admittedly fewer matches were broadcast live in the early years of the competition.

¹⁶ The Celtic League began in 2001/02. It was divided into two groups in its first two seasons. There were 16 ERC matches between Celtic League teams during that period but there were no corresponding league matches between the teams because they were in different groups. There were ERC matches between Welsh and Scottish teams prior to the Celtic League but we do not have attendance data for the Welsh-Scottish League which operated from 1998/99 up to the formation of the Celtic League. We do not have Top 14 attendance data pre 2004/05 but there were few all French ERC matches prior to that date.

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