Competitive balance and spectator attendance: the case of the Korean Professional Baseball League

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Abstract: This study aims to analyse whether the uncertainty of outcome hypothesis applies to the Korean Professional Baseball League (KPBL). Specifically, the purpose of this study is to examine the competitive balance of the KPBL and investigate socioeconomic factors that may influence attendance. A structural time-series model is estimated to investigate the relationship between competitive balance and average game attendance in the KPBL from 1982 to 2012. The results provide evidence that the uncertainty of outcome hypothesis, as measured by competitive balance, does apply to the KPBL.

Keywords: competitive balance; uncertainty of outcome hypothesis; attendance; time series analysis; Korean Professional Baseball League; KPBL.


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This paper is a revised and expanded version of a paper entitled ‘Competitive balance and game attendance in Korean Professional Baseball League’ presented at the North American Society for Sport Management Conference, Ottawa, Ontario, 2–6 June 2015.
1 Introduction

Professional baseball league has been one of the most popular professional sports in Korea since the inception of the Korean Professional Baseball League (KPBL) in 1982. However, the KPBL’s popularity began to wane in 1995, when there was a documented decline in attendance. More recently, the Korean national team reached the semi-finals at the World Baseball Classic (WBC) in 2005 and 2009, and won the gold medal at the 2008 Beijing Olympics and the 2010 Guangzhou Asian Games. After these achievements, attendance at KPBL games increased, reaching a record number of 7,156,157 attendees in 2012. With this recent increase in popularity, the KPBL decided to expand the league by adding two new teams: one was added in 2013 and one more is expected in 2015. However, season attendance dropped to 6,411,855 in 2013, raising new concerns about the decrease in attendance compared to the previous year.

Attendance is considered one of the core assets of any professional sport. It not only determines the competitiveness of individual teams but also influences the competitiveness of the league as a whole, in the context of the professional sports industry. Increased attendance generates more revenue not only from ticket sales but also from media contracts, concession and merchandise sales, advertising, and even parking. Therefore, the survival and growth of professional sports is inextricably linked to attracting spectators. Scholars generally agree on this, and research on this subject has been done from all different perspectives.

When it comes to spectator attraction, sports marketing researchers have suggested that key factors affecting spectators’ decisions to attend include the stadium facility, ticket prices, weather, demographic characteristics, and loyalty (e.g., Levin and McDonald, 2009; Robinson and DeSchrver, 2003; Welki and Zlatoper, 1994). In addition, it has been suggested that a professional sports team’s ethical management and corporate social responsibility activities, and maintaining a positive reputation for the league and its players naturally lead to increased spectator desire to attend games (e.g., Czarnitzki and Stadtmann, 2002; Sheth and Babiak, 2010; Walker and Kent, 2009). Previous studies have focused on management strategies for creating spectator attraction from market-in perspectives looking at causes outside of the game: they thus have the limitation that the game itself (the product-out strategy) is not covered.

The professional sports industry differs from other industries in that each team in the league does not supply its own products (in this case, games) (Taylor and Gratton, 2002; Villar and Guerrero, 2009). For example, typical companies usually compete with rivals for profits. However, in the professional sports industry, two teams must cooperate while playing the game. The quality of the product in a professional sport league is measured by how entertaining the game is for the paying fans. Games that are more exciting and engaging are more attractive to fans, and games will be more exciting if the skill levels of the competing teams are evenly matched. Therefore, in order for the league to grow and develop, all teams need to maintain a similar skill level.

Competitive balance, based on Rottenberg’s (1956) uncertainty of outcome hypothesis (UOH), is often cited as one of the most important factors in determining the competitiveness of a game as a product in the professional sports industry (e.g., Forrest and Simmons, 2002; Fort and Maxcy, 2003; Lee, 2006; Maxcy and Mondello, 2006; Pawlowski, 2013). Rottenberg (1956) claimed that a game with a predictable outcome does not have much value as a product. That is, when two teams have fairly equal
chances of winning, it is more interesting for fans, leading to an increase in the game’s value as a product. Conversely, if the competing teams have an evident difference in skill levels, fans are less interested, and the value of the game as a product decreases.

Numerous previous studies have examined the relationship between fan attendance and competitive balance in order to verify the UOH, but the results have been inconsistent. Although the majority of studies found a difference in attendance depending on competitive imbalance in most professional sports leagues (e.g., Eckard, 2001; Hogan et al., 2013; Humphreys, 2002; Lee, 2004, 2006; Lee and Fort, 2005; Levin and McDonald, 2009; Schmidt and Berri, 2001; Soebbing, 2008), some studies have shown the opposite result (e.g., King et al., 2012; Mills and Fort, 2014; Szymanski, 2001).

In Soebbing’s (2008) study of Major League Baseball (MLB), he examined the relationship between competitive balance and regular season average attendance, using the actual to idealised standard deviation ratio. In a study of Australian rules football, Borland and Lye (1992) measured competitive balance in terms of the difference in league standing of the two teams participating in the contest. Levin and McDonald (2009) estimated attendance for five non-major professional sports leagues (Arena Football League, Central Hockey League, Major Indoor Soccer League, National Lacrosse League, Northern Baseball League) during the 2002–2003 season. They claimed that the sample of non-major professional sports leagues offered a unique opportunity to isolate the effects of competitive balance from other factors such as star players, distance between markets, and media attention. Most recently, Hogan et al. (2013) examined competitive balance (short- and medium-term) and game attendance in a study of European Rugby Union Leagues. Each of these studies found that competitive balance had a positive impact on fan attendance.

On the other hand, Szymanski (2001) found that match attendance was unrelated to competitive balance for English professional league football. In a study of the Australian National Rugby League, King et al. (2012) found that probability of making the playoffs and home team success are more important determinants of match attendance than competitive balance. Mills and Fort (2014) found a non-significant relationship between outcome uncertainty and attendance at National Football League (NFL), National Hockey League (NHL), and Major League Baseball (MLB) games, while the relationship was significant for the National Basketball Association (NBA).

Many previous studies examining the relationship between fan attendance and competitive balance using time series data have considered competitive balance as a control variable and focused on examining changes in the number of spectators due to microscopic factors affecting game attendance, and reported that a home team advancing/not advancing to playoffs in a recent season, betting odds, and the league opening effect influence game attendance, particularly in the first half of the season (Borland and Macdonald, 2003; McDonald and Rascher, 2000; Soebbing, 2008). That is, they have examined changes in the number of spectators caused by microscopic rather than macroscopic factors. In the context of Korean professional sports leagues, Lee (2002) has also conducted a study relating to the competitive balance of the KPBL and found that competitive imbalance was the main reason for the decline in attendance. However, his work was limited in that it did not consider a variety of situational factors influencing competitive balance and spectator attendance. Moreover, the fact that the research was based on data from a decade ago makes it difficult to apply to the KPBL’s current situation. As a result, there is a desperate need for research that helps create an understanding of the attendance fluctuation in the league since the 2000s. Accordingly,
the purpose of this study is to investigate the impact of competitive balance on attendance while considering the various socioeconomic factors that might influence attendance in the KPBL.

2 Measures of competitive balance

Competitive balance is regarded as the ideal variable to measure the uncertainty of game outcome and considerable effort has gone into measuring it. One of the most frequently used measures of competitive balance is the relative standard deviation (RSD) developed by Scully (1989). RSD compares the actual standard deviation (ASD) with the idealised standard deviation (ISD) of winning percentages, the latter taking its name from the idealised case in which each team has an equal probability of winning each game. A larger value for RSD indicates a wider spread of outcomes, adjusted to control for the dispersion expected from random variation, and thus a greater degree of competitive imbalance.

\[ RSD = \frac{ASD}{ISD} \]

The excess tail frequencies (ETF), developed by Fort and Quirk (1995), measure how often extreme winning percentages occur in the league. If the distribution of winning percentages is skewed to the left (or right), then many teams have low (or high) winning percentages. If the right or left tail is very long, extremely high or low winning percentages exist in the league. In both situations, the competitive balance is not ideal, as it would be in an evenly distributed league.

\[ ETF = 0.5 ± (2 \times ISD) \]

Lee (2004) proposed tail likelihood (TL) to address the ETF limitation that it does not consider actual winning percentages but only the number of teams in the league. TL represents the likelihood that the winning percentages of the top and bottom 20% of teams will occur in the idealised normal distribution.

\[ TL = \sum_i f \left( \frac{w_i - 0.5}{ISD} \right) \]

where \( i \) is the index number of the top and bottom teams as a certain percentage of the teams in the league, \( f \) is the standard normal probability density function, and \( w_i \) is the winning percentage of team \( i \). If TL increases, the tails of the distribution are moving closer to the league average winning percentage of 0.500. For example, 20% of the eight teams in the KPBL is 1.6 teams. The top and bottom 20% of teams therefore represent 1.6 teams at the top and bottom of the league, respectively. Lee (2004) claimed that, in this instance, the first and second teams from a weighted average reflecting 0.6 teams.

In this study, however, we are concerned about losing information about actual winning percentages by using the weighted average rather than the actual winning percentages of the 0.6 teams in TL. Thus, we used the actual winning percentages of teams that are out of scope as measured by ETF and applied them to TL to measure competitive balance. The greater the value, the greater the degree of competitive balance.
3 Data and empirical model

This study uses KPBL time-series data from 1982 through 2012. Because the KPBL was formed in 1982, we have only 31 observations. Therefore, the stability of the data must be verified. If there is a trend or non-stationary stochastic process, unit root testing must be performed to avoid spurious regression problems (Gujarati and Porter, 2009). In addition, if there is autocorrelation, this complicates the application of statistical analyses by reducing the number of independent observations. This leads to incorrect statistical analyses, exaggerating the precision and statistical significance of the estimated regression parameters (Gujarati and Porter, 2009). This means that the t-statistics will be larger than they should be, leading to the mistaken claim that some coefficients are statistically significant when they are actually not. Therefore, as verification for unit roots, the augmented Dickey-Fuller (ADF) test was used, and the Durbin-Watson test was performed to determine whether there is evidence of autocorrelation (see Table 1). We applied natural logarithmic transformation to settle the problem of non-stationary time-series data.

Table 1  Result of the stationary test for time series

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF test statistic</th>
<th>DW statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnATT</td>
<td>−4.862682</td>
<td>.0080</td>
</tr>
<tr>
<td>lnCBR</td>
<td>−6.915925</td>
<td>.0000</td>
</tr>
<tr>
<td>lnINCOME</td>
<td>−4.338131</td>
<td>.0019</td>
</tr>
<tr>
<td>lnTICKET</td>
<td>−3.714384</td>
<td>.0106</td>
</tr>
</tbody>
</table>

The null hypothesis of a unit root is rejected at the 5% level based on the ADF test, and the value of the Durbin-Watson test was near 2, indicating that there is no autocorrelation (Gujarati, 2003). Furthermore, correlation analysis was performed to increase the statistical reliability of the data processing. As shown in Table 2, there was no correlation among each of the independent variables used in the present study.

Table 2  Correlation analysis

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>lnATT</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lnCBR</td>
<td>.235</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lnINCOME</td>
<td>.381*</td>
<td>−.061</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lnTICKET</td>
<td>.562**</td>
<td>−.046</td>
<td>.178</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WC</td>
<td>−.264</td>
<td>.018</td>
<td>.124</td>
<td>−.170</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WBC</td>
<td>.126</td>
<td>.254</td>
<td>.274</td>
<td>−.201</td>
<td>−.048</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OLYMPIC</td>
<td>.357*</td>
<td>.190</td>
<td>.306</td>
<td>.099</td>
<td>−.048</td>
<td>−.069</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>IMF</td>
<td>−.234</td>
<td>−.002</td>
<td>.116</td>
<td>.337</td>
<td>−.070</td>
<td>−.101</td>
<td>−.101</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Notes: *p < .05, **p < .01.

Therefore, the stability of data was verified. From these proofs of authentication, the ordinary least squares (OLS) regression equation used for the objective of this study as it applies to regular season KPBL attendance is as follows:
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\[
\ln{ATT}_t = \beta_0 + \beta_1 \ln{CBR}_t + \beta_2 \ln{INCOME}_t + \beta_3 \ln{TICKET}_t + \beta_4 \ln{WC}_t + \beta_5 \ln{WBC}_t + \beta_6 \ln{OLYMPIC}_t + \beta_7 \ln{IMF}_t + \epsilon_t
\]

Table 3  OLS regression result

<table>
<thead>
<tr>
<th>Variables</th>
<th>DepVar: lnATT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S.E</td>
</tr>
<tr>
<td>Constant</td>
<td>1.357</td>
</tr>
<tr>
<td>lnCBR</td>
<td>.062</td>
</tr>
<tr>
<td>lnINCOME</td>
<td>.080</td>
</tr>
<tr>
<td>lnTICKET</td>
<td>.206</td>
</tr>
<tr>
<td>WC</td>
<td>.190</td>
</tr>
<tr>
<td>WBC</td>
<td>.154</td>
</tr>
<tr>
<td>OLYMPIC</td>
<td>.109</td>
</tr>
<tr>
<td>IMF</td>
<td>.104</td>
</tr>
</tbody>
</table>

Notes: \( R^2 = .789, \text{adj-} R^2 = .685, N = 30, F = 10.399, p < .001, DW = 1.433. \)

The dependent variable, number of attendance (ATT), is the average attendance per game. We assumed that average attendance represents the change in attendance more accurately than total attendance because each team played a different number of games. There were also a few instances in which a new team joined the league and running the KPBL was changed. As shown in Figure 1, attendance increased steadily until the mid-1990s and decreased dramatically from 1995 until 2005, at which point attendance began to increase significantly again.

Competitive balance (CBR), an internal factor that might influence attendance, is regarded as the ideal variable to measure the uncertainty of game outcome. The optimal level of competitive balance in the KPBL was achieved in 1983 (–0.21), while the highest level of competitive imbalance was in 2001 (–3.09). Comparison of attendance based on the level of competitive balance indicates a general increase in attendance for the years where there was a relatively high level of competitive balance, but a decrease when there was a competitive imbalance (see Figure 2).

**Figure 1**  Scaled average KPBL attendance, 1982 to 2012
INCOME, an external factor that might influence attendance, represents the real per capita GDP and shows constant increases, except in 1998 and 2009 (see Figure 3). The real ticket price, calculated by dividing the nominal ticket price by consumer price index increases until 1997 and then decreases until 2006 before beginning to increase again (see Figure 4).

Meanwhile, the Korea professional soccer league and KPBL, as representative professional sport leagues in Korea, have coinciding seasons, and therefore naturally compete with each other. Lee (2002) suggested the necessity of verifying the substitution...
effect of professional soccer on the KPBL under the increasing popularity of the Korean professional soccer league after the 2002 Korea-Japan World Cup. Because Korea hosted the World Cup in 2002 and the Korean team made it to the semi-finals, the majority of baseball fans likely became more interested in soccer at that time. Therefore, we included the 2002 Korea-Japan World Cup variable (WC) as a dummy variable in the analysis.

If other international sporting events lead to a decrease in KPBL attendance, an increase in attendance could be expected when international baseball events take place. Therefore, it is necessary to analyse the performance of the Korean national baseball team in international events from the mid-2000s onwards (i.e., 2006, 2009 WBC fourth place; 2008 Beijing Olympics gold medal; 2010 Guangzhou Asian Games gold medal) and how they have affected attendance. We therefore also included these as dummy variables (WBC and OLYMPIC).

Most previous research has considered professional sports ‘luxury goods’ from an economic standpoint (e.g., Demmert, 1973; Lee, 2002; Noll, 1974). As a result, the demand for professional baseball can be sensitive to changes in consumption patterns caused by business fluctuation, and changes elastically based on consumers’ individual preferences. In fact, it has been reported that the loss of consumer confidence surpassed the decrease in income during the financial crisis in Korea. It was reported that the decrease in income was about 10%, while the decrease in consumption was more than 15% in 1998 (Jung and Nam, 1999). Accordingly, analysis is needed to determine whether attendance of professional baseball games, defined as a luxury good, did decrease during the financial crisis. Therefore, the period of financial crisis (IMF), from 1998 to 2001, was added as a dummy variable in this study.

4 Results and discussion

This study conducted OLS regression and the result produced an F value of 10.399 ($p < .001$) and R-squared of .69, which means that the variables explain about 69% of the variation in attendance. The problem of multicollinearity was considered low, as confirmed by the variance inflation factor (VIF). None of the variables indicate the presence of multicollinearity, as they all have a VIF of less than 10 (see Table 2). On the other hand, the Durbin-Watson statistic ($DW = 1.433, N = 30$) was also found to have a lower bound of 0.926 and an upper bound of 2.052 (at the .05 significance level). No conclusion regarding the existence of autocorrelation can be drawn; therefore, the independence of the residuals cannot be verified. Accordingly, as an alternative test of autocorrelation, the residual of autocorrelation (ACF) and partial autocorrelation functions (PACF) must be examined as well.

As illustrated in Figures 5 and 6, the results of ACF and PACF examinations of the model confirm that no particular pattern can be seen beyond the confidence limit interval, and that the distribution occurs at a constant level; thus, it can be concluded that autocorrelation is not a problem for this model. As such, the OLS model estimation is considered appropriate.

The result provides evidence that the uncertainty of game outcome hypothesis, as measured by competitive balance, does apply to Korean professional baseball (see Table 2). It was revealed that competitive balance has a positive effect on attendance ($\beta = .260, t = 2.310$). This means that increasing spectator expectations of uncertainty in
the game’s outcome, which provides spectator motive to attend a game, arouses an interest in the game and thus increases the probability of spectators attending. This supports the results of previous studies (Soebbing, 2008), and implies that competitive balance of the teams playing in a game should be achieved to increase attendance.

**Figure 5** Autocorrelation function (see online version for colours)

![Autocorrelation Function](image)

**Figure 6** Partial autocorrelation function (see online version for colours)

![Partial Autocorrelation Function](image)
Competitive balance and spectator attendance

It is necessary to implement appropriate policies and institutional strategies to achieve competitive balance among teams in the league. It has been suggested that competitive imbalance among teams can be resolved through transferring and trading free agents (e.g., La Croix and Kawaura, 1999; Sanderson and Siegfried, 2003). Aiming to implement such a plan, the KPBL provides privileges such as first-round picks of rookie players, an increased number of foreign players\(^1\), and second-round draft picks\(^2\) to new teams entering the league by forming a new team or re-establishing a team, but not when new owners take over an existing team.

Next, the change in attendance due to external factors was examined. It was found that income has a positive impact on the number of attendance ($\beta = .329$, $t = 2.637$). This can be interpreted to mean that as income level gets higher, preferences toward leisure activities increase, leading to an increase in the number of fans visiting the baseball stadium. However, contrary to the general economic logic that demand decreases as the price of a product increases, this study found that the number of attendance increases with ticket price ($\beta = .642$, $t = 5.542$). It is expected that the main cause of this result is that the ticket price used in this study was the actual ticket price, reflecting the consumer price level. That is, although the nominal ticket price increases, the increase felt by consumers in light of the price level is not as distinguishable, and may even be a decrease.

In addition, it is possible that the extent to which increased ticket price influences decreased attendance may be offset by a continuous increase in national income. It is also possible that the ticket price for KPBL games has been set too low. If the ticket price is too low compared to consumers’ marginal utility, consumers’ response to the increase in price, up to a certain level, is inelastic. Consequently, the ticket prices for KPBL games show a Giffen’s goods characteristic under which the income effect surpasses the substitution effect. This shows the possibility of an increase in attendance even with the increase in price, leading to a point of additional debate over the optimal level of increase in ticket prices for KPBL games.

Meanwhile, we analysed the effect of other international sports events held in Korea on attendance at KPBL games and found a negative relationship ($\beta = –.229$, $t = –2.128$). This explains why professional baseball spectators were lost to the Korea-Japan World Cup in 2002. Although the KPBL is thought to have a larger fan base than the Korean professional soccer league, in reality, soccer is the most popular sport in Korea. A national soccer team game is one of the sporting events in which Koreans are most interested. Furthermore, the 2002 Korea-Japan World Cup was held in Korea, and as the Korean national team made it to the semi-finals, the attention of all sports fans was focused on the event. Accordingly, the decrease in attendance of professional baseball games during the World Cup was somewhat expected.

On the other hand, the impact of the achievements from international baseball events on attendance of domestic professional baseball was not significant, which was quite different from the expectations. The result showed that neither of the WBC ($\beta = .044$, $t = .360$) or OLYMPIC ($\beta = .086$, $t = .732$) variables had much statistical relevance. One likely cause of this result is that 2006, 2008, 2009 and 2010, when WBC, the Olympics, and the Asian Games were held, were seasons in which competitive balance was achieved. This means that although the achievement in the international event may have partially affected the increase in attendance, this cannot be seen as having a direct causal connection to the attendance increase. Secondly, although most Korean players playing in
the MLB and the Japan League joined the Korean national team to participate in the WBC, the Asian Games, and the Olympics, they all returned to their own leagues following the event. Therefore, although the Korean baseball team had great achievements in international events, with big leaguers playing a key role, the reality that fans would not be able to see them in the domestic league meant that the results did not influence increased attendance in the domestic league.

Finally, it was found that the financial crisis variable, representing a national economic crisis, had a strong negative effect on attendance ($\beta = -0.491, t = -4.399$). This kind of external impact can neither be anticipated ahead of time nor controlled by the stakeholders of the KPBL. As mentioned earlier, as professional sports including professional baseball, encompass characteristics of luxury goods, people have no choice but to respond sensitively to economic fluctuations, which will eventually lead to a decrease in attendance. In fact, it has been shown that attendance of most Korean professional sports, including baseball, declined drastically during the financial crisis. Hence, professional baseball stakeholders must exert effort to strengthen competitive balance, which they can directly manage and oversee. This is the most effective way to prevent spectators from leaving owing to an external factor like an economic shock.

5 Conclusions

This study aimed to analyse the effect of competitive balance on attracting spectators and keeping them interested in the KPBL. Therefore, we examined whether the league’s competitive balance can shield the league from decreased the attendance due to socioeconomic factors. The results lead to several practical suggestions. First, the results showed that income, ticket price, financial crisis, and competitive balance affect KPBL attendance. However, it is impossible for league stakeholders to anticipate or control these factors, with the exception of ticket price. If other conditions are equal, fans’ interest in professional baseball is ultimately triggered by excitement about and interest in the game. This starts with competitive balance, which is associated with greater uncertainty in game outcomes. Therefore, the KPBL needs to consider policies and reforms to strengthen competitive balance in order to offset the possibility of a decrease in attendance. Second, KPBL attendance decreased when the World Cup was held in Korea in 2002. This signifies that an increase of demand for one event influences the decrease in attendance of other events. Aside from competition among sporting events, the development and expansion of other alternative types of social culture can also shrink the demand for professional sports. Therefore, the KPBL needs to establish a strategy for creating and maintaining sustainable demand by enhancing the value of professional baseball.

The results of this study have several academic implications as well. Despite the expectation that the success of the Korean national baseball team in the WBC and the Olympics would increase attendance, this study found that the effect is not statistically significant, which is somewhat unexpected. Nevertheless, as there have been insufficient studies on the effects of international event outcomes on attracting domestic league spectators, this study is significant in that it has attempted to examine these effects. In addition, the study used long-term time-series data, unlike previous research where a much smaller amount of data was used owing to the lack of serial data. This study was able to address the non-stationary problems that may occur with short-term time-series
data. This analysis of actual proof is meaningful in terms of looking at variables affecting the attendance of KPBL games.

However, there were some limitations in conducting the analysis and several suggestions can be made for future research. First, this study only uses information on winning rates on a yearly basis to produce competitive balance. However, the possibility that a team will advance in the playoffs can be represented as an important factor influencing total attendance (Soebbing, 2008). In addition, competitive balance itself does not contain qualitative information about the game; therefore, even an identical distribution of winning rates, if the quality of a game is not high enough, one should bear in mind the likelihood of a decrease in fan interest. In a similar vein, changes in team rankings within the league should also be considered a factor, meaning that even if the league’s level of competitive balance is considered high, if one team dominates the majority of games, there is the possibility of declining fan interest in games and in the league as a whole. In order to verify these effects, there should be a thorough analysis of panel data by combining the longitudinal time-series data used in this study with cross-sectional data that includes individual teams’ competitive balance information.

Second, although this study focused on the importance of competitive balance, it did not consider precedent variables, because problems of endogeneity could have occurred if sub-factors of competitive balance were simultaneously included in the research model. Accordingly, a future study should conduct exploratory analysis of sub-factors of competitive balance by using a statistical technique such as two-stage least-squares regression.

Finally, the short time-series data used in this study were a limitation as well. In a future study, therefore, it is necessary to analyse the relationship between competitive balance and the number of spectators by considering various control variables such as season opening effect, advancing/not advancing to playoffs, population, and weather by carrying out a match analysis using panel data in addition to the seasonal analysis.

References


**Notes**

1 Under the former foreign player system of Korean professional baseball, first introduced in 1998, each team was able to have two non-Korean players. Since 2014, the system has expanded: all teams can have three foreign players, including two active foreign players. In the case of NC and KT, which will participate in the 2015 League, the KPBL Board temporarily allowed them to have four foreign players and three active foreign players, given the competitive imbalance among the teams.

2 Based on the Rule 5 draft, which is in effect in MLB, it was first introduced in KPBL in 2012. This policy is aimed at selecting existing players rather than rookie players. Each team can pick players, except for the 40 players included in the reserve list, from the perspective that the players scouted through this route does not necessarily have to be registered as active on the roster; this contrasts slightly with the Rule 5 draft.