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An Assessment of Global Market Penetration of Major League Baseball: Case of the Korean Baseball League

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The Korean Professional Baseball (KPB) as a market has shown a downward trend since 1996; there are two possible explanations: televising Chan-ho Park's games in Korea and trading valuable players resulting from the 1997 East Asia economic crisis. The purpose of this study was to assess the impact of these two occasions on the KPB industry. The Multiple Interrupted Time Series (MITS) was employed to analyze monthly data of average attendance from April 1991 to September 2001 (N = 66). The results indicated that the two occasions had statistically significant influences on the downward slope of the KPB league at the .05 alpha level. Moreover, for the reliability of the results obtained, the relationship between annual team standings and attendance was examined through the Spearman rank order analysis. In the results, there were no statistically significant relationships at the .05 alpha level, except for one team. Therefore, it can be concluded that the results from the MITS analysis were relatively reliable. Based on the results, some implications have been suggested: the need for attempting promotional strategies for the KPB, the demand for new policies guiding the trading of amateur players, and the possibility that the global market penetration of Major League Bsseball(MLB) can result in unbalanced global markets.

key words *: professional baseball, multiple interrupted time series, market penetration*

Introduction

The global market expansion of the four major professional sport leagues in the United States is a phenomenon of relatively recent origin. Since the participation of the National Basketball Association (NBA) stars in the 1992 Barcelona Olympic Games, under the appellation "Dream Team," the NBA as an American sport product has expanded successfully beyond the borders of the United States. The National Hockey League (NHL) has arguably been an international association, based upon both US and Canadian markets, from its inception (Quirk & Fort, 1992). Today, the NHL obtains a quarter of its players from European countries; this steady supply of European players for the NHL has definitely contributed to the expansion of its market in international venues. The operation of the National Football League Europe (NFLE) by the National Football League (NFL) demonstrates the efforts of the latter body to expand its market worldwide (Polite & Jackson, 2002). Although the NFLE has not yet generated profits, the NFL does not appear poised to withdraw operational support of the European league or, for that matter, the expansion of American football in Europe. Major League Baseball (MLB) is another league seeking global expansion in terms of both the supply of eminent baseball players and marketing strategies. Clubs within the MLB have obtained good players from Central America and, since the mid-1990s, have

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courted several new suppliers and consumers in Asia, notably Japan, South Korea, and Taiwan. The expansion of the MLB market into Asia has generated results that are much better than expected.

Successful Asian player migrations to American baseball clubs have significantly increased the global marketability of the MLB, especially when these players returned to their countries of origin for games. Notable examples include Hideo Nomo, Ichiro Suzuki and Kaz Sasaki from Japan as well as Chan-Ho Park and Byoung-Hyun Kim from South Korea. Based upon the star-status of Suzuki and Sasaki in Japan, the MLB opened its 2003 season at the Tokyo Dome with two games between the Seattle Mariners and the Oakland A's. Exploiting the popularity of these players in their home countries, the MLB has managed to triple the television broadcasting-fee in Japan (King, 2002). Based upon the local popularity of Park and Kim in South Korea, the MLB television-broadcasting fee has increased approximately ten-fold during a four-year period, from $300,000 in 1996 to $3 million in 2000 (TVnToday.com, 2000). In other words, MLB has successfully penetrated the Asian market in its effort to expand globally. A local downside to the MLB expansion into the global marketplace is an evident decline in the fan-base and success of local leagues. It has been noted that attendance has decreased at Japanese baseball league games, due to the outflow of valuable players (Lee, 2003); the situation with the KPB is similar.

Background of Major Factors on the Downward Trend

The KPB league was established in 1981 with six teams; two additional teams joined during the next twenty years (Korea Baseball Organization, 2002)1. Even though its initiation was intended to deflect attention from political instability in Korea (Yoo, 2002), the average attendance at games steadily increased each year thereafter until 1995. Attendance has more recently, since 1995, exhibited a clear downward trend. Two likely explanations for the decrease in attendance at KPB games are the "Chan-Ho Park Syndrome" and "trading quality players" resulting from the economic unrest in 1997.

The "Chan-Ho Park Syndrome" describes the transfer of Korean public attention to American baseball with the drafting of Park by the Los Angeles Dodgers as a free agent pitcher in 1994. This event created a sensation among the Korean people, providing an unprecedented opportunity to watch a Korean athlete competing at the highest level of baseball. Since April, 1996, when the Korea Broadcasting System (KBS) began televising the LA Dodgers' games in which Park played, he has become one of the most popular athletes in South Korea. This is certainly supported by the fact that there is a 30% increase in the sale of daily sports' newspapers when they include information about Park. According to a report written by Yok (1997), Park was rated the most popular athlete in Korea. The interest of the Korean people has increased in direct proportion to Park's success in the "big league," resulting in more attention being given to MLB games and less to KPB games.

An additional factor that has almost certainly contributed to the decline in attendance at KPB games seems to be trading top players to the Japanese professional baseball league. South Korea suffered a severe financial setback near the end of 1997, resulting in a 55% depreciation of the Korean won against the U. S. dollar (Liu, 1997) and doubling of the unemployment rate (Liu,

2000). The nation's economic difficulties directly affected the Korean league in several ways. Not only did the economic crisis make fans much less likely to attend stadium events, causing the attendance rate to decrease significantly for all professional sports, including baseball, but professional sports' clubs were also forced to seek desperate solutions for survival. Due to the East Asian economic crisis, KPB teams needed to sell or trade their top players to stay operational. For instance, the Haitai Tigers, one of eight clubs in the KPB, traded valuable players such as Dong-Lyul Sun (pitcher) and Jong-Bum Lee (infielder) to the Japanese professional baseball league for substantial profit. Although such trades resulted in crucial financial resources for clubs, they were disastrous for the league. The loss of valuable players contributed to the disinterest of fans. Consequently, the two possible influential factors (Chan-ho Park's Syndrome and Trading top players to other countries) have led to the downward trend of the average attendance ranging from 8,793 in 1996 to 4,998 in 2000 (KBO, 2001a).

Significance and Purpose of the Study

Since 1995, the KPB industry has shown a downward trend due to several difficult circumstances such as televising Chan-Ho Park's games, trading top-notch players, economic crisis, and so on. How can practitioners overcome such difficult situations? Understanding the nature of the phenomenon represented by a sequence of observations (time-series data) will provide valuable explanations to understand the current situation of the KPB industry and to forecast future values of the time series variable. Forecasting is a necessary input to sound marketing strategies whether in the KPB industry, or in any other business settings.

The possible impacts of the two instances on the KPB industry may be seen as a conjecture rather than a fact because evidence explaining the impacts has not been provided. However, the conjecture was considered worthwhile enough to formulate the purpose and research hypotheses for this study. The purpose of this study was to examine the impact of the outflow of eminent players on the downward trend of the Korean professional baseball market. The two research hypotheses were developed to test (1) whether televising LA Dodgers' games in which Park played had an impact on the professional baseball industry both short-term and long-term, and (2) whether trading top-notch players had an impact on the professional baseball industry both short-term and long-term.

Applicability of the Multiple Interrupted Time-Series (MITS)

In order to examine the impacts of two incidences (televising Park's games and trading top-notch players to other countries), the multiple interrupted time series (MITS) was employed. The time-series quasi-experiment was proposed initially by Campbell (1963) as a means of assessing the impact of a discrete intervention on a social process. The method has been most frequently used in non-sport areas, especially political science or economics.

The interrupted time-series has generally been used in numerous areas such as instances relating to the impact of new traffic laws (Campbell & Ross, 1968; Glass, 1968), the impact of the Occupational Safety and Health Act (OSHA) (Lewis-Beck & Alford, 1980), the impacts of gun

control laws (Deutsch & Alt, 1977; Hay & McCleary, 1979), and the impact of air pollution control laws (Box & Tiao, 1975). Also, the method was used to examine some economic effects of the Cuban Revolution (Lweis-Beck, 1979). It has more recently been applied in psychological research areas (Mesch & Dalton, 1992; Pollock, 1994). Nevertheless, it is also regarded as a useful method because the two trades seemed to be important instances similar to those used in other research employing the interrupted time-series.

In addition, the research conducted by Joo, Choi, and Mun (2003) has determined that the MITS is much more easily understood, yet as powerful as other time series methods. Their study using the MITS focused on the impact of strikes on the MLB attendance. The results were compared to the results of the research performed by Schmidt and Berri (2002), which also focused on equivalent interruptions (strikes), but used a different time-series method, Auto Regressive Moving Average (ARMA). In comparison, both studies determined significant short-term but insignificant long-term effects of the 1981 and 1994-95 strikes. Therefore, it can be concluded that the MITS method is just as powerful as other time-series methods, at least the ARMA.

Methods

Research Design

To achieve the first research hypothesis for this study, the initiation period of televising the LA Dodgers' games that included Park was designated as an independent variable. For the second hypothesis, the initiation period of trading top-notched players was designated as an independent variable. A dependent variable for both questions was monthly average attendance at professional baseball games from April 1991 to September 2001 because the attendance rate is likely to reflect the situation of the Korean Professional Baseball industry. Thus, due to the duration of the baseball season from April to September, the total number of observations (N = 66) was analyzed. The secondary source of data was obtained from the 'Official Baseball Guide' annually published by the Korean Baseball Organization (from 1991 to 2001). The more specific procedures for this study are explained in the following section.

Model for Chan-Ho Park's Impact

The issue of the first research hypothesis was to determine whether game-attendance in this time series has been affected by televising LA Dodgers games, specifically in relation to the increase in Park's popularity. Informally, to assess the effect of this intervention, this study looked at the shift in attendance after April 1996, when KBS started broadcasting Park's games. Formally, it was concerned with whether or not the observed change was statistically significant. The correct estimation of the following regression equation would permit statistical evaluation of this simple interrupted time-series design:

$$Y_t = b_0 + b_1X_{1t} + b_2X_{2t} + b_3X_{3t} + e_t \quad (1)$$

where Y_t = monthly observations on the number of attendants in professional baseball games from April, 1991 to September, 2001; X_{1t} = a counter for months from 1 to 66, the number of observations; X_{2t} = a dichotomous variable scored 0 for observations before televising Park's games, and 1 for April ,1996 and after; X_{3t} = a counter of months scored 0 for observations before the intervention and 1, 2, 3,... for observations after the intervention; b_0, b_1, b_2, b_3 = parameters to be estimated; and et = error.

Parameters b_0 and b_1 indicate, respectively, the level and slope of the time-series prior to televising Park's games in April, 1996. To determine whether b_0 and b_1 are altered by the intervention, b_2 and b_3 must be examined. If the estimate for b_2 is not significantly different from zero, it can be inferred that televising the games had no effect on the level of the time series, which would indicate no short-term effect. Similarly, if the estimate for b_3 does not differ significantly from zero, the inference is that the intervention had no effect on the slope of the time series, which would also indicate no long-term effect.

Model for Trade Impact

Due to the East Asia economic crisis of 1997, league owners initiated the trading of quality players. At that time, the Korean Professional Baseball experienced a downward trend resulting, it is believed, from financial setbacks and a lack of popular players. The second research issue was to determine whether game attendance during this time series was affected by the trading of valuable players such as Dong-Lyul Sun (pitcher, Haitai) and Jong-Bum Lee (infielder, Haitai) to the Japanese baseball league. In order to examine the second research hypothesis, the equation (1) is not appropriate because it does not represent the impact of trading top-notched players. To introduce the trading intervention, the MITS design has been provided. The regression equation is:

$$Y_t = b_0 + b_1X_{1t} + b_2X_{2t} + b_3X_{3t} + b_4X_{4t} + b_5X_{5t} + e_t \quad (2)$$

where Y_t, X_{1t}, X_{2t}, X_{3t} are defined as in Equation (1); X_{4t} = a dichotomous variable scored 0 for observations before the trading of valuable players, and 1 for April, 1998 and thereafter; X_{5t} = a counter of months scored 0 for observations before trading and 1, 2, 3,... for April, 1998 and thereafter.

If the estimate for b_4 is not significantly different from zero, it can be inferred that trading players had no effect on the level of the time series, which would indicate that there was no short-term effect. Similarly, if the estimate for b_5 is not significantly different from zero, the inference is that the trading-intervention had no effect on the slope of the time series, which would indicate no long-term effect.

Detection of Autocorrelation

Autocorrelation has been defined as correlation between the members of a series of observations ordered in time series data (Davison & MacKinnon, 1993). In the regression context, which was employed for this study, it assumes that such autocorrelation does not exist (Gujarati, 1995). Therefore, using the time-series data, which is monthly average attendance from April 1991 to September 2001, this study needs to determine if the data contain autocorrelation or not. In this study, the most well-known test for detecting autocorrelation, the Durbin-Watson d statistic method, was employed because this method is relatively less fallible than simply analyzing errors (Gujarati, 1995; Webster, 1995).

The Durbin-Watson statistic is used to test the null hypothesis of no autocorrelation. Under the whole range from zero to four, there are three different zones to make a statistical decision using d-value calculated: zone with evidence of autocorrelation, zone of indecision, and zone with no evidence of autocorrelation (Durbin & Watson, 1951). Based on such situations as the number of independent variables (k = 5), the number of observations (n = 66), and the significant level of alpha (α = .05), two critical values were calculated: d_L = 1.46 and d_U = 1.77. The critical values would be compared with actual d-value. If $0 < d < d_L$ or $4 - d_L < d < 4$, it indicates significant autocorrelation. If $d_U < d < 4 - d_U$, there is no evidence of autocorrelation. The rest area indicates zone of indecision, meaning that one cannot conclude whether autocorrelation exists or not.

Results / Discussion

Monthly data back to 1991 were used to test the MITS model of Equation (2). <Table 1> shows the coefficients concerning the MITS model. Estimating that model with ordinary least squares (OLS) provides the following:

$$A_t = \underset{(9.432)}{7067.529} + \underset{(2.224)}{.700X_{1t}} + \underset{(.776)}{.215X_{2t}} - \underset{(-2.886)}{2.337X_{3t}} + \underset{(-.191)}{.050X_{4t}} + \underset{(2.059)}{1.047X_{5t}} + e_t \quad (3)$$

R^2 = .665 N = 66 Durbin-Watson (D-W) = 1.970

where the values below the parameter estimates = the t-ratios; R^2 = coefficient of multiple determination; N = number of observations (April, 1991 ~ September, 2001); D-W = Durbin-Watson statistic. In order to yield desirable estimators in ordinary least squares (OLS), the error terms should be uncorrelated, $E(e_i e_j) = 0$, $i \neq j$. In the equation (3), D-W = 1.970, which indicates the degree of autocorrelation, showed no evidence of autocorrelation because the *d*-value was greater than 1.77 (d_U) and less than 2.21 ($4 - d_U$).

In the equation (3), the proper combination of parameter estimates provides a simple regression fit within each time period, and these are depicted over the observations plotted in <Figure 1>. The value of b_1 (t = 2.224, p < .05) exhibits that before the impetus of televising and trading, the attendance at Korean Professional Baseball games has gradually increased. However, after the

intervention of televising Park's games, the attendance rate moved significantly downward. Such a circumstance is quantified by $b_1 + b_3$ ($t = -2.886$, $p < .01$), which is statistically significant. Again, since the trading of players resulting from the financial crisis in 1997, a significant downward slide has been observed. The slope of $b_1 + b_3 + b_5$ ($t = 2.059$, $p < .05$) indicates such a situation. Therefore, based on the coefficients from the equation (3), two interventions have had long-term impacts on attendance at Korea Professional Baseball games. It can be inferred that the two interventions had negative impacts on the professional baseball industry.

Table 1. Coefficients from MITS Model for Televising and Trading Impacts

Variables	Unstandardized Coefficients	Std. Error	Standardized Coefficients (beta)	t-value	p-value
b_0	7067.529	749.351		9.432	.000 ***
b_1	93.867	42.210	.700	2.224	.030 *
B_2	1104.887	1422.979	.215	.776	.441
B_3	-498.112	172.580	-2.337	-2.886	.005 **
B_4	-263.099	1357.383	.050	-.191	.849
B_5	365.420	177.438	1.047	2.059	.044 *

Note. * p<.05, ** p<.01, and *** p<.001. Dependent variable (A_t) is the monthly average attendance.

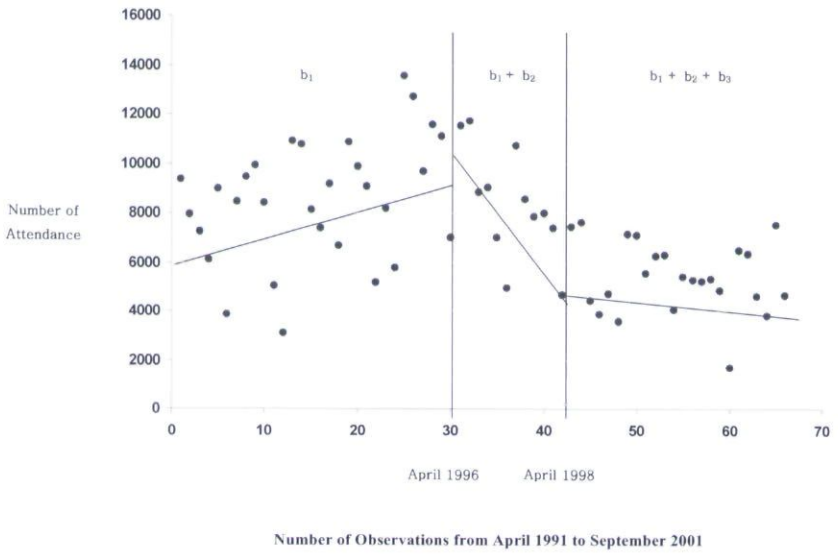

Figure 1. Multiple Interrupted Time Series analysis of the televising and trading interventions

The two slopes ($b_1 + b_3$ and $b_1 + b_3 + b_5$), indicating the long-term effects of both interventions, must be more closely examined because the slope of $b_1 + b_3$ is much steeper than the other, b1 and $b_1 + b_3 + b_5$, even though all slopes are statistically significant at the alpha level of .05. This phenomenon should be viewed as related to the particular situation of GNP and GDP in Korea.

According to a report provided by Daewoo Economic Research Institute, the size of the GDP has been greater than that of the GNP since 1996 (Lee, 1998). This means that the sum of the wages, allotment, and interest that foreigners or foreign companies earn in Korea is greater than what Korea or Korean companies earn in other countries; in other words, Koreans are more seriously concerned about the current economic crisis. When such a circumstance is considered, the slope presented by $b_1 + b_3$ seems to most clearly reflect the effects of televising Park's games and, to a lesser degree, trading quality players.

In considering the coefficients b_2 and b_4, that respectively indicate the short-term effects of televising and trading, a questionable issue is evident. Even though D-W indicates no significant autocorrelation, a Box-Jenkins (1970) analysis of the autocorrelation and partial autocorrelation functions of the residuals from Equation (3) show a slight seasonal fluctuation every sixth month because monthly data was used for this study. Thus, after controlling b_1, b_3, and b_5 by the removal of the trends (slopes) in these observations, the converted observations were examined by one-way ANOVA (See Table 2). This test was designed to examine the difference among three time periods: prior to televising (PT), between televising and trading (BTT), and after trading (AT). A dependent variable is the average attendance at Korean professional baseball games. The result demonstrates statistically significant differences between the three time periods in relation to attendance ($F = 6.742$, $p < .01$). To determine which time periods show statistically significant differences, the Gabriel Post-Hoc Test was administered (see Figure 2). The findings show that there are statistical differences between PT and BTT, and between PT and AT at the .05 alpha level; however, there are no significant differences between BTT and AT at the .05 alpha level. Therefore, the results from the Gabriel Test reveal that the two interventions significantly influenced the natural trend of attendance in Korean Professional Baseball games.

It must be considered that variables other than the televising of Park's games and trading valuable players have influenced attendance at KPB games; these variables must be correlated in MITS. When these "third variables" are identified, the apparent effects of the two interventions on attendance are expected. Based upon the assumption that team standings are likely to have a positive impact on game attendance (DeSchriver & Jensen, 2002), annual team standings are used as a third variable in this study. To test whether or not this variable is influential, the Spearman's rank-order analysis was utilized between the annual team standings from 1991 to 2001 and annual attendance during those periods. If the Spearman's rho values are statistically significant at .the 05 alpha level, the effects of two interventions (televising and trading) are likely to be spurious. The result of this analysis demonstrated no evidence of relationship between team standing and attendance on all league teams, except for one team, Lotte ($\rho_{rho} = -.827$, $N = 9$, $p < .01$). In relation to the seven correlation coefficients from other teams, LG ($\rho_{rho} = -.329$, $N = 9$, $p = .387$), Doosan ($\rho_{rho} = -.253$, $N = 9$, $p = .511$), Samsung ($\rho_{rho} = -.256$, $N = 9$, $p = .505$), Haitai ($\rho_{rho} = -.656$, $N = 9$, $p = .055$), Hyundai ($\rho_{rho} = -.262$, $N = 9$, $p = .496$), Hanhwa ($\rho_{rho} = -.321$, $N = 9$, $p = .400$), and SK ($\rho_{rho} = -.553$, $N = 9$, $p = .122$), there are no statistically significant values at the .05 alpha level. It can, therefore, be inferred that team standing is generally insignificant when correlated with team attendance from 1991 to 2001. In other words, according to results from the test of the third variable, the effects of the two interventions on attendance were not spurious.

Table 2. ANOVA Analysis based on the Deseasonalized Time-Series Data

Time Periods	Means	SD	F	Sig.	Post-hoc(Sig.)
PT (1)	922.833	2348.692			1-2 (.003) **
BTT (2)	-1534.670	1269.416	6.742	.002	2-3 (.437)
AT (3)	-571.792	1949.616			1-3 (.038) *

Note. * p<.05 and ** p<.01. Dependent variable (A_t) is the monthly average attendance.

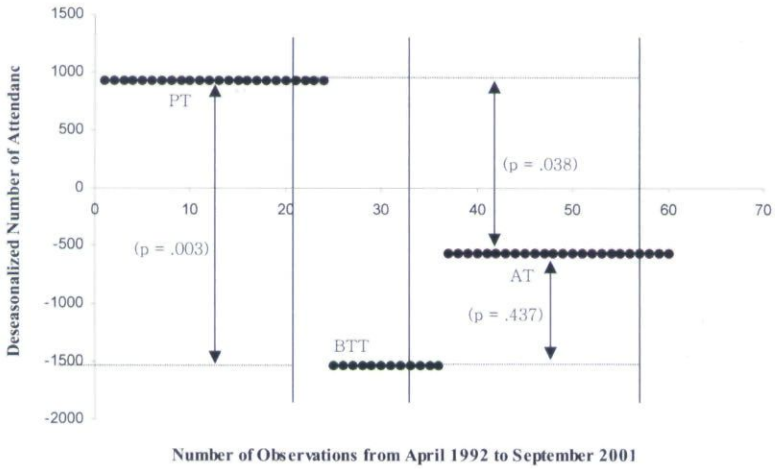

Figure 2. Short-Term Impacts from a Post-hoc Test based on the Deseasonalized Time-Series Data

Conclusion / Implications

This study assessed the current status of the Korean professional baseball market; it specifically indicated long-term effects of televising Park's games and trading valuable KPB players resulting from the 1997 economic crisis. The effect of televising Park's games on the decline of the attendance at KPB games seems to be clear. However, the effect of the second interruption might be ambiguous because the nation's economic difficulties directly affected the Korean league in several ways. Thus, the second interruption includes the effects of an economic crisis (IMF) and trading star players on the attendance at KPB games because trading star players (Dong-Lyul Sun and Jong-Bum Lee) occurred due to the economic crisis of the Haitai Tigers.

Such influences were likely to continue unless the Korean Baseball Organization (KBO), the governing body of the Korean Professional Baseball league, provides new policies and marketing strategies designed to protect the domestic industry and re-attract national attention to Korean professional baseball games. Recently, the KBO or league clubs tend to focus on marketing strategies just for short-term effects such as fan event in field, ticket coupon usage. In order to overcome such circumstances, they should make efforts to keep the philosophy or vision of the KPB in fans' or potential fans' minds.

The economic crisis of 1997, which was a leading cause of trading quality players, was, of

course, an event beyond the control of the KBO; however, the downward trend resulting from televising Park's games could have been minimized with effective marketing strategies. The home-run derby between Mark McGwire and Sammy Sosa, during the 1998 and 1999 seasons, is an instance of effective marketing. This event was the most explosive home-run race in the history of the MLB and was very effectively exploited, as a promotional product, by the league. Another important instance is Babe Ruth and Roger Maris; at the professional peaks of these two players, millions of fans gathered to watch them dominate the home run race (Yancey, 2000). The KPB and its clubs should similarly utilize marketing strategies to revitalize national attention.

Another evident problem, of course, is the player agreement contracts between Korea and the United States. According to the 2001 *Baseball Regulations* (KBO, 2001b), when an American club wishes to engage a Korean professional baseball player, the American club should first determine the status and availability of the Korean player. This can be achieved through more effective communication between the Korean and American baseball commissioners. Although better communication strategies would not have helped in the case of Park since he was a collegiate player, it would prevent the loss of valuable players at the professional level. There are currently no guidelines relating to trading amateur players; Park was contacted directly by the American league. In order to prevent the further deterioration of the Korean baseball industry, the Amateur Baseball Association should consider designing policies to regulate trading amateur players.

There is, of course, a "flip side" to the global expansion of the MLB market. Since the 1980s, the MLB has successfully penetrated international markets; however, in the cases of Japan and Korea, baseball fans have become less interested in domestic games. In other words, even though the MLB is able to successfully profit from its global expansion, it is certainly arguable that this is a short-term impact. Because the transfer of interest is based upon the status of individual players and not upon the inherent attractiveness of the MLB to Korean baseball fans, the decline of the KPB may ultimately lead to an overall decline of interest in both local and global baseball. A more balanced global market, not domination by a particular league, is more likely to result in the continuous development of international baseball industries.

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