Scientific Research Publishing

The Relationship between Player Characteristics, Team Characteristics and Athletes' Remuneration: An Advanced Empirical Study of Asian and US Professional Baseball Leagues

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Abstract

This paper studies factors that determine salary among professional baseball players in the Asian (Japan, Korea and Taiwan) and US. Empirical results show that US baseball players are the highest paid and those in Taiwan receive the lowest salary, with a large difference of 75 times. Experience, age, education and other variables, as well as population of teams' home cities are influential. Whether or not a player transfers to other teams, their health conditions (measured as BMI) and other variables significantly affect salary, and there is no significant variance arising from different management environments in different countries. Although team age and player salary are correlated significantly in the three countries, the correlation is positive in the US and negative in Asian (Japan, Korea and Taiwan). However, their health conditions (measured as BMI), training, education and population of teams' home cities have insignificantly correlation with the total salary from multi-year contracts.

Keywords

Professional Sports, Baseball, Player, Annual Compensation, Contract

1. Introduction

Salaries of baseball players are high.[1] A review of literature on factors that de-

[1]Taking 2003-2014 as an example:

Country	US	Japan	Korea	Taiwan
Average Per capita GDP (in US$10,000)	4.99	3.72	2.63	1.83
Average Salary of Baseball Players (in US$10,000)	396.05	52.65	33.64	5.28

termine baseball player salaries shows that include experience [1] [2], player's performance [2], age [3], contract length [4], team performance [5], sports awards [6], previous-season team revenues [7], and contract signing team located in birth state [8] as factors affecting athlete salary.

Cross-national studies on athlete salaries are few and far between. Most of them focus on salary distribution within single regions [6] [7] [9] [10] [4]. This study sets as its target of study professional baseball league in Japan, Korea, Taiwan and the US between 2003 and 2014. In addition to an analysis of salary structures, this paper mainly aims at studying salary differences among players. This paper is divided into five sections. The first section is the introduction. The second includes a review of the literature on professional athletes' salaries and proposes hypothesis. Section Three builds an empirical model, explains the sources of data and defines the variables. The fourth section offers an analysis of results and discussion. The last section focuses on conclusions.

Literature Review

In any professional career, an employee does not necessarily stay in one company for life or even, and remains over a long duration. Transferring from one profession to another or from one firm to another leads to accumulation and diversity of experience, thus also affecting salary. Neal [11] points out that when changing jobs, if old and new jobs are in the same area, the resulting experience and seniority are beneficial to salary increase. If the new job is of a different profession, the originally accumulated human resource capital (seniority and experience) no longer counts, and thus leads to a drop in salary. Among professional baseball leagues around the world, regulations on player team transfer and the degree of difficulty vary. For new players transferring into a team for a new season, their seniorities are also related to professional player experience (*i.e.* after becoming professional, they still form part of a baseball team)[2]. In this study, it is predicted that when professional players transfer to another team in a new season, past experiences and seniority accumulate lead to a raise in salary.

H1: Baseball player team transfer and salary are positively correlated.

Obesity is not conducive to physical activities [12]. Overweightedness (obesity) easily leads to diseases, lowers down quality of life and is thus considered a condition not conducive to work. Therefore, obesity is negatively related to salary [13]. Although athletes from different countries have varying physiques, they form an important factor influencing performance. From this, it is easy to realize how physical stamina and degree of health is far more emphasized in athletics than in other industries. For this reason, overweight baseball players may have poor stamina and reduced dynamism, thus affecting performance, and eventually, reduced remuneration.

H2: Baseball players' degree of obesity and salary are negatively correlated.

Laborers' salary is related to company characteristics [14]. The higher the

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[2]An analysis of the data for 2003-2014 shows that this phenomenon is universal for all transferring players in countries where professional baseball is played.

company's age is, the higher the salaries [15]. Heyman [14] asserts that the older companies are, the more profitable they become, and thus more willing to pay higher salaries. Similarly, Brown and Medoff [16] also point out that the older a company is, the more stable are job opportunities, and that the higher a company needs high-technical capability employees, the higher will average salaries become, as compared with younger firms. Professional athletics differ from other industries in management characteristics. Older teams may mean more stable financial conditions (profitability) that spell survival. They are financially capable of paying higher salaries, and able to attract better players. In this study, we predict that the age of a professional baseball team is directly related to salary.

H3: The baseball team's age and the salary of professional baseball players are positively related

Training emphasizes needed capabilities. Through a change in employees' skills, knowledge, attitudes and behavior, training improves work performance [17]. After receiving training, employees improve their productivity and may be paid higher remuneration [18]. Williams [19] also points out that in a competitive labor market, the training received by an employee and the benefits he derives are concretized in his future higher salary. In this paper, we predict that after receiving training, professional athletes become more productive and thus, receive higher salaries.

H4: The length of training of professional baseball players and salary are positively correlated

2. Methodology

As there is incomplete information on professional athletics, we have tried to guarantee data reliability by obtaining information from data provided by professional baseball leagues around the world[3]. Other information were derived from statistics published in websites[4] and news publications[5]. The subject of analysis are professional baseball players (at least some major league or Division 1[6] experience) who have played at least once in the US, Japan, Korea and Taiwan

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[3]http://mlb.mlb.com (Major League Baseball, American); http://www.npb.or.jp (Nippon Professional Baseball, Japan); http://www.cpbl.com.tw (Chinese Professional Baseball League, Taiwan); http://www.koreabaseball.com (Korea Professional Baseball League)

[4]http://home.a07.itscom.net/kazoo/pro/pro.htm (Salaries of Japanese Baseball Players)
http://content.usatoday.com/sports/baseball/salaries/default.aspx (Salaries of U.S. Professional Baseball Players)
http://mlbcontracts.blogspot.com (Contracts Signed by US Professional Baseball Players)
http://twbsball.dils.tku.edu.tw/wiki/index.php?title=%E9%A6%96%E9%A0%81 (Wikipedia: Baseball)
http://www.baseball-reference.com/players (Other data on Major League Baseball)

[5]Professional baseball players' salaries are not made public in Taiwan or Korea. The figures may only be extrapolated based on media reports (Baseball Match Handbook published by the Chinese Professional Baseball League and Korea Professional Baseball League) and news
(http://tw.knowledge.yahoo.com/question/question?p=%E4%B8%AD%E8%8F%AF%E8%81%B7%E6%A3%92&qid=1509032907564) or other websites.

[6]Division 1 refers to one that is adopted in Asian. Division 1 is a formal competition. Division 2 is for injured players, the poorly performing and young players. In the US, it is differentiated as major league or minor league. The minor league is similar to Division 2, which is mainly for training young athletes or those adjusting after a poor performance.

from 2003 to 2014. After screening, a total of 15,948 valid samples were obtained. Professional baseball players sign contracts once per season. But there are also many players who sign contracts with maturity periods lasting for more than a year (the so-called multi-year contract). In the latter, there is no need to sign new contracts defining validity period, and salaries are not affected by performance during the said period, and other such matters, making players sufficiently guaranteed in such contracts. In this study, the examined contracts are either the per-season type (nonmultiyear contracts) or the multi year type. We categorise different salary groups based on the type of contract signed. Based on Palmer and King [6], Slaughter *et al.* [20], Torgler and Schmidt [21], Stone and Pantuosco [1], this study uses four control variables (academic degree, professional seniority, age and the population of the city in which the team is located). The salary equations for professional baseball players are the following.

$$NMYSALARY_t = \alpha_0 + \alpha_1 CHANGE_t + \alpha_2 BMI_t + \alpha_3 TEAM_{t-1} + \alpha_4 TRAINING_{t-1} \\ + \alpha_5 EDU_t + \alpha_6 EXP_{t-1} + \alpha_7 AGE_t + \alpha_8 POP_t + \varepsilon_t \quad (1)$$

$$MYSALARY_t = \alpha_0 + \alpha_1 CHANGE_t + \alpha_2 BMI_t + \alpha_3 TEAM_{t-1} + \alpha_4 TRAINING_{t-1} \\ + \alpha_5 EDU_t + \alpha_6 EXP_{t-1} + \alpha_7 AGE_t + \alpha_8 POP_t + \varepsilon_t \quad (2)$$

where $NMYSALARY_t$ is the salary of player i at time t measured according to the player's total salary (in U.S. dollars) in a non-multi-year contract (*i.e.*, signed once per year); $MYSALARY_t$ is the salary of player i at time t measured according to the player's total salary (in U.S. dollars) in a multi-year contract[7]; $CHANGE_t$ is a dummy variable which is equal to one if the player i at time t belonged to a new team after the previous season otherwise, is equal to zero; BMI_t (body-mass index) is the health of player i at time t measured in weight divided by height (in meters); $TEAM_{t-1}$ is the team's lagged number of years of establishment measured as the number of years from entry into professional baseball; $TRAINING_{t-1}$ is the player's lagged degree of on-the-job training measured as the number of games through division 2 or minor league; EDU_t is a dummy variable which is equal to one if the player i at time t has obtained bachelor degree otherwise, is equal to zero; EXP_{t-1} is the player's lagged the number of experiences measured as the number of seasons that the player has played[8]; AGE_t is the age of player i at time t measured in the actual age of the player; POP_t is the population of the city in which the team is located at time t measured as the natural logarithm of the population[9] of the team's home city.

In order to avoid possible bias from extreme values, the study also adopt those samples only include the sample data of from the 5th percentile to the 95th percentile as measures for the robustness test [22].

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[7]In the situation of a multiterm contract signed between 2003 and 2014, the equation is calculated as a total of all of the actual payments guaranteed within the term of the contract.

[8]To match actual conditions in international baseball competitions, any record of participation in professional baseball matches in any season or country are considered a participation experience in that playing season.

[9]Statistics released by the government in a city of each team and estimated based on information obtained from Wikipedia (English version).

3. Empirical Results

Analysis of variables such as characteristics of baseball players and team, human capital and others over the three countries reveals some interesting observations (Table 1). It shows that the characteristics of baseball players or team from different countries vary. Of them, in terms of players' obesity (BMI)[10], baseball players in the US average as obese. The Japanese and Korean tend to be overweight. Taiwanese baseball players have standard BMI. Reduction in the number of teams or team conglomeration have resulted in a low establishment age among the existing teams in the three countries (The establishment ages in the US, Japan, Korea and Taiwan are 87.5, 59.3, 13.9 and 11.8 years respectively). Viewed from the angle of human capital, US players show higher seniority and older age (35.76 years), reflecting the fact that American professional baseball players enjoy longer professional life. A possible reason maybe because US players have better physical conditions than their Asian counterparts. Another reason is that major league affords better training that helps maintain stamina, muscle power and playing skills. Taiwan players have lesser experience (lower seniority) and average younger at 29.86 years. Reasons maybe that Taiwan baseball players suffer from sports injuries[11] due to too-frequent dispatching, resulting in a shorter professional life. It has also led to the hiring of younger players, and thus explaining a lower average age among Taiwan players.

The summary statistics of the player' salary among nations, those from the US receive the highest total salary[12], followed by Taiwan with the lowest (Table 2).

Table 1. Descriptive statistics (average).

Variable	U.S	JAPAN	Taiwan	Korea
BMI_t	27.84	24.71	23.88	25.32
$TEAM_{t-1}$	87.5	59.3	11.8	13.9
$TRAINING_{t-1}$	12.3	17.5	29.5	22.7
EXP_{t-1}	10.36	9.38	5.42	6.38
AGE_t	35.76	31.32	29.86	29.98
N	5462	3007	1826	2316

Note: BMI is the degree of health (obesity). TEAM is the age of a team. TRAINING is the degree of training. EXP is the player's experiences. AGE is the age of player.

Table 2. Descriptive statistics (annual salary, in US ten thousand dollars).

	Total salary	Mean		T-test
		2003-2008	2009-2014	
U.S	396.05	386.42	405.69	0.048
Japan	52.65	48.99	56.32	0.055
Korea	33.64	30.56	36.72	0.067
Taiwan	5.28	5.01	5.56	0.092

[10]BMI equal to or larger than 27 is considered obese, "overweight" is 24 - 27, and standard is 18.5 - 24.

[11]Insufficient rest days or too much pitching, thus leading to sports injury.

[12]Most salary contracts are signed before the start of a new season. For convenience of analysis, salaries' currency conversion is based on the exchange rate in 20003-2014. The rate was obtained though www.oanda.com

Based on country, overall salary level can be compared, such that US players receive 7.52 times that of Japanese professional baseball players, while the Japanese receive 1.56 times the salary of their Korean counterparts and the Korean receive 6.37 times the salary of their Taiwanese counterparts. The Americans earn 75 times of what Taiwanese professional baseball players receive. This large disparity in salary perhaps explains growing ambition among Asian players to find employment in the US. Comparing average salaries for 2003-2008 and 2009-2014, there is significant difference in the Asian and US Professional Baseball Leagues, reflecting perhaps that salary levels among professional baseball players have changed with the overall management environment. Furthermore, salary levels rose in both the US and Asian, showing that despite the financial tsunami, the team's sponsors have not reduced their investment in their baseball teams.

The results of the regression and panel estimates for player's salary equations are presented. It shows that players' team transfer is negatively and significantly correlated with players' annual salary (Table 3), suggesting that signing of contracts with new teams in the current year leads to reduction in salary. There is no evidence to support H1 and contrasts with Neal's findings [11]. One possible explanation for this result is the most professional baseball players who change teams are non-free agent players[13]. A change of teams is often passive, *i.e.* the team determines if a player is to be transferred to another team and players relatively do not make the decision of accepting or rejecting. For this reason, in a professional baseball team, it is commonly taken that players who are transferred had performed poorly in the former team. Thus, the accepting team pays an inferior salary to the transferred player.

Furthermore, player stamina and degree of health are far more stressed than in other industries. BMI (body mass index) has a positive significant impact on players' annual salary (Table 3). This finding does not support H2 and different from the conclusions made by Brunello and D'Hombres [13]. One possible explanation for this result is that obesity leads to doubts about a person's health. However, baseball players need more energy for muscle strength[14], and players of smaller frames may lack the qualities needed in professional baseball. Thus, professional baseball players differ from those in other industries, *i.e.*, heavier weights (obesity) mean higher salaries.

It is interesting to note that the teams' age has opposite effects on the players' salaries (Table 3). In US professional baseball, the regression coefficient is positive and significant. One possible explanation for this result is because few of the 30 teams in the Major League Baseball suffered net loss. Besides, the major league officially adopts the so-called profit-sharing system[15], making teams' overall finances quite stable. Thus, the older a team is, its accumulated resources may also be more substantial, which increases the possibility of salary raise for players. Management characteristics in US professional baseball are similar with

[13]Non-free agent players leave their teams involuntarily. The system is adopted in the US and Asian.
[14]It is generally believed that appropriate obesity can increase pitching speed and hitting distance.
[15]Balancing revenues by major leagues.

Table 3. Salary regression results (non-multi-year contracts).

	Dependent Variable: *NMYSALARY*ₜ			
	USA	Japan	Taiwan	Korea
Intercept	0.145***	0.225***	0.275***	0.442***
$CHANGE_t$	−0.094*	−0.057*	−0.086**	−0.062*
BMI_t	0.355***	0.340***	0.039**	0.057*
$TEAM_{t-1}$	0.476***	−0.021*	−0.608***	−0.462***
$TRAINING_{t-1}$	0.001	0.01	0.008	0.005
EDU_t	0.138**	0.061**	0.016*	0.038*
EXP_{t-1}	0.447***	0.079**	0.765***	0.326***
AGE_t	−0.489***	−0.101**	−0.108**	−0.087*
POP_t	0.412***	0.129***	0.052**	0.102**
R^2	0.482	0.372	0.277	0.296
F-value	22.482***	21.362***	18.561***	19.972***
VIF	1.337	1.427	1.375	1.286
N	5462	3007	1826	2316

Note: *NMYSALARY* is the salary of player *i* at time *t* measured in the player's total salary (in US dollars) in a non-multi-year contract (*i.e.* signed once a year); CHANGE shows that the player has changed teams. BMI is the degree of health (obesity). TEAM is the age of a team. TRAINING is the degree of training. EDU is a dummy variable which is a question of whether a player has obtained bachelor's degree. EXP is the player's experiences AGE is the age of player. POP is the population of the city in which the team is located. *** indicates statistic significant at 1% level; ** at 5% level; and * at 10% level.

those of other industries, a viewpoint that concurs with conclusions made by Troske [15] and Heyman [14]. However, in Asian professional baseball leagues, the correlations are negative and significant. This may be explained by the fact that in both countries, most teams encounter serious losses, and are dependent on assistance from other companies or the government for their survival. The older a team age is, the more losses are accumulated, thus increasing the burden of the sponsors of teams. In order to save on costs and spending, they cut back on players' salaries. Therefore, management characteristics in Asian fail to support H3. Thus, H3 is only partially supported. At the same time, compared with Asian baseball, Taiwan's negative regression coefficient is the largest. This may be because Taiwan's professional baseball teams are sponsored by small and medium enterprises. Long-term losses incurred in managing a team make financial burdens even more pronounced than in Japanese and Korean teams. This leads to larger cuts in player salaries.

Mode of training professional baseball players differs from other firms; the degree of training has insignificant effects on the players' annual salaries (Table 3). One possible explanation for this result is that division 2 or minor league games are seen as on-the-job training, that division 1 or major league players who join it are mainly those recuperating from injuries or adjusting their physi-

cal conditions. Once back in shape, they return to division 1 and major league. Besides, those who have joined the major league (or division 1) are superior to those who have not when it comes to technique and capabilities. Thus, participation in division 2 or minor league is mainly for players' adjustment and not necessarily associated with improving performance. For this reason, correlation with salary is insignificant. This is contrary to the findings of Williams [19]. Thus H4 is not supported.

Furthermore, all of the control variables have statistically significant impacts on salaries (Table 3). Of them, education, work experience between players' annual salary have positively significant correlated. Although professional players emphasized more on physical stamina and skills, a university degree may be done with improving skills. At the same time, work experiences show that the more senior a professional baseball player is, the more it reflects accumulated human capital and the more he is perceived as a senior player with more stability in the field, able to stimulate team spirit and more familiar with games, all directly beneficial to the team, and thus means higher salaries. In contrast, player's age and player's annual salary are negatively correlated. This implies that the older players become, the less will be their stamina and they are more prone to injuries and for these reasons, they contribute less to the team, for which they receive lower salaries than their younger teammates.

Team transfer in a new season has significantly positive correlation with the total salary from multi-year contracts (Table 4). One possible explanation for this result is that those who have signed multi-year contracts are mostly free agent players[16], and when their contracts mature (regardless of which initial contract type), they decide whether to transfer teams and sign a contract with a new team. If any team offers a more attractive multi-year contract (such as longer contract term, higher salary, etc.), players are easily charmed and are more willing to join a new team. Team wage has significantly positive correlation with the total salary from multi-year contracts in U.S and significantly negative correlation with the total salary from multi-year contracts in Asian (Table 3). In US professional baseball, the major league officially adopts the so-called profit-sharing system, making teams' overall finances quite stable. Thus, the older a team is, its accumulated resources may also be more substantial, which increases the possibility of multi-year contracts salary for players. However, in Asian professional baseball leagues, most teams encounter serious losses. The older a team age is, the more losses are accumulated, thus saving on costs and spending. This leads to larger cuts multi-year contracts in player salaries.

Furthermore, work experience has significantly positive correlation with the total salary from multi-year contracts (Table 4). At the same time, work experiences show that the more senior a professional baseball player is, the more it reflects accumulated human capital and the more he is perceived as a senior player with more stability in the field, able to stimulate team spirit and more familiar with games, all directly beneficial to the team, and thus means higher

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[16]Those who have signed multi-year contracts are free agent players.

Table 4. Salary regression results (multi-year contracts).

Dependent Variable	$MYSALARY_t$			
	USA	Japan	Taiwan	Korea
Intercept	0.335**	0.446***	0.562***	0.074
$CHANGE_t$	0.876***	0.338**	0.431**	0.158**
BMI_t	−0.016	0.028	0.094	−0.032
$TEAM_{t-1}$	0.556***	−0.674***	−0.778***	−0.102*
$TRAINING_{t-1}$	0.012	0.038	0.044	0.031
EDU_t	0.028	0.057	0.032	0.033
EXP_{t-1}	0.129**	0.242*	0.275**	0.087*
AGE_t	−0.542***	−0.448***	−0.412**	0.018
POP_t	0.064	0.059	0.031	0.019
R^2	0.372	0.314	0.226	0.112
F-value	19.535	18.248	17.641	13.464
VIF	1.148	1.432	1.417	1.089
N	3217	38	60	22

Note: $MYSALARY_t$ is the salary of player i at time t measured in the player's total salary (in US dollars) in a multi-year contract; $CHANGE_t$ is a dummy variable which is equal to one if the player i at time t belonged to a new team after the previous season otherwise, is equal to zero; BMI_t (body-mass index) is the health of player i at time t measured in weight divided by height (in meters); $TEAM_{t-1}$ is the team's lagged number of years of establishment measured as the number of years from entry into professional baseball;; $TRAINING_{t-1}$ is the player's lagged degree of on-the-job training measured as the number of games through division 2 or minor league; EDU_t is a dummy variable which is equal to one if the player i at time t has obtained bachelor degree otherwise, is equal to zero; EXP_{t-1} is the player's lagged the number of experiences measured as the number of seasons that the player has played[17]; AGE_t is the age of player i at time t measured in the actual age of the player; POP_t is the lagged population of the city in which the team is located measured as the natural logarithm of the population of the team's home city. *** indicates statistic significant at 1% level; ** at 5% level; and * at 10% level.

salaries from multi-year contracts. In contrast, player's age has significantly negative correlation with the total salary from multi-year contracts (excluding Korea) (Table 3). This implies that the older players become, the less will be their stamina and they are more prone to injuries and for these reasons, they contribute less to the team, for which they receive lower salaries from multi-year contracts than their younger teammates.

Results from variance inflation factors explain variables for correlation; the result lies between 1.286 and 1.432 (Variance Inflation Factors < 10); hence, there is no correlation problem. Furthermore, to avoid possible bias from extreme values, this study adopted only samples that included the sample data from the 5th percentile to the 95th percentile as measures for the robustness test; the results showed that most of them were consistent[18].

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[17]To match actual conditions in international baseball competitions, any record of participation in professional baseball matches in any season or country are considered a participation experience in that playing season.

[18]In order to shorten the tables, we omit the solution.

4. Conclusion and Implications

This study primarily probes into factors that influence the total remuneration of professional baseball players. Using players' characteristic variables (team transfer or not, degree of health, and degree of training), team characteristic variables (team age), and the controls variables (education, experience and player's age, population of the city in which the team is located to analyze differences in player remuneration. In the past, Most of studies focus on salary distribution within single regions or the US baseball league. There is a treasure throve of studies salary among international professional baseball players. Little has been done on multinational studies. This study aimed to determine salary differences (in both non-multi-year and multiyear contracts) among professional baseball players in the United States, Japan, South Korea, and Taiwan. Factors affecting players' annual total salaries in these countries in 2003 to 2014 are analyzed and compared.

Results show that such factors as players' transfer to another team or not, degree of health (BMI), education, work experience, player age, and population of the city in which the team is located are decisive in determining player salary. Their influences are significantly made different by variations in countries' environments. Two variables such as whether a player transfers to another team and degree of health (BMI) influence in a manner significantly different from theoretical expectations and findings reported in the literature. On the other hand, team age shows inconsistent influences among differences countries.

As there exists significant difference among player salary structures in the baseball leagues of different countries, theories on human capital and characteristic variables can reasonably explain salaries of players. Besides, by a comparison of salaries, team's administration must hire better quality talents (with a university degree, young and experienced players). Although payment modes of professional athletes differ from employees in other industries, players can still be, by way of a salary mechanism, stimulated to work and learn, inspired to self-development and continue learning.

Salary can serve as a work motivator. In 1996, 2005, 2007 and 2008, 2011, Taiwan's professional baseball was embroiled in gambling, dealing a serious blow on professional baseball as an industry. Most people believe that they have to do with low salaries among players (compared to other countries) and the absence of an optimal mechanism. Team's administration must be aware of factors affecting pay as they set optimal salary mechanisms that assure fair salary structures. In recent years, there have been exchange visits among teams from different countries (such as the US vs. Japan All Star games). Many excellent players even joined foreign baseball leagues. Since salaries are higher in the US Major League, there is a rising tendency for foreign players to join the league. This has resulted in a serious talent drain for some Asian countries and this serves as a basis for emphasizing the need to improve salary structures.

Salary contracts signed by baseball players differ from those of other professional sports. In US baseball, players' salary contracts are mostly done in the

multi-year mode. In Japan, there were also players who signed multi-year contracts with teams. In Taiwan, it was not until 2006 when a professional baseball player signed this kind of salary contract. Although it guarantees the rights of players, this mode increases the financial burden of the sponsors of team because of guaranteed payment. Moreover, if during the contract validity period, a player should be injured or other unexpected untoward events, the team would have to bear the negative impact (cost efficiency). Therefore, the multi-year contracts and the annual contracts have each their pros and cons. It is therefore an important issue on professional sports management and players to seek the best salary contract that would benefit both sides. Currently, studies on this type of contracts are few and the underlying theory is also rather weak. Results of this study can serve as a reference on the factors that influence choice of which contract mode to take.

In summary, results of this study have the following implications. Although empirical results of this study can well serve as a reference for academic research and team's administration pragmatics, the characteristics of our data are quite restrictive. For instance, information on player salaries of Taiwan's and Korea's baseball leagues is incomplete, thus dictating the need for corroboration through further research. Similarly, although samples are cross-sectional data from 2003 to 2014, which allows trend analysis of professional baseball players' salary change over time, the value in terms of studying long-term changes in salary structures is quite limited. This may be because there are more variables affecting professional athletes' salaries, such as per capita income, business cycle, teams' financial status, size of the audience per match, etc. On the other hand, salary data in professional sports are more detailed than in other professions. Yet, some variables, such as bonus payment and other incentives are not made public (Only the US Major League does so.). Had they been available and included in the analysis, they could have led to more pronounced results. Overall, findings in this study are beneficial in further understanding the features of player salaries in professional baseball leagues of the focus countries, as well as afford a comparison of their differences. All these can serve as a reference for further studies in this area.

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