

The Development of a Valuation Model to Determine the Real Market Value of Professional Baseball Players

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Aim

Since the establishment of Korean Baseball Association (KBO) in 1982, the KBO League has grown into one of the most popular professional sports in Korea in terms of its economic size and social influence of the league. Since the mid-2000s, the KBO League has developed as a successful sport industry mainly due to its prominence in the subsequent international conventions and the increased awareness of the top-tier players. Specifically, more than 15 Korean-born players had experiences in playing in the Major League Baseball and their popularity and skill level significantly contributed to enhancing the league quality of KBO. More importantly, with the guidance of KBO and collaboration of Korean Baseball Players' Association (KBPA), the 'Sport Agent (-cy)' business officially and legally was finally introduced in Korea for the first time since KBO has been launched in 1982.

Theoretical Background and Literature Review

As the baseball business prospered, the player's salary has also skyrocketed. The average salary of the league players in the 2018 season was the highest at about 150 million won (US\$ 0.14 million) and some Free Agent (FA) players signed over 10 billion won (US\$ 9.3 million). With that being said, it has become more critical than ever before to develop the reasonable, convincing, and empirically proved model to determine the true market value of the baseball players solely based on their performances on the field in Korea. There exist some seminal studies on market valuation of the professional baseball players in MLB. In fact, Scully (1974) applied the equilibrium wage theory of labor economics to sports and both Krautman (1999) and Depken and Wilson (2004) tried to quantify the contribution of the team players to victory. Furthermore, Sing and Dick (2003), Barns and Bjarnadóttir (2016), and Wasserman and Paul (2016) applied this statistical model to free agent market. Tom Tango (2007) designed Wins Above Replacement (WAR) as an effective tool to compare the true value of baseball players to their contribution to a team win and determine the appropriateness of a player's salary through relative comparison. Korean scholars also investigated the correlation and salary determinants between performance and salary of the players. Although there have been a number of studies on the determination of player salaries, the uniqueness of the sports labor market and the difficulty of gaining the relevant data and information made it hard to produce the world-agreed upon valuation model.

Results and Discussion

The main purpose of this current study is two-fold. Firstly, it attempts to develop the model to determine the true market value of Korean professional baseball players (hitters only) solely based on their athletic performances on the field. Secondly, it is to provide the evidential data for the market value of baseball players in Korea. The data and information were obtained from baseball almanac from KBO from 1997 to 2016 and 793 players who qualified the minimum at bats requirement were only included for data analysis. Three steps were implemented with oblique rotation to answer the aforementioned research questions. First, principal component factor analysis was utilized to eliminate multicollinearity among 12

sabermetrics indices (OPS, GPA, SECA, TA, RC, RC/27, XR, ISO, PSN, sOBA, %OW, BABIP) and thus an increase in the power of explanation of the proposed model with $KMO(=0.77)$, $p<0.001$. Second, the proposed model was successfully developed with $\text{Years of Experience} * 921.5 + \text{FA (free agent)} * 53528.9 + \text{PHI(Power Hitter Index)} * 7313 + \text{CHI(Contact Hitter Index)} * 5893.6$. Lastly, the proposed model explained 56% of the variances of the market value for the Korean professional baseball players and proved to be statistically valid.

Conclusion and Implications

While the player valuation model presented in this study could be improved with additional variables not considered, it may be useful in providing new evidence from the academic standpoint about the low salary of non-FA players and the controversy about the ransom bubble of some FA players. In addition, this model could make an important contribution to not only determining the market value of the baseball players in Korea but also presenting a new player evaluation criterion.

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