Original Article

Sunk cost effect in the Korea basketball league

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Abstract:

This study examines the sunk cost effect, an irrational behavior, by using Korea professional basketball players' performance records and playing time. Data covering 2001 to 2010 were collected from diverse statistical records from the Korean Basketball League (KBL) website. An initial sample of 187 KBL rookies was collected; 115 samples were ultimately retained after 72 without official records or who retired within three years were removed. The results based on ordinary least squares regressions showed that, first, prior point per game, prior toughness, and prior accuracy were significant predictors of playing time in the second season. Second, prior point per game was a significant predictor of playing time in the third season. Third, the sunk cost effect was statistically discovered in the third season.

Key words: sunk cost fallacy; decision-making; Korea Basketball League, player draft

Introduction

Decision makers generally make rational decisions based on prior results, but this does not always lead to desirable outcomes. Irreversible costs due to choices that cannot be reversed can accrue through the commitment of resources (Borland, Lee and Macdonald 2010). Although decision makers tend to consider only the additional expenses and benefits when making rational decision, they also tend to overestimate the initial expenditure and then exaggerate the investment (Thaler 1980).

From an economic perspective, unrecoverable costs should be ignored in rational decision making; unfortunately, decision makers are obsessed with them, as well as with time and effort (Gupta 2009). Making investments despite past costs that cannot be recovered is called the “sunk cost effect” (Arkes and Blumer 1985; Brockner and Rubin 1985). Though considering sunk costs during decision making is obviously irrational, the process has been studied in various fields, such as personal decision making, interpersonal decision making, new product development, financial decision making, and performance evaluation (Bazerman et al. 1982; Biyalogorsky et al. 2006; Garland 1990; Garland and Newport 1991; Heath 1995; Soman and Cheema 2001). People will tend to use unsatisfactory services or products because they have paid for them, such as someone who continues to work out despite suffering back pain after having paid for an expensive membership at a fitness center.

This phenomenon has also been found in professional sports. According to Bourgie (2001), team managers must make tough decisions about player utilization, such as starting lineup, player substitution, and strategies, before every game because a player's talent and experience are not perfect predictors of performance. In professional basketball, rookies entering the league are allocated to teams ever year during the draft. Managers seek to acquire outstanding rookies early in the draft. Rookies selected in the first round may receive higher salaries and face higher expectations than the others selected during the second or third round. In addition, many teams in the professional basketball league (including the National Basketball Association; NBA) plan to do less than everything they can to win in order to accumulate some losses and thus obtain a higher pick in the upcoming draft, even though teams should always put the best team possible on the court as often as possible. This strategy is called “tanking” and can be used over several months or even several seasons (Exter 2013).

In this context, rookies are always in the spotlight as agents of team-rebuilding strategies, in terms of either a breakthrough after poor results or expectations for new talent. However, if they do not prove their value, managers may decide to keep them on the bench. Therefore, this study examines the sunk cost effect, an irrational behavior, by using Korean professional basketball players' performance records and playing time.

Korea Basketball League and its draft system

The Korea Basketball league (KBL) started in 1997 with only 10 teams. Prior to the league, several companies had managed their own amateur basketball teams. To boost fan interest and improve game quality, the KBL permitted each team to have tryouts and drafts for two foreign players. This foreign player rule was thereafter frequently revised because the foreign players became pivotal to winning games. The foreign player tryouts and drafts came to determine each season's result. To address this systemic flaw, the KBL ruled that only one of the foreign players could be on the court during a game.

Thus, the rookie draft was critical. It was revised many times in terms of selection order, appropriate method, and upper payment limit. The main mechanism of the draft is the “equality” rule, designed to prevent wealthier teams from monopolizing the outstanding players. Before this rule, inappropriate scouting and contracts were common, by which talented players would join a club along with other, less talented players included in the deal as a package. The equality system was introduced to eliminate that practice and foster equal opportunity in player selection. The system improved the sport, as it allowed most teams to maintain a certain level of athletic performance.

Sunk cost effect

Early studies on the sunk cost effect examined courses of action regarding money, time, and effort. Staw (1976) conducted business-related simulation research to investigate how investments depended on courses of action. He found that those who had experienced losses invested more money than did those who had not. Tegar (1980) proved that some people tended to spend more money when they expected rewards that were quick but relatively small. Brockner and Rubin (1985) found that people tended to spend a great deal of money and time in pursuit of a receding and ambiguous goal. Finally, Garland and Newport (1991) conducted interesting research through a Latin square design. They hypothesized that the degree of the sunk cost effect was observed differently because of the total budget, decision scenario, and sunk cost proportion. They demonstrated that the strength of the sunk cost effect was influenced by a variety of social conditions. All of the aforementioned research challenged the standard common sense about people’s desire to avoid losses by studying real-world behavior.

On the basis of prior studies, it might be expected that draft ranking could help predict playing time, even after controlling for the player’s performance. Thus, the following hypotheses are proposed:

Hypothesis 1: A player’s prior performance will have a positive influence on playing time in the following season.

Hypothesis 2: Draft ranking will have a negative influence on playing time after controlling for the player’s performance.

Method

Sample

Data covering 2001 to 2010 were collected from diverse statistical records on the KBL website. Key statistics include PPG (points per game), FG% (field goal percentage), RPG (rebounds per game), DEF (defense rebound), OFF (offense rebound), APG (assists per game), SPG (steals per game), 3P% (3-point percentage), BPG (block per game), FT% (free-throw percentage). Team managers tend to want their foreign players with exceptional scoring and physical abilities to be centers or power forwards rather than guards. Therefore, over half of all rookies were guards or small forwards from 2001 to 2010. The initial sample included every player selected in the first and second draft rounds. From this total, 72 samples were removed because they lacked official records or had retired within three years. As shown in Fig. 1, 115 samples were used in the analysis.

Fig. 1. Rookies’ positions from 2001 to 2010

Variables

The KBL keeps a variety of statistical records. Playing time was used as a dependent variable, and the players’ performance records were used as independent variables. Ten individual records (PPG, FG%, RPG, OFF, DEF, APG, SPG, 3P%, BPG, and FT%) were selected to create an index for players’ performance. These records accurately reflected the players’ productivity and performance (Staw and Hoang 1995).

Departing from Staw and Hoang (1995), we excluded PPG from the players’ performance because it is the most important variable for predicting the following season’s playing time. Therefore, nine individual records were analyzed in an exploratory factor analysis without PPG.

Data analysis

Ordinary least square (OLS) multiple regressions were conducted to test for the influence of KBL draft ranking on playing time after controlling for other variables (i.e., player’s position, PPG, toughness, and

accuracy). Draft ranking, position, prior PPG, prior toughness, and prior accuracy were used as predictors of playing time in the target year. This process was repeated for the other two regressions using SPSS ver. 20.0; every statistical significance level was .05.

Results

Exploratory factor analysis

Nine performance variables were subjected to maximum likelihood (ML) with direct oblimin rotation for EFA. As shown in Table 1, the two factors Toughness and Accuracy were extracted and explained 76.786% of the variance. Toughness consisted of BPG, OFF, and DEF, and Accuracy consisted of APG, SPG, and 3P%. During this process, FG%, RPG, and FT% were deleted because of low communality and double loading. Finally, Cronbach's α , Kaiser–Meyer–Olkin's index (KMO), Bartlett's index, and RMSEA (root mean square error of approximation) were all deemed acceptable, based on criteria in the literature (Hu and Bentler 1999; Steiger 1990).

Table 1. Pattern matrix for performance of basketball athletes

Items	Toughness	Accuracy	Communality	Cronbach's α
BPG	.944	-.181	.433	.796
OFF	.893	.046	.822	
DEF	.802	.340	.903	
APG	.021	.895	.811	.701
SPG	.143	.848	.803	
3P%	-.086	.675	.834	
Eigen value	3.083	1.524		
% variance (cumulative)	51.383	25.403		
(76.786)				

Note: KMO = .765; Bartlett's test = 1554.374, $df = 15$, $p = .000$; $\chi^2 = 8.095$, $df = 4$, $p = .088$, RMSEA = .054

Correlation and Regression Analyses

As shown in Table 2, the 14 variables used for this study ranged from -.580 to .934. Although some correlation coefficients were over .80, the critical value for multicollinearity, they were not involved in the regression analysis at the same time. For example, the correlation value between PPG2 and playing time2 was .923. However, PPG2 is an independent variable for playing time3, not playing time 2.

The first season's playing time (playing time1) was significantly associated with draft ranking ($r = -.580$), but not with position. The second season's playing time (playing time2) had the highest significant correlation value was found with PPG1 ($r = .732$), followed by accuracy ($r = .663$), toughness ($r = .615$), and draft ranking ($r = -.455$) while player's position did not have a significant association with playing time2. Similarly, the third season's playing time (playing time3) was significantly associated with PPG1 ($r = .737$), accuracy ($r = .608$), toughness ($r = .539$), and draft ranking ($r = -.483$), but not with player's position. The high correlation values of playing time and accuracy with PPG might indicate that KBL coaches prioritize an offensive basketball style as opposed to a physical or defense-oriented style.

Table 2. Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Ranking	1													
2. Position	-.05	1												
3. PPG1	-.55***	-.13	1											
4. PPG2	-.46***	-.04	.81***	1										
5. PPG3	-.51***	-.04	.70***	.81***	1									
6. Toughness1	-.43***	-.04	.78***	.74***	.64***	1								
7. Toughness2	-.38***	.02	.65***	.80***	.66***	.90***	1							
8. Toughness3	-.40***	-.03	.65***	.74***	.81***	.85***	.88***	1						
9. Accuracy1	-.50***	.05	.73***	.59***	.54***	.41***	.30***	.33***	1					
10. Accuracy2	-.40***	.11	.61***	.74***	.57***	.34***	.39***	.35***	.84***	1				
11. Accuracy3	-.45***	.06	.56***	.61***	.77***	.33***	.32***	.46***	.81***	.78***	1			
12. Playing T1	-.58***	-.05	.95***	.76***	.68***	.73***	.57***	.59***	.83***	.68***	.64***	1		
13. Playing T2	-.46***	.04	.73***	.92***	.73***	.62***	.71***	.64***	.66***	.84***	.65***	.76***	1	
14. Playing T3	-.48***	-.03	.64***	.74***	.93***	.54***	.56***	.75***	.59***	.69***	.84***	.67***	.73***	1
Mean	8.03	1.63	4.67	4.53	4.95	0.59	0.59	0.60	0.74	0.75	0.76	13.97	14.27	15.00
SD	5.45	0.65	3.80	3.70	4.24	0.56	0.58	0.54	0.70	0.65	0.72	9.48	8.79	9.71

Note: *** $p < .001$; Ranking and position were measured on a nominal scale.

Table 3 reports the results of three OLS regression analyses. A series of regression analyses was carried out to find the effects of draft ranking, player position, PPG, toughness, and accuracy on playing time. The first regression model, including playing time1 as a dependent variable and draft ranking and position as two independent variables was significant, adjusted $R^2 = .330$, $F = 29.12$, $p < .001$. The results showed that only draft ranking ($\beta = -.584$, $p < .001$) explained a significant amount of the variance in playing time during the rookie season. The second regression model for playing time2 included draft ranking, position, and previous season's performances (PPG1, toughness1 and accuracy1). The model explained 58.2% of the variance in playing time during the 2nd season. The result indicated that accuracy1 ($\beta = .326$, $p < .001$) made the most significant contribution to the prediction of playing time2, followed by PPG1 ($\beta = .319$, $p < .05$) and toughness1 ($\beta = .229$, $p < .05$). However, the regression coefficients for two other variables, i.e., draft ranking and position, were not significant. The third regression model concerning playing time during the 3rd season was significant, adjusted $R^2 = .556$, $F = 29.57$, $p < .001$. The results showed that PPG2 ($\beta = .562$, $p < .001$) and draft ranking ($\beta = -.306$, $p < .01$) were significant predictors in explaining the level of playing time3. Overall, draft ranking was a significant variable in explaining the level of playing time for the 1st and 3rd seasons, even after considering any effects of players position and performance. Staw and Hoang (1995) claim that the sunk cost effect in the National Basketball Association (NBA) was discovered from the second season to the fifth. However, it appeared only in the third season in the KBL.

Table 3. The effect of draft ranking on playing time

Variables	1 st season		2 nd season		3 rd season	
	<i>B</i>	β	<i>B</i>	β	<i>B</i>	β
draft ranking	-1.015***	-.584	-.027	-.017	-.306**	-.172
position	-1.116	-.077	.996	.074	-.506	-.034
prior PPG			.736*	.319	1.473***	.562
prior toughness			3.587*	.229	-.042	-.003
prior accuracy			4.063***	.326	1.957	.130
intercept	23.945		4.309		10.187	
adjusted R^2	.330		.582		.556	
<i>F</i> -value	29.122***		32.762***		29.566***	

Note: * $p < .05$, ** $p < .01$, *** $p < .001$

Discussion

The sunk cost effect is a controversial issue, and studies of it have provided mixed results. This study offers the following observations. First, the players' prior performance had a positive influence on playing time in the following season. In the second season, prior PPG, prior toughness, and prior accuracy were significant predictors of playing time. However, the prior accuracy factor's standardized coefficient was greater than that of prior PPG and prior toughness in the second year. This result implies that team managers tended to give their better players more of a chance to play. As mentioned, the fundamental role of foreign players is to score, while Korean players support them by assisting and stealing. Therefore, a strong ability to be supportive could have guaranteed a Korean player's court time at the beginning of the season.

In the third season, prior accuracy was no longer significant, but prior PPG was a significant predictor of playing time—and more powerfully so than in the second season. This result indicates that the players' basic roles changed as the team's strategy changed with the addition of new team members, such as new foreign players and trades. In other words, rookies were generally asked to merely support their team initially and were then later expected to generate more substantive results, such as scoring. They also tried to show their value on the court after becoming free agents. Thus, the key determinants of Korean players' playing time are prior scoring and prior accuracy, but this depended on the team's strategy and the player's desire.

Second, the sunk cost effect was statistically identified in the third season. After controlling for every variable's fixed effects, draft ranking had a negative influence on player's playing time in the third season: a rookie selected early in the draft had more playing time in the third season regardless of performance. Unlike in Staw and Hoang (1995), who detected a sunk cost effect from the first to the fifth season, this study's results reflect the KBL's lack of human resource infrastructure, as well as the league's relatively short history and potential manpower shortage. According to the Korea Basketball Association (2014), there are 411 student athletes in 34 elementary schools, 443 student athletes in 35 middle schools, 390 student athletes in 30 high schools, and 287 student athletes in 17 universities in Korea. The KBL, launched in 1997, has just 10 teams, and only 200 players were enrolled in the first team roster, including the foreign players on each team. In addition, many of the rookies selected in the second round received insufficient court time and retired early in the second

season. Therefore, the sunk cost effect was not discovered because the data used in this study did not include the players who lacked official records for the second season. The sunk cost effect does operate in the third season, chiefly because of the KBL's lack of a human resource pool.

Limitations

This study offers important findings on the sunk cost effect in the KBL. However, it also has several limitations. First, the data sample was small after players with missing records were removed, affecting the reliability and generalizability of the results. Second, conducting a general least square regression would be preferable to an ordinary least squares regression to clarify the sunk cost effect because the former could analyze more specific data, including longitudinal and cross-sectional information. Finally, other determinants such as injury and trade should be included in future analyses to confirm the effects found in this study.

Conclusions

In this study, it was discovered that the sunk cost effect was witnessed in the third season of rookie players, but not in the second season. Even though coaches could have decided recently acquired players' playing time based on more objective measures such as point per game, their decisions were somewhat influenced by the previous investment on rookie players.

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