

DOES BOSNIAN LEAGUE BASKETBALL HAVE A TENDENCY OF QUALITY IMPROVEMENT?

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Abstract

This work is based on 13 standard indicators of situational effectiveness in basketball and its aim is to get the answer to the question whether Bosnian League basketball has a tendency of quality improvement. Two seasons of League 6, basketball championship in Bosnia and Herzegovina, 2004/2005 & 2009/2010, were used to get the data for this research. Thirty (30) games were played in each of the two seasons. T-test was used to determine the significance of arithmetic means between winning and losing sides in applied situational indicators, and discriminative analysis was used to determine the difference on a global level as well as contribution of each situational indicator to discriminant function. Research results confirm that the quality of Bosnian League basketball in the 2009/2010 playoff games is equally dispersive on a balanced level for almost every team (6), so in comparison to the 2004/2005 season, it can be said that Bosnian League basketball has reached considerably higher level of quality. Balanced quality of teams in Bosnian League 6 in the 2009/2010 season causes high quality defense, and such defense on the other hand creates versatility and new quality on the offensive end, so now three-point field goal made and blocked shot appear as new indicators which create difference between winners and losers. It can be expected that in the near future some other team will by its quality pull away from the other teams, and create a new and positive tendency of basketball development in Bosnia and Herzegovina.

Key words: Transition offense, set offense, set defensive play, indicators of situational effectiveness, discriminant analysis, T-test.

INTRODUCTION

Modern top quality basketball is a game of detail and finesse. Processes which basketball players as individuals and teams as units go through, starting from the initial stage all the way to top quality basketball have to be professionally and scientifically set up. Activity of a basketball player becomes measurable through situational (action) successfulness by means of standard and nonstandard indicators of situational effectiveness (Trninic S., Milanovic D., Dizdar D – 1977). Result in basketball is established on the level of team achievement, accomplishment of a team as a unit, because basketball is a team game where teamwork and harmony of team members presented by tactics are demonstrated.

With intention to study the game of basketball, we used information from the previous researches (Gomez et al. 2008) for this one. We even used information from the research conducted 5 years ago about League 6, final stage of regular basketball season in Bosnia and Herzegovina, and determined the circumstances in Bosnian League from that period. This research has also a longitudinal characteristic in a certain way, because through research on basketball season in Bosnia and Herzegovina which has just finished and through comparing this season with the 2004/2005 season we came up with the answer to the question defined in the title of this research.

METHODS

Entity sample

Entity sample for this research comprises teams which took part in League 6, final regular season

stage of basketball championship in Bosnia and Herzegovina. League 6 had the same format for the 2004/2005 and 2009/2010 seasons. Two teams that represented Bosnia and Herzegovina in the regional NLB League joined four teams with the best records during the first stage of regular season to form League 6. There were 10 rounds in League 6 with total number of 30 games played. Games produced 30 winning and 30 losing sides, in both of the above mentioned seasons. Two teams, KK Bosna and KK Siroki, were the teams which represented Bosnia and Herzegovina in the regional NLB League in both 2004/2005 and 2009/2010, and which were included in the national championship after the end of NLB season and at the start of League 6.

Variable sample

Each basketball game offers huge amount of data which can be recorded and which are about the types and quality of performance by certain players or teams. FIBA technical committee has standardized 13 indicators of situational effectiveness in basketball, which are recorded for each team within a game and those are: two-point field goal – made (Š2US), two-point field goal – missed (Š2NE), three-point field goal – made (Š3US), three-point field goal – missed (Š3NE), free throw – made (SBUS), free throw – missed (SBNE), offensive rebound (SN), defensive rebound (SO), assist (A), personal foul (OG), turnover (IL), steal (OL), blocked shot (B). Official statisticians are specially trained to record the above mentioned data using the software for recording stats on basketball games, and they are responsible for the data.

Data processing methods

Data processing in this research was done using the software for multi-variant analysis. Statistical significance of differences between two or more groups in one or more variables very often is defined in kinetic researches (Dizdar, D, 2006). Variables in this research are processed by standard descriptive procedures. T-test was used to determine differences of arithmetic means between winning and losing sides and to test the significance of these differences, based on 13 standard indicators of situational effectiveness in basketball. Discriminative analysis was included to determine differences at a global level, and based on the obtained results we defined hierarchy of variables contributing to the difference between successful (winning) and unsuccessful (losing) teams.

RESULTS AND DISCUSSION

This work offers the answer to the question whether Bosnian League basketball has a tendency of quality improvement, and that answer is based on the analysis of standard indicators of basketball effectiveness and on the facts which we obtained by comparing elements of situational effectiveness in League 6, final stage of regular season in Bosnia and Herzegovina in the 2004/2005 season and in recently finished 2009/2010 season. Possibility of comparing these elements was made easier by the fact that League 6 was played in the same format. It included 4 teams with the best records from the first stage of regular season which were joined by

two teams that represented Bosnia and Herzegovina in the regional NLB League (KK Bosna and KK Siroki represented Bosnia and Herzegovina in NLB League in both seasons), with 30 games played in both 2004/2005 and 2009/2010.

T-test determined partial differences in the space of standard indicators of situational effectiveness. Statistically significant differences between winning and losing teams in the 2004/2005 season were recognized in the following indicators of situational effectiveness: assist, two-point field goal – made, two-point field goal – missed and defensive rebound. Difference in the variable steal was recognized on the limit of statistical significance. Based on these variables, winning teams had more assists (13.83 per game), defensive rebounds (18.90 per game), two-point field goals made (32.03), and steals (10.83), while losing teams had more two-point field goals missed (18.10).

Defensive rebound and steal as basketball parameters of defense separate winning from losing teams, while assists and two-point field goal made as basketball elements of offensive effectiveness with the element two-point field goal missed of losing teams support the theory that by using quality defensive basketball winning teams assured assumptions for successful offensive plays where the effectiveness of making two-point field goals was manifested, which very often results from a good pass leading to a basket (assist).

Table 1. T – test, 2004/2005 and 2009/2010 results

Winners-losers 2004/2005					Winners-losers 2009/2010				
Variables	Mean Win	Mean Los	t-value	p	Variables	Mean Win	Mean Los	t-value	p
Š2US	32,03	25,63	3,16387	0,002479	Š2NE	33,26	33,46	0,11178	0,911386
Š2NE	15,00	18,10	-2,82895	0,006403	Š2US	20,03	17,60	-2,32597	0,023537
Š3NE	7,63	6,23	1,89603	0,062941	Š3NE	23,03	21,83	-0,77439	0,441848
Š3US	12,33	13,46	-1,21568	0,229033	Š3US	8,90	7,13	-2,32536	0,023572
SBNE	18,86	17,06	1,18679	0,240150	SBNE	23,86	22,033	-1,10834	0,272290
SBUS	7,53	6,70	0,92132	0,360701	SBUS	17,20	15,83	-0,95200	0,345048
SN	8,70	7,76	1,15954	0,250988	SN	7,50	8,03	0,65181	0,517097
SO	18,90	16,03	2,80965	0,006750	SO	21,50	19,30	-1,85040	0,069352
A	13,83	9,66	3,73136	0,000435	A	16,16	11,73	-3,44591	0,001065
OG	23,60	21,83	1,57735	0,120153	OG	22,90	23,53	0,63038	0,530921
IL	11,60	13,66	-1,89035	0,063711	IL	12,13	15,36	3,22144	0,002093
OL	10,83	8,83	1,99732	0,050489	OL	9,46	7,00	-2,89990	0,005264
B	1,96	2,16	-0,56469	0,574462	B	2,23	1,46	-1,96206	0,054560

T-test was used for League 6 in the 2009/2010 season to identify statistically significant differences in the following variables for the assessment of situational effectiveness: steals, turnovers, assists, three-point field goal made, and two-point field goal made, while the variable blocked shot was also very close to statistical significance. Winning teams

had more steals (9.46), assists (16.16), three-point field goals made (8.90) and two-point field goals made (20.03), blocked shots (2.23), while losing teams had more turnovers (15.36).

Offensive effectiveness of winning teams is manifested in field goals made from mid-range and

distance, as well as in assists. Defensive effectiveness on winning teams is recognized in the variables blocked shot, steal, but also in opponent's turnovers. In relation to the 2004/2005 season, in recently completed season new variables that show statistical significance in distinguishing winning from losing teams are three-point field goal made and blocked shot. Distinguishing in the above mentioned variables is characteristic of a high-quality defense, especially set defensive plays.

Calculation of necessary parameters for discriminant analysis, for winning and losing teams in both seasons, was done on the processed data. Differences in 13 standard indicators of situational effectiveness were analyzed by canonical discriminant analysis. It is about discriminating data for both groups (winners – losers), so the method is equivalent to Fisher's linear discriminant method. Statistical significance of calculated discriminant function is tested by Burtlet χ_c - test.

Table 2. Distinctive values of discriminant function

Function 1	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
League 6 (04/05)	1.683^a	100.0	100.0	.792
League 6 (09/10)	1.549^a	100.0	100.0	.780

Table 2 contains distinctive values of discriminant functions, canonical correlation and variance percentage. Obtained distinctive values are very high, 1.683 (04/05 season) and 1.549 (09/10 season) which indicates that 13 standard indicators of situational effectiveness are great for distinguishing winning from losing teams. Obtained

values are close to the values published in the previous researches, for example Pleslic (1994) who obtained correlation .833 and Separovic (2007) .799; Trinic, Milanovic and Dizdar (1997) .766, and Pojskic et al. (2009) .809, so they confirmed high predictive values for 13 standard indicators of situational effectiveness.

Table 3. Significance test of discriminant function by Wilks' Lambda and χ_c - test

League	Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
League 6 04/05	1	.373	50.836	13	.000
League 6 09/10	1	.392	48.182	13	.000

Results in table (3) prove statistic significance of discriminant function by Wilks λ and Burtlet χ^2 test. Obtained values of Wilks λ test were low (.373 for 04/05 season and .392 for 09/10 season), while χ^2 test shows .000 significance for both seasons. Based on the results in table (4) which presents structure matrix containing correlation of the applied variables for the assessment of situational effectiveness with discriminant function, we can notice differences in the type and number of variables in analyzed competitions for both seasons.

Table 4. Correlation between certain variables and discriminant function

Structure Matrix

League 6 04/05		League 6 09/10	
	Function1		Function1
A	.378	A	.364
Š2US	.320	IL	-.340
Š2NE	-.286	OL	.306
SO	.284	Š2US	.245
OL	.202	Š3US	.245
Š3US	.192	B	.207
IL	-.191	SO	.195
OG	.160	SBNE	.117
Š3NE	-.123	SBUS	.100
SBUS	.120	Š3NE	.082
SN	.117	SN	-.069
SBNE	.093	OG	-.067
B	-.057	Š2NE	-.012

Functions at Group Centroids

Groups	04/05	09/10
	Function 1	Function 1
0 (Losers teams)	-1.276	-1.224
1 (Winner teams)	1.276	1.224

In the 2004/2005 season the following variables had the highest correlation with discriminant function: assist, two-point field goal made, two-point field goal missed, defensive rebound and steals. Since the majority of 30 wins in League 6 (23) for the 2004/2005 season belonged to KK Bosna (10), KK Siroki (7), KK Borac (6), and since these teams completely dominated the competition we can explain this as a result of their quality (fitness and conditioning, individual quality of players and team quality). Defensive part of the game, defensive rebound, steal, and the quality of defense resulting in high contribution of the variable two-point field goal missed, with high contribution of the variables two-point field goal made and assist indicates that domination by winning teams was reflected in successful transition offense.

Uneven quality of teams which took part in League 6 caused the possibility for dominant teams to exert

their quality through strong defense and high quality transition offense. This observation was also confirmed in the research which was conducted using 15 indicators of situational effectiveness, where two more indicators (two-point field goal–dunk and two-point field goal– layup) were added to already existing 13 indicators (Šeparović, V., 2007).

In the 2009/2010 season the following variables had the highest correlation with discriminant function: assist, turnover, steal, two-point field goal made, three-point field goal made and blocked shot.

Each team won at least one game in League 6 which had total number of 30 games: KK Široki (8 wins), KK Bosna (7), KK Igokea (6), KK Čapljina (6), KK Sloboda (3) and KK Zrinjski (2). Two segments of the defensive part of the game, blocked shot and steal, two-point field goal made, three-point field goal made and assist come as a consequence of quality offensive sets and they are a very important group of variables based on which it can be concluded which part of the game discriminates between winning and losing teams on a global level.

Hence, the quality of defense on these 30 games improved offensive part of the game in the sense that it became more versatile and that in order to win it is necessary to have the level of quality which is reflected in high field goal percentage from mid-range and distance. Assist remains a constant which as a part of situational effectiveness in League 6 for the 2009/2010 season has the largest contribution to the power of discriminating between winners and losers, but because of well-balanced quality of teams they occur in set plays.

Quality set defensive plays on the player with the ball initiates opponent's move inside, while the team defense tries to stop that move inside and leaves opponent with a chance to recognize player movement on defense and to make an assist. Depending on the situation, assists are made to low-post players or to outside shooters since it is very often a conceptual risk for the defense, but that risk is the reason why three point field goal made is a successful part of situational effectiveness which strongly contributes to the difference between successful and unsuccessful teams in League 6 for the 2009/2010 season.

CONCLUSION

The answer to the questions defined in the title of this research is positive, the quality of Bosnian League basketball in League 6 for the championship of Bosnia and Herzegovina, in the strongest national basketball league is having the upward trend. Conclusion of this research is that we

determined the fact that the quality of League 6 teams is equally dispersive on all teams, in relation to the 2004/2005 season for which we confirmed that only three teams were defined as quality teams, and two of those three teams represented Bosnia and Herzegovina in the regional NLB League that season (KK Bosna and KK Široki).

This balanced quality of teams is caused by the improvement of defense which demands good conditioning for all teams, so now it is not possible to dominate on transition offense, because based on a quality preparation teams can now defend opponent's attempt to create an advantage on the offensive end by creating extra space or players and to get so called "easy points".

In League 6 for the 2009/2010 season, set offense is the part of basketball where the difference between successful and unsuccessful teams. The quality of transition defense, controlling opponent's fast break and setting half-court defense makes the contest very complex, therefore to win in such conditions it is necessary to be well prepared and organized for a basketball game. Optimal integral preparation of a basketball player can be achieved by rationally controlled practice over the years, which allows success in top quality basketball (Trninic, S. 2006).

The best basketball is a combination of organization and improvising, and well-balanced quality of teams competing in a basketball league creates conditions for improving the quality of the game itself through larger number of games between the teams with balanced quality. The quality of League 6, final stage of regular season in Bosnia and Herzegovina for the 2009/2010 season is better than in League 6 for the 2004/2005 season in terms of how many teams participate in determining the quality of the league (we can say that all 6 teams play their role).

Whether the strongest teams in League 6 (KK Bosna and KK Široki) have succeeded or not in the previous five years, the period between these two researches, to reduce the gap between them and the teams competing in the regional NLB League in terms of quality, is a question for which an answer can be given by a new research.

Teams which took part in League 6 for the 2009/2010 season made possible with their quality and through a well-balanced league to create conditions for ongoing improvement of basketball in Bosnia and Herzegovina. We can expect changes in the selection of teams for the upcoming seasons, and also in technology of practice plans. These changes will even more strengthen already well balanced quality of the league which possibly can improve to a level where the teams from Bosnian League can be contenders in the regional NLB League.

REFERENCE

1. Dizdar, D. (2006). Kvantitativne metode [Quantitative methods]. Sveučilišni udžbenik. Kineziološki fakultet Sveučilišta u Zagrebu. Grafički zavod Hrvatske d.o.o.
2. Gómez, M.A., Lorenzo, A., Sampaio, J., Ibáñez, S.J., & Ortega E. (2008). Game-related statistics that discriminated winning and losing teams from the Spanish men's professional basketball teams. *Collegium Antropologicum*, 32(2): 451-456.
3. Pojskić, H., Šeparović, V., Užičanin, E. (2009). Differences between successful and unsuccessful basketball teams on the final olympic tournament. *Acta Kinesiologica* 3, (2): 110-114.
4. Šeparović, V. (2007). Uspješnost košarkaških ekipa u prostoru situacionih pokazatelja primarnog tranzicijskog i pozicionog napad. Doktorska disertacija.[Doctoral thesis], Tuzla: Fakultet za tjeljeni odgoj i sport Univerziteta u Tuzli.
5. Trninić, S, Milanović D, Dizdar, D (1997). Diskriminacijska analiza pobjedničkih i poraženih ekipa u prostoru standardnih pokazatelja situacijske efikasnosti u košarkaškoj igri. *Leistung sport*, 2:29-34, *Rivista di Cultura Sportiva*, 38:49-55.
6. Trninić, S. (2006). Selekcija, priprema i vođenje košarkaša i momčadi [Selection, preparation and conduct of players and basketball teams]. Sveučilišni udžbenik, Sveučilište u Splitu. Vikta - Marko d.o.o.

DA LI KLUPSKA KOŠARKA U BOSNI I HERCEGOVINI IMA TREND RASTA KVALITETE ?

Originalni naučni rad

Sažetak

Cilj ovog rada je da se na osnovu 13 standardnih pokazatelja situacijske efikasnosti u košarci dobije relevantan odgovor na pitanje da li klupska košarka u Bosni i Hercegovini ima trend rasta kvalitete. Podaci za ovo istraživanje crpljeni su iz dvije takmičarske sezone Lige 6 prvenstva Bosne i Hercegovine iz sezone 2004/2005 i sezone 2009/2010. Odigrano je po 30 utakmica u svakoj sezoni. T – testom je utvrđena značajnost razlika između aritmetičkih sredina između pobjedničkih i poraženih ekipa u primjenjenim situacionim pokazateljima, a diskriminativnom analizom je utvrđena razlika na globalnom nivou kao i doprinos svakog situacionog pokazatelja diskriminativnoj funkciji. Rezultati istraživanja potvrđuju da je kvalitet klupske košarke u Bosni i Hercegovini u završnici prvenstva u sezoni 2009 / 2010 ravnomjerno disperziran na uravnoteženom nivou u gotovo svim klubovima (6), tako da se u odnosu na sezonu 2004 / 2005, može reći da je klupska košarka dosegla značajno viši nivo kvalitete. Ujednačen kvalitet ekipa Lige 6 u sezoni 2009 / 2010 uzrokuje visok kvalitet igre u fazi odbrane, a takva odbrana opet provocira raznovrsnost i novi kvalitet u napadačkom segmentu igre, pa se kao novi pokazatelji koji diskriminiraju pobjednike od poraženih pojavljuje šut za tri poena uspješan i blokada šuta. Može se očekivati da će se u budućem periodu kvalitetom izdvojiti neka od ekipa koja će odrediti i novi pozitivni trend razvoja bosanskohercegovačke košarke.

Ključne riječi: Tranzicijski napad, pozicioni napad, poziciona odbrana, pokazatelji situacijske efikasnosti, diskriminativna analiza, T – test.

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