

ORIGINAL SCIENTIFIC PAPER**Novica Gardasevic¹, Dejan Ceremidzic², Aleksandar Vujkovic³**¹ Doctoral studies Student, Faculty of Physical Education and Sport, University of East Sarajevo² Faculty of Physical Education and Sport, University of East Sarajevo³ PI High School "Stojan Cerovic" Niksic**UDK:796.323.2****DOI: 10.7251/SIZEN0119005G****THE DIFFERENCES IN SITUATION SUCCESS BETWEEN THE ABA LEAGUE
BASKETBALL PLAYERS IN SEASON 2018/19***Summary:*

The aim of the study was to determine whether there are statistically significant differences in the situational efficiency parameters between domestic (ex YU) and foreign (out of ex YU) basketball players, the players of the Adriatic Basketball League (ABA League) in the 2018/19 season. The study analyzed 20 parameters of situational efficiency. Using Mann–Whitney U test, it was found that there are statistically significant differences among the basketball players in 7 of the 20 analyzed variables. Players foreigners statistically significantly more lose and win the ball, hit and miss the 2- pointshot and more often block the opponent's shot. Based on the differences, it was concluded that the players foreigners are, much more in contact with the ball than the domestic players. The general conclusion is that the basketball game in the ABA League for the 2018/19 season was focused on players foreigners, which could have a certain impact on the affirmation of players from the former Yugoslavia.

Key words: ABA league, basketball, situational success, Mann–Whitney U test, differences**INTRODUCTION**

Basketball is a collective sport game in which the goal is to score more points than opponents and thus win. Since 1891, when Dr. James Naismith has invented basketball, until today, basketball has been intensively developed and has become one of the most popular sports branches. The intense development of basketball required the need to monitor efficiency both individually and team as a whole. Monitoring implies numerical definition of situational efficiency, through standard and implemented parameters in the game. For the purpose of easier monitoring of situational efficiency, the International Basketball Federations(FIBA-Federation International Basketball Association) standardized the situational efficiency parameters that are monitored at each official match. According to Malacko& Radjo (2004), the data on the situational efficiency of the team and individual athletes are based on new requirements in every scientific and professional activity where informatics play a very important role in its overall development.

Situational efficiency in basketball, through the analysis of standard parameters of the game, is the subject of research by the scientific public (Ceremidzic D., & Ceremidzic T., 2010; Gardasevic, Ceremidzic, & Markovic, 2018; Sindik, Jukic, & Adzajlija, 2012; Subotic& Ceremidzic, 2017; Uzelac, Milanovic, & Stefan, 2016; Vareslija, 2014).

The Adriatic Basketball League (English: Adriatic basketball league – ABA) is a basketball competition founded in 2001, intended primarily for clubs from the former Yugoslavia (ex YU)

republics (Montenegro, Serbia, Bosnia and Herzegovina, Slovenia, Croatia and Northern Macedonia). Special invitations by the organizers of the league (English: Adriatic Basketball Association) to participate in the ABA League were occasionally taken by teams outside the territory of the former Yugoslav republics; Maccabi Tel Aviv (Israel), Nimbruk (Czech Republic), SolnokOlaj (Hungary), Levski Sofia (Bulgaria). The imperative of the ABA League winner, secures placement in Euro-league, while the defeated finalists and semi-finalists will be given the opportunity to participate in Euro-cup. In the basketball season of 2018/19, the Adriatic League played 12 clubs from 5 former Yugoslav republics; BuducnostVoli and Mornar Bar (Montenegro), Red Star MTS, Partizan NIS, FMP, Mega Bemax (Serbia), Zadar, Cibona, Cedevita (Croatia), Petrol Olimpija, Krka (Slovenia) and Igokea (Bosnia and Herzegovina). The former Yugoslav Republic of Northern Macedonia did not have a representative in the 2018/19 season. In previous seasons, Northern Macedonia was represented by clubs KarposSokoli and MZT Skopje Airport in the Adriatic Basketball League.

In addition to the fact that the Adriatic Basketball League is primarily aimed for affirmation of players from the territory of the former Yugoslav republics, more and more foreigners (players outside the ex YU) take part in the season. In the season 2018/19, in the regular part of the competition (22 rounds to semi-finals), about 59 players outside the ex YU area played the Adriatic League (29.80%), while there were about 139 players from the ex YU area (70.20%). Most foreign players come from the United States (USA).

According to the above, the subject of research is the standard (basic and performed) parameters of situational efficiency, basketball players of the ABA league.

The aim of the research is to determine the differences in the situational efficiency parameters between domestic (ex YU) and foreign (outside of ex YU) basketball players, the players of the Adriatic Basketball League (ABA League) in the 2018/19 season.

METHOD OF WORK

Examinee sample

The Examinee sample included 162 basketball players from 12 clubs that played Adriatic basketball league (ABA league) in the 2018/19 season. The sample included players who played on 7 or more matches of the regular part (22 rounds) of the competition, which is about 32% of the total possible performance. The Examinee sample is subdivided into 2 sub-samples:

- 121 basketball players born in the former Yugoslav republics (Montenegro, Serbia, Bosnia and Herzegovina, Slovenia, Croatia and Northern Macedonia),
- 41 basketball players born outside of the former Yugoslav republics.

Variables sample

The variables sample included 20 standard (basic and derived) parameters of the situational efficiency of basketball players, defined by the International Basketball Federation (FIBA);

1. a successful 1-point shot (ŠUT1U), 11. jump in defense (SKOKO),
2. an unsuccessful 1-point shot (ŠUT1N), 12. jump in attack (SKOKN),
3. percentage of shot for 1 point (ŠUT1%), 13. assistances (ASIST),
4. a successful 2- point shot (ŠUT2U), 14. stolen balls (UKRAL),
5. an unsuccessful 2- point shot (ŠUT2N), 15. lost balls (IZGBL),
6. percentage of shot for 2 points (ŠUT2%), 16. fouls (FAUL),
7. a successful 3-point shot (ŠUT3U), 17. blocked shot (BLOK),
8. neuspješna šut za 3 poena (ŠUT3N), 18. total points (POEN),
9. an unsuccessful 3-point shot (ŠUT3%), 19. success index (INDEX),
10. total percentage of shots (UŠUT%), 20. total time spent in the game (MIN).

Variables included in this research were analyzed in some of the previous studies (Gardasevic et al., 2018; Milanovic, Jukic, & Bracic, 2001; Nakic 2004, Sindik et al., 2012; Vareslija 2014). Results for all variables are taken from the official ABA League website (<https://www.aba-liga.com/>).

Data processing methods

Adequate mathematical-statistical methods and procedures were used for processing, data entry and analysis of results. For all application of the variable, the basic descriptive indicators are calculated; arithmetic mean, minimum and maximum values and standard deviation. The regularity of the distribution was tested using the Kolmogorov–Smirnov test. Of the statistical procedures, Mann–Whitney U test was used to determine the differences between the subjects. Data processing is performed in the IBM software package SPSS 20.0 for Windows.

RESULTS AND DISCUSSION

Table 1.

Descriptive parameters of applied variables

Variables	N	Min	Max	Mean	St. Dev.	KS	p
ŠUT1U	162	.00	109.00	25.89	21.15	1.95	0.00
ŠUT1N	162	.00	68.00	9.95	9.66	2.30	0.00
ŠUT1%	162	.00	100.00	71.14	15.77	1.35	0.05
ŠUT2U	162	1.00	100.00	30.21	21.47	1.30	0.06
ŠUT2N	162	2.00	95.00	27.49	17.32	1.46	0.02
ŠUT2%	162	16.70	77.30	50.02	11.10	0.85	0.46
ŠUT3U	162	.00	48.00	13.54	12.28	1.72	0.00
ŠUT3N	162	.00	83.00	26.42	21.64	1.50	0.02
ŠUT3%	162	.00	100.00	29.29	17.43	1.35	0.05
UŠUT%	162	17.60	65.60	44.28	9.27	0.71	0.68
SKOKO	162	3.00	115.00	35.51	22.32	1.20	0.10
SKOKN	162	1.00	66.00	15.18	12.57	1.65	0.00
ASIST	162	1.00	126.00	27.42	25.26	2.29	0.00
UKRAL	162	1.00	44.00	10.94	7.77	1.69	0.00
IZGBL	162	.00	56.00	20.62	13.02	1.50	0.02
FAUL	162	5.00	71.00	37.32	16.03	0.80	0.54
BLOK	162	.00	39.00	4.30	6.36	3.17	0.00
POEN	162	10.00	334.00	126.95	76.76	1.11	0.17
INDEX	162	-23.00	477.00	132.58	92.83	1.04	0.22
MIN	162	45.00	726.00	309.14	153.66	1.12	0.16

Legenda: *N* – examinee number, *Min.* – minimal result, *Max.* – maximal result, *Mean* – arithmetic mean, *St. Dev.* – standard error of arithmetic mean, *KS* – Kolmogorov- Smirnov test, *p* – significance of KS test.

Table 1 shows the descriptive parameters of the applied variables of the situational efficiency of the basketball players of the ABA league in the 2018/19 season. Given that all the players' results who played on 7 or more games are covered, there are significant differences between minimum and maximum results in all variables. The dispersal of the results caused the violation of the normal distribution, which was concluded on the basis of statistical significance (p) for the results of the Kolmogorov Smirnov test in 11 variables. According to the violation of the distribution of the results,

the determination of the differences between the situational efficiency of the basketball player was realized using the nonparametric statistical method of Man - Whitney U test.

Table 2.

The Results of Mann-Whitney U test

Varijabla	Grupa	Mean Rank	Median	MVU	p
ŠUT1U	1	78.46	19.00	2848.50	.15
	2	90.48	22.00		
ŠUT1N	1	78.90	7.00	2795.50	.22
	2	89.18	7.00		
ŠUT1%	1	80.26	73.10	2631.00	.56
	2	85.17	74.50		
ŠUT2U	1	75.44	26.00	3214.00	.05
	2	99.39	36.00		
ŠUT2N	1	76.23	23.00	3118.50	.01
	2	97.06	29.00		
ŠUT2%	1	79.96	51.50	2666.50	.47
	2	86.04	50.80		
ŠUT3U	1	77.46	9.00	2969.00	.59
	2	93.41	14.00		
ŠUT3N	1	78.26	19.00	2873.00	.13
	2	91.07	25.00		
ŠUT3%	1	78.71	30.50	2818.00	.19
	2	89.73	34.20		
UŠUT%	1	77.91	42.90	2914.50	.09
	2	92.09	46.00		
SKOKO	1	78.15	31.00	2886.00	.11
	2	91.39	38.00		
SKOKN	1	81.77	13.00	2498.00	.90
	2	80.71	11.00		
ASIST	1	78.80	17.00	2807.00	.20
	2	89.46	27.00		
UKRAL	1	76.21	8.00	3120.50	.01
	2	97.11	11.00		
IZGBL	1	76.43	17.00	3094.00	.01
	2	96.46	23.00		
FAUL	1	79.93	37.00	2670.50	.46
	2	86.13	36.00		
BLOK	1	76.88	2.00	3040.00	.02
	2	95.15	3.00		
POEN	1	75.60	108.00	3195.00	.00
	2	98.93	141.00		
INDEX	1	75.88	112.00	3161.00	.00
	2	98.10	161.00		
MIN	1	78.19	268.00	2880.50	.12
	2	91.26	331.00		

Legenda: *Group 1* – domestic players, *Group 2* – players foreigners, *Mean Rank* – arithmetic mean of rank, *Median* – medians, *MVU* – Man – Whitney U test, *p* – coefficient of difference significance.

Results of Man - Whitney U test in Table 2, have shown that in 7 of the 20 applied variables, there is a statistically significant difference between the ABA basketball players born on the territory of the former Yugoslav republics and the foreign basketball players in the situational efficiency parameters.

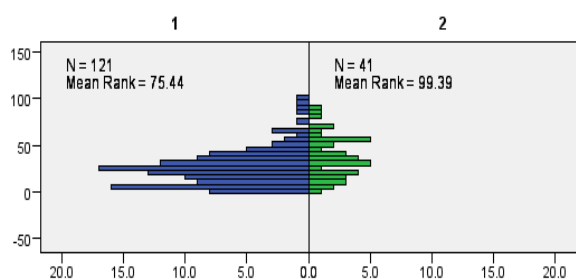
Statistically significant differences were made in variables; a successful 2-point shot, an unsuccessful 2-point shot, stolen balls, lost balls, blockade shots, total points and performance index. Basketball players foreigners had more successful 2-point shots (ŠUT2U - 36.00:26.00), they were significantly more likely to win or take the ball away (UKRAL - 11.00:8.00), they were more efficient in the block (BLOK - 3.00: 2.00). During the 22 rounds of the regular part of the competition, players foreigners scored significantly more points (POEN -141.00:108.00) and achieved a better index of success during the season (INDEX - 161.00: 112.00). Also, basketball players born outside the area of former Yugoslavia, significantly missed the 2-point shot (ŠUT2N - 29.00:23.00) and they lost the ball more often (IZGBL - 23.00:17.00). In the Table 2, apart from the arithmetic mean rank, (Mean Rank) median (Median) is presented for each variable, as a value that more realistically represents the relationship of differences between groups in variables (Pallant, 2017).

Comparing the value of the median as the central value in the distribution of results, with the average values for individual variables from other surveys, it was noted that there are certain differences. The average of a successful 2-point shot in the Croatia A-1 league (Sindik et al., 2012) for the 2006/07 season was 34.03 successful shots per player in the season, while in this research a successful 2-point shot was 26.00 shots domestic and 29.00 players foreigners in the 22 rounds of the regular part of the competition. On the basis of previous values, it would be wrong to conclude that Croatian clubs in the 2006/07 season were more efficient than ABA League clubs in the 2018/19 season. If we take into account the percentage of the 2 points shot, it is 38.88% (Croatian A-1 league), ie 51.50% domestic and 50.80% foreign players of the ABA league in the 2018/19 season. The average unsuccessful 2 points shots in the Croatian A-1 League for the 2006/07 season was 26.99 per player, which is more than the domestic players in the ABA league in the 2018/19 season (23.00), or less compared to the foreigners (29.00) from the ABA League.

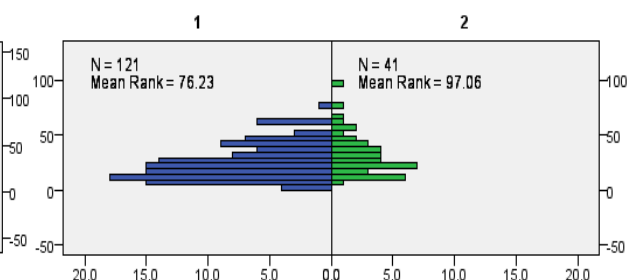
The percentage of 3- point shot was higher in both domestic (30.50%) and foreign players (34.20%) of the ABA league compared to national team players (25.75%) of the London 2012 Olympic Games (Vareslija, 2014). By comparing the results of the same survey, players at the 2012 Olympics, on average, won 3.12 balls and lost 6.78 during the championship, while in the ABA league, home and foreign players won the ball at 8.00:11.00 and lost in ratio 17.00:23.00 per season. The number of games in the Olympic Games is significantly lower than the 22 regular season games in the ABA league, which significantly affects the differences in the above parameter.

Compared to the percentage of 3-point shots with players from Euro league for the first part of the 2016/17 season (Ceremidzic&Delic, 2016), it was concluded that the domestic (30.50%) and the foreign (34.20%) players of the ABA League had a poorer percentage of shots compared to Euroleague players where the percentage was 37.22%. Compared with NBA players for the first part of the 2016/17 season (Ceremidzic&Delic, 2016), the percentage of the shot of foreigners from the ABA League was almost identical with NBA players 34.20 - 34.40.

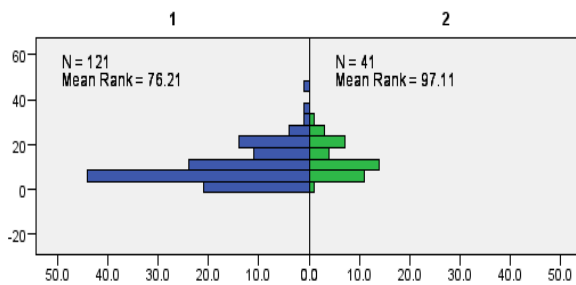
Based on the results obtained, it can be noted that the players foreigners are much more in touch with the ball and that they are much more "spending the ball" in relation to domestic players. This is indicated by the fact that they lose much more and win the ball, hit and miss the 2- point shot, and that they often block the opponent's shot. Surely, this situation suppresses the creativity and efficiency of domestic players in the ABA league and thus have a worse performance index. In support of the above is the fact is that the finalists of the ABA league in the 2018/19 season are namely the clubs where most foreigners played, ie, BC BuducnostVoli from Podgorica (Montenegro) and BC Red Star MTS from Belgrade (Serbia).



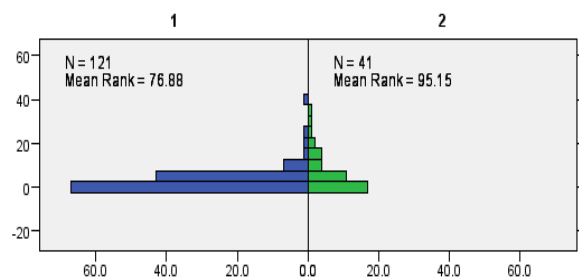
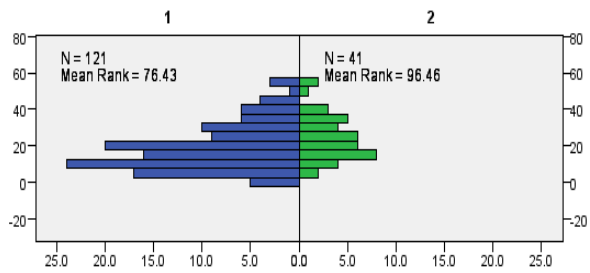
Picture 1. Frequency of the results for the variable successful 2-point shot (ŠUT2)



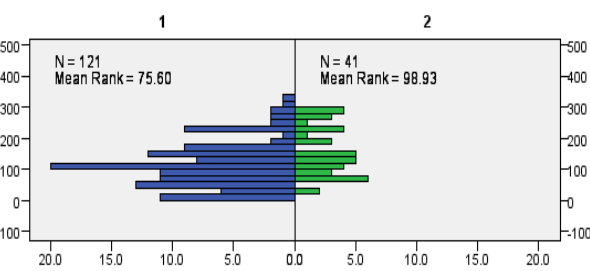
Picture 2. Frequency of the results for the variable unsuccessful 2-point shot (ŠUT2N)



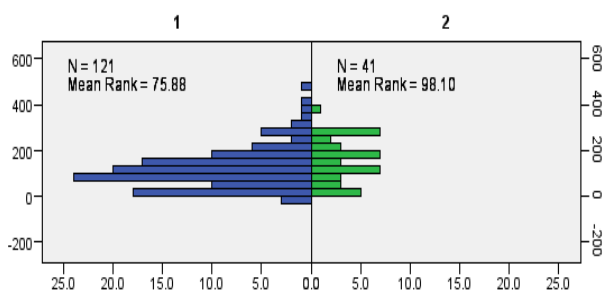
Picture 3. Frequency of the results for the variable stolen balls (UKRAL)



Picture 5. Frequency of the results for the variable blockade of the shot (BLOK)



Picture 6. Frequency of the results for the variable total points (POEN)



Picture 7. Frequency of the results for the variable index of efficiency (INDEX)

CONCLUSION

Using the non-parametric statistical method, Man-Whitney U test, it has been concluded that there are statistically significant differences between 7 of the 20 applied situational efficiency variables among the sub-samples basketball players of the ABA League. It was found that basketball players born outside the territory of the former Yugoslav republics have more successful 2-point shots, more often take the ball, block the opponent's shot and score more points than players born in the former Yugoslav republics. These parameters probably also condition the fact that players foreigners have a better index of efficiency (INDEX) due to better efficiency in the above four variables (ŠUT2U, UKRAL, BLOK, POEN). The previous observation would need to be further investigated and possibly confirmed. According to the fact that the players foreigners considerably more missed the 2-point shot and more often lose the ball (ŠUT2N and IZGBL), it can generally be concluded that ABA leagues basketball players who come out of the territory of the former Yugoslavia are more often in the possession of the ball, that is, they are the bearers of the game. On the basis of the results obtained, it can be generally concluded that ABA basketball teams with more foreigners in the team have a greater chance of success. Accordingly, semi-final matches in the 2018/19 season were played by teams that rotated most of the players foreigners during the season (BC BudućnostVoli, BC Red Star MTS, Partizan NIS and Cedevisa). It is certain that thanks to foreign players the ABA League has additionally gained on quality and dynamics, while on the other hand it is certain that domestic players harder get chance to prove themselves and thus stagnate.

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