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Study on free throws in the romanian men's national league of basketball

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Abstract

The increasingly frequent use of computers in analyzing the game of basketball, offers the advantage of a fast analysis of a player's or a team's performance, one free of mathematical errors. The following study focuses on analyzing the free throws in the Men's National League of Basketball, emphasizing those features that can make the difference between the champion team and the other participants. Thus, starting from the hypothesis that the team on the first place must be the team with the lowest average of the free throws of the visiting teams, this study would like to point out the number of free throws that were given to the host teams and to the guest teams. Other aspects that have been analyzed in this paper include the percentage of scored points in free throws, the percentage of free throws for teams participating in the LNBM (Men's National Basketball League) and the teams that have benefited from the most free throws, so that the data obtained can provide coaches with a series of useful information for future preparation.

Key words: *basketball, free throw, free throw percentage.*

Rezumat

Computerizarea datelor jocului de baschet ne dă posibilitatea să evaluăm performanțelor unui jucător sau al unei echipe pe baza unei analize rapide, fără erori matematice. Acest studiu s-a axat pe analiza aruncărilor libere în Liga Națională de Baschet Masculin (LNBM), urmărindu-se acele aspecte care pot face diferența dintre echipa campioană și restul participantelor. Pornind de la ipoteza că echipa de pe primul loc trebuie să fie echipa asupra căreia media procentajelor aruncărilor libere a echipelor vizitatoare este cea mai mică, acest studiu dorește să evidențieze câte aruncări libere au fost acordate echipelor gazdă și câte echipelor oaspete din totalul de aruncări libere. Alte aspecte ce au fost tratate în acest studiu sunt: ponderea punctelor marcate din aruncări libere, procentajele aruncărilor libere ale echipelor participante în LNBM și echipele care au beneficiat de cele mai multe aruncări libere. Toate aceste datele obținute oferă antrenorilor o serie de informații utile în vederea pregătirii viitoare.

Cuvinte cheie: *baschet, aruncare liberă, procentajul aruncărilor libere.*

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Introduction

The uniformity of the teams' results, both nationally and internationally, with the scores of many games nowadays registering minor differences, means that the importance of free throws is witnessing a significant increase. Moreover, the free throw has started to play a more important role also due to the fact that the rules are evolving towards making the game more dynamic and less violent. The bonus situation reveals how important a successful free throw is nowadays. It can actually become a tactical element at the end of the games.

The theoretical documentation has included the analysis of the following specialized terms:

- away game – a game played at an opponent's venue [1]; also referred to as on the road;
- home game - a game played on a team's home ground [2]; also referred to as at home;
- free throw - a free throw is an opportunity given to a player to score 1 point, uncontested, from a position behind the free-throw line and inside the semi-circle. A set of free throws is defined as all free throws and possible subsequent possession of the ball resulting from a single foul penalty [3];
- free-throw percent[4]age - free throw percentage (FT%) is a basketball metric that expresses a player's successful free throws in comparison to their total attempts [5]. Free throw percentage (FT%) is calculated as: free throws shot/ free throws attempted X 100;
- box score - a printed summary of a game as a table that lists the players and their individual performance according to all statistical categories;
- standings – listings classifying the participants in a sports competition according to the results; a table consisting of this order [6]. The rankings of the regular 2015-2016 championship were the following (Table I) [7]:

Table I. Standings of the 2015-2016 National Basketball League regular season

Team	Wins - losses
Oradea	17 – 5
Cluj Napoca	15 – 7
Steaua	15 – 7
Tg-Mures	14 – 8
Craiova	14 – 8
Sibiu	13 – 9
Dinamo	11 – 11
Tg-Jiu	10 – 12
Galati	8 – 14
Timisoara	5 – 17
Pitesti	8 – 14 *
Medias	2 – 20

Study hypotheses and objectives

This study sets off from the following hypotheses:

1. The first place will be won by the team which allows the visiting teams to convert the lowest percentage of free throws.
2. The first place will be won by the team with the biggest percentage of free throws converted in away games.

The reasons for choosing these starting points are mostly psychological[8], such as spatial cues, topographical memory, the players' psychological comfort and their self-confidence [9], and the quality of the installations (backboards, basket) with the help of which the players have developed their dynamical stereotype of shooting[10].

Furthermore, the study has the following objectives:

1. To compare the number and the percentage of free throws given to home teams as opposed to those given to visiting teams;
2. To find out the percentage of free throws out of the total points scored;
3. To find out the percentage of free throws for the teams participating in the League.

Material and methods

This study focused on the members of the teams participating in the regular season of the League. The 12 teams played weekly "round robin" home and away games, leading to a total of 132 games. All these games were statistically analyzed by assessing their box score (Table II). The number of free throws was recorded in the following situations: throws given to the home team vs. visiting teams, emphasizing the points gained from free throw out of the total points scored during the game

Table II. Example of a box score

Nr. Player	MIN	2P		3P		FG		FT		REB		AS		PF		TO	ST	BS	EFF	+/–	PTS
		M/A	%	M/A	%	M/A	%	M/A	%	O	D	T	CM	RV							
3 *Martin Gilbert Zeno	35:18	8/13	62%	0/3	0%	8/16	50%	5/5	100%	1	5	5	1	5	1	2	1	22	14	21	
4 *Andrei Mandache	34:59	2/3	67%	3/5	60%	5/8	62%	4/8	50%	1	4	5	1	4	2	1	2	17	6	13	
5 *Sean Antwan Barnette	32:54	2/6	33%	1/3	33%	3/9	33%	4/8	50%	4	6	10	3	5	1	1	1	12	12	11	
8 Radu Rares Pasca	09:38	1/1	100%	1/2	50%	2/5	40%	1/2	50%	1	1	1	1	1	1	1	1	6	4	8	
11 Uros Lucic	12:29	2/5	40%	1/3	33%	3/6	50%	1/2	50%	3	2	5	3	2	1	1	1	9	-3	8	
12 Silviu Lupusavei	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
13 Miha Zupan	16:35	1/2	50%	0/2	0%	1/4	25%	1/2	50%	1	1	1	1	1	1	1	1	-2	9	3	
24 Catalin Petrisor	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
21 Bogdan Tibirna	04:55	0/1	0%	-	-	0/1	0%	-	-	1	1	1	1	1	1	1	1	2	1	2	
22 *Salih Nuhanovic	18:32	2/5	40%	-	-	2/5	40%	1/2	50%	2	5	7	3	3	4	1	2	12	-8	5	
24 Bogdan Nicolescu	00:56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-2	
55 *William Edward Franklin	33:46	4/9	44%	0/2	0%	4/11	36%	4/6	67%	2	1	3	5	3	2	1	1	9	5	12	
Team	-	-	-	-	-	-	-	-	-	2	3	5	-	-	-	-	-	-	5	-	
Total	200:00	22/43	51%	6/23	26%	28/63	44%	17/27	63%	14	28	42	16	25	23	10	5	5	2	92	79

Results and discussions

In the regular season of the National League, mainly season 2015-2016, 5065 free throws were shot. 3664 of them were converted into points scored, which represents a success rate of 72.33%. The home teams shot 2439 free throws, scoring 1926 points, a percentage of 73.34%, whereas the visiting teams shot 2439 free throws, with 1738 successful shots, which is a percentage of 71.25% (Table III).

Table III. Listing the free throws in the National League

	Free throws made	Free throws attempted	Average
Home Team	1926	2626	73.34%
Visiting team	1738	2439	71.25%
Total	3664	5065	72.33%

Since the studies [11] show that, out of the total points scored, those achieved through free throws should range between 20% and 25%, only the team from Sibiu (20.03%) falls within these limits. All the other teams fall below this line (Table IV).

Table IV. The percentage of points scored through free throws

No	Team	Total points	FTM	%
1.	Sibiu	1717	344	20.03
2.	Craiova	1790	349	19.49
3.	Steaua	1726	327	18.94
4.	Tg Jiu	1686	317	18.80
5.	Galati	1714	311	18.14
6.	Dinamo	1787	321	17.96
7.	Timisoara	1606	288	17.93
8.	Oradea	1763	315	17.86
9.	TgMures	1829	302	16.51
10.	Cluj	1624	267	16.44
11.	Pitesti	1673	268	16.01
12.	Medias	1598	255	15.95
	Total	20513	3664	17,86

Using the North American Basketball as reference, since in this case the average percentage of free throws is close to 70% in the college championship – NCAA [12] – and 75% in the professional championship – NBA [13], the average percentage of free throws in the main Romanian basketball league is 72.33%, as shown in Table V.

Table V. LNBM Free throw percentages

No	Team	Games	FTM	FTA	%
1.	Tg Jiu	22	317	421	75.30%
2.	Pitesti	22	268	356	75.28%
3.	TgMures	22	302	407	74.20%
4.	Cluj	22	267	362	73.76%
5.	Timisoara	22	288	392	73.47%
6.	Dinamoi	22	321	446	71.97%
7.	Galati	22	311	434	71.66%
8.	Steaua	22	327	458	71.40%
9.	Sibiu	22	344	483	71.22%
10.	Medias	22	255	359	71.03%
11.	Oradea	22	315	446	70.63%
12.	Craiova	22	349	501	69.66%
	Total		3664	5065	72.33%

Regarding the study's hypotheses, after analyzing the box scores of the games in the NLMB, the following data was revealed:

Hypothesis 1 – *“The first place will be won by the team which allows the visiting teams to convert the lowest percentage of free throws”* – is confirmed. Thus, the leader in the rankings with 17 victories and 5 defeats, the team from Oradea, allowed the visiting teams to score only in 63.26% of the free throws on their court (Table VI). It is worth mentioning that the referees awarded teams visiting Oradea the fewest free throws, 147.

Table VI. Visiting team's free throw percentages

	Free throws attempted	Free throws made	Free throws percentage %
Oradea	147	93	63,26
Galati	228	149	65,35
Cluj Napoca	195	135	69,23
Tg-Jiu	240	168	70,00
Craiova	262	185	70,61
Dinamo	184	130	70,65
Tg-Mures	214	152	71,02
Medias	198	144	72,72
Pitesti	184	137	75,20
Timisoara	220	166	75,45
Steaua	168	127	75,55
Sibiu	199	152	76,38

Hypothesis 2 – *“The first place will be won by the team with the biggest percentage of free throws converted in away games”* – was rejected. With a percentage of 68.86% free throws scored in away games, Oradea comes 9th in this classification. The team from Timisoara with only five victories during the regular season has the highest percentage of free throws in away games, 77.64%. Craiova, the team with the lowest percentage of free throws scored in away games, 65.54%, was awarded the most free throws out of all teams, 267 (Table VII).

Table VII. Road free throw percentages

	Free throws attempted	Free throws made	Free throws percentage %
Timisoara	170	132	77,64
Pitesti	176	133	75,56
Steaua	213	158	74,17
Tg-Jiu	194	143	73,71
Dinamo	200	146	73
Galati	235	169	71,91
Tg-Mures	195	139	71,28
Cluj Napoca	167	119	71,25
Oradea	219	153	69,86
Sibiu	231	157	67,96
Medias	172	114	66,27
Craiova	267	175	65,54

Conclusions

As a result of our study on free throws in the Men's National League of Basketball, we can draw the following conclusions:

- Comparing the number of free throws given to the home team with that of visiting teams, as well as with their success rates, proves that the percentage of shots had an almost constant value, regardless of where the game took place, the difference between the two being of only 2% in favor of the host-team;
- The constant percentage in the free throws in the League falls out from its range as well. Thus, the difference between the highest percentage (Târgu Jiu – 75.30%) and the lowest (Craiova – 69.66%) is of under five units;
- With the exception of only one team, the percentage of points scored from free throws is fewer than 20% out of the total. To coaches, this may reveal underlying tactical problems when it comes to obtaining free throws, but also problems in training, when it comes to increasing the percentage of successful shots in this case;
- The study hypotheses are partially confirmed, leaving room for interpretations. Such an example could be the low percentage of free throws given to visiting teams in Oradea, where the lack of familiar visual cues and the hostile environment promoted by the home team's fans does not seem to have affected the results significantly. A reason for this low percentage could be the small number of free throws awarded to the visiting teams, when, as already pointed out above, the percentage of free throws in the League was generally consistent;
- The data from the statistical analysis can offer coaches a series of useful information to help them correct training patterns in future seasons.

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