

DIFFERENCES IN INDICATORS OF SITUATIONAL EFFICIENCY BETWEEN FOOTBALL TEAMS ON DIFFERENT LEVELS OF COMPETITION

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Abstract

The main goal of this study is to obtain information on the frequency of technical and tactical display, and on the basis of parameters evaluating offensive and defensive elements of football. For the needs of this study the following indicators of situational effectiveness were analyzed: GOALS – number of goals scored; SHOT ON TARGET – number of shots on goal; SHOT OFF TARGET – number of shots that miss the goal; CORNER KICKS – number of corner kicks and FOULS – number of fouls received. Five games on five different levels of competition were analyzed: thirty (30) games of BH Premier League from 2008/2009 season, twenty-five (25) games from Euro 2008, forty (40) games of European League from 2011/2012 season and twenty-nine (29) games from 2010 World Cup. From statistical analyses used for the needs of this research, Median test was applied. This test helps us to determine whether there are any differences between the entity groups, but we cannot know among which groups that difference is the most expressed. Therefore, the results obtained in this research were transformed on a higher level with the help of Bloom's procedure, and after that univariate analysis of variance was used. In order to reduce the probability of a possible error within univariate analysis of variance and because of higher number of mutual comparisons, and also because of groups with unequal number of entities, Scheffe's method was used.

Keywords: difference, efficiency, football, level

Introduction

On the basis of game analysis it is possible to obtain the overview of certain situations that occur during a football match. Such information offer a possibility to identify the advantages which can later be maintained or improved, and disadvantages, which suggests areas that need improvement. The use of tactical variants within the game is not standardized because it depends on large number of factors, primarily of technical, tactical as well as physical preparation of players. Researches that covered this problems have tried to show which technical and tactical displays distinguish winning from losing teams (Lago-Penas, Lago-Ballesteros, Dellal & Gomez, 2010; Rowlinson, & O'Donoghue, 2007; Grant, Williams & Reilly, 2009). We have to emphasize that the analysis of football is very complex. Complexity is reflected in large number of different situations in which players can find themselves (Jordi, Waitzman & Nunes-Amaral, 2010). Each situation requires the use of certain technical and tactical actions aimed at solving the given situation. With regard to the fact that the game of football is

in rapid development and improvement, we can say that information obtained through this research cannot be a long term solution for the clear picture of how to apply technical and tactical elements. By detecting certain technical and tactical actions and their frequencies, we can predict which technical and tactical elements contribute in improving the quality of football (Grant, et.al. 2009). For success in football, technical and tactical element shot on goal is very important, which was analyzed in this study as well. Efficiency of shooting on goal (goal scored) is one of the important factors distinguishing winning from losing teams. Goal scoring in football depends on technical and tactical domination of one team. Also, one of the factors that influence shooting efficiency is the quality of passing i.e. assisting (Armatas, et al.2009; Hewer & James, 2004; Njororai, 2004; James, Mellalieu & Holley 2002; Hughes & Franks 2005). One segment of football, which is the basis of this research, is shot on goal frequency with respect to distance from goal. By this way we want to obtain information whether teams have more frequent use of shooting on goal inside or outside the box with respect to the level of competition. Previous researches have helped obtain data which show that these parameters are also variable with respect to the level of competition (Yiannakos & Armatas 2006; Carling, Williams, & Reilly 2005; Janković, Leontijević, Jelušić, Pašić, & Mičović, 2011;). Some authors have also obtained data which show that winning teams had larger shooting frequency than losing teams within the same level of competition (Szwarc, 2004; Hughes & Snook 2006).

Goal scoring is determined by technical characteristics and use of player's individual tactics in completing a shot on goal. Group offensive tactics is important in creating a situation for getting in the position to shoot. Besides the above mentioned, when it comes to creating better situation for a shot on goal and goal scoring, the opponent's tactics is also important. If defensive players by using their own tactical actions give forwards enough time and space, than their attacks on goal will definitely be more successful (Hughes, & Churchill, 2005; Lago-Ballesteros, & Lago-Penas 2010; Engelbrecht, 2010). However, we have to emphasize here that accomplished frequency of shooting on goal depends of effective playing time during a match. Therefore, within this study we also took into consideration the frequency of standard situations (fouls and corner kicks) that occur in a football match. Each whistle stops the game and reduces effective playing time. These parameters directly influence and determine efficiency of a team which is reflected through shots on goal and goals scored (Engelbrecht, 2010; Carling, et.al. 2005; Luhtanen, Belinskij, Hayrinen & Vanttinen, 2001). The main goal of this research is to determine whether there are differences between national teams competing on international level of competition and teams playing in national leagues. In this research we also took into consideration parameters of situational efficiency for teams competing in Premier League of Bosnia and Herzegovina in 2008/2009 season, so that we can compare them with teams that played on a higher level of competition. For a long period of time, teams from our country have not been good enough to qualify for one of the stronger levels of competition. If we raise the level of quality for our national league, Bosnian national team will certainly have better quality. In other words, we want to use this study to obtain information on the frequency of using technical and tactical display which evaluates offensive and defensive elements of football. By this way, mainly from the aspect of Premier League in Bosnia and Herzegovina, we can see in which segments we are weaker, equal or stronger in comparison to stronger levels of competition.

Methods

Entity Sample

For the needs of this research, games from five different levels of competition were analyzed. We analyzed indicators of situational efficiency in thirty games played in Bosnian Premier League for 2008/2009 season. Within these thirty games we obtained sixty entities, and entities within this group are marked as group entities "Premijer 2008". We also analyzed twenty five games played on Euro 2008, held in Austria and Switzerland. This helped us obtain fifty entities within this group, which are marked as "Euro 2008" group entities. Within the Champions League we analyzed forty games played during 2011/2012 season. Through this analysis we obtained eighty entities within this group, which are marked as "Champions League" group. We analyzed forty games within the European League for 2011/2012 season and obtained eighty entities within this group. Entities from this group are marked as "European League" group entities. We included one more level of competition in the analysis, and that was 2010 World Cup held in South Africa. We took into consideration 29 games from the World Cup and by that way obtained 58 entities. Entities within this group are marked as "2010 World Cup" group entities.

Data Collection Methods

Data collection on situational efficiency of teams participating in Bosnian Premier League during the 2008/2009 season was performed by a measuring team that analyzed recorded games and registered the data in specially adapted forms. Before analyzing recorded games and data registering, the measurement team performed a trial measurement of certain technical and tactical elements of situational efficiency, i.e. variables chosen for this research. By this way, members of the measuring team were introduced to variables they need to monitor and register in the form. They were also explained criteria for all variables they were monitoring, so that possibility of making the same mistakes while analyzing a game could be reduced. The measurement team consisted of: five professors of Physical Education and Sport and five coaches from the football school "Eurofootball". After the trial measurement they were divided into two groups and each group analyzed all games. After the analysis was completed, results of both groups were summed up and compared, in order to get as objective indicators as possible. By comparing the obtained data, we learned that there were no deviations in analyzed variables between the two measurement groups, which tells us that they had similar criteria.

Data on situational efficiency of national teams that took part in Euro 2008 were obtained from official website www.euro2008.com which offered official stats from the European football championship. Data on situational efficiency for 2011/2012 Champions League and European League season were obtained from official website of UEFA www.uefa.com. Data on situational efficiency of national teams that took part in the World Cup 2010 were obtained from official FIFA website www.fifa.com.

Variable Samples

Variables within this research consist of technical and tactical elements used by both teams during a match. These statistical indicators are promoted by FIFA and UEFA for all competitions organized by them. For the needs of this research, we took five variables into the sample.

GOALS – number of goals scored,

SHOT ON TARGET – number of shots on goal;

SHOT OFF TARGET – number of shots that miss the goal;

CORNER KICKS – number of corner kicks;
FOULS – number of received fouls.

Statistical Procedures

For determining differences between the teams taken in the entity sample we used Median test. By using Median test we can see whether there are any differences between entity groups, but we cannot know between which groups is the difference most expressed. Because of this, data obtained through collecting process will be transformed by Bloom's procedure in order to transform them on a higher level. After that we will apply univariate analysis of variance by using Post Hoc comparison. In order to reduce probability of making mistakes because of higher number of mutual comparisons and because of groups with unequal number of entities, Scheffè method is used.

Results

On the basis of obtained results presented in table 1, we can see in which of the used variables arithmetic means differ among themselves. We can see that in variables number of scored goals and number of shots on target there are no statistically significant differences between entity groups. In variable number of shots off target, we identified statistically significant differences between "World Cup 2010" group and all other groups. In variable number of corner kicks, we identified no statistically significant differences between the groups. And finally, in variable number of committed fouls we identified statistically significant differences between "Premijer 2008" and all other groups. Also, in the same variables there is a difference between "Euro 2008" group and other groups except "World Cup 2010" group.

Table 1

		GOALS			SHOT ON TARGET		SHOT OFF TARGET		CORNER KICKS		FOULS	
		Median (1.00)			Median (5.00)		Median (6.00)		Median (4.50)		Median (13.00)	
		ANOVA			ANOVA		ANOVA		ANOVA		ANOVA	
		Scheffe test	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.
European League	Champions League	.0260886	.987	-.0464477	.901	.0115546	.999	.0407754	.938	-.0570092	.751	
	Premijer 2008	.0295073	.984	-.1118220	.266	-.0187802	.995	.0395849	.957	-.3593710	.000	
	Euro 2008	.0303170	.986	-.1027617	.411	-.0499542	.851	-.0110084	1.000	-.2039190	.001	
	World Cup 2010	.0693113	.729	-.0787755	.640	-.4388800	.000	-.0132021	.999	-.0975708	.325	
		Median (1.00)			Median (5.00)		Median (5.00)		Median (4.00)		Median (14.50)	
		ANOVA			ANOVA		ANOVA		ANOVA		ANOVA	
		Scheffe test	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.
Champions League	European League	-.0260886	.987	.0464477	.901	-.0115546	.999	-.0407754	.938	.0570092	.751	
	Premijer 2008	.0034186	1.000	-.0653743	.774	-.0303349	.967	-.0011905	1.000	-.3023619	.000	
	Euro 2008	.0042284	1.000	-.0563140	.879	-.0615088	.725	-.0517838	.910	-.1469099	.046	
	World Cup 2010	.0432227	.939	-.0323278	.980	-.4504346	.000	-.0539775	.883	-.0405616	.937	

		Median (1.00)			Median (6.00)		Median (6.00)		Median (4.00)		Median (21.50)	
		ANOVA			ANOVA		ANOVA		ANOVA		ANOVA	
		Scheffe test	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.
Premijer 2008	European League	-0.0295073	.984	.1118220	.266	.0187802	.995	-0.0395849	.957	.3593710	.000	
	Champions League	-0.0034186	1.000	.0653743	.774	.0303349	.967	.0011905	1.000	.3023619	.000	
	Euro 2008	.0008098	1.000	.0090604	1.000	-.0311739	.976	-.0505933	.932	.1554520	.048	
	World Cup 2010	.0398041	.964	.0330465	.983	-.4200997	.000	-.0527870	.912	.2618002	.000	
		Median (1.00)			Median (5.00)		Median (6.00)		Median (5.00)		Median (17.00)	
		ANOVA			ANOVA		ANOVA		ANOVA		ANOVA	
		Scheffe test	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.
Euro 2008	European League	-0.0303170	.986	.1027617	.411	.0499542	.851	.0110084	1.000	.2039190	.001	
	Champions League	-0.0042284	1.000	.0563140	.879	.0615088	.725	.0517838	.910	.1469099	.046	
	Premijer 2008	-.0008098	1.000	-.0090604	1.000	.0311739	.976	.0505933	.932	-.1554520	.048	
	World Cup 2010	.0389943	.972	.0239862	.996	-.3889258	.000	-.0021937	1.000	.1063482	.352	
		Median (1.00)			Median (6.00)		Median (15.00)		Median (5.00)		Median (15.00)	
		ANOVA			ANOVA		ANOVA		ANOVA		ANOVA	
		Scheffe test	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.	Mean dif.	Sig.
World Cup 2010	European League	-0.0693113	.729	.0787755	.640	.4388800	.000	.0132021	.999	.0975708	.325	
	Champions League	-.0432227	.939	.0323278	.980	.4504346	.000	.0539775	.883	.0405616	.937	
	Premijer 2008	-.0398041	.964	-.0330465	.983	.4200997	.000	.0527870	.912	-.2618002	.000	
	Euro 2008	-.0389943	.972	-.0239862	.996	.3889258	.000	.0021937	1.000	-.1063482	.352	
	Median Test			Median Test		Median Test		Median Test		Median Test		
	Sig.	.626		Sig.	.079	Sig.	.000	Sig.	.520	Sig.	.000	

Discussion

Obtained results clearly show statistically significant difference between “World Cup 2010” and all other groups in variable number of shots off target. We see that entities of this group had higher average of shots on target in comparison to other groups. It should be pointed out that the frequency of shots on target depends on technical qualities of players, individual tactics of players who are involved in the play, to the tactics of opponents (Armatas, et al.2009; Hewer & James, 2004; Njororai, 2004). For a team to create better position for a shot on goal, it needs to have players with high technical qualities in order to make a pass on time. Some authors came to a conclusion (Armatas, et al.2009; Lago-Penas, Lago-Ballesteros, & Rey, 2011) that championship contenting teams made higher number of shots on opponent’s goal inside the box from lower-ranked teams. This is influenced by technical qualities of play-

ers, team chemistry and ability to perform tactical variations and create better position for a shot on goal. All groups (teams/national teams) that were analyzed score one goal per match. In accordance with this fact we can say that group "World Cup 2010" is much less efficient in performing shots on goal from the other groups, with regard to completed frequency of shooting on goal. Based on the results of this research we can say that groups (teams / national teams) that have higher shooting efficiency also have better technical and tactical display. To be more accurate, selection policy of strikers for top quality teams is getting closer to selecting strikers that have higher average of efficiency when it comes to shooting on opponent's goal. This is proved by the fact that a large number of researches is concerned with the analysis of successful shots average, i.e. shots that found back of the net (Bell, Walker, McRobert, Ford & Williams, 2006; Hughes, & Petit, 2001). Conclusions in previous researches showed decrease in the number of attacks which ended in unsuccessful shot on goal (Jankovic, Leontijevic & Micovic, 2009). It should be pointed out that number of successful and unsuccessful shots on opponent's goal is also influenced by the distance from which the shots are taken (Engelbrecht, 2010). In accordance with this fact we can say that teams pay more and more attention on defending their own goal. Of course, frequency of shooting on goal depends on the opposing side's players as well, i.e. whether defenders by performing defensive tactics allow opposing strikers enough time and space for organizing their attack. In some previous researches authors determined that winning teams differ from losing teams in overall number of shots and number of shots on target (Lago-Penas, et al. 2010; Erdil, Bozkurt, & Isleyen 2010; Armatas, et al.2009). A shot on goal is a finishing element in the game of football and the aim of it is to score a goal. Shooting itself is also related to the intellect of players, therefore we can say that factors influencing a player or a team getting into position to shoot on goal as well as shooting on goal are various, starting from individual and group tactics all the way to the experience of players (Duch, Waitzman, & Nunes-Amaral, 2010). We think that quality of the final pass leading to a shot on goal is of great importance for creating a good opportunity for a shot on goal. Effective final pass is also influenced by time accordance between players who assist and players on the receiving end of a final pass. In relation to that it is important that player who makes the pass sees his teammate who is in position to shoot. Timely pass depends on technical qualities of players who are included in the play, but also on individual tactical abilities of players. Technical quality comes into full effect in a good assist. Tactical abilities of players in creating position for a shot on goal, come into effect when it comes to choosing a good position to shoot and in predicting movement of opponent's defenders which is important for a high quality final pass (Armadas, et al. 2009).

Statistically significant differences between the groups are present in variable number of fouls committed. As we can see from table 1, the highest number of fouls on a match was made by teams from "Premijer 2008" group, and then national teams from "Euro 2008" group. Therefore, we can conclude that effective playing time is less for these two entity groups in comparison to the other groups. An interesting fact is that there are no statistically significant differences between the groups in variables goals scored, number of corner kicks as well as in variable shot on target. We can say that "Premijer 2008" and "Euro 2008" groups for less effective playing time accomplished similar frequency in the above mentioned variables. Higher frequency of game stoppage can be related to tactical behavior of players within a team (cooperation), weaker player interaction after a steal as well as overall game strategy (Memmert, 2011; Memmert 2010; Bate, 1998). Higher frequency of received fouls per game can occur as a consequence of irrational tactical actions which would allow defenders to stop their opponents on time. Also, higher frequency of game stoppage can occur due to the lack of technical preparation as inadequate response to a given situation. Of course, for adequate

response to a given situation it is very important to have creativity of players which should be systematically developed through a long term process of player development (Hughes, & Franks, 2005; Hughes, & Churchill, 2005). Big number of fouls (game stoppage) doesn't have to be deficiency for teams. Efficient organization of after the whistle plays, especially in the opponent's side of the pitch is mainly influenced by tactical quality of players. It is necessary that in organizing attacks on goal players use their tactical actions for creating space, so that team / national team could organize a better and more efficient attack. Authors dealing with this issue (Fulurija, 210) have came up with results which point out that efficiency of after the whistle plays inside the box depends on the number of players participating in organizing those plays. In researches covering defensive elements in football (Lago-Penas, et al. 2011; Lago-Penas, et al. 2010) statistically significant differences between winning and losing teams in number of red and yellow cards were determined. These differences are to the advantage of losing teams which were defined as weaker teams. On the basis of obtained results by our research, we can say that it is evident that entities within "Premijer 2008" group are more inferior in terms of technical and tactical display in comparison to the other groups. Entities of "Euro 2008" group are also more inferior than entities of the groups with which statistically significant difference was determined. We have to point out that a certain percentage of fouls belongs to offensive players who commit fouls after they lose the ball near opponent's goal. This can be a part of team's strategy. That was how (Engelbrecht, 2010) the analysis of professional football teams showed that majority of fouls was committed by offensive players straight after they lost the ball. Game stoppage mostly resulted from offside and fouls. In accordance with obtained results, it is evident that if committed fouls are not part of the strategy, teams should work on tactical actions which would contribute to more efficient organization of after the whistle plays. All of this is related to technical and tactical quality of each player and their abilities to anticipate. It should be emphasized that reaction speed on the pitch is not determined just by time of reaction. This is exactly where importance of anticipation ability comes into full effect. Players with better anticipation abilities have quicker and more accurate reactions on both sides of the pitch (Abernethy, Wann, & Parks, 1998).

Conclusion

It is evident that for a long period of time teams from Premier League of Bosnia and Herzegovina haven't been able to qualify for a major football tournament. On the basis of this research we want to find information which will mainly be a positive influence on raising the quality of football in Bosnia and Herzegovina. We can see that teams from "Premijer 2008" group for less effective playing time created the same average of shots on goal. The same teams have the highest average of fouls committed per match. When we compare these parameters we can say that teams had an easy time creating positions for a shot on goal. This leads us to assumption that defensive players left opponent's offensive players enough time and space for organizing their plays. Therefore, these teams should pay more attention to group and individual tactics. Teams should constantly improve and modernize all technical and tactical elements (offense and defense) used in a match, with accent on as higher situational variance as possible. This would raise the quality of game from the tactical point of view. By this way players gain experience through a number of problematic situations that can occur during a match, and it also reduces possibility of surprises that opponent might throw at them. High frequency of game stoppages is obvious on this level of competition. As we pointed out, big number of game stoppages doesn't have to be a deficiency, but more attention should be paid on tactics of standard situations. Efficiency of completed after the whistle offensive plays doesn't depend only on tactical but also on technical quality. Therefore, raising the level

of players' technical preparation would lead to better conditions for raising the quality and rationalization of tactical variations used in a match. This is one of the conditions for raising overall quality of football on this level of competition. Obtained results lead us to think that it is necessary to direct practice process in football schools towards demands of top quality sports. This is possible by adapting practice, which would eventually produce players who can meet the standards of modern football. On each football match, number of possible situations is almost endless. Therefore, understanding the structure and logic of dealing with situations that occur in a match is very important. Understanding phases and sub-phases of a match becomes key and it is a precondition for continuous development of players and their overall quality as well as for team development.

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