# THE IMPORTANCE OF BALL THROW-IN IN FOOTBALL

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## Abstract

*Based on 88 matches of 2014/2015 Croatian first football league we determined the importance of ball throw-in in regard to final outcome of the match and the competition. Using Mann-Whitney test and Pearson coefficient, we collected data proving that throw-in as a situational efficacy indicator does not pose a significant difference to the winning team (p=0,42), nor does it influence the final placement in league system of competition (r=0,38). The results point to the need for a more quality restart and finding alternative ways to develop this part of the match.*

***Key words:*** *throw-in, notational analysis, situational efficacy, football.*

## Introduction

Matches and team or individual competitions (sports or martial arts) can be observed as complex dynamic systems where two opposing entities play off each other for the win (two teams, two pairs, or two individuals). Performance of these entities and their efficacy is determined by the level of skill, knowledge, technique, and abilities of players (competitors) and is directly connected to the victory. In football, the match is where the clash happens. Systemic observation of a football match shows many characteristic events which repeat themselves, are recognizable, and can be noted. These events and their outcomes show a degree of situational efficacy of the player and the team, and the level of their performance. Analysis of these events can determine why a certain team managed to get ahead – how the final outcome of the match came about. Throw-in is an event where the player throws in the ball with his arms, according to game rules, from the place the ball crossed the vertical borders of the field. Referee decides on the throw-in when the ball touched a defense player and crossed over the vertical border of the field via the ground or the air. There are two possible outcomes–throw-in keeps the ball (the ball stays with the player's team) and throw-in loses the ball (the ball goes to the opposing team because the throw-in wasn't in accordance with the rules or for some other reason) (Bašić et al., 2015). Analysis of throw-in parameters will show the possible relevance of the mentioned situational efficacy indicator in regard to final outcome of the match and the league system of the competition.

## Methods

*Material for analysis*
Research was conducted on 88 matches of Max TV first Croatian football league. For the needs of this study we analyzed a half-season consisting of 90 matches. Due to certain technical issues, one match was not filmed, and one ended in 3:0 score because the rules were not upheld.

*Sample*
Entities of this research are teams. First Croatian football league has 10 clubs.

*Variable sample*
Matches were described using notated performance indicators (variables) of the throw-in (Bašić et al., 2015).

*Data collection*
Matches were filmed to HDD/DVD in the form of video. Using a special computer tool called Courteye, matches were analyzed and prepared for data study. Five notators worked on analyzing the matches.

*Statistical analysis*
For determining the reliability of gathered data, we used the intra-observer variability for differences between data gathered by the same notator on two different occasions(Hughes et al., 2002,2003, 2004). For throw-ins we gathered a 92% reliability. For determining the differences between the winning and defeated teams, we used Mann-Whitney test and Pearson correlation coefficient for determining the relation between performance indicators and final outcome of the competition.

## Results

Based on matches analyzed we can see the relation between *throw-in* as a situational efficacy indicator and final placement in league system of competition, and we can determine whether there are statistically significant differences between winning and defeated teams.
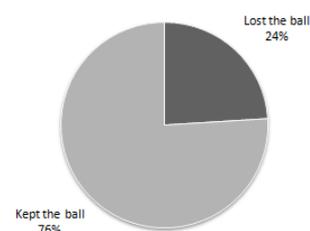


Figure 1. The percentage of throw-ins which led to losing the ball or keeping it in possession.

Table 1. Final placement of teams after a half-season (TEAM), total number of matches played (NM), number of wins (POB), draws (DRAW) and losses (LOS), as well as number of points (PTS), number of points per match (P/M) and a total number of throw-ins (N-THR)), arithmetic mean of throw-ins (AM-THR) and correlation coefficient of throw-ins and final placement (r).

| TEAM | NM | WIN | DRAW | LOS | PTS | P/M | N-THR | AM-ULR |
|---|---|---|---|---|---|---|---|---|
| Dinamo | 17 | 13 | 4 | 0 | 43 | 2,53 | **392** | **23,06** |
| Rijeka | 18 | 12 | 3 | 3 | 39 | 2,17 | **388** | **21,56** |
| Hajduk | 17 | 8 | 5 | 4 | 29 | 1,71 | **371** | **21,82** |
| Lokomotiva | 18 | 7 | 4 | 7 | 25 | 1,39 | **280** | **15,56** |
| Zagreb | 18 | 6 | 6 | 6 | 24 | 1,33 | **362** | **20,11** |
| Slaven Belupo | 17 | 5 | 5 | 7 | 20 | 1,18 | **353** | **20,76** |
| Split | 17 | 3 | 8 | 6 | 17 | 1,00 | **398** | **23,41** |
| Istra 1961 | 18 | 3 | 7 | 8 | 16 | 0,89 | **348** | **19,33** |
| Osijek | 18 | 4 | 3 | 11 | 15 | 0,83 | **361** | **20,06** |
| Zadar | 18 | 3 | 3 | 12 | 12 | 0,67 | **350** | **19,44** |
| **r=0,38** | | | | | | | | |

Table 2. Arithmetic mean (AM) and standard deviation (SD) of throw-in of the winning team (WIN) and the losing team (LOS) and z-value (z) for determining differences and errors (p).

| | AM | SD | z | p |
|---|---|---|---|---|
| WIN | **20,40** | 6,44 | 0,79 | **0,42** |
| LOS | **19,67** | 7,50 | | |

### Discussion and conclusion

Based on results (Table 1 and 2) of a relatively low corelation coefficient (r=0,38) and the difference between arithmetic mean of winning (AS=20,40) and defeated teams (AS=19,67), which is not statistically significant (p=0,42), we can conclude that *throw-in*, as a situational efficacy indicator, does not pose a difference between winning and defeated teams and is not related to final placement in league system of competition.

Throw-ins are defined by football match rules. From all restarts, this one is the most frequent (AS=20,47), proven by Siegle and Lames (2012) which shows that throw-ins occur on average 39,69 times during a match in German football league.

A great game dynamic and different offensive and defensive actions lead to a great number of throw-ins. The significance of this parameter is not visible through league system of competition but it can be significant in individual cases as a surprise factor for the opponent – for creating an opportunity to score a goal.

Of course, first the players need to be good in simple and complex combinations in order for throw-in to be performed in the best possible way, especially if the game is restarting in the middle or end sub-phase of offense, closer to opponent players, and players in the match are specialized for effective restart.

In Image 1 we can see the throw-in structure based on the outcome. In 76% of throw-ins the ball is kept in possession, while in only 24% of throw-ins the team loses the ball. Because of hand precision, throw-ins can be very precise, but not in a great distance like when the ball is passed via foot. But there are specialized players inside every team who know how to throw-in the ball when greater distance is involved - this can be a valuable surprise factor for the opponent defense, especially if the match was stopped in their half of the field, closer to the goal door, but it can be surprising from great distance as well because the offside rule does not apply during throw-ins.

Even though during the throw-in that team has one less player, ball is usually kept in possession. Defense players are positioned so that the opponent cannot go forward, but if the throw-in is done backwards from the position of throwing, most likely the team will keep possession of the ball – which is the aspiration for most teams. That is why throw-ins are often chosen.

As mentioned earlier, if the throw-in occurs closer to the opponent goal, the aspiration is to use simple and complex combinations and a minimal ball contact to get in front of opponent goal. This leads to a greater possibility of ball possession for the outnumbering team.

In training process they need to work on those action combinations to keep the ball after the throw-in considering different sup-phases of offense. Based on the results for the *throw-in* variable we can conclude that it is not significantly related to final placement in league system of competition and it does not pose a difference between winning and defeated team.

Even though it is a very frequent game event, it is not significantly relevant as a situational efficacy indicator in a circuit system of competition.

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## VAŽNOST UBACIVANJA LOPTE RUKOM U NOGOMETU

**Sažetak**

*Na temelju 88 utakmica prve Hrvatske nogometne lige sezona 2014/2015 utvrđivana je važnost ubacivanja lopte u igru rukom s obzirom na konačan ishod utakmice i natjecanja. Primjenom Mann-Whitneyjevog testa i Pearsonovog koeficijenta korelacije dobiveni su podaci da ubacivanje lopte u igru rukom kao situacijski pokazatelj efikasnosti statistički značajno ne razlikuje pobjedničke od poraženih ekipa (p=0,42), te da nije s kranjim plasmanom u ligaškom sustavu natjecanja (r=0,38). Dobiveni rezultati ukazuju na potrebu kvalitetnijeg izvođenja prekidai gre, odnosno pronalaženju alternativnih način provođenja ovog dijela igre.*

***Ključne riječi:*** *ubacivanje lopte rukom, notacijska analiza, situacijska efikasnost, nogomet.*

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