Závislost tržní hodnoty týmu na výsledcích dosažených na Mistrovství světa ve fotbalu 2014 v Brazílii

Dependency of market value of a team on the result achieved at the FIFA World Cup 2014 in Brazil

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Abstrakt

Tento příspěvek obsahuje srovnání celkové tržní hodnoty fotbalových týmů, které se zúčastnily mistrovství světa v roce 2014 v Brazílii. Tržní hodnota týmu se rovná celkové tržní hodnotě všech hráčů v týmu bez ohledu na to, zda se zúčastnili hry nebo ne. Španělský tým měl nejvyšší tržní hodnotu a honduraský tým nejnižší.

Celková tržní hodnota týmu se pak vztahuje k jeho úspěchu (nebo neúspěchu) na mistrovství světa představovanému celkovým počtem získaných bodů. Výsledky regresní a korelační analýzy ukazují medián vlivu tržní hodnoty týmu na výsledky dosažené na mistrovství světa 2014. Hodnota korelačního koeficientu je 0,53.

Dalším cílem bylo určit efektivnost národních fotbalových mužstev na MS 2014 jako poměr kvality týmu (představované celkovou tržní hodnotou týmu) a celkového počtu bodů dosažených v turnaji. Z tohoto hlediska byl nejefektivnější kostarický tým, zatímco anglické mužstvo bylo nejméně efektivní.

Abstract

This paper contains a comparison of total market values of football teams that attended the FIFA World Cup 2014 in Brazil. The market value of a team is equal to the total market values of all the players in the team, regardless of whether they did or did not attend the game. The Spanish team had the highest market value and the Honduran team had the lowest.

The total market value of the teams is then related to their success (or lack of success) at the World Cup, represented by the total number of points gained. The results of regression and correlation analysis show the medium effect of the market value of a team on the result achieved at the World Cup 2014. The correlation coefficient value is 0.53.

Another goal was to determine the effectiveness of national football teams at WC 2014 as a ratio of team quality (represented by the total market value of the team) and the total number of points achieved at the tournament. From this point of view the most effective team was the Costa Rican team, while the English team was the least effective.

Klíčová slova: *fotbal, mistrovství světa, tržní hodnota, efektivita.*

Keywords: *football, World Cup, market value, effectiveness.*

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INTRODUCTION

There are several factors influencing the chance of winning a match or the whole contest (league or tournament). Disregarding the factor of luck, the most important factor is certainly the quality of the team's game; this is determined by the quality of players who comprise the team. A football team consists of eleven players – however these only very rarely play for the whole game, so it's also necessary to take into consideration the quality of possible backups.

Many authors (Carmichael, Forrest & Simmons, 1999; Feess & Muehlheusser, 2003; Amir & Livne, 2005; Forker, 2005; Tervio, 2006; Frick, 2007) claim that the factor representing the players' quality is primarily their market value. There are a number of indicators for a player's value. Among the most important are international experience, the price of their last transfer fee and their performance. Performance is measured by the number of goals scored, number of shots, number of successful and unsuccessful passes, number of kilometres run in one game, number of feints, number of ball losses and possessions etc. Naturally, different parameters are relevant for goalkeepers than for defenders, midfielders or forwards. Another important indicator is also the player's age, especially with regard to his predicted career length (Hoffmann, Chew Ging & Ramasamy, 2002). Older players have mostly fewer values than younger players, but benefits of the older players to the teams can be higher than the benefits of the younger players. It could be so because the older players don't have so long career before them than the young players have, so this decrease their market values. A player's value can be increased owing to the success of the team (such as advancement into a higher level competition or participation of the team in the Champions League). Serious or repeated injuries can cause the value to decrease (Tunaru, Clark & Viney, 2005). A factor that is often discussed, but nevertheless valid, is the player's country of origin. According to some authors, players from the Netherlands and Brazil are preferred. Having a Brazilian in the team seems to be analogous to having a chef from France or a monk from Tibet. An average Brazilian player is allegedly more valuable on the market than an excellent player from, say, Mexico (Kuper, Szymanski, 2012). In terms of market value, African players in particular are often undervalued, with football clubs buying them "with discount" (Poli, 2006).

METHODS

The study focused on the national teams participating at the World Cup 2014 in Brazil. First, market value of each team was evaluated. Market value was determined as the total market value of all the players in the team, regardless of whether they have or have not played in the game. Each team consisted of 23 players in total – 3 goalkeepers, 8 defenders, 8 midfielders, and 4 forwards. The market value of individual players is set by licensed FIFA agencies and scouting agencies. Parameters such as age, international experience, last transfer fees, and performance are taken into account, with the source for these being statistics published by Transfermarkt GmbH & Co KG just before the beginning of the World Cup. If we accept the premise that market value is the main indicator of a player's quality, then the total market value of a national team shows the quality of the whole team.

The quality of a team is a decisive factor when it comes to its success or failure in a competition or a tournament. Therefore, total market value of the teams participating at World Cup 2014 indirectly showed the teams' chances for success at this global tournament. In this sense the Spanish team should have had the greatest chances of winning the title, because its players had the greatest market value before the tournament, specifically EUR 622 mill. (EUR 27.04 mill. per player). The lowest chance of success in regard to total market value fell to the Honduran team with market value of EUR 21.15 mill. (EUR 0.92 mill. per player).

To support this claim the correlation coefficient, a mutual relation between total market value of the national teams and their result at the World Cup 2014, has been calculated. The value of the correlation coefficient will determine the probability that the observed quantities are depend-

ent on each other, but it will not be possible to confirm the fact that absolute market value of a national team is a *cause* and the number of points achieved is its *effect.* The correlation itself does not allow us to decide that.

The last entry needed for calculation of the correlation coefficient and subsequent *effectiveness*, as the ratio of a team's quality and the total result achieved at the tournament, was the number of points gained by each national team at the World Cup 2014. The gained points are the main indicator of individual teams' success at the World Cup. In the group stage the teams gained 3 points for a victory, 1 point for a tie and 0 points for a defeat, in accordance with the rules of football. In the knockout stage the teams were awarded 3 points for advancement and 0 points for defeat, for the needs of our study, regardless of the game's result after the end of the basic playtime.

Apart from the correlation of total market value and the total number of points gained, effectiveness of national teams has also been calculated as a ratio of a team's quality and the total result achieved at the tournament. Effectiveness of a national team was calculated as a ratio of the sum of the market values of all the players in a national team and the number of points gained at the tournament. Simply put, the result shows how much Euro "was necessary" for gaining one point at the World Cup 2014. This means that the lower the resulting value, the higher the effectiveness achieved by the given team at the World Cup.

$$E = \frac{\sum PMV}{P}$$

E - effectiveness of a national team
PMV - player market value
P - number of points

RESULTS

The researched hypothesis of co-dependency between the market value of a national team and the result it achieved, represented by number of points, was verified by two-dimensional linear regression analysis. Results are shown in diagram 1.

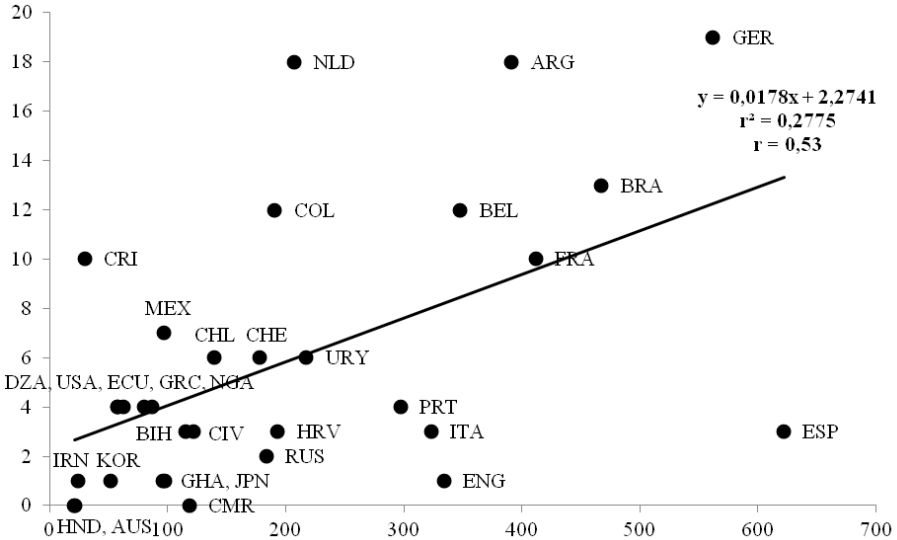

Diagram 1: Regression and correlation analysis

Pearson correlation coefficient reached 0.53, which means a medium strong relation between a national team's market value and the number of points achieved, using the method of least squares, a regression line equation y = 0.0178x + 2.2741. The interpretation of the equation might be that each 1 million Euro gained in a national team's market value means a gain of another 0.0178 points more. In other words, for every 56.18 million Euro, the team would gain one more point on the final sum of points. However, this conclusion must be treated with caution, as the Pearson's correlation coefficient did not reach its highest possible value, 1, and the determination coefficient is 0.2775, so the regression line above only explains 27.75 % of variance of the points gained. 16 teams in total gained a higher number of points than the regression line shows, which is exactly half of the participating teams. The remaining 16 national teams gained a lower number of points. The team closest to the predicted number of points gained is Uruguay, which was predicted to reach the value of y = 6.15, which is almost equal to the 6 points that it gained in reality. The teams that lie the farthest from the regression line are the very successful teams of the Netherlands and also the very unsuccessful Spanish team which won the last tournament in the Republic of South Africa. The regression analysis is naturally somewhat distorted by the fact that teams can only gain whole points, not a number of points with decimal numbers.

The results support the thesis that teams with a higher market value really do have higher chances of achieving success in the tournament. Although the title was not gained by the Spanish team, which left the group stage after an unconvincing performance, the winning team of Germany was in 2nd place in the order of market values. The team with the lowest market value and therefore also the lowest chance of success indeed ended up last. The last place, 32nd in total, is not officially announced, but with regards to its 3 defeats and the worst score of 8 : 1 the team of Honduras can be placed last.

Another goal of this study was to determine the effectiveness of national football teams at the World Cup 2014 as a ratio of a sum of market values of all the players in national teams and their final result achieved at the tournament. In this measurement the Costa Rican team turned out to be the best. The team's market value was less than average when compared to other teams (29.63), but the Costa Rican team still managed to gain two victories and one tie in Group D and advance to the round of 16 from the first place, where in addition the Costa Rican team succeeded against the team of Greece. It was not eliminated until the quarter-finals, following a penalty shoot-out with the Dutch team, the second most effective team of the World Cup. One point gained by Costa Rica was represented by EUR 2.96 million, which was no doubt the least from all the national teams, and therefore we evaluate it as the most effective in our measurement.

It is not easy to determine the least effective team of the tournament. Three teams did not gain any points at the World Cup (Cameroon, Australia and Honduras). While the Australian and Honduran teams indeed had the lowest market values (EUR 21.35 mill. and EUR 21.15 mill.) and therefore they had the lowest chances of success, the Cameroonian team's market value was relatively high (18th place – 118.45 mill.). From this point of view it may be seen as the least effective team in our measurement.

However, if effectiveness of national teams is evaluated as ratio of team's market values and the number of points gained, it must be kept in mind that it is not possible to divide by zero. With the number of points gained being "0", it was not possible to measure the effectiveness of the three teams above.

Out of the teams whose effectiveness could be arithmetically determined, the national team of England had the worst result, having gained only 1 point at the tournament. Its total market value of EUR 334 mill. therefore also represents this team's effectiveness coefficient.

Complete results of national team's effectiveness as a ratio of team's quality and the total result it achieved at the tournament are shown in table 1.

Table 1: Effectiveness as a ratio of team's quality and the total result it achieved at the tournament

team	total market value of a team (EUR mill.)	total number of points gained	*effectiveness* (EUR mill. per one point)
Costa Rica	29.63	10	**2.96**
Netherlands	207.50	18	**11.53**
Mexico	96.55	7	**13.79**
Algeria	57.20	4	**14.30**
USA	57.80	4	**14.45**
Ecuador	62.85	4	**15.71**
Columbia	190.20	12	**15.85**
Greece	79.90	4	**19.98**
Nigeria	86.85	4	**21.71**
Argentina	391.50	18	**21.75**
Chile	139.30	6	**23.22**
Iran	24.10	1	**24.10**
Belgium	348.00	12	**29.00**
Germany	562.00	19	**29.58**
Switzerland	178.00	6	**29.67**
Brazil	467.50	13	**35.96**
Uruguay	217.63	6	**36.27**
Bosnia and Herzegovina	114.95	3	**38.32**
Ivory Coast	121.70	3	**40.57**
France	411.75	10	**41.12**
South Korea	51.93	1	**51.93**
Croatia	193.25	3	**64.42**
Portugal	297.25	4	**74.31**
Russia	183.80	2	**91.90**
Ghana	96.35	1	**96.35**
Japan	98.00	1	**98.00**
Italy	323.00	3	**107.67**
Spain	622.00	3	**207.33**
England	334.00	1	**334.00**
Cameroon	118.45	0	**-**
Australia	21.35	0	**-**
Honduras	21.15	0	**-**

DISCUSSION

The market values of players and the methodology of their calculation are a much discussed topic among both the public and experts. The goal of this study was not to become part of that polemic. Market values were regarded as fact and they were seen only as an input value for other mathematical calculations.

As we have stated above, the correlation coefficient representing the relation between total market value of national teams and the number of points gained at World Cup 2014 was calculated to be **0.53**. This means medium positive relation. The result is not surprising. Certain dependency of team's quality (represented in cash) on the achieved result is also proved by other research (Kesenne, 2000; Zimbalist, 2002; Michie & Oughton, 2004; Goossens, 2005; Groot, 2007; Lee,

2010, Peeters & Szymanski; 2014). However, that is mostly oriented on national leagues where the factor of luck is less important, since during one season every team plays in a large number of games and though some may be influenced by a happy or unhappy turn of events, the quality of a team usually shows in the total sum of all matches.

Apart from the dependency of the market value of a national team and the result at the FIFA World Cup our study also evaluated effectiveness of national teams as ratio of a team's quality and the total result achieved at the tournament. According to this evaluation *the most effective* team was the Costa Rican team and *the least effective* was the national team of England.

The result of the Spanish team can no doubt be seen as a great failure, since it only gained three points for winning against Australia in Group B. One point therefore represented EUR 207.33 mill., which is the second highest number after the English team. It should however be noted that Spain would not have been evaluated as highly effective even if it had achieved maximum success. Had it, hypothetically, won all three matches in the Group B and all four in play-off, Spain would have gained 21 points in total. In regard to its total market value (EUR 622 mill.), its success coefficient would reach a relatively high number of EUR 29.62 mill. After all, the winning team of Germany reached only the 14th position in the effectiveness evaluation.

This reflection clearly shows that in this kind of measurement teams with very high overall market values cannot be evaluated as the most effective ones, despite the maximum success in the tournament that can be achieved. The effectiveness coefficient gained by the Costa Rican team (2.96) could not under any circumstances be gained by a total of 25 from the 32 teams participating at the World Cup 2014.

The enormous sports success of this Central American country is proved also by comparing the results of this study with the results of national teams' effectiveness measurement performed at the UEFA European Championship in Poland and Ukraine in 2012 (Šíma, Ruda, Omcirk, 2013). According to the same methodology, the most effective team of the championship, the Czech Republic with its total market value of EUR 105 mill. and a gain of six points, reached a coefficient of EUR 17.5 mill, which is almost six times more than the coefficient of Costa Rica at the World Cup 2014.

CONCLUSION

The result clearly shows that the market value of a team had a certain effect on the result achieved by that team at the World Cup 2014. The relation between a team's market value and the total number of points it achieved was medium positive. The correlation coefficient reached 0.53. Hypothetically, if the two teams farthest from the regression line were removed from the study, the correlation coefficient would be 0.7, which would mean strong dependency.

The final generalization, which does not apply universally, that "the higher the market value of a team, the more points gained" can be interpreted that evaluation of football players by specially licensed agencies has its reasons. Market values of players probably very significantly reflect their abilities. Confirmation of this hypothesis would however require much more extensive analysis.

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