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Correlation between profitability and transfer activity in European football

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Abstract

The transfer market of European football can be classified as a system. In this system, the effectiveness of participant teams can depend on the activity in players' transfers. This article assesses the utility of network analysis in analysing connections between the mentioned concepts. The hypothesis is that there is causality between a club's activity in the transfer market and its profit from transfers. This research is based on empirical transfer data of major soccer teams, which have had a significant role in the last 12 years in Europe. It is assumed that the most active clubs in the transfer system have more financial power in the transfer market, while teams which are not active in transfers have less profit from transfers. In the network analysis, the teams can be defined as a set of nodes and connected by edges (interactions). The thickness of the edges and the size of the nodes depend on the volume of transfers among clubs. The number of interactions and the amount of the transfer price can measure this volume also. Considering the results of network indices, the relationships between the two phenomena were reviewed. In order to explore these relationships, the correlations among all of the relevant variables in the transfer market were also measured.

Introduction

Thanks to the decades long of continuous growth of sport and to fact that it has practically developed into an autonomous industry the economic researches related to sport are increasingly appreciated. Of course, the most important issues are the resources (which is also the highest value), the human capital that is the studies of the athlete himself from various aspects. One of the most important key drivers of sport is competition, which in the professional sphere also means economic success beyond the success of the sport. The emphasis, of course, is on sport

successes (national and international), because these successes entail the result of economic growth (Dobson, Gerrard, 1999). In order to maintain success, the clubs make a great effort to develop the best players, aiming not only to strengthen their own team but also to weaken their opponents. Given the fact that in the world of professional sports usually there are economic companies behind the associations, it is presumed that retaining, selling or buying of a significant athlete is the most important business issue (Poli et al., 2015).

The processes that have taken place in the European football in the last two decades provide the topicality of this issue. Thanks to the radical changes in regulation (e.g. Bosman rule), the international mobility in the European football job market has drastically increased. The number of foreign players in Europe (one third of all players) in recent years far exceeds the overall (general) labour market, where foreigners account for only a few percentages of the workforce (Szymanski, 2014).

The changes in the labour market transfer of the past 12 seasons throughout the top 50 teams in European football were examined in this research.

According to our hypothesis, sport firms, which invest heavily on human resources transactions (i.e. active on the transfer market), have better economic results, because one of the biggest opportunities for club management is the actual "management" with athletes.

Many researchers have recognized the applicability of network analysis in this topic (Kapanova, 2012; Lee et al., 2015), which was primarily a demonstration of movements in the transfer industry. A more in-depth research on the relations between the network analysis and transfers was carried out by Liu et al. (2016). In our analysis the movements of the players' market were examined from an economic point of view. In addition to descriptive statistics some indices of network analysis were also used.

Data and results

In the course of our survey, the most important 50 teams (English, French, German, Italian, Spanish, Turkish and Russian) chosen by us who participated in the European Championships of the last 12 seasons were analysed (Data are from transfermarkt.com). In these tournaments there were 3850 real transactions involving a player purchase between the seasons of 2005/06 and 2016/17. Therefore, the transfers that were made with a loan contract or without any compensation are not in this survey. During the last 12 seasons, the top 50 teams have bought and sold players for more than € 23.5 billion.

All transactions on the transfer market were characterized by eight quantitative variables, and the existing relationships between them were examined by a correlation analysis in order to substantiate our initial hypothesis according to which transfer activity results in economic benefits.

In addition, the main indicators used in the network analysis were also utilized. Table 1 and Table 2 contain the descriptive statistics of eight variables measured by all of the 50 teams and the correlations between.

Considering the transactions made during the last 12 seasons in the Top50 teams, correlation relationships were investigated among the following variables:

- out-degree: an indicator (individual level) used in network analysis, which represents the number of players sold by each team
- rev_trans (revenue of transfers): revenue from the sales of the players
- in-degree: also known as a network analysis indicator showing the number of players purchased by each club

- cost_trans (cost of transfers): the amount spent by the teams for buying players
- profit_trans (profit of transfers): the benefits from the sales and purchases of the players
- value_trans (value of transfers): the amount spent on playing players for each team
- transactions: the total number of transactions carried out by the certain club
- out-in: the difference between the number of athletes sold and bought

Table 1 Descriptive statistics of eight variables

Var./Desc. stats	Mean	Std. deviation	Minimum	Maximum
rev_trans	265,590,460	153,174,865	1,280,000	571,550,000
cost_trans	390,401,960	300,254,817	135,000	1,338,745,000
profit_trans	-124,811,500	218,090,246	-1,036,270	201,461,000
value_trans	655,992,420	423,872,191	1,415,000	1,641,220,000
transactions	93	30	8	169
out-degree	41	15	5	83
in-degree	52	17	3	91
out-in	-11	12	-36	12

Source: Authors' creation, Transfermarkt, 2018.

Table 2 Correlation Matrix (significant, strong relations marked with italics)

	out-degree	rev_trans	in-degree	cost_trans	profit_trans	value_trans	trans-action	out-in
out-degree	1.000							
rev_trans	*0.718*	1.000						
in-degree	*0.724*	0.561	1.000					
cost_trans	0.433	*0.718*	0.399	1.000				
profit_trans	-0.092	-0.286	-0.155	*-0.872*	1.000			
value_trans	0.567	*0.870*	0.485	*0.968*	*-0.721*	1.000		
transactions	*0.917*	0.682	*0.939*	0.447	-0.136	0.563	1.000	
out-in	0.191	0.079	-0.538	-0.038	0.109	0.001	-0.217	1.000

Source: Authors' creation, Transfermarkt, 2018.

There is "strong" correlation if the absolute value of correlational coefficient is more than 0.7. From the correlational coefficients obtained, that in contrast to our expectations, there is only a weak or negative relationship (-0.136) between the transaction and the profit (profit trans). In practice, this means that those clubs that are active in the transfer market typically closed an unprofitable transfer balance in the last 12 seasons.

Even more interesting is the strong but opposite correlation (-0.721) between the total value of transfers (value_trans) and their profit (profit_trans), which can be interpreted as that clubs selling high-value players typically have a loss on the transfer market. So, it means that those clubs (starclubs) that can purchase expensive players can undertake the loss that arose from the selling because of the sport successes and advertising. On the other hand, smaller clubs have the potential to buy primarily talented and even cheaper athletes, who are later ready to be sold as better players to stardom associations with significant benefits.

This is illustrated in Table 3, where the profit rankings from the transfers can be seen.

The results obtained reflect the correlation calculated in Table 2, namely the strong negative link between the value of the transfers and the profit they derive from. Therefore, it is easy to see that profitability is typically achieved by smaller

teams, whereas the star clubs at the end of the ranking are clearly unprofitable. Of course, browsing over the transfers of the past few years there are examples when a star team could generate huge profit on some sales and purchases. For example, the Manchester United, which bought Cristiano Ronaldo from FC Porto for € 19 million in 2003 and then, 6 years later sold him for 94 million euros for the Real Madrid team.

Table 3 The first and the last 10 clubs from the rankings of the profit made from transactions

Rank	Team	Profit_trans	Rank	Team	Profit_trans
1	Udinese	201,461,000	41	AFC Sunderland	-220,895,000
2	FC Sevilla	122,900,000	42	FC Liverpool	-274,385,000
3	Espanol	67,300,000	43	FC Bayern Munich	-321,650,000
4	OGC Nizza	51,950,000	44	Juventus	-340,390,000
5	VFB Stuttgart	50,280,000	45	FC Chelsea	-379,080,000
6	Werder Bremen	43,440,000	46	FC Barcelona	-525,180,000
7	FC Villarreal	43,335,000	47	Real Madrid	-525,900,000
8	FC Getafe	33,230,000	48	Manchester United	-544,760,000
9	FC Valencia	26,080,000	49	FC PSG	-580,500,000
10	CSKA Moscow	25,325,000	50	Manchester City	-1,036,270,000

Source: Authors' creation, Transfermarkt, 2018.

There are 1156 cases out of a total of 3850 transactions in the Transfers Network, where the player has switched a club more than once, so in these cases the financial results of the transfers can be individually examined. Just as an example: Fernando Torres in the 2007/08 season transferred from the Atletico Madrid to the Top50 team FC Liverpool, the transfer amount was € 38 million later he transferred to the FC Chelsea in the 2010/11 season and the purchase price was € 58.5 million. As a result, FC Liverpool earned a profit of € 20.5 million just on the one-player buy-in.

The balance of the 1156 transfers included in the analysis can be illustrated in the following Figure 1 (the above-mentioned Liverpool buy and sell balance is represented in the balance of the € 1214.2 at the arrow on the left side):
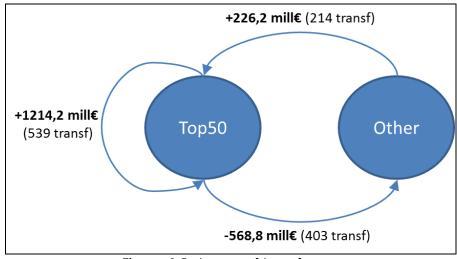

Figure 1 Balance of transfers

Source: Authors' creation.

Figure 1 fully supports our earlier findings: the player transfers have a specific evolution and its steps are the followings:

1. the small teams sell the players to the Top50 clubs with positive economic result (with profit);
2. as long as the players represent a high level of value and there is demand for them from the leadership of another Top50 team, the seller team can also benefit from the transfer;
3. finally, a presumably outdated or injured player moves from the Top50 to a smaller team, but this "big team" already realizes a loss

Our survey is clearly not complete, as in addition to the transactions involving the 50 flagship teams, there is no information about our further trading, but the results are so clear that our initial hypothesis can be considered, as justified.

In the second half of our research the labour market were analysed by the main indicators known from network analysis. One of the main indicator that describes the network operators shows the number of relations connecting the individual to the others. This indicator is called the degree of individual network points (degree). In the case of directional graphs the in-degree and the out-degree of the examined point differentiate the relationships coming to and starting from the given actor (Sebestyén, 2011).

Using the degree indicators, i.e. the players bought and sold by each team, the rank of the 50 clubs were set up. Table 4 contains the top10 individual scores.

Table 4 Number of players bought by the teams

Rank	Team	In-degree
1	Udinese	91
2	Juventus	86
3	AS Roma	85
4	Napoli	76
5	Fiorentina	75
6	Manchester City	72
7	AFC Sunderland	72
8	Inter	70
9	Torino	69
10	Galatasaray	65

Source: Authors' creation, Transfermarkt, 2018.

It is clear from Table 4 that Italian clubs dominate the ranking of most, while no Spanish and German teams can be found at all (it might be surprising that Udinese with its moderate budget has bought more players than the star clubs). It is important in the aspect of our in-degree examination because in a network at the level of an individual player level this ranking is the same as the simplest as the simplest prestige -indicator, so in our case the Italian teams are the most attractive to the players. This statement is not affected by the fact that there would be a significant change in the rank if the weighted connections are examined. Instead of the dominance of the Italian clubs the star clubs would be far ahead of the ranking (Table 5).

Table 5 The purchase amount spent on players by each team

Rank	Team	Cost_fee
1	Manchester City	1,338,745,000
2	Real Madrid	1,041,100,000
3	Manchester United	937,380,000
4	FC Chelsea	931,500,000
5	FC Barcelona	884,670,000
6	FC Liverpool	845,935,000
7	Juventus	809,830,000
8	FC PSG	752,550,000
9	Tottenham Hots.	707,100,000
10	Inter	654,525,000

Source: Authors' creation, Transfermarkt, 2018.

Taking into account the number of players sold, the dominant market activity of the Italians remains, so the most powerful teams - similar to the rank of purchases - are not in the lead (see Table 6)

Table 6 Number of players sold by teams

Rank	Team	Out-degree
1	Juventus	83
2	AS Roma	71
3	Tottenham Hots.	69
4	Inter	63
5	Udinese	62
6	VFB Stuttgart	59
7	FC Liverpool	58
8	AC Milan	52
9	Sevilla FC	52
10	Fiorentina	50

Source: Authors' creation, Transfermarkt, 2018.

In addition to the prestige index, the betweenness-centrality can be also defined that shows the central actors of the network, and it is based on the fact that those actors have power who are among others (so they can control the resources flowing through the network) (Galambosné Tiszberger, 2015). This indicator shows the primary mediators (brokers) in the European transfer market (Table 7).

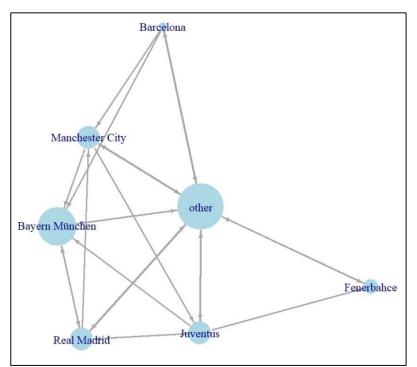Table 7 Ranking based on the mediation activity of the teams

Rank	Team	Betw_centr
1	Manchester City	62.93
2	FC Chelsea	57.98
3	FC Liverpool	56.15
4	FC Sevilla	53.04
5	Real Madrid	48.71
6	Juventus	47.65
7	Tottenham Hots.	42.42
8	FC Bayern Munich	42.28
9	Athletico Madrid	38.34
10	Manchester United	38.32

Source: Authors' creation, Transfermarkt, 2018.

It can be seen from the Table 7 that - unlike the results from earlier - the star associations are more likely to have the role of the mediator in the transfer market.

The leading rank of the Manchester City is not surprising after that it is one of the most prestigious (in-degree) team in Europe. So, the players are more likely to transfer to them thanks for probably the fact that since 2008 the owner is one of the world's richest Arabic sheikh who has invested enormous amount of money into the player stock. The team's prestige is further enhanced by the fact that he managed to sign up Guardiola two years ago, who is one of the best coaches in the world ago.

Looking at the rankings, it is conspicuous that half of the teams from the list of 10 are English, which clearly indicates that they are controlling the European football market. The reason for this is financial, because the Premier League is the most valuable league in Europe, which means that the huge amount of money coming from television broadcasts, marketing and merchandising activities will be greatly benefited by the teams. The decisive role of the English associations in the transfer market is due to this revenue and the large number of foreign owners.

Just for an illustration, Figure 2 shows a network of 6 randomly selected teams.

Figure 2 Illustrative network*
*Note: R software was used.
Source: Authors' creation.

It is clear, that the teams in the network are not of the same importance (the size of nodes shows the value of theirs in-degree). The in-degree of Barcelona is the least one, what means that they have sold and bought less players then the other clubs and they did not trade with all the teams in this network. It can be surprise, that Bayern Munich has the biggest prestige what means that they bought players from all clubs except of Fenerbahce.

Conclusion

As a result of the analysis, it can be shown that the economic profit from the player transfer does not depend on the amount of players sold (or the number of players bought). From this, it can be concluded that the transfer's profitability of the teams in

the transfer market is clearly determined by a lucky or knowledgeable purchase, which is realized as a profit for later after the transfer of the player. It can also be established that the big businesses in the transfer market are only the result of the movement for the players among the 50 top teams when a star player is still selling at the zenith of his career. Otherwise, even the sale of the (previously) most valuable players cannot be realized with significant profit, presumably because in these cases the high selling price was preceded by a relatively high purchase price. On the other hand, teams with more modest budgets are aiming for players who are likely to gain a lot of profit later.

Looking at the transfer transactions of the European football in the last 12 seasons, it can be concluded that the game policy of the star clubs is determined by income from immediate sport successes and marketing. Accordingly, they are able to and willing to sign on very high-priced players, who would normally only be discarded when they are replaceable and in most cases they can be sold only at a lower price. For smaller associations, by contrast, the main transfer industry motivation is the best investment since in their case the profit realized at each transaction gives them the opportunity to acquire players that are more valuable.

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