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Competition in professional German soccer – The myth of the national cup

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A. Introduction and purpose of the study

Professional German soccer clubs compete in two different contests, the Bundesliga and the DFB-Pokal (national cup). Whereas the competition in the Bundesliga already is a popular research topic (see for example Lehmann and Weigand, 1997, Czarnitzki and Stadtmann, 2002, Frick, 2004, Dietl and Franck, 2007, Koning, 2009), the competition in the DFB-Pokal has not been investigated yet. This is especially surprising as the DFB-Pokal is the more traditional contest. It was introduced in 1935 whereas the Bundesliga only exists since 1963. Additionally the DFB-Pokal has, according to a popular German saying, ‘its own laws’ and is meant to produce more unexpected match outcomes than the Bundesliga. Examples for fascinating match outcomes where clubs from lower divisions managed to achieve astonishing victories against big Bundesliga clubs in the DFB-Pokal are numerous. FC Bayern Munich for example lost in 1990 against FV 09 Weinheim, in 1994 against TSV Vestenbergsgreuth and in 2000 against 1. FC Magdeburg – all of which clubs from lower divisions. The hope for a breathtaking result where David beats Goliath creates the special atmosphere in national cup matches – not only in Germany but all over Europe.

The purpose of this study is to examine the competition in the DFB-Pokal. The central question is whether the DFB-Pokal really has ‘its own laws’ and whether match outcomes are less predictable than Bundesliga match outcomes. If so, this would suggest that underdogs have a higher chance to beat the favourite in a tournament style contest than in a league style contest.

For the sport economic literature and praxis this research is highly important for two reasons. First the match outcomes in the national cup offer valuable information about the competition between a country’s soccer clubs that the above mentioned studies have not considered. Therefore the results offer a completely fresh angle at a country’s competitive level in soccer. Second the organizer of the national cup in Germany, the Deutscher Fussball Bund (DFB) has recently sold the national cup TV rights for nearly 130 million Euros for three years, making the national cup financially more attractive. An understanding of the dynamics of the national cup and the chances of winning is consequently highly important to soccer clubs. If this study finds for example that an underdog has higher chances to win a match in the national cup, it might be a reasonable strategy for the underdog to focus more efforts on the national cup.

B. Theoretical background

In the Bundesliga, as a typical league style contest, all soccer clubs compete against each other twice per season. A win is rewarded with three points and a draw with one point. When each club played against each other club twice, the season is over and the club with the highest number of collected points is the champion. In the DFB-Pokal, as a typical tournament style contest, the 64 participating soccer clubs are drawn into 32 match fixtures. The 32 winning clubs are then drawn into 16 match fixtures and so on until only two clubs are left over and the final match takes place. An important characteristic of the DFB-Pokal is that a club drops out of the contest with a single loss as only the winner is qualified for the next round.

The purpose of the study is to examine whether match outcomes in the DFB-Pokal are less predictable than match outcomes in the Bundesliga, i.e. whether a tournament style contest produces more unexpected results than a league style contest. Psychological research offers two theories that would help to explain this phenomenon.

First, psychological theory provides explanations that the favourite is more likely to lose a match against an underdog in the DFB-Pokal (tournament style contest) than he is in the Bundesliga (league style contest). This is mainly because the pressure to win is higher and because high pressure causes the favourite to fail. In the DFB-Pokal the pressure on the favourite is higher than it is in the Bundesliga because a single match decides on who enters the next round and who drops out of the competition, i.e. there is no second chance to repair a loss (Paulus, 1983, Ehrlenspiel, 2006), the obtainable benefits from a single win are higher (McGrath, 1970, Ariely et al., 2009) and the audience has high and clear expectations regarding the match outcome and a loss against a lower division club would be embarrassing for the favourite (Zajonc, 1965). Baumeister (1984) now finds strong support for the relationship between the pressure to perform well on a task and a negative performance. Jordet et al. (2007) prove the relationship between pressure and performance in soccer showing that penalty kicks that excel high pressure on the player are less successful than non-pressure-kicks.

Second, psychological theory provides explanations that the underdog is more likely to win a match against a favourite in the DFB-Pokal (tournament style contest) than he is in the Bundesliga (league style contest). This is mainly because the motivation to win is higher and because high motivation causes the underdog to perform well. In the DFB-Pokal the motivation of the underdog is higher than it is in the Bundesliga because historic underdog wins from the past (like the above mentioned) serve as positive example (Mook, 1996), the public sympathizes with the underdog (Vandello et al., 2007), underdog player's are intrinsically motivated by the setting itself (Rheinberg, 2006) and high targets, such as winning against a big club from a higher division, are especially motivating if the actual chances of winning are low (Locke, 1964).

Frintrup and Schuler (2007) now find that a motivation in sports is a major determinant of sportive performance in general. Stoeber and Becker (2008) confirm this relationship in soccer.

The above theories on pressure to perform and motivation explain that the favourite is more likely to fail in DFB-Pokal matches than in Bundesliga matches and that the underdog is more likely to perform well in DFB-Pokal matches. These theories could explain why the DFB-Pokal produces more unexpected match outcomes than the Bundesliga does.

C. Research methodology

The study uses a dataset with 32.158 match outcomes from the Bundesliga and the DFB-Pokal beginning with the 1963/64 season. The dataset was adjusted for matches that were manipulated or corrected later due to violation of rules such as the “amateur”-rule or the “foreigner”-rule. Three different, independent research methodologies are applied.

First, the domination of big clubs in the two competitions is investigated. The concentration of good final ranks is measured via the so called Top-K-Ranking. It measures how many different clubs were among the top k clubs within a specified timeframe (see Buzzacchi et al., 2003, for an application example). The more different clubs managed to enter to top k ranks, the less the concentration of good ranks on few top clubs and the less predictable is the contest.

Second, the share of unexpected match outcomes in DFB-Pokal and Bundesliga matches is compared. For each match an underdog and a favourite is determined via the average final league rank over the last three seasons. The club with the lower, i.e. better, average rank is the favourite (see Groot and Groot, 2003, who also use league ranks). In both contests groups of matches are formed that can be compared between the contests. For example one group contains only matches where the difference in the average final rank of the two clubs is at max ten ranks. In this group the number of underdog wins is compared between the two contests. Mathematically this is described by $U = \frac{\sum (R_{ij} - R_{ji})}{M}$, where the share of unexpected match outcomes (U) in the group of matches (s) is determined via the sum of unexpected match outcomes (R_{ij} and R_{ji}) in the group of matches (s) divided by the number of matches (M) in the group of matches (s). R_{ij} and R_{ji} take the value of 1 if the underdog wins in matches R_{ij} with the home club i and the away club j and matches R_{ji} with the home club j and the away club i, where $j > i$ regarding the average of the last three years final league rank of the clubs. If the underdog is significantly more often successful in one of the contests this contest is considered less predictable or more unexpected.

Third, the realized betting points per match are calculated as a measure for the level of predictability of outcomes. The realized betting points are the odds that are paid out after the match. If for example the betting odd for a home win is 2,1 for a draw 3,0 and for an away win 4,5 and the home club wins, the realized betting points are 2,1. The betting odds used stem from a bookmaker and are considered information efficient as the bookmaker takes all available information on the actual playing strength of the clubs into account (e.g. available talent, current team form etc). The on average realized betting points should be identical in the two contests, if however one contest has on average higher realized betting points, this contest has unexpected outcomes that cannot be explained by differences in playing strength.

D. Results

The three introduced measures do not provide fully consistent results. The first measure, the Top-K-Ranking proves that there are more different successful clubs in the DFB-Pokal than in the Bundesliga and that the top ranks are less predictable in the DFB-Pokal. For example on average 7,182 different clubs entered the top four clubs in three consecutive years in the Bundesliga and 9,773 in the DFB-Pokal.

| Top-K-Ranking | Contest | N | μ | Σ | Levene-Test | Shapiro-Wilk-Test | T-Test | | Mann-Whitney-U-Test | |
|------------------|------------|----|-------|----------|-------------|-------------------|--------|-------|---------------------|-------|
| | | | | | Sig. | Sig. | T | Sig. | Z | Sig. |
| Top 4 in 3 years | Bundesliga | 44 | 7,182 | 1,187 | 0,599 | < 0,001 | - | < | -7,423 | < |
| | DFB-Pokal | 44 | 9,773 | 0,961 | | < 0,001 | 11,254 | 0,001 | | 0,001 |

Table 1: Top-K-Ranking

The second measure, the comparison of the share of unexpected match outcomes in comparable groups of matches shows that the Bundesliga produces more unexpected match outcomes than the DFB-Pokal. Of the 16.092 matches in Bundesliga where the average rank difference between the clubs is at max ten ranks, 5.042 matches ended in an unexpected outcome (31,3%), i.e. an underdog win. Of the 1.113 matches in the DFB-Pokal in the same category, 249 ended in an unexpected outcome (22,4%), which is significantly less. Another group of matches that was compared between the contests is the group of identical matches, i.e. matches that took place in

both competitions with the same clubs in the same season in the same stadium. No difference in match outcomes was found for this category.

| Group of matches (<i>s</i>) | Contest | M_s | U_s | $M_s - U_s$ | Pearson's | | | |
|--|------------|--------|-------|-------------|------------|---------|------------|---------|
| | | | | | Chi-Square | | Cramer's V | |
| | | | | | Value | Sig. | Value | Sig. |
| Average rank difference between 0 and 10 ranks | Bundesliga | 16.092 | 5.042 | 11.050 | 39,248 | < 0,001 | 0,055 | < 0,001 |
| | DFB-Pokal | 1.113 | 249 | 864 | | | | |

Table 2: Share of unexpected match outcomes

The third measure, the realized betting points in the contests, also shows that the Bundesliga has more unexpected match outcomes than the DFB-Pokal. In the 5.697 Bundesliga matches where betting odds were available on average 2,383 betting points were realized. In contrast on average only 2,319 were realized in the DFB-Pokal. As the underdog has higher betting odds than the favourite this shows that the underdog actually better performs in the Bundesliga. The standard deviation of the realized betting points is higher in the DFB-Pokal which implies that there are higher variations around the mean.

| Wettbewerb | N | μ | σ | Levene-Test | Kolmogorov-Smirnov-Test | Welch-Test | | Mann-Whitney-U-Test | |
|------------|-------|-------|----------|-------------|-------------------------|------------|-------|---------------------|-------|
| | | | | Sig. | Sig. | T | Sig. | Z | Sig. |
| Bundesliga | 5.697 | 2,383 | 0,808 | < 0,001 | < 0,001 | - | 0,160 | -2,897 | 0,004 |
| DFB-Pokal | 479 | 2,319 | 0,965 | | < 0,001 | 1,409 | | | |

Table 3: Realized betting odds

E. Discussion

The study does not confirm that the DFB-Pokal has 'its own laws' and significantly more unexpected match outcomes than the Bundesliga. Whereas the DFB-Pokal has more different successful clubs than the Bundesliga, it does not have significantly more unexpected outcomes in matches that are comparable between the contests. Additionally it does not have more unexpected outcomes in terms of higher realized betting points than the Bundesliga.

Single, highly unexpected match outcomes such as wins of underdogs from lower division against strong Bundesliga-clubs are with regard to the entire contest an exception. However as an exception they receive more public attention than a usual match and we experience a phenomenon that psychological theory calls selective perception. Selective perception refers to the process of categorizing and interpreting information in a way that favours one category or interpretation over another. Information tends to be selectively perceived in ways that fit with existing individual needs, goals, values, attitudes, and beliefs. If people believe the myth that the DFB-Pokal has more unexpected outcomes than the Bundesliga, they automatically, outside their conscious awareness, will find evidence for this.

Regarding the initially formulated theories of high pressure for the favourite and high motivation for the underdog, the results of this paper do not prove these incorrect but prove that the context they were used in does not fit. It could for example be that the favourite in the Bundesliga is under a pressure just as high as in the DFB-Pokal as the Bundesliga promises high revenues and the opportunity to compete with international clubs. Also it might be possible that the big Bundesliga clubs are professional enough to cope with pressure in the DFB-Pokal so that it doesn't have an effect at all. Additionally the underdog might not be as motivated in the DFB-Pokal as described as the actual chances of winning the contest are rather low.

It is difficult to measure and weight unexpected outcomes from the Bundesliga (such as the championship of 1. FC Kaiserslautern in their first year after promotion in the first league in 1997/98) against highly unexpected match outcomes in the DFB-Pokal. However the methodologies applied in this study lead to the conclusion that the Bundesliga is just as unexpected as the DFB-Pokal. For the underdog this implies that the actual chances of winning a match against a favourite is not higher in the DFB-Pokal than it is in the Bundesliga. Putting more emphasis on the DFB-Pokal matches therefore is not a convincing strategy for the underdog.

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