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Success in sports: A longitudinal study of the German Premier Soccer League

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Nr. 457

Jörn Littkemann/ Sören Salomo

Success in Sports:

**A Longitudinal Study of the
German Premier Soccer League**

Vortragsmanuskript

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Success in sports: A longitudinal study of the German premier soccer league

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ABSTRACT

During the last decades numerous studies of empirical research in business administration have focused on successful management of strategic processes in industrial corporations. Central determinants of business success have been identified. Especially in marketing and strategic management science a large number of advanced statistics have been tested and successfully adapted in order to isolate the relevant key factors.

The following paper will exemplify how these statistical instruments can be applied to plan successful strategies in sport management. The analysis is based on the data over a period of thirty years from the German premier soccer league. We test which factors are significant for winning the championship. Implications and recommendations to management of sports are drawn out of these results.

Littkemann, J. and Salomo, S.

Success in Sports: A longitudinal Study of the German Premier Soccer League

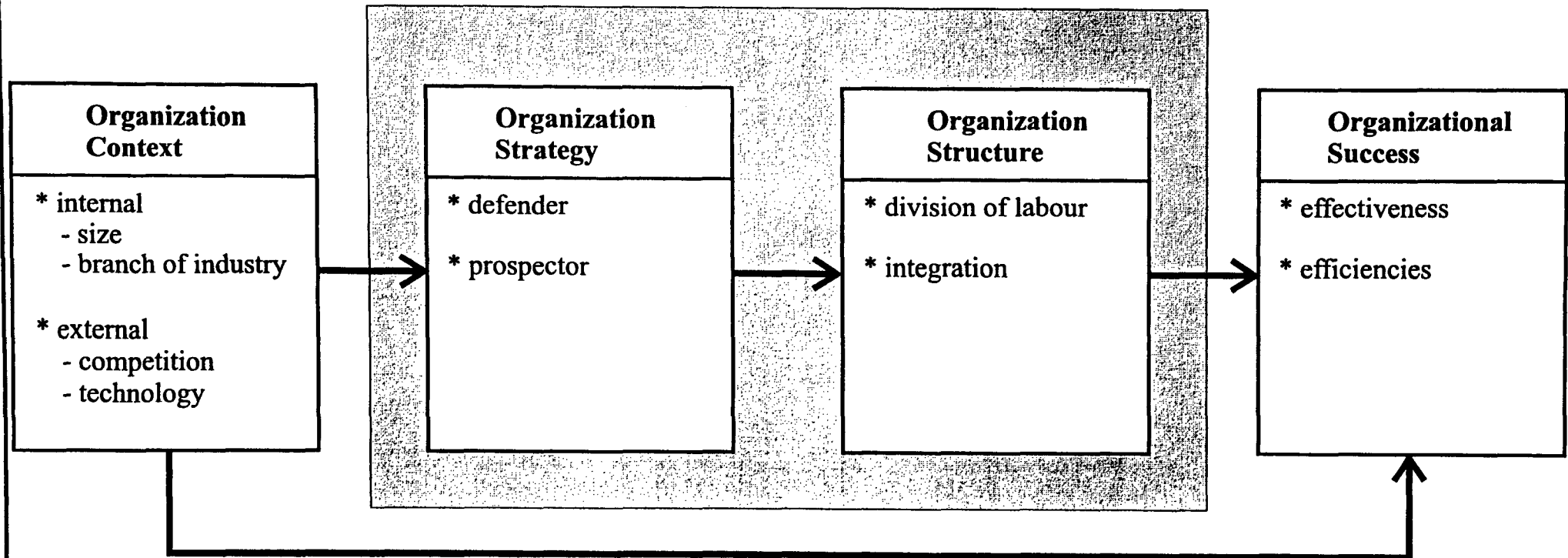
A. STRATEGY AND STRUCTURE: SOME ORGANIZATIONAL THEORIES

One main thesis in organizational theory claims that the connection between strategy and structure is decisive for organizational success (Schewe 1996). Starting point for a lot of theoretical and empirical work in business administration was the study of Chandler (1962) who investigated four big American corporations. Chandler postulated: "The thesis (...) is then that structure follows strategy and that the most complex type of structure is the result of the concentration of several basic strategies." It is the main target of the top management, responsible for developing the strategies, to create suitable structures. At last, organizational success is a function of the "fit" between strategy and structure, while different context factors are to be considered.

Figure 1 shows the conceptual framework of strategy and structure which is found in many empirical studies concerning industrial corporations (e.g. Galbraith/Nathanson, 1978; Child/Kieser, 1981; Miles/Cameron, 1982; Dutton/Jackson, 1987).

From the sport management's point of view the problem is that organization theory gives a wealth of solutions for industrial corporations to fit strategie and structure successfully. The first question is then what different kinds of strategy and structure do exist in sport organizations. Second, it is interesting to know which mixture of strategy and structure increases organizational success and which not.

Fig. 1: The conceptual framework of strategy and structure within the organization theory



B. RESEARCH DESIGN

We test which factors of strategy and structure are significant for German professional soccer organizations to attain organizational success. Professional soccer has been played in Germany for more than thirty years. In 1963, the German premier soccer league called *1. Fussball-Bundesliga* was founded with sixteen teams competing for the championship. The first professional champion was crowned in 1964: the *1. FC Koeln*. Nowadays, eighteen teams fight every year for winning the championship. All soccer teams are organized as registered sport clubs. In most of these sport clubs other kinds of sports - including non professional activities- are organized as well. We choose to concentrate our analysis on professional soccer teams and their typical strategies and structures. Our research design is presented in Figure 2.

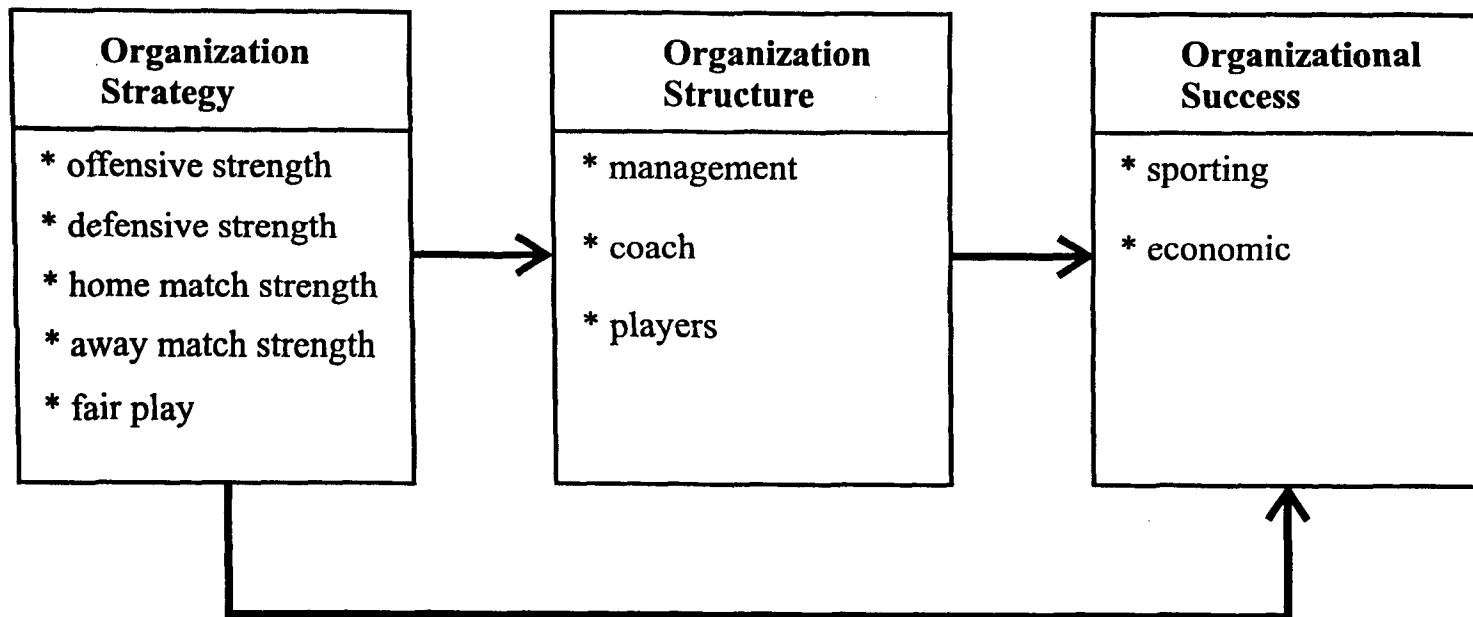
The main target of sport clubs is to attain success in their specific domain: sports. At the end of the playing year success of each club is measured by the place on the league table. Organizational success increases by the position the team comes in. Moreover, sporting success correlates highly with economic success since a better place in the table attracts more spectators and derives more money from television broadcast, merchandising and other advertisement.

In addition, sporting success increases the market price of the players and the image of the club. That is why the organization structure of sport clubs is geared towards the sporting area. Generally, the German clubs are organized in three main parties: management, coach and players work together in order to reach sporting success.

The tasks of management includes hiring and firing the coach and the players and dealing with administrative activities. The key persons in charge of achieving sporting success are the coach and the players. Particularly the coach is responsible for sporting success, since on an operational basis it is his/her duty - and only his/her duty to choose the right eleven players every game during the season.

There do exist a wide variety of sport strategies to win a game. E.g. offensive strength as a strategy means that the team first has to be lined up to score goals, in contrast to defensive strength focusing only on preventing goals. These strategies often depend on the philosophy or image of a club. They influence the selection of management, coach and players and they have direct influence on organizational success.

Fig. 2: Strategies and structures of soccer teams



Following the organization theory we postulate that different strategies and different structures in sport clubs lead to different organizational success. In this study we want to investigate which strategies and which structures have a direct effect on success and which strategies influence which structures, e.g. changing the team line-up or firing the coach.

C. METHOD

I. DATA

We collected the data by analysing the press (Kicker Sportmagazin 1993) on the first thirty years of the German premier soccer league beginning in 1964 and ending in 1993. All sport clubs who took part at least ten times in one of the analysed thirty playing years were admitted to the sample. For a total of twenty clubs we computed the following measures for each year. Unfortunately data about the management has not been sufficiently documented in the press. Only three clubs were on request able to give us internal information. In addition the annual report is neither due to submission to the public in Germany. Consequently data about management and context factors could not be included in the analysis.

II. MEASURES

variables of organization strategy

offensive strength: shooting goals

defensive strength: getting goals

home match strength: home match points

away match strength: away match points

fair play: sending-offs, penalties

variables of organization structure

coach: change of coach

players: accumulated amount of players active

variables of organizational success

sporting: winning the championship

economic: sum of spectators during a season

III. ADVANCED STATISTICS

Since this study focusses on factors significant for winning the championship, we examined t-tests for differences in means for each of the covariates. Additionally we conduct a discriminant analysis to assess the independent and combined association of these variables with eventual sporting success. Since the conditions for winning the championship might have changed over the years the latter analysis is performed both for the total period of time observed as well as for partial periods.

D. RESULTS

I. DESKRIPTIVE STATISTICS

Deskriptive statistics for the variables used in the analysis are shown in Table 1.

II. UNIVARIATE FINDINGS

The first part of this analysis examined the differences between soccer teams winning or not winning the championship over a period of thirty years. Findings are shown in Table 2 with insignificant variables listed at the end.

Obviously a team winning the championship should perform significantly better on points and goals scored during the season than other teams, since the champion is defined as the most winning team. Significant differences in means observed seem to be tautology in this context. But splitting both measures in a) home and away match points and b) shooting and getting goals does open the possibility for interpretation. The importance of each "splitted" measure might provide some further insight in factors relevant for winning the championship.

Only the "fair-play variables" do not differ significantly between champions and non-champions over the period observed. Fair play does not determine the organizational success in terms of championship but might influence other strategic aspects like popularity among supporters.



TABLE 1
Descriptive statistics

Variable	N	Mean	Min	Max	SD
penalties (against)	458	4.987	0	17	2.4
penalties	458	5.124	0	13	2.586
sending-offs	458	1.009	0	7	1.298
spectators	458	373502.5	33590	904157	127085.9
change of coach	458	0.312	0	1	0.464
home match points	458	23.376	9	33	4.146
away match points	458	11.681	0	24	4.727
points per season	458	35.116	14	60	7.615
shooting goals	458	56.026	28	101	13.738
getting goals	458	52.653	22	94	12.176
accumulated amount of players active	458	20.251	13	28	2.378



TABLE 2
Univariate findings

Variable	champion		non-champion		sig.
	Mean	SD	Mean	SD	
penalties (against)	3.97	2.03	5.06	2.41	*
sending-offs	0.76	1.455	1.03	1.29	*
spectators	502685	104744	364769	123774	***
change of coach	0	0	0.33	0.47	***
home match points	28.83	2.04	23.0	3.99	***
away match points	20.10	2.29	11.11	4.29	***
points per season	48.93	3.29	34.18	6.89	***
shooting goals	74.69	13.25	54.76	12.84	***
getting goals	34.48	6.65	53.88	11.47	***
accumulated amount of players active	18.07	2.07	20.40	2.33	***
penalties	5.59	3.08	5.09	2.55	()

* for $p < .05$, ** for $p < .01$, *** for $p < .001$, () for $p < .10$

Champions do though change their coaches lesser than non-champions - they obviously seem to be more content with their operational management than others.

Additionally champions tend to rely on a smaler amount of players than their less performing counterparts. They do attract more spectators accumulated for one season than all other contestants.

III. MULTIVARIATE FINDINGS

A discriminant analysis was computed in order to isolate the most discriminating covariates between champions and non-champions. Before reporting the results obtained, it is important to make some analytical clarifications. The discriminant analysis has proofed to be a robust statistical tool, well accepted with dichotomeus classification problems.

However, it is not the aim of this study to evaluate a function able to predict future champions but to demonstrate which variables play an important role in determing a champion or non-champion. Bearing this in mind we choose a stepwise method electing a variable to be part of the model in case of sufficient discriminating power. Prior probability was set to 0.5 thus securing that the function computed will be able to differ correctly between the two groups although the real number of champions is by far lesser than the number of non-champions.

The standardized canonical discriminant function listed below consists of three discriminating variables able to sepearate champions effectively from non-champions. The coefficients of the function can both be interpreted in direction as well as strength or importants of the influence executed be their respective variables.

$$z = - 0.24V_8 + 0.32V_{14} + 0.77V_{15}$$

Not surprisingly the amount of points reached in each season determines the championship positively. Both home match (V_{14}) and away match points (V_{15}) proof to have discriminating power. A team winning the championship has to be strong both in home and away matches.

Additionally the accumulated amount of players actively involved during a season is important for winning the championship (V_g). The negative coefficient implies that in order to become a champion the amount of active players should be reduced. It seems that the commonly known phrase "never change a winning team" is true in this special case.

Since it can not be assumed a priori that conditions for winning the championship are stable over the whole period observed, we compute the same analysis for both an early and a late period of time. The variables significant for becoming a champion in the first ten seasons (1963/64 - 1972/73) of the premier soccer league and the last ten seasons (83/84 - 92/93) do not differ that much. In both cases the home and away match points show significant discriminating power.

While no other variables seem to have important in the eighties and nineties the early years champions are determined additionally by the number of players and penalties. Although the number of players discriminate champions from non-champions considered the thirty-years analysis, this organization structure variable seems to loose important lately.

E. CONCLUSIONS

The results strongly suggest that the strategic variables home and away match strength combined with the organizational variable accumulated amount of players actively involved during a season are central for determining the championship in the German premier soccer league over the past thirty years. The decreasing importance of the latter variable might be an indicator of changed conditions over the last years in professional soccer. The introduction of additional national and international leagues, stronger physical demands by new tactics and more media-driven short-term success orientation by coach and manager might influence this development towards a larger number of players active during a season.

Since our data does not provide any information about actual economic success we can not test our assumption that sporting success correlates with economic success. However, it can be argued that these two measures of success do not necessarily go together in the future. A team without significant sport success - like winning the championship - might though be sufficiently successful in economic terms.

Economic success can e.g. be improved by creating a positive image and strong supportership, which means using marketing activities to promote the sports team and create a positive return on investment. Following this idea the management of the sport clubs should put more emphasis on economic related areas. A more professional business administration could improve economic success. It can be argued that while sporting success was a central objective during the past, future activities of the management should focus more on business aspects.

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