

# Myths and Facts about Football



Myths and Facts about Football:  
The Economics and Psychology  
of the World's Greatest Sport

Edited by

Patric Andersson, Peter Ayton and Carsten Schmidt

**CAMBRIDGE  
SCHOLARS**

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P U B L I S H I N G

Myths and Facts about Football: The Economics and Psychology of the World's Greatest Sport,  
Edited by Patric Andersson, Peter Ayton and Carsten Schmidt

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## PREFACE

DANIEL FINKELSTEIN<sup>1</sup>

I constantly find myself called a spoilsport. Why? Because I insist on subjecting football clichés to rigorous analysis. I can't just sit there and listen to someone saying that the worst time to concede a goal is just before half time without wondering—is it true? I can't see home advantage change the course of a tournament without wondering—how does it work? I can't see a team sack its manager without wondering—did he really deserve it? And I robustly reject the idea that such analysis spoils the romance of football. I am not rejecting the banter, the punditry, the weird stats. I just want them to be true. Who can argue with that?

I have to admit that I was a football fan for about 35 years before it occurred to me that data told you the story of soccer. Actually, it didn't so much occur to me as to my friend and collaborator Dr Henry Stott, who was at Warwick University when I first met him. Henry was part of a new wave of academics, a number of them represented in this volume, who had begun to model football hand use sophisticated statistical methods to reveal football's secrets.

Quite early on in my conversion to a football data fanatic, I came across the work of Peter Ayton and admired his insights. So when he told me that this volume was appearing I was excited, and remain so. I think you should be too.

I think the sort of material he together with Patric Andersson and Carsten Schmidt have gathered in this book represents the future of sports writing. People are always a bit surprised to find me deadly serious about that, but if I wasn't I wouldn't bother with football stats at all.

I believe data can tell you far more than commentators, experts, former players or casual pundits. I believe that objective measurement is not just a way to rank and value players, but the only way. I believe a statement

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<sup>1</sup> Daniel Finkelstein OBE is the author of the "Fink Tank"—a regular column appearing in 'The Times' and the only regular sports feature devoted to using scientific methods for predicting and understanding football.

made about football that can't be quantified and tested using data is a non statement.

Over the next ten years, managers are going to twig to this. When there are millions of pounds at stake they aren't going to go on valuing players by reading Shoot magazine and watching a video, are they? So we, the data fiends, we're going to take over the world my friends. Starting here. Starting with this book.

## ACKNOWLEDGEMENTS

Football is a simple game; 22 men chase a ball for 90 minutes and at the end, the Germans win.

Those famous words were uttered by the English former footballer Gary Lineker after England had lost the semi-final in the World Cup 1990 against West Germany on penalties. There is, however, much more to say about the game of football, at least from the scientific point of view. As shown by the present book, this sport is imbued with various phenomena that should not only be interesting for researchers in economics, psychology, and other behavioral sciences, but may also stimulate people sharing a professional or recreational interest in football. A variety of those phenomena is thoroughly described and analysed in this volume, which could not have been completed without the support and engagement of many people to whom we are grateful.

First and foremost, we are indebted to all authors who have contributed chapters to the book. They have put down a great deal of efforts to produce papers that empirically investigate fascinating topics. Many authors have also actively taken part in the peer-review process and, thus, helped to improve the quality of this book.

Second, we wish to thank all individuals who have patiently acted as reviewers and, accordingly, given invaluable comments to different versions of the chapters. In alphabetical order, they are: Leif Brandes, Thomas Brenner, Rene Cyranek, Marco Caliendo, Mattias Ekman, Kimmo Eriksson, David Hardman, Peter Högfeldt, Magnus Johannesson, Alexander Klos, Stefan Luckner, Daniel Memmert, Håkan Nilsson, Johan Pütz and Tim Rakow.

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Fourth, we wish to express our sincere gratitude to the Sonderforschungsbereich 504 of the University of Mannheim and the European Association for Decision Making for financial support that enabled us to organise the University of Mannheim workshop on “Economics and Psychology of Football”, which was held in June 2006

(see [www.sfb504.uni-mannheim.de/EconPsyFootball06](http://www.sfb504.uni-mannheim.de/EconPsyFootball06)). Most chapters of the present book originated from papers presented at that workshop. In connection, Patric Andersson wants to gratefully acknowledge research grants provided by Handelbankens Forskningsstiftelser. And Carsten Schmidt thanks Deutsche Bahn for upgrading their ICE trains servicing Mannheim - Berlin with power plugs.

Fifth, we would like to thank Raphael Abiry for contributing the cover artwork. The picture displays Johan Neeskens famous penalty, awarded during the 1st minute of the 1974 World Cup final, where he shot straight towards the middle of the goal—with goalkeeper Sepp Maier moving to his right.

Finally, we would like to extend a special thanks to our families and friends for encouragement while this book project was being completed.

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# CHAPTER ONE

## INTRODUCTION AND OVERVIEW

PATRIC ANDERSSON, PETER AYTON  
AND CARSTEN SCHMIDT

The television show *Monty Python Live at the Hollywood Bowl* from 1982 features a comic sketch called *International Philosophy—Return Match*, where a team of famous German philosophers (such as Leibniz, Kant, Hegel, Schopenhauer, Nietzsche and Heidegger) plays against a team of equally famous Greek philosophers (such as Plato, Aristotle, Heraclitus, Sophocles, Socrates and Archimedes) in a football match in a crowded Olympic stadium in Munich. Seemingly, like many occasions in real life, the television commentator views the Germans as the favourites. Once the referee (characterised by Confucius) blows the whistle for kick-off, the philosophers turn away from the ball, hands on chins in deep contemplation and commence ambling aimlessly around on the pitch thinking deeply and occasionally gesticulating rather than kicking the ball. They are apparently absorbed in deep contemplation on, presumably, the subject of football. Nothing much appears to happen until the very last minute of the match, when the striker of the Greek team, Archimedes, has an idea, shrieks “Eureka” and runs towards the ball and kicks it, whereupon the Greeks start to actually play football. Within seconds, they manage to score a goal (a diving header by Socrates from a cross from Archimedes) which turns out to be decisive. The German philosophers surround the referee protesting frantically against the goal using their respective school of thoughts; for example, Hegel arguing that “reality is merely an a priori adjunct of non-naturalistic ethics”, Kant via the categorical imperative holding that “ontologically it exists only in the imagination” and Marx claiming it was offside. But their protests are in vain and the Greeks win the match.

In a sense, it is not surprising that the philosophers pondered the game of football. The nature of this sport seems to have a rather high degree of complexity. In particular, scientific analyses of league competitions in

several popular team-sports (e.g., American football, baseball, basketball, football and ice-hockey) suggest that football is the most competitive sport, in the sense that better teams are occasionally beaten by the underdogs (Ben-Naim, Vazquez & Redner, 2007). On the basis of analyses of matches in prior World Cups, Wagenaar (1988) estimated that the influence of chance on the outcome was about 95%, but stressed that the margin between a game of chance and a game of skill was weak and almost undetectable. Like Wagenaar, one may argue that the presence of uncertainty makes football thrilling and interesting to watch.

Football is also associated with various phenomena that relate to, among other things, strategic choice, decision-making, management of resources, competition, judgmental forecasting, motivation and labour markets. Additionally, this worldwide game is surrounded by different cognitive beliefs, which may shape behaviour and expectations. For example, the conception that players who have scored goals in consecutive matches are thereby more likely to score in their next match has not only implications for coaching and the action on the pitch, but also the evaluation of performance and betting. As a consequence, contemporary economists, psychologists and researchers in various other disciplines are attracted by football to the extent that they conduct scientific investigations. Another reason for their attraction is the abundance of available statistics, permitting rigorous analyses of football-related phenomena. Unlike the philosophers in the aforementioned comic sketch, the scientists have a good understanding of how the game of football is played.

The present book aims to describe economic and psychological analyses of phenomena in and about football. Particular focus is put on evaluating some everyday myths and common conceptions that are associated with this sport. Here are three examples: (1) many sports commentators seem to believe that a team runs a greater risk of letting a goal in just after it has scored, (2) the team that starts in a penalty shoot-out has an advantage over its opponent and (3) many people appear to think that extensive knowledge of football is essential for accurate predictions. Besides establishing the degree of truth in such ideas, this book also presents evidence for phenomena not necessarily related to any widely held beliefs. Some of the issues that will be covered concern strategies in penalty-taking, mental processes underlying referee decisions, the role of fans on the match outcome, the risk of relegation for newcomers in league football, determinants of the duration of footballer careers, the effects of differences in salaries among players and stock-market reactions to events of listed football clubs.

The remainder of this introductory chapter proceeds as follows. In the next section, the rationale for the present book is described. Then comes a brief description of economic and psychological research on football aimed to illuminate its development and differences in perspectives and methods. The penultimate section outlines the contents of the book. Finally, this chapter ends with a discussion of conclusions and suggestions for further research.

## **Rationale for the Book**

In essence, the present book is the upshot of two scientific meetings. Firstly, in 2005 two of the editors took the initiative to convene a symposium at an international conference on behavioural research on judgment and decision-making (i.e., SPUDM-21), which took place in the beautiful city of Stockholm in Sweden. The idea was to illustrate the potentials of using features and data from the game of football to evaluate the extent to which theories of decision-making and empirical findings from laboratory sessions with students apply to real life. After all, football is imbued with a range of decision-making tasks. Besides involving uncertainty and monetary effects, those tasks may, for example, require assessments of probabilities (e.g., the likelihood of match-outcomes) and call for instantaneous responses in a stressful environment stretching the limit of human information-processing capacity (e.g., decisions about whether a player is offside). The three papers, which were discussed at the symposium, concerned three different topics: (1) cognitive fallacies about the nature of the game of football (e.g., the beliefs that players who have scored goals in consecutive matches are more likely to score next times), (2) behavioural tendencies of referees to make biased decisions in favour for the home team and (3) the use of intuitive versus analytical procedures to make accurate forecasts. As hinted by the symposium, studying phenomena in and about football does not only enrich scientific knowledge of how decisions are made in natural settings, but also provides valuable empirical tests of the validity of theories.

Secondly, as a consequence of the symposium, the editors of the present book decided a year later to organise an international workshop with two main goals: (1) taking stock of the interdisciplinary approaches and perspectives used to empirically investigate behaviour, cognitive fallacies, decisions, predictions, strategic choices and other phenomena in and about football and (2) bringing together economists, psychologists and researchers from other behavioural sciences sharing an interest in conducting scientific investigations of those issues. The workshop has

opportunistically scheduled to take place in Mannheim, Germany—just a week before the start of the 2006 World Cup (see <http://www.sfb504.uni-mannheim.de/EconPsyFootball06>). In all, the workshop assembled about 45 researchers in economics, psychology and related disciplines who came mainly from the European continent. Some 25 papers were presented and they dealt with two broad topics: (1) beliefs and behavioural tendencies of the actors on the pitch (i.e., players and referees) and (2) off-pitch phenomena like predictions of match outcomes, the labour market for footballers and the role of team performance. Many of those papers are reported in the present book. Besides several interesting findings, the workshop showed that there was little interaction between economists and psychologists in that they seemed to conduct studies related to football with limited awareness of each other—despite the fact that their studies often concerned similar phenomena. One of the participating psychologists remarked vividly that economists often failed to acknowledge psychological findings. Thus, the workshop concluded that there was an urgent need to build bridges between researchers from different disciplines; a need that motivated the present book. The interdisciplinary synergy we attempted and continue with this volume echoes other similar tentative but growing debates between psychology and economics manifested in papers, conferences and edited books (See e.g. Hertwig and Ortmann 2001, Brocas and Carrillo, 2003; 2004).

There have been a few earlier attempts to connect scientists interested in empirical investigations of behavioural phenomena with football. In 2006, two important anthologies were published. One of them is written from the perspective of economics and addresses issues like the determinants of attendance at football matches, the factors underlying transfer values, the effectiveness of clubs in maintaining their competitive edge and the efficiency of betting markets (Gerrard, 2006). The other anthology takes a different angle and looks at the role of marketing for club managers, sports manufacturers and other actors in the football industry to improve revenues, trade marks and values (Desbordes & Chadwick, 2006). At the time of the World Cup 2006 in Germany, the *International Journal of Sports Psychology* published a timely special issue devoted to various research problems related to football such as what personal characteristics are required for successful refereeing, techniques for developing skills in playing football and mental factors that may impair penalty shoots. Also from 2006 came an intriguing bestseller entitled “How to score: Science and the beautiful game” that gives scientific insights into a broad variety of topics such as the history of tactics, the aerodynamics of ball flights and the physiological and

psychological aspects of playing football (Bray, 2006). In 2001, Dobson and Goddard (2001) released an influential book that not only gives a comprehensive account on how economics applies to and explain various topics in professional football at club level, but also presents new empirical findings in regard to English league football. In addition, there are some books that have considered the sociology of football (Giulianotti, 1999) and the managerial aspects of the business of football (Morrow, 1999). Nevertheless, to the best of our knowledge, there appears to be a paucity of scientific work that blends economics and psychology when investigating phenomena in and about football. The present book seeks to fill this gap.

## **Economic and Psychological Analyses of Phenomena in Football**

To shed light upon the degree of attention among economists and psychologists to carry out research in regard to football, we consulted various bibliographic databases (e.g., EconLit, SSCI, Scopus). Using the keywords “football” and “soccer”, we conducted a search in Scopus and tracked publications over the past three decades.<sup>1</sup> It was found that the number of articles dealing with football (and soccer) in economics and psychology was 5 and 18 in the 1980s. In the 1990s, the corresponding number had risen to 33 and 143 publications. From 2000 to 2007, it amounted to staggering 100 and 385 articles. In the area of business studies, which arguably relates to economics, during the same periods of time had the following frequencies of football-related papers: 2, 58 and 295. Searches in other bibliographic databases (e.g., EconLit and SSCI) gave similar results. Additionally, a check with the webpage of the Social Science Research Network (see [www.ssrn.com](http://www.ssrn.com)) showed that over the last three years (2005-2007) there were some 25 working papers related to (the European definition of) football. Thus, there appears to be a growing interest among economists and psychologists to investigate phenomena in and about football.

Searching for prior publications in the aforementioned databases enabled us also to find out about the early published research on football in the economic and psychological sciences. In the early 1960s, the psychologists Cohen and Dearnaley (1962) conducted a fascinating study aimed at empirically investigating the ability of footballers to assess the

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<sup>1</sup> For simplicity, we did not exclude publications that concerned American football, as that would have been a tedious task.

chance of making goals from different distances. The study is mainly based on experiments, where players from two professional clubs (Manchester United and West Bromwich Albion) in the English Football League and two amateur teams took part as participants. Each participant was, among other things, instructed to individually mark six positions on the pitch where he felt that he would score with an accuracy of 0.01, 0.20, 0.40, 0.60, 0.80 and 0.99, respectively. From each of those positions, he then made five shots to the goal, which was not guarded by a keeper and his performance was recorded. Before selecting the positions, the participants had been informed that their judgments of skills would be evaluated in such a manner. As expected, the levels of expected and actual accuracy were found to be negatively related to the distance to goal. The correspondence between expected and actual accuracy was somewhat good, although there was a tendency of exaggerating the true performance. Specifically, circa 44% (22%) of the judgements overestimated (underestimated) the true performance, whereas the remainder were accurate. To some extent, those results relate to the notion of overconfidence, which is the propensity to overestimate the correctness of one's predictions (e.g., see Griffin & Brenner, 2004).

Furthermore, Cohen and Dearnaley (1962) observed that the players, on average, managed to score 5 out of 5 shots from a closer distance to the goal (mean 26 feet) than expected distance (mean 21feet), indicating underestimation of skills. No substantial differences could be found between the professionals and the amateurs. In an attempt to verify their findings, Cohen and Dearnaley (1962) analysed three filmed matches (i.e., the FA Cup final in 1956, the European Championships final in 1960 and a league match) and tried to count the number of shots made within and outside the penalty area as well as their success rates. Their analyses showed that the frequency of successful shots was greater within than outside the penalty area (i.e., 13 goals out of a total of 44 attempts vs. 1 goal out of 32 attempts), an observation that agreed with the results from the experiments. Despite the intriguing approach and results, the study of Cohen and Dearnaley (1962) has received only modest attention by scientists. Over the years, this study has only been cited eight times.

Apparently, it took the economists roughly a decade longer than the psychologists to realise the potentials of using football as a vehicle to carry out scientific investigations. In the early 1970s, Sloane (1971) argued that the football club could be viewed as a firm that has the objective to maximise its value, or as it is generally referred to in economics, utility. He theorised that the value function of the club included the following interdependent variables: profit, security, spectator attendance, playing

success and health of the league in which the club plays. For example, a club might have to ensure that it is not relegated from a league rather than optimizing success. In light of the fact that some football clubs are governed by people who may have other motives than purely monetary ones (e.g., a quest for power or a wish that the local club survives), Sloane (1971) discussed the possibility that profit maximisation did not apply to football clubs. Over the years, this study has been cited about 29 times, implying that it has had some impact on contemporary economists.

Those seminal papers are instructive in that they illuminate the differences in approaches and perspectives used in economics and psychology when investigating football-related phenomena. On the one hand, economists concentrate on evaluating whether actual actions with real-life incentives deviate from that assumed by theoretical models of rational behaviour as well as to what extent any deviations could impair economic efficiency. An important assumption is that individuals act rationally in terms of specifying their goals and making decisions in accordance to those goals; an assumption that has been heavily disputed over the years (see e.g., Simon, 1979; Hogarth & Reder, 1986; Thaler, 1992; Gigerenzer & Selten, 2002). On the other hand, psychologists tend to look at mental and motivational factors underlying behaviour and reasons for individual differences. Unlike economics, psychology is not typically built around fundamental axiomatic postulations and can, thus, be regarded to be a somewhat fragmented discipline with an amalgam of diverse strands of research that have different perspectives and traditions. One might, therefore, argue that psychologists can be more innovative and less conservative in their choice of research topics than economists. Nevertheless, psychological research is usually based on theory and often motivated by paradoxes in prior findings.

There are also methodological differences between the two disciplines, as suggested by our bibliographic searches and the contents of the present book. Typically, economic research on football-related phenomena relies on available statistics concerning penalties, goals, bookings, odds, attendance, stock-prices and other relevant facts. For example, Bird (1982) collected data on attendance and admission prices from 33 seasons as well as on retail price index to model the demand for English League football. When appropriate, economists try to take advantage of changes of rules and other circumstances in the environment of football to perform field experiments. For instance, in an attempt to investigate the effects of increased incentives, Garicano and Palacios-Huerta (2006) made comparisons between matches played in seasons when wins gave two and three points, respectively. By using available statistics, economists can

ensure that behaviour is observed in its natural environment where individuals are sufficiently experienced and motivated.

In contrast, psychologists tend to conduct experiments, surveys, interviews and other procedures in order to acquire reliable empirical materials regarding behaviour and its underlying processes. An instructive example is the aforementioned study of Cohen and Dearnaley (1962). By conducting their own data collections, psychologists are not restricted to consider hypotheses that are easily tested by available statistics—although questions might be raised about reliability and validity. Unlike economists, psychologists seldom bother about the role of incentives when performing experiments (Hertwig & Ortmann, 2001). Nevertheless, psychological studies exist that employ “natural” rather than experimentally contrived data. For instance, Ayton (1997) evaluated odds from British bookmakers and found that the odds for a general match outcome (e.g., a win) were often smaller than the sum of the odds for the same outcome given specific events (e.g., a win after winning, drawing, or losing the first half). Thus, the bookmakers seemed to assess (implicit) probabilities in a somewhat biased manner.

## Contents of the Present Book

The remainder of the present book is organised around various aspects of football. Like the game itself, it is divided into two halves. Whereas the first half concentrates on phenomena that are explicitly related to the performers on the pitch, the second half concern issues that are linked to the actions of the agents off the pitch. In all, the book spans 20 separate chapters that are all based on empirical investigations. In what follows, the contents of the two halves are listed and each of their chapters is briefly described.

### **First half: On-pitch phenomena**

In the first half of the book, consideration is given to (erroneous) beliefs and behaviour of footballers and referees. Specifically, there are ten chapters touching on four interacting themes or parts: myths and flawed beliefs, strategic choice, team behaviour and performance and referee behaviour and its underlying factors.

**Myths and flawed belief:** This section consists of three papers that examine the rationality of some widely held beliefs and conceptions about the nature of the game of football. Firstly, Peter Ayton and Anna Braennberg take a careful look at the validity of some myths about causal relationships regarding the scoring of goals in football matches. Their

empirical materials include a survey involving professional footballers from a club in the English Premier League as well as statistical analyses of available data on some seasons of the aforementioned league. Basically, the survey confirms that professional footballers share, to some extent, beliefs about the game that run counter to the results of the analyses. Contrary to the beliefs of the footballers, the authors report the following empirical findings: (1) a player who scored in his last few games does not increase his chances of scoring in his next game, (2) scoring just before half-time does not have any extra impact on the outcome of the game and (3) teams are not more likely to concede a goal immediately after scoring. That, the beliefs of such experts are at variance with statistically measurable aspects of the game raises interesting questions about the validity of our reliance on experience as a basis for judgment and, more parochially, suggests that there may be opportunities for developing and informing strategies based on analysis rather than intuition.

Secondly, Moritz Daum, Jan Rauch and Friedrich Wilkening investigate whether professional footballers have adequate knowledge of the laws of momentum. Their chapter applies the literature on intuitive physics showing that many adults possess naïve ideas about matter, energy and the forces those concepts have on each other. Due to this so-called naïve Aristotelian concept of physics, people tend to underestimate the momentum of a moving object when they try to redirect it to a target and, thus, miss the target. Daum and his colleagues analyse all matches of the 2006 World Cup and identify some 377 situations where a forward player redirected a ball, which came from a cross, by kicking or heading it towards the goal. Those situations are then evaluated with respect to positions and angles. As regards the shots, Daum et al. find that the observed distribution were almost in line with that of the theoretical model, suggesting that the players were aware of the physical laws. In contrast, but consistent with prior research, the observed distribution of the headers deviates from that of the model, indicating systematic errors and reliance on naïve physics among the footballers. The authors speculate that the reason for this tendency originates from cognitive factors.

Thirdly, Martin Kocher, Marc Lentz and Matthias Sutter survey beliefs related to penalty shootouts. Such a breathtaking procedure is now commonly used in cup competitions to settle matches that end with a draw when 90 minutes and 30 minutes overtime has been played. The authors have collected data on the penalty shoot-outs from 20 years of the German Football Association Cup (DFB-Pokal). Contrary to some frequently invoked myths, they do not find any evidence that the home team win more often than the away team or that taking the first penalty would give a

decisive advantage. Their analyses also suggest that in the early rounds of the cup, professional footballers are more likely to miss when the penalty is decisive, but this tendency disappears the closer the team is to the final. However, in later rounds, players of the home team are slightly more likely to fail to convert penalties than the players of the away team. The authors discuss their findings in light of literature concerning the influence of social pressure and “choking”.

**Strategic choice:** This section is devoted to the choice behaviour of footballers when taking penalty kicks. Specifically, the behaviour of both actors involved in such a situation is considered. Starting from the perspective of the striker, the game theorists Wolfgang Leininger and Axel Ockenfels note that the scoring probability of penalties taken before 1974 was significantly lower than those taken after 1976. The authors attribute this finding to institutional changes. In particular, they argue that the *institution* of the penalty duel before 1974 could be depicted, in game-theoretical terms, as a so-called  $2 * 2$  game between the striker and the goalkeeper. Such a game involved two behavioural options: shot (or dive) to the left or the right corner of the goal. After 1976, the institution of the penalty-taking was modified to the form of a so-called  $3 * 3$  game involving the previously mentioned options as well as the alternative to shoot (or stay) in the middle of the goal. Thus, the choice set of the players had been expanded. Leininger and Ockenfels claim that this change in the perception of penalty-duels (as two different games) was caused by the “shrewd and revolutionary” penalty taken by the Dutch player Johan Neeskens in the final of the 1974 World Cup between West Germany and Holland. In the first minute, Neeskens aimed a penalty straight into the middle of the goalmouth. The introduction of this new innovative strategy is said to have been completed when, in 1976, the Czechoslovak player Panenka followed the example of Neeskens and decisively settled the European Championships final between West Germany and Czechoslovakia. The authors end their chapter by discussing the application of game theory to the game of football.

Focusing on the perspective of the goalkeeper, the psychologists Ofer Azar and Michael Bar-Eli analyse the outcomes of 286 penalties in international matches. Their analyses indicate that given the empirical distribution of kicks, the difficulties in foreseeing the behaviour of the striker as well as the need for immediate action, the best strategy for goalkeepers is to simply remain in the middle of the goal. Despite this alleged rational strategy, the data show that goalkeepers stay put in less than 6.3% of the penalties. The authors argue that the observed behaviour depends on “action bias” triggered by the conventional norm saying that

goal keepers must dive when trying to save penalties. A survey of 32 professional goalkeepers gives evidence that confirms the existence of this norm. According to the survey, a conceded goal yields worse feelings for goalkeepers when staying in the middle of the goal (= omission of action) than diving to one of the corners. As argued by the authors, this observed tendency of biased decision-making is somewhat remarkable, because goalkeepers have incentives to act in a rational manner and also frequently encounter this type of situation.

**Team behaviour and performance:** This section includes three chapters that survey phenomena related to the team of footballers on the pitch. To open this part, psychologists Chanan Goldschmidt and Gary Bornstein introduce the interesting idea that the way a footballer celebrates the goal he (or, for that matter, she) has just made reveals his (her) attitudes towards his (her) team and team-mates. Their idea stems from the fact that scoring a goal implies rewards for both the individual player as well as his (her) team. Drawing on literature from economics and psychology, the authors hypothesise that football clubs with team-oriented scorers will perform better than clubs with self-oriented scorers. Post-scoring behaviour of 125 goals were evaluated with respect to three categorical variables: (1) the degree of attention to the spectators or the team-mates, (2) the direction of the running of the scorer after the goal (spectators vs. team-mates) and (3) the number of team-mates embracing the scorer. In the terminology of Goldschmidt and Bornstein, team-oriented (or self-absorbed) players tend to turn to their attention and run to their team-mates (or the spectators) and hug at least seven (or less than two) of their team-mates. The authors find some tentative empirical support for their hypothesis, but acknowledge the need for further research to establish the validity of their intriguing methodology and the robustness of their observations.

Stimulated by evidence showing that the colour of sportswear has an impact on the likelihood of winning in many individual sports (e.g., boxing, tae kwon do, wrestling and judo), Matthias Sutter and Martin Kocher investigate whether such a tendency is present in football. Based on analyses of data from the German Football League (i.e., Bundesliga), they document that this tendency does not appear to exist in the world's greatest sport. This finding is perhaps not so surprising when one considers the nature of football (cf. Ben-Naim et al., 2007). The authors discuss possible reasons for why the colour of sportswear is associated with different effects in individual and team sports.

The section ends with a chapter by Lionel Page and Katie Page investigating the empirical support of the Second Leg Home Advantage.

This notion refers to the effect which occurs when teams are, on average, more likely to win a two-stage knockout competition when they play at home in the second leg. Examining some 5,000 matches from more than 50 years of three different European football cup competitions, the authors show that this effect exists and is still significant after controlling for extra time and team ability. It should be noted that the effect seems to have weakened over the recent years. The authors argue that the Second Leg Home Advantage could be attributed to the differential stakes involved in the two matches. After all, the second match in a two-stage knockout is decisive.

**Referee behaviour:** This section spans two chapters concerning economic and psychological analyses of referee decision-making. Firstly, Peter Dawson analyses of patterns in the incidence of disciplinary sanction (yellow and red cards) taken against players in the English Premier League over the period 1996-2003. His analyses show an increase in the number of offences subject to disciplinary sanction, but there is no consistent trend in the incidence of disciplinary sanctions. However, individual referee effects make a significant contribution to the explanatory power of the model, suggesting inconsistencies between referees in the interpretation or application of the rules.

Secondly, drawing on psychological principles of perception and psycho-physics, Ralf Brand, Henning Plessner and Christian Unkelbach examine two of the more controversial refereeing tasks: judging offside and awarding yellow cards. As regards the former task, the authors cite evidence suggesting that about a quarter of the judgments are incorrect and discuss possible reasons for this gloomy fact. One explanation concerns psychophysical limitations in perception and the argument is as follows. To judge offside correctly, the lineman has to simultaneously keep at least five objects (i.e., two players of the attacking team, the last two players of the defending team and the ball) in his/her visual field; a task that is impossible for the human eye to resolve. Another explanation is called optical-error hypothesis and stems from the fact that it is very difficult for the linesman to maintain the optimal position where offside can be correctly decided. Once he deviates from this position, he will ultimately make systematic errors. Moreover, Brand and his colleagues assume that the decision to award a yellow card can be characterised as a categorical task where the referee must classify any given contact scene between two or more players into categories like “no foul”, “foul” and “severe foul punishable with a yellow card”. Following this assumption, the authors describe a theoretical model of the mental processes underlying decisions of such classifications as well as quote recent empirical evidence

illustrating how this model applies to refereeing. They conclude that the study of basic psychological processes is highly important for understanding (flawed) referee decision-making and for developing measures that help referees to improve their skills.

## **Second half: Off-pitch phenomena**

The second half of the book focuses on phenomena that concern attitudes and behaviour of actors at the side of the pitch. Specifically, ten chapters deal with four themes: (1) fan behaviour and demand for football, (2) predictions of match outcomes, (3) labour market and conditions for footballers and (4) stock-market reactions to events of listed football clubs.

**Fan behaviour and demand for football:** This section starts with a chapter by Rob Simmons, where he challenges the conventional economic analysis of demand for football and argues that it rests on flawed assumptions. In particular, it assumes that fans are passive utility-maximizing consumers and that they react positively to uncertainty of the outcome. In contrast, he suggests that fans are indeed active and only interested in the prospect of success for their teams. After all, fans try to help their teams by putting pressure on the players of the opposing team and the referees through various activities. Occasionally, they may also harass the manager of their own team when it does not meet up with their expectations. Simmons surveys recent research on the role of attendance to match outcome. He concludes that fan pressure often gives an edge to the home team, but could also have less desirable consequences in that it could lead its players to underperform. For example, research points out that the players of the home team tend to miss their penalties to a larger extent than those of the away team, as also described by the previously mentioned chapter of Kocher and his colleagues.

The section continues with a chapter concerning how supporters evaluate their favorite clubs. Vyacheslav Jevtushenko, Mathias Landsberg and Magnus Söderlund look into the matter by applying two approaches originating from consumer research. One of them implies that fans give an overall evaluation of their club as well as evaluate it with respect to different attributes (e.g., playing performance and home stadium facilities). The other approach assumes that fans accumulate in their memory salient incidents associated with their club (e.g., a win of cup final and relegation from the first league). Based on a survey involving 1047 avid Swedish football fans, the authors document the following findings: (1) both negative and positive incidents in the life of a supporter influence how their favorite club is perceived, (2) the influence of negative incidents

tends to deteriorate over time, whereas the influence of positive incidents remains intact. Thus, the memories of an infamous loss will vanish, but the memories of a successful cup final will live forever.

Finally, José Lejarraga and Guillermo Villa analyse the sporting mortality of professional football teams. They hypothesise that professional sports leagues exhibit a liability of newness, meaning that new teams are the first to go down. Using data from the Spanish Football League for seasons 1992/1993 to 2003/2004, they estimate demotion probabilities and explore the possibility of a liability of newness. Their results show that new teams are more likely to be relegated. Based on the demotion probabilities, a novel measure of competitive balance is introduced and proved to be a significant determinant of attendance. The authors discuss their findings in light of the literature on organisational failure.

**Expert and market predictions of match outcome:** This section is devoted to illuminating the ability of individual football experts and so-called experimental asset markets to predict the outcome of international football tournaments like the World Cup and the European Championships. The section consists of three chapters. Firstly, Patric Andersson addresses the question: How good are football experts in predicting football? He argues that three main groups of experts exist: tipsters (i.e., those who issue forecasts and betting advice in the newspapers), odds-setters (i.e., those who assess the chances for different sports events) and pundits (i.e., those who make forecasts of football on a non-professional basis). Besides surveying prior economic and psychological research on the area, he conducts an empirical investigation on the ability of professional tipsters and odds-setters to predict the outcomes of previous World Cup matches. This investigation is based on archival data. Prior research suggests that forecasting ability varies between different football experts in that tipsters seem to be poor at predicting, whereas odds-setters are good at producing reasonably accurate probabilistic forecasts. On balance, the empirical investigation gives results that are fairly consistent with prior research. Specifically, it indicates that tipster performance is modest and that odds-setters give pretty realistic probabilistic forecasts of the match outcomes of the World Cup, although they exhibit some tendencies of under- and overestimate the actual frequencies. Such tendencies relate to, what is called in the jargon of economists, the favourite-longshot bias. As claimed by the author, when evaluating the forecasting performance of football experts one must take into account the fact that the sport, which they try to foresee, is associated with high complexity and a limited degree of predictability.

Secondly, Carsten Schmidt and Axel Werwatz tackle the general question: How well do markets predict the outcome of an event? For the Euro 2000, the authors innovatively set up an experimental asset market where subjects bought and sold contracts regarding the winning teams of individual matches. Besides comparing market-generated probabilities with odds of bookmakers, the authors identified the determinants of the quality of the market prognosis. The market performed better than random and was slightly better than the odds (in terms of mean square error). Moreover, the more certain the market predicted the outcome of an event to be the more accurate was the prediction.

Thirdly, Carsten Schmidt, Martin Strobel and Henning Oskar Volkland revisit the analysis of the previous chapter by using data of the World Cup 2002 prediction market. In addition, they propose a new method for testing predictive accuracy by means of a non-parametric test for the similarity of probability distributions and evaluate the incorporation of information in market prices by comparing pre-match and half-time price data. They find a reversed favourite-longshot bias—stating that bettors overestimate the favourites' probability of winning and underestimate the longshots' probability of winning—when analysing market prices before the start of the match and this bias does not disappear with the inflow of new information until half-time. Unlike the markets bookmakers' appear to be perfectly calibrated. Consistent with the study by Schmidt and Werwatz in the previous chapter the markets do assign relatively higher probabilities to their favourite when compared to the odds-setters. Together with a long streak of surprising outcomes this fact appears most likely to be responsible for the predictive inaccuracy of the 2002 World Cup prediction market.

**Labour market and conditions for footballers.** This section begins with a chapter by Bernd Frick, Gunnar Pietzner and Joachim Prinz that aims to identify the individual characteristics influencing the duration of player careers. To investigate this issue, the authors rely on a unique data set on all footballers that have played in the German Football League (Bundesliga) in any of the seasons from 1963/64 to 2002/03. On average, the career of the players lasted less than four years. The statistical analyses show that the length of the career was affected by player age, position, tenure with the current team, number of games played and number of goals scored per season. For example, goalkeepers tended to have the longest career, whereas forwards had the shortest. Besides individual characteristics, the livelihood of footballers depends on the performance of the club for which a player is active. The closer a team finishes to the bottom of the league, the higher is the probability that its individual

players disappear from the league. The authors discuss their findings in light of the changes in employment legislation (e.g., the Bosman-ruling).

Bruno Frey, Sascha Schmidt and Benno Torgler end this section and report on an empirical study examining the effects of relative income difference among football players. Their study is motivated by the paucity of empirical evidence in economics together with the greater availability of statistics in football. Their data set covers eight seasons of the German premier football league (Bundesliga) and includes a salary proxy and several performance variables. The results show that player performance is strongly affected by relative income position. When the salary of a player falls short of the average as this difference increases, his willingness to perform decreases, leading to a reduction of productivity. The larger the income differences within a team, the stronger are the effects of positional concern. Team composition also significantly affects behaviour. Frey and his colleagues conclude their chapter by discussing how those findings, which are based on the behaviour of football players, apply to business life.

**Stock-market reactions to events of listed football clubs:** In the final section of the second half, which concerns off-pitch phenomena, attention is drawn to the shareholders (and investors) of listed football clubs and how they react to different events related to the clubs. This section includes two chapters. Firstly, José Allouche and Sébastien Soulez consider three types of events and examine their effects on the (adjusted) stock-prices of listed clubs in the English football leagues. The types of events deal with (1) sports performance (i.e., wins or losses in cup competitions), (2) acquisitions and sales of players and (3) the business of the club. The employed data set includes all major events happening to the 14 listed football clubs (e.g., Manchester United, Newcastle and Leeds United) on the London Stock Exchange across three seasons. Adopting the traditional methodology of event studies in finance, the authors document that wins (losses) were associated with increasing (decreasing) stock-prices, but that the stock-market reacted differently depending upon the characteristics of the clubs as well as the nature of the performance. For example, the reactions to wins (losses) were larger (smaller) for clubs in the Premier League than clubs from the first and second divisions. Defeats (victories) in European cup competitions meant that the stock-prices plummeted (increased). Whereas sales of players had no effects, signing new players lead to drops in the stock-prices. As regards business events, news regarding sponsors and construction work on stadium was associated with positive reactions.

Secondly, Jan-Christoph Rülke and Georg Stadtmann take a closer look at how the stock-market responds to match outcomes of a listed

football clubs by applying two different approaches of news models. The authors use four seasons of stock-market data for Borussia Dortmund, which is the only German football club that is listed. Besides the commonly employed adjustment of the stock-price changes, the authors control for expectations of match outcomes by considering the odds from bookmakers. Their analyses suggest that there is a link between sporting success and subsequent changes in the stock-market and that alternation in the corporate governance tends to affect the stock price.

## **Conclusions and Pointers for Further Research**

Our firm belief is that future research on behaviour, cognitive fallacies, decisions, predictions and strategic choices in regard to football would benefit from interdisciplinary perspectives and approaches. Parallels can be drawn from behavioural economics, which has been stimulated by findings from psychological studies of decision-making and has incorporated them into formal models of human behaviour (cf. Thaler, 1992; Laibson and Zeckhauser, 1998). The field of behavioural finance also heavily capitalises on psychological concepts and has increased our understanding of investor and stock-market behaviour (Wärneryd, 2001). Psychologists can also profit from an awareness of economic perspectives (cf. Wärneryd, 1988).

The studies presented in this book, while all focused on football, give an indication that they can tell us about far more than just football; on reviewing the chapters in this book it is striking how often general aspects of behaviour not specific to football are revealed. Sometimes indeed issues can be analysed in football contexts *more* clearly and easily than in the broader contexts of life where one can envisage that they also apply. In this regard the famous words of Bill Shankly the legendary Liverpool manager of the 1960s and early 1970s have a certain resonance: “Some people believe football is a matter of life and death. I'm very disappointed with that attitude. I can assure you it is much, much more important than that.” The game of Football offers such an ideal opportunity to investigate such general issues as strategic choice, behavioural decision-making, management of resources, competition, judgmental forecasting, motivation and labour markets arguably because, unlike the many contexts in life where we wish to understand these issues, it has a clear-cut structure with well defined rules and objectives and offers some clear criteria for measuring performance.

That discussion and analysis of the game of football could be so effectively and hilariously parodied by Monty Python is also a sobering

warning to those who attempt to use formal methods to draw out implications from the game. However, we trust that one contribution of this book is to show that an analytic approach can offer real insights and progress in the understanding of a wide variety of types of behaviour involved in football. Finally, reviewing the evidence it is clear that Karl Marx was, in this one instance at least, correct: Socrates' goal was plainly offside.

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