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Field evidence from professional penalty kicking

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Coping with advantageous inequity – Field evidence from professional penalty kicking*

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This contribution examines the effect of advantageous inequity on performance using data from top-level penalty kicking in soccer. Results indicate that, on average, professionals do not perform worse when they experience unfair advantages. However, we find a negative effect of advantageous inequity in situations where success is less important.

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1. Introduction

The way people deal with unfair arrangements affects decision making in many economic areas, such as principal-agent problems, public choice, cooperation, or (multinational) bargaining. It is hence of great importance to understand how people react in situations where they receive more than they earn, meaning that their outcome/input ratio exceeds the one of the reference group. Adams (1965) labels these kind of arrangements as "advantageous inequity". Based on insights from cognitive dissonance theory and previous findings from the lab she concludes that inequity creates unpleasant tension within an individual, which increases in the level of unfairness. If inequity favors the individual, a feeling of guilt arises.[1]

Insights from social psychology and behavioral economics show that there are different ways to cope with advantageous inequity. For example, subjects might try to change the outcome/input ratio to restore fairness, or try to justify their advantage. However, almost all of the empirical results have been gained from laboratory experiments. This study uses field data from top-level penalty kicking in soccer to examine how professionals react to an unfair advantage in a high-stake environment where hesitation or 'pondering' typically weakens performance. We find that, on average, players' performance is not affected by the quality of the referee's decision on a penalty (henceforce labelled as call). This result is robust to different econometric strategies and a variety of controls. We therefore conclude that possibly existing fairness concerns are in the aggregate offset by self-serving mechanism. However, in situations where success is less important, kickers perform worse (by 14 percentage points) if the penalty call was either questionable or wrong. We interpret this result as a negative impact of advantageous inequity on performance.

The paper is divided into five parts. Section 2 briefly reviews previous literature. Section 3 presents the data set. In Section 4 we perform the empirical analysis. Finally, Section 5 concludes.

[1] See Baumeister et al. (1994) or Lewis et al. (2010) for an examination of guilt from a psychological perspective.

2. Literature review

A large body of research in social psychology and behavioral economics aims at understanding fairness concerns and their implications for the decision making process, including the seminal papers of Fehr and Schmidt (1999), Bolton and Ockenfels (2000), or Konow (2000). Generally, when being exposed to advantageous inequity, an individual must cope with two contradictory forces. These are self-interest ("what s/he wants") and fairness concerns ("what s/he believes to be right"). For instance, Peters et al. (2008) provide evidence for this inner conflict by showing that overpaid subjects need more time to report their satisfaction compared to a neutral setting. Or, as e.g. Sweeney (1990) demonstrates, we can observe that a higher wage does not increase pay satisfaction in case subjects perceive that they already earn more than they deserve.

Now, given that advantageous inequity brings subjects in an uncomfortable situation, there are two basic ways to attenuate the dissonance and/or to protect (or enhance) the positivity of the self. First, one way to deal with situations of inequality is to reduce it. For instance, in line with equity theory, the "survivor guilt" felt by workers whose colleagues are dismissed randomly leads to an increase in performance (see e.g. Brockner et al. (1986)). On the contrary, subjects tend to decrease effort when they feel unfairly treated, such as being poorly paid compared to a reference group (Lindquist, 2010; Abeler et al., 2010; Gächter and Thöni, 2010). Second, another way to cope with an unfair advantage is to justify it. The so-called self-serving bias (SSB) terms people's tendency "to take credit for successful outcomes in life, but to blame the situation or other people for failing outcomes" (Campbell and Krusemark, 2007, p. 846). The phenomenon was firstly described in a precise way by Heider (1958) who observed that cognition is affected by a person's needs, desires, and preferences (Mezulis et al., 2004). As an illustrative example, Babcock and Loewenstein (1997) mention the well-known *above-average effect* (or *illusory superiority*), by which subjects tend to overestimate their skills and abilities, but underestimate undesired personality traits.[2] In economics, the SSB is used to explain

[2] A related concept is *strategic self-ignorance*, see e.g. Thunström et al. (2016) or Onwezen and van der Weele (2016).

the outcome of negations (see e.g. Babcock and Loewenstein (1997) or Kriss et al. (2011)), tax evasion (Blaufus et al., 2015) or fiscal policies (Deffains et al., 2016). In one of the rare field studies, Babcock et al. (1996) examined teacher contract negotiations and found a SSB on both sides regarding a list of communities which serve as references in terms of wages.

However, most prior research on advantageous inequity has been limited to laboratory setups. For instance, a common research design is to ask subjects how satisfied they are with certain distributions, or about their perception of fairness in certain situations. Thus, to our best knowledge, there is not a single previous study that has investigated the impact of advantageous inequity on performance with field data. This paper seeks to close the gap with data from professional penalty kicking. Our approach helps to meet objections regarding the transferability of laboratory findings to real-life situations (Hart, 2005; Levitt and List, 2007, 2009). The skepticism arises from low monetary incentives, a small number of participations and a pool of subjects that is generally regarded as not being representative, and a potential bias coming from the influences of testers' preferences (e.g. Babcock et al. (1996)). Sports data, on the contrary, offer a wealth of information (Kahn, 2000) and high incentives for individuals.[3] Thus, we are confident that the high-stake environment at hand enables us to gain deeper insights on how professionals cope with unfair situations to their favor.

Data from penalty kicking have previously been used, notably to test game-theoretical predictions (see, e.g., Chiappori et al. (2002), Palacios-Huerta (2003), Azar and Bar-Eli (2011) or Dohmen and Sonnabend (2016)). Prior research has shown that there are manifold factors affecting the outcome of a penalty kick, such as the presence of spectators (e.g. Navarro et al. (2012)), playing at home or away (e.g. Dohmen (2008a)), players characteristics (e.g. Palacios-Huerta (2003), Savage and Torgler (2012), Baumann et al. (2011), Weigelt et al. (2012), or Dohmen and Sonnabend (2016)), the importance of success and the minute of play (e.g. Savage and Torgler (2012)), 'hot hand' or momentum effects (e.g. Jordet et al. (2012)), and stadium characteristics (e.g. (Scoppa, 2008)). We

[3]Savage and Torgler (2012) claim that "athletic fields supply real-world laboratories for testing economic theories" (p.2425).

acknowledge the importance of these variables and, consequently, use a large set of controls in our econometric approach to isolate possible effects of fairness concerns.

3. Data and Empirical Approach

A penalty kick in soccer is a shot taken from the penalty mark located in a distance of 11 meters to the goal. It is awarded for certain offenses inside the penalty area. Since players other than the kicker and goalkeeper must reside outside the penalty area, and the goalkeeper is not allowed to move forward until the ball has been kicked, the situation can be characterized as a duel between two players.[4]

The data we use are provided by IMPIRE AG – *Innovative Medientechnik und Planung AG* and comprise information on all penalty kicks taken in the first German professional soccer league (*1.Bundesliga*) since the start of the season 1993/1994 until the first half of the season 2003/2004.[5] In total, the data cover 857 penalty kicks attempted by 221 different players. All penalty calls are categorized into three distinctive categories according to the quality of the ruling:

- 'correct' if the call was indisputable and right,
- 'wrong' if the call was clearly false, and
- 'questionable' if the penalty call was neither clearly wrong nor without any doubt the right call.

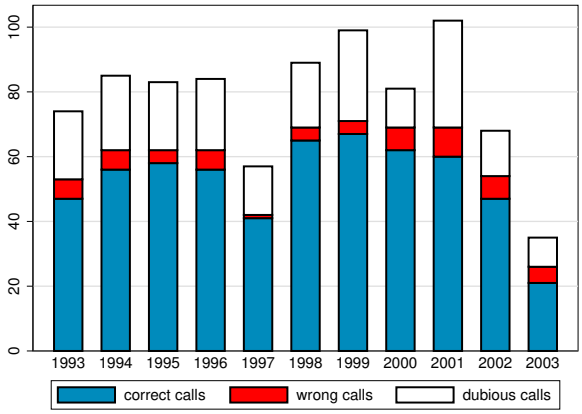
While Figure 1 plots the absolute number of penalty kicks in our data by quality of the call and season, Figure 2 additionally includes the intermediate score.

Moreover, the data provide detailed information about the outcome of the kick, the identity of the kicker, the fouled player, the fouling player, the defending goalkeeper, and

[4]Law 14 of the official *Laws of the Game* (Fédération Internationale de Football Association (FIFA), 2017) defines the procedural rules that apply to penalty kicks. A comprehensive summary and discussion can be found e.g. in Palacios-Huerta (2003).

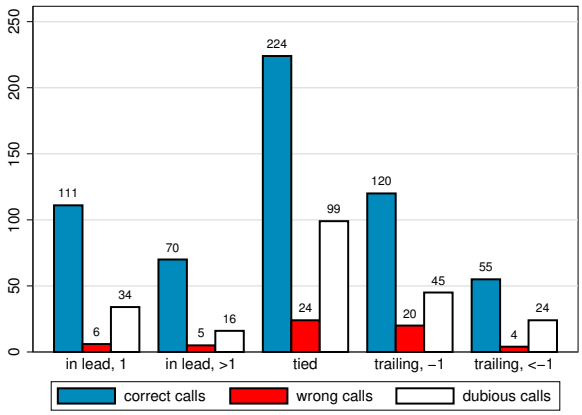
[5]IMPIRE AG, which was taken over by deltatre AG in 2014, is one of the largest independent media service providers in Germany (see http://www.bundesliga-datenbank.de/en/aboutus/). Their observers attend each league match of the German soccer league (*Deutsche Fußball Liga GmbH*) and collect detailed information on match actions including penalty kicks. Their reports might include inaccuracies, which, however, should not occur systematically.

Figure 1: Number of penalty kicks by quality of call and season.



Notes: Sample of penalty kicks in German Bundesliga, seasons 1993/1994 through 2003/2004. $N = 857$, 59 coded as wrong, 218 as questionable, and 580 as correct.

Figure 2: Number of penalty kicks by intermediate standing.



Notes: Sample of penalty kicks in German Bundesliga, seasons 1993/1994 through 2003/2004. $N = 857$.

the referee. Descriptive statistics for further variables used in our econometric analysis can be found in Table 1. It shows that a goal is scored in 74.49% of all observed attempts, and that a low number of 10.6% of kicks is taken by the fouled player himself.[6] As a first implication, we assert that the kicker is favored in the penalty-duel (which has often been described as a "war of nerves" (Palacios-Huerta, 2003)), and that the pressure therefore is on his side. Hence, we expect the player taking the penalty to be more vulnerable to distraction and uncertainty.[7] In addition, Table 1 reveals that 66% of penalty kicks are

[6]See Kuss et al. (2007) for an analysis of self-taking predictors.

[7]See Jordet et al. (2007) and Savage and Torgler (2012) for an extensive discussion on the stress/performance relationship in the penalty kick situation.

Table 1: Descriptive statistics of the main variables.

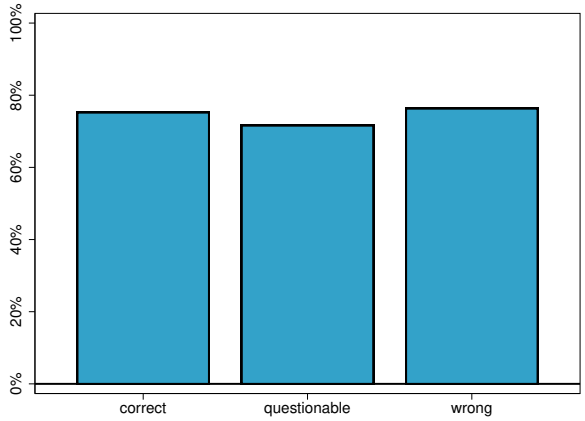
Variable	Mean	Std.Dev.	Min	Max
successful attempt	0.744	0.437	0	1
attempt by fouled player	0.106	0.308	0	1
minute	52.912	25.115	1	94
score difference	0.001	1.334	-5	6
home game	0.664	0.473	0	1
attendance (in % of capacity)	74.886	23.149	12.857	100
matchday	16.964	10.121	1	34
rank	9.065	5.274	0	18
points	20.797	15.018	0	70
goals	23.071	16.129	0	70
rivalry	0.018	0.131	0	1

Notes: Sample of penalty kicks in German Bundesliga, seasons 1993/1994 through 2003/2004, $N = 857$.

awarded to home teams. Combined with the fact that penalty calls favoring the home team exhibit a higher share of incorrect decisions (about 7%), this points to the known referee bias towards the home team (Dohmen, 2008b; Dohmen and Sauermann, 2016).

Next, Figure 3 presents kickers' rate of success by quality of the referee's call. Apparently, no visible correlation can be found, and, indeed, *wrong calls* have the highest rate of success. We turn to the econometric analysis in the next section.

Figure 3: Success rate of penalty kicks by quality of call.



Notes: Sample of penalty kicks in German Bundesliga, seasons 1993/1994 through 2003/2004. $N = 857$.

3.1. Econometric strategy and first results

In a more elaborate empirical approach, we intend to estimate the relationship between the quality of the penalty call and the kicker's subsequent scoring probability. In essence, we want to test whether advantageous inequity has an effect on performance or not. In case fairness concerns affect a player's performance, we should expect the scoring probability to decline given the penalty was not correctly called by the referee. However, if self-serving concerns and/or in-group-serving motives dominate, we should expect to observe no significant relationship between the quality of the call and performance (or even a positive one).[8]

Formally, we estimate the following linear probability model (LPM):

$$score_{i,k} = \beta_0 + \beta_1 incorrect\ call_{i,k} + \beta_2 fouled\ player\ kicks_{i,k} + \gamma' \mathbf{X} + \xi_k + \varepsilon_{i,k}. \quad (1)$$

The dependent variable, *score*, is a binary outcome measure that takes on the value one if the penalty kick i of player k is scored and zero otherwise.[9]

Our main variable of interest is again a binary variable. In detail, $incorrect\ call = 1$ when the umpire's call was not categorized as a correct call (i.e. categorized as 'questionable' or 'wrong'), and $incorrect\ call = 0$ when the call was classified as 'correct'.[10]

Next, $fouled\ player\ kicks$ is another dummy variable which equals one if the fouled player takes the penalty kick himself, and zero if otherwise. Naturally, it is only available for penalty kicks awarded after an offense committed against an individual opponent (about 89% of all observed penalty kicks), but not for infringements such as the illegal use of hands. Note that very few cases of "fouled player kicks" combined with "wrong call" exist.

[8] See e.g. Kandel and Lazear (1992), Gould and Kaplan (2011), or Georganas et al. (2015) for peer pressure effects on performance.

[9] The data do distinguish between penalties that were saved by the goalkeeper and kicks that missed the target without keeper interference. Unfortunately, we cannot use that additional information in our framework, since only about 5 percent of all attempts are outright misses. Yet, as a failed penalty kick can certainly be the result of excellent goalkeeping, we incorporate goalkeeper fixed-effects in column (5) of Table 2 to control for keeper ability.

[10] We combine the two categories 'questionable' and 'wrong' because the data only identify 59 penalty calls as 'wrong' (218 as 'questionable' and 580 as 'correct'). Consequently, we pool both categories together in order to compare two categories of comparable size.

Furthermore, $\mathbf{X}$ is a vector of team- and game-specific control variables including score difference dummies, 10-minute interval dummies for playing time, relative game attendance in percent of stadium capacity, as well as a home game dummy to control for a possible referee home-field bias. We also control for variables measuring success during games before by including goals scored, points and team ranking before the game. In addition, we include a dummy controlling for regional rivalry games (i.e. local derbies). While the score difference and the time played at the time of the call allow us to control for the relative importance of the penalty, we also include a seasonal trend to account for the steady decline in penalty conversion rates over time (see Figure A.1 in the Appendix). And, a match day linear trend is included to control for increasing importance to score within-season. Finally, fixed-effects ξ_k control for unobserved time-invariant kicker characteristics, and $\varepsilon_{i,k} \sim N(0, \sigma^2)$ is a mean-zero error term which captures all other uobserved factors influencing *score*. We refrain from using the number of attempted penalty kicks by player because we cannot sufficiently proxy experience due to the fact that we lack of information on players' careers before the observation period.[11]

Table 2 then tabulates the estimation results from different specifications of model (1). Our preferred specification (2) incorporates kicker fixed-effects, while controlling for a seasonal linear time trend.[12] It shows that the estimated β_1 is not significantly different from zero, meaning that a penalty call classified as being a correct call is not associated with a change in the scoring probability. This result suggests that, on average, advantageous inequity does not impact performance.

In addition, Table 2 reveals that it does not affect scoring rates when the fouled player takes the penalty kick himself (i.e. $\hat{\beta}_2$ is not statistically greater than zero).[13] And, we estimate a robust decline in performance for penalty kicks attempted at intermediate

[11] The endogeneity problem given by players' tendency to retire after failure has been discussed in Dohmen (2008a) and Dohmen and Sonnabend (2016).

[12] Note that Dohmen (2008a) identifies a structural change in scoring probabilities due to a rule change in 1997 according to which the keeper was allowed to change his position laterally on the goal line before the shot has been taken. Figure A.1 in the Appendix plots the annual conversion rate by season. Overall, we face a slight decline over the observed seasons but no structural break.

[13] This finding validates Kuss et al. (2007), who also assess that self-taking does not predict scoring probabilities. Moreover, we do not observe selection effects which might occur if a fouled player, being aware that the call was wrong, refuses to take the subsequent penalty kick: *incorrect call* and *fouled player kicks* are not correlated at any conventional statistical level.

scores of trailing by 3 through 5 goals. We interpret this as a give-up effect in the sense that penalty kickers do not give full effort due to the fact that the game is already out of hand.

Our main findings proof to be highly robust to different specifications. In detail, results do not change in case the seasonal trend is replaced by season dummies (column (4) of Table 2). The same applies for the inclusion of referee dummies (to control for potential unobserved referee characteristics) or goalkeeper dummies (to control for unobserved goalkeeper heterogeneity) in column (5). Besides these different LPM specifications, we also estimate a LOGIT model. The outcome is tabulated in column (3) of Table 2. Again, results do not change qualitatively compared to our preferred model estimates.

3.2. Split sample estimations

In the next step, we accommodate the fact that our data covers penalty kicks in a very heterogeneous set of situations by splitting the sample accordingly. Table 3 presents the results.

First, as kickers could react sensitively to the audience' composition and a familiar environment, we subdivide the overall sample into home and away game penalty attempts (columns (2) and (3)). Both samples do not differ qualitatively from the pooled-sample estimates (column (1)), as neither penalties in home nor away games yield a significant association between quality of the call and the outcome.

Second, choking under pressure is a well-documented phenomenon. For instance, research shows that, in general, choking becomes more likely the more is at stake.[14] We address this issue in terms of time and score. More specifically, we expect penalty kicks in the first half to be less relevant than kicks in the second half, simply because of the time left to alter the score and the overall outcome of the game. However, after splitting the sample into two halftimes (columns (4) and (5)), no significant difference for the association between the quality of the penalty call for the home and away game samples can

[14]For instance, Ariely et al. (2009) analyze experiments showing that individuals perform worse when stakes are higher.

be found.

Yet, things change when we take a look at intermediate scores (columns (6) to (8)). Here, the overall sample is grouped into three sub-sample: the kicker's team is trailing, the team is in the lead, or the game is tied.[15] While there is, again, no significant effect of the referee's decision quality on scoring probabilities in case of a setback or a tie, the quality of the kick is positively associated with the quality of the call if the benefiting team is in the lead. That is, kickers of a leading team perform worse given the penalty call was not correct. More precisely, in this case, the probability of a goal decreases by 14 percentage points (column (8)).

As an explanation, we point out that an additional goal's benefit when the team is already ahead is comparably low.[16] Ceteris paribus, scoring when the match is tied yields two additional points (for the match win), whereas an additional goal when trailing by one results in one point (for the tie). On the contrary, scoring in case of a lead does not change the points a team expects to be awarded at the end of the game. Following this idea, we argue that these situations leave more scope for fairness concerns, making kickers more vulnerable to advantageous inequity.[17] Moreover, there is reason to expect the effect to be nonlinear. Unfortunately, due to the relatively small number of observed penalties by score difference, we are not able to test our hypothesis.

[15]Note that, due to obvious data constraints, we refrain from using interaction terms in our estimation models. In addition, we do not split the overall sample into smaller sub-samples than presented in Table 3 because, at the level of a particular score (e.g. trailing by one), the number of observations is too small to fully trust the fixed-effects estimations.

[16]For instance, in a setting of penalty shootout kicks, Savage and Torgler (2012) juxtapose the 'pressure to win' and the 'pressure to lose'. The idea is that the penalty kick situation affects the kicker negatively in case a failure ends the shootout with a defeat for his team, whereas the possibility to win the shootout with a final goal might even be perceived as a positive stress effect. They find that while the 'pressure to win' increases the scoring probability by around 17 percent, the 'pressure to lose' decreases the scoring probability by around 45 percent.

[17]To rule out that the result is driven by score depending differences in the kicker selection, see that two-sided t-tests for differences in means reveal that neither self-taking nor the kicker's experience differ significantly across scores.

Table 2: Association between quality of penalty call and outcome

	(1)	(2)	(3)	(4)	(5)
	No FEs	**Preferred**	**Logit**	**FEs I**	**FEs II**
Incorrect call	-0.028	-0.033	-0.145	-0.028	-0.041
	(0.030)	(0.031)	(0.157)	(0.031)	(0.037)
Fouled player	-0.024	-0.027	-0.124	-0.029	-0.051
kicks	(0.051)	(0.060)	(0.258)	(0.062)	(0.061)
Team ranking	-0.005	-0.001	-0.032	-0.001	0.002
before game	(0.004)	(0.005)	(0.022)	(0.005)	(0.005)
Points	-0.004	0.001	-0.023	0.005	0.008*
before game	(0.003)	(0.004)	(0.017)	(0.004)	(0.005)
Goals scored	0.003	-0.000	0.019	-0.003	-0.006
before game	(0.003)	(0.004)	(0.015)	(0.004)	(0.004)
Rivalry game	-0.039	-0.082	-0.219	-0.055	-0.205
	(0.119)	(0.139)	(0.618)	(0.133)	(0.152)
Rel. attendance	0.000	0.001	0.000	0.001	0.002**
(in %)	(0.001)	(0.001)	(0.004)	(0.001)	(0.001)
Home game	-0.034	-0.048	-0.189	-0.049	-0.015
	(0.033)	(0.036)	(0.182)	(0.035)	(0.044)
Matchday trend	-0.002	-0.003	-0.009	-0.004	-0.004
	(0.002)	(0.002)	(0.012)	(0.003)	(0.003)
Seasonal trend	-0.007	-0.031***	-0.038		
	(0.006)	(0.011)	(0.029)		
S[-5,-3]	-0.189*	-0.209*	-0.902**	-0.202*	-0.210*
	(0.101)	(0.113)	(0.442)	(0.111)	(0.107)
S[-2]	0.015	0.022	0.087	0.015	-0.023
	(0.062)	(0.060)	(0.364)	(0.061)	(0.073)
S[-1]	-0.013	-0.032	-0.067	-0.030	-0.057
	(0.037)	(0.040)	(0.199)	(0.040)	(0.050)
S[1]	-0.083	-0.131	-0.439	-0.142	-0.231**
	(0.078)	(0.098)	(0.396)	(0.098)	(0.096)
S[2]	-0.040	-0.036	-0.224	-0.040	-0.104
	(0.068)	(0.083)	(0.357)	(0.083)	(0.091)
S[3,6]	-0.002	-0.020	-0.008	-0.025	-0.014
	(0.045)	(0.054)	(0.247)	(0.054)	(0.061)
Kicker FEs	-	*Yes*	*Yes*	*Yes*	*Yes*
Season FEs	-	-	-	*Yes*	*Yes*
Opponent FEs	-	-	-	-	*Yes*
Keeper FEs	-	-	-	-	*Yes*
Referee FEs	-	-	-	-	*Yes*
N	857	857	857	857	857
R^2	0.033	0.367	-	0.381	0.551

Standard errors in parentheses (cluster for kicker-id), * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Dependent variable is equal to 1 if observed penalty resulted in a score, 0 else. The data include 221 penalty kickers, 54 referees and 95 goalkeepers.

Table 3: Association between quality of penalty call and outcome - heterogenous situations

		Game location:		*Halftime splits:*		*Intermediate score:*		
	Pooled	**Home**	**Away**	**Half 1**	**Half 2**	**Trailing**	**Tied**	**In lead**
Incorrect call	-0.033	-0.019	-0.063	-0.083	0.027	-0.073	-0.011	-0.144**
	(0.031)	(0.038)	(0.069)	(0.067)	(0.042)	(0.068)	(0.053)	(0.070)
Fouled player kicks	-0.027	-0.062	-0.041	-0.051	-0.016	0.040	0.052	-0.133
	(0.060)	(0.071)	(0.108)	(0.100)	(0.073)	(0.131)	(0.110)	(0.092)
Further controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Kicker FEs	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
N	857	569	288	324	533	268	347	242
R^2	0.367	0.446	0.693	0.564	0.466	0.653	0.507	0.619

Standard errors in parentheses (cluster for kicker-id), * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Dependent variable is equal to 1 if observed penalty resulted in a score, 0 else. All specifications include the same set of control variables as specification (2) of Table 2, as well as kicker fixed-effects.

4. Conclusion

Findings from social psychology and behavioral economics suggest that advantageous inequity can impact the performance of individuals. However, the direction and magnitude of the effect is not entirely clear. This article expands the empirical literature, which is dominated by evidence from laboratory experiments, to data from the field.

That is, we use data from a high-stakes environment where highly trained athletes have to complete a standardized task. More specifically, we examine whether the quality of a referee's penalty kick decision (categorized as 'correct', 'dubious', or 'wrong') impacts performance of the attempting kicker. In other words, when attempting an incorrectly called penalty, the observed player encounters advantageous inequity.

Our findings indicate that, on average, no significant effect of an incorrect call on performance can be detected. Consequently, if adverse effects of advantageous inequity such as fairness concerns (guilt) exist, they are dominated by self-serving mechanism like (pure) egoism, in-group-serving motives, or, as a rather unconsciously working mechanism, the self-serving bias. This result is robust to alternative specifications used to control for unobserved factors which might influence penalty kick outcomes.

In a more detailed analysis, we look at performance in situations which differ with regard to the relative importance of success. While splitting the sample by first/second half or home/away turf does not yield different results, stratifying the data for the intermediate score reveals a significant negative effect of an incorrect call on the scoring rate. We explain this finding with a shift in the weights of the two opposing effects: Low-stake situations leave more scope for fairness concerns and/or 'pondering', which otherwise are suppressed or, whether consciously or not, ignored. In addition, as the dissatisfaction with rewards has been established as another consequence of unfairness (see e.g. Sweeney (1990)), the fear of spoiling the upcoming win provides a further explanation of the result. Overall, the finding can be seen as support for the insights gained from (low-stake) laboratory studies.

On the evidence presented, one might argue that we have no direct information on how the fouled player or the kicker, respectively, perceived the situation according to which the

penalty kick was awarded. To meet this objection, we state that professional soccer does not take place in a vacuum, and includes not only the athletes, managers and staff, but also spectators and media attention. Thus, we would expect that the way the opponent, (perhaps) the own team, and the audience react to wrongly awarded penalty kicks will ultimately mirror the quality of the referee's decision to the players involved. That is, beyond common partiality and all other things equal, reactions vary with the quality of the referee's decision.

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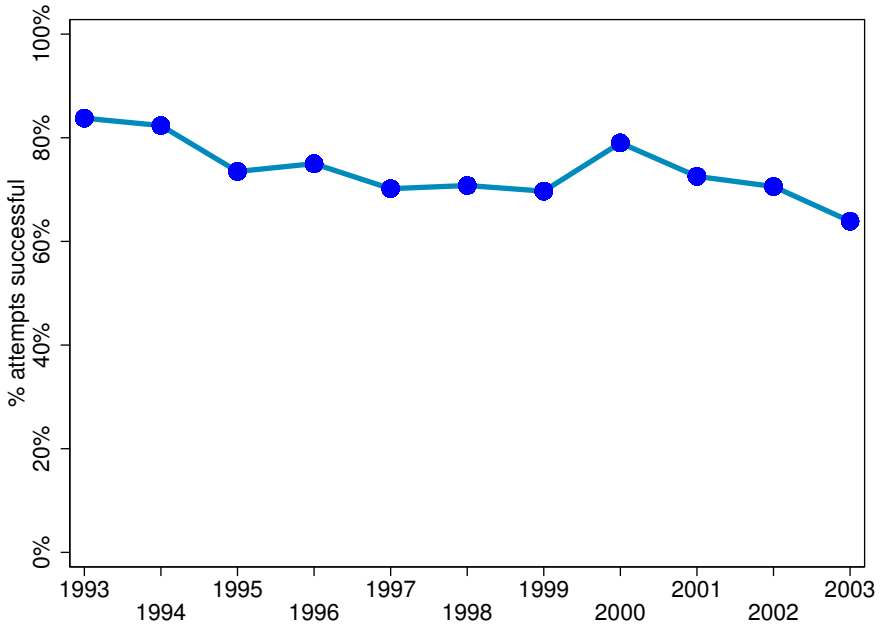
A. Appendix: Figures

Figure A.1: Percentage of successful penalty kicks by season.



Notes: Sample of penalty kicks in German Bundesliga, seasons 1993/1994 through 2003/2004. $N = 857$

Highlights

- We study the effect of advantageous inequity on performance.
- We therefore use field data from a high-stake environment, that is penalty kicking in professional soccer.
- On average, we do not find a significant effect of advantageous inequity on performance.
- However, if relative importance of performance is low, it shows that kickers perform worse when being exposed to advantageous inequity.