Long live Fenerbahçe: The production boosting effects of football

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Abstract

The connection between Turkish industrial production performance and the success of a popular Turkish football team, namely Fenerbahçe, is the central theme of this article. The success of Fenerbahçe is interpreted as a proxy for the workers' mood or morale. Performing a transfer function analysis on our monthly data set, we reveal positive feedback from Fenerbahçe's success, which proxies workers' mood/morale, to economic performance such that the monthly industrial growth rate increases by 0.26% with the number of games won by Fenerbahçe in European cups regardless of where the game is played. Evidence of the effects of games against domestic rivals on industrial performance is not statistically significant.
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The connection between Turkish industrial production performance and the success of a popular Turkish football team, namely Fenerbahçe, is the central theme of this article. The success of Fenerbahçe is interpreted as a proxy for the workers' mood/morale. Performing a transfer function analysis on our data set, we reveal a positive feedback from Fenerbahçe's success to economic performance such that the monthly industrial growth rate increases by 0.26% with the number of games won by Fenerbahçe in European cups, regardless of where the game is played. On the other hand, the evidence of the effects of Fenerbahçe's domestic games on industrial performance is not statistically significant. Based on our findings, it can be argued that there is a psychological/social link between the success of a top rank Turkish team and the performance of workers in industry.

The main claim of this study is that when people's favorite team is successful then they get in a better mood and become more productive. Since we do not have a direct measure of "mood", we employ the success of a popular football team as an indicator of people's "mood". We also provide an array of possible theoretical explanations for our hypothesis and propose a transmission mechanism that defines the process that links football success to workers' productivity. More specifically, Fenerbahçe's success is expected to affect growth of industrial production positively and in a statistically significant manner. The validity of this hypothesis is tested under different model specifications to check for the robustness of our statistical assessment.

At the very beginning, we should admit that our choice of Fenerbahçe as the object of analysis does not represent any subjective preferences. This choice is basically motivated by the general perception of the team by the Turkish society often uses the phrase "Fenerbahçe Republic". That is, the team is a stylized example/symbol of a long-lived sports institution and supporters' strong loyalty to it.[2]

The next section presents our proposed mechanism, which links productivity to football success. This is followed by a discussion of the relevant literature. Then, the structure of the Turkish football industry is described. Finally, estimates and commentary on results are presented as separate sections, in that order.

1. Proposed relationship between football success and productivity

It is argued that the proposed relationship between football success and industrial productivity is triggered by some temporary innovations to social cohesion among the supporters of a team. Football success, in this regard, is an innovation that boosts the morale and self-esteem of the fans of a team. This will elevate the individuals' morale and self-esteem. In this way, higher self-esteem will lead to higher production due to more social behavior and more efficient decision making. In the next section, we discuss, in more detail, each component of our proposed mechanism. It should be stressed that the lines of literature that are drawn upon are not mutually exclusive in their respective scopes.

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[2] As a part of robustness tests, we repeated the analysis for the other two big teams in Turkey (Beşiktaş and Galatasaray), the basic conclusions were robust.

2. Literature and the background material

2.1. Economics of sports

The economics of sports literature suggests that productivity can increase following the success of football. Coates and Humphreys (2002) investigate the determinants of real income in cities with professional sports teams and report evidence that the home city of the winner of the Super Bowl has higher real per capita income. Similarly, Pollard (2002) addresses the linkage between growth performance and the World Cup success of selected countries and demonstrates a positive relationship. Pollard (2002) highlighted the importance of income expansion effects through multipliers. However, it is plausible that productivity changes are also a source of growth.

There are other studies examining the relationships between success in sports and economic performance. Ashton, Gerrard, and Hudson (2003) reveal a strong association between the performance of the England's football team and subsequent daily changes in the FTSE 100 index. They mention a possible 'feel good' factor to explain why the stock market reacts to the performance of the national football team. Watson (2001) demonstrates that the Super Bowl has proved to be right 83% of the time in predicting an increase in the stock market. Similarly, in Haugen and Hervik (2002), ups and downs of the London Stock Exchange map the disasters and triumphs of the English football team.

None of these studies measure the exact mechanism through which sporting success affects production. However, all of them highlight the observation that sporting success has certain effects on economic variables. Consequently, one might attribute such effects to a psychological/social influence upon productivity.

2.2. Identity, social cohesion and spectating behavior

Iso-Ahola and Hatfield (1985) argue, when they examine spectator behavior, that in a sports culture it is likely that individuals will become sports consumers who are drawn most powerfully toward contests between equal but successful teams. Fans will also personalize victory and bask in reflected glory. Finally, external attribution biases psychologically insulate spectators from the pain of defeat, and internal biases make winning that much sweeter. Based on these, we can attribute importance to the role of sport events in re-establishing and maintaining the self-esteem and morale of the spectators.

The term 'social cohesion' is often used to describe a positive characteristic of a society that deals with the relationships among members of that society. It is synonymous with 'social fabric', implying a supporting structure for the groups within a society. In other words, it is the bonding effect of that web of social relationships through which individuals are attached to and help each other in a society, knowingly or inadvertently, to achieve their full potential (Stanley, 1997, p. 2).

It should be stressed that spectating behavior and football performance should not be thought of as major sources of identity and pride; but as complementary ones.

For an average citizen, football-related material is almost always accessible and consumable. More importantly, the consumption of football by a spectator mostly requires a gathering of people, although that gathering makes them an aggregate rather than a group. Moreover, once we accept the function of football to maintain pride, we can say that this aggregate becomes more closely attached each time they are engaged in a football event. In line with the above arguments, Kennedy (2001, p. 282) argues that in many cases in professional sports the community of spectators is a thoroughly commodified cohesion. He suggests, the state or commercial sponsors, and the broadcasting media, contribute to the lack of cohesion or lack of community that spectators otherwise feel in their everyday lives.

Social identification can be defined as the perception of belonging to a group and a sense of openness with the group (see, Ashfort & Mael, 2001). Tolman (1943) argues that with identification, agents feel at one with the group. The successes/failures of a group become the agent's successes/failures; the groups' prestige/humiliation becomes the agent's prestige/humiliation. Identification also enhances self-esteem, provides meaning and purpose in life and raises aspirations (see for example, Ibarra, 1999). Being a fan of a football team is a specific form of social identification. Fanship is an association in which a great deal of emotional significance is derived from membership. Schafer (1969) argues that fans of a team value their team as an extension of their personal sense of self. Therefore, they value their team's success as their own success. Success in football provides a reference point in agents' behavior to maximize their individual potential. Seeing what others are capable of may provide motivation to strive and achieve (e.g., Ibarra, 1999). Heider's (1958) balance formulation suggests that a fan of a team who evaluates a team positively will also evaluate the associated fan positively. Therefore, this increases the agent's self-esteem in the eyes of others. Sloan (1979) measured fans' moods before and after a game. He found that agents report greater happiness and lower anger or discouragement after a victory, and the opposite is true after a loss. Schwarz, Strack, Kammer, and Wagner (1987) reported that German men were more satisfied with their lives after a victory of the German national team in the 1982 Soccer World Championship but the opposite was true after a defeat. Hirt, Zillman, Erickson, and Kennedy (1992) found that one's favorite team's winning/losing does affect the fan's mood or self-esteem. After a win, agents estimated their own abilities to perform various tasks to be higher than subjects whose team lost. Moreover, game outcome affects agents' estimates of their own future performance.

Certain characteristics of football success can be an important dimension in the success–productivity relationship, especially when we reconsider the case in a domestic versus international perspective. Once we accept the aforementioned relationship, we could accept it for all teams in a domestic league. In this case, the success of a given team within a domestic league will improve the morale of its supporters while reducing that of the supporters of other teams, possibly implying a crowding out of productivity outcomes. On the other hand, when a team plays abroad against a foreign rival, it is quite likely that the domestic non-supporters of the team will support it on that occasion. Therefore, winning against a foreign rival will increase the morale of society more than winning against a domestic rival.

Another reason why wins against foreign rivals stimulate the production is that national pride could be enhancing self-esteem and mood for a sports fan even more. States usually have at least one national football team to represent them in international competitions and their national football associations represent them in the FIFA (Fédération Internationale de Football Association), (Duke & Crolley, 1996, p. 4). Anderson (1983) treats nations as imagined communities combining both objective and subjective attributes. Tomlinson (1994) suggests that nations attain their fullest expression in either of two ways: war or sport. Consequently, football captures the notion of an imagined community. The national identity is confirmed, when eleven players are representing it in a match against that of another nation. Therefore, general motivation and pride of a nation can be enhanced through football matches.

The contribution of sports to nationalism can be marked as important even in the era of globalization. Wong and Trumper (2002) examine the cases of two global celebrity athletes and conclude that they serve as national culture icons for the formation and reaffirmation of national identities in their countries of birth, despite their transnational nature.

2.3. Mood and productivity

Positive mood has been associated with various behaviors that may enhance performance; these are greater support behavior, enhanced creativity, more efficient decision making, greater cooperation, the use of more successful negotiation strategies and fewer absences (see, for example, Baron, 1990; Forgas, 1998; George, 1989; Staw & Barsade, 1993). George (1991a, 1991b) associates positive mood with sales-related prosocial behavior, but negative mood is associated with lower performance (Monk, 1990).

Even if there is extensive literature on the relationship between mood and performance, this does not mean that the causation is from mood to performance. It might very well be the case that performance affects mood (see, Wright, Cropanzano, & Meyer, 2004). However, Baumeister, Campbell, Krueger, and Vohs (2003) associate the mood with achieving more goals, more satisfaction with progress toward goals, more behavioral pursuit of goals. Their research suggests high self-esteem people use better self-regulation strategies than low self-esteem people to achieve their respective tasks.

On the other hand, Parkinson, Totterdell, Briner, and Reynolds (1996) argue that mood affects a range of processes including perception, reasoning, memory and behavior, all of which may be involved with performance. Totterdell (1999) found that cricket players' subjective and objective performances are related to their happiness, energy, enthusiasm, focus and confidence during the match. In particular, players perform better when they are happy, focused, energetic, enthusiastic and confident. As regards how mood affects performance, Matthews (1992) elaborated on two channels on this transmission: (i) the facilitating effects of energetic mood on information processing efficiency; and (ii) the facilitating effects of hedonic tone (pleasantness of mood) on the processing of mood-congruent information.

The model of George and Brief (1996) proposes that moods (both positive and negative) are related to performance. They argue that moods can influence both the distal (i.e., related to behavior choice or effort level) and the proximal (i.e., related to the actual task-specific behavior itself) aspects of motivation. For distal motivation, moods affect the various cognitive mechanisms associated with how one determines "appropriate" expectancy, instrumentality and valence levels. For example, positive moods lead to higher expectancies because of the effects that positive moods have on such cognitive processes as mood-congruent recall and judgment (George, 1996).

Moods, especially positive ones, may lead to proximal motivation (actual task-specific behaviors) through their ability to stimulate employee self-motivating behavior, even if their potential effects are not as easily observed and are not direct.

To sum up the discussion of this sub-section, this theory of psychology and the associated empirical research provide us with support as to how the positive/optimistic psychological state of individuals is correlated with job performance. In the spirit of the discussion of this section, Fenerbahçe's success, owing to the wide popularity of the team, significantly adds to fans' self-esteem and mood, consequently improving job performance and productivity due to a better decision making process and the enhancement of social cohesion, although it might be temporary.

On the whole, the literature that has been surveyed provides us with theoretical support as to the productivity enhancing effects of "football success". Briefly, spectating behavior transforms the football success into an elevated level of morale. This initial boost augments social cohesion and individual's self-perception. Then, through the self-esteem/mood channel, people tend to cooperate more, have more efficient decision making processes and demonstrate a higher level of productivity. From a technical point of view, we are not equipped to measure any of these variables except football success and productivity. Our proposed mechanism introduces a plausible attempt to explain the connection between sporting success and productivity, which has not been addressed in detail in earlier literature on sports economics.

3. Turkish football industry and social aspects of football in turkey

The Turkish National Football League (NFL) was established in 1959. The number of teams, varying between 12 and 20, was finally fixed at 18 after the 1994–95 season. Currently, all the teams play each other during the season and the winning team receives 3 points, ties get 1 point and the losing team gets no points. At the end of each season, the team having the highest overall score wins the championship.

The teams to play in the Turkish Cup are determined by the Turkish Football Federation on the basis of their previous performance in the Turkish Cup and in the NFL. The number of teams that play in the Turkish Cup changes every year. Unlike the NFL, the Turkish Cup uses the process of elimination.

Teams that represent Turkey in European tournaments are determined by games played among themselves. The first two teams in the NFL participate in the

Champions League. The winner of the Turkish Cup and the third, fourth and fifth teams participate in the UEFA Cup (Union of European Football Associations). The participants in the Cup Winners Cup (CWC) are the winners of each nation's Cups.

Certain characteristics of the Turkish football industry distinguish it from its counterpart in the US. First, the experience of sports franchises is not customary. There is no franchise market in which urban administrations demand the existence of professional sports teams in their territories. Rather, we observe an already settled structure (i.e., teams do not move from one city to another) and all sports teams are partially subsidized by the budget of the Ministry of Youth and Sports. Second, the teams established in Istanbul dominate the countrywide football industry. Finally, the construction of new stadiums is rare. Owing to these characteristics, our study also differs from studies in the earlier literature of Sports Economics since we deal with overall industrial performance rather than the well-being of individual cities.

A quick glance at football in Turkey will reveal that the football industry has developed rapidly during the last three decades. At this point, it is important to note that the evidence on the importance of football in Turkey is anecdotal rather than being in the form of full-fledged academic studies. We can base our discussion of the issue on two studies: In the first one, Sert (2000), similar to Iso-Ahola and Hatfield (1985), reports that football has turned out to be a lifestyle in Turkey. He argues that football has an almost perfect association with the more general term 'sports' in Turkey. Furthermore, the term football instantly calls forth the well-established football teams of Istanbul, one of which is Fenerbahçe. The mass media has played the most important role in cultivating the rapid emergence of this football culture, especially through primetime TV broadcasts. Weekly TV broadcast schedules are quite focused on football-related material. For instance, it is possible to find more than one football magazine issued regularly. Football, in general, turns out to be the most commonly shared public concern. Concerning football as a marketable mass-media commodity, Miller (1999) argues for the *televisualization* of sport and *sportification* of television, the process of sports teams becoming media entities.

4. Model and estimation method

To explore the linkage between national productivity growth and the success of a football club, in this case Fenerbahçe, the following general model is proposed in Eq. (1).

$$g_t^y = g^y(g_{t-i}^y, z_t, D_t) \tag{1}$$

With regard to this model, the following variable definitions apply. Industrial performance is measured by using g_t^y, the 100 times monthly rate of growth of the industrial production index, which is computed as the logarithmic difference of the seasonally adjusted industrial production index at time t. To be specific, we define

$$g_t^Y = 100 \times [\log(\text{IPSA}_t) - \log(\text{IPSA}_{t-1})] \tag{2}$$

Table 1
List of success variable

W_h: wins at home field

W_d: wins in opponent's field

T_h: ties at home field

T_d: ties in opponent's field

L_h: losses at home field

L_d: losses in opponent's field

W_h^{Turkey}: wins at home field, in the games played in NFL

W_d^{Turkey}: wins in opponent's field, in the games played in NFL

T_h^{Turkey}: ties at home field, in the games played in NFL

T_d^{Turkey}: ties in opponent's field, in the games played in NFL

L_h^{Turkey}: losses at home field, in the games played in NFL

L_d^{Turkey}: losses in opponent's field, in the games played in NFL

W_h^{Europe}: wins at home field, in the European cup games

W_d^{Europe}: wins in opponent's field, in the European cup games

T_h^{Europe}: ties at home field, in the European cup games

T_d^{Europe}: ties in opponent's field, in the European cup games

L_h^{Europe}: losses at home field, in the European cup games

L_d^{Europe}: losses in opponent's field, in the European cup games

$W_h^{Non\text{-}season}$: wins at home field, in the non-season games

$W_d^{Non\text{-}season}$: wins in opponent's field, in the non-season games

$T_h^{Non\text{-}season}$: ties at home field, in the non-season games

$T_d^{Non\text{-}season}$: ties in opponent's field, in the non-season games

$L_h^{Non\text{-}season}$: losses at home field, in the non-season games

$L_d^{Non\text{-}season}$: losses in opponent's field, in the non-season games

W_h^{Season}: wins at home field, in the season games

W_d^{Season}: wins in opponent's field, in the season games

T_h^{Season}: ties at home field, in the season games

T_d^{Season}: ties in opponent's field, in the season games

L_h^{Season}: losses at home field, in the season games

L_d^{Season}: losses in opponent's field, in the season games

W: wins

T: ties

L: losses

W^{Turkey}: wins in NFL

T^{Turkey}: ties in NFL

L^{Turkey}: losses in NFL

W^{Europe}: wins in European cup games

T^{Europe}: ties in European cup games

L^{Europe}: losses in European cup games

$W^{Non\text{-}season}$: wins in the non-season games

$T^{Non\text{-}season}$: wins in the non-season games

$L^{Non\text{-}season}$: wins in the non-season games

W^{Season}: wins in the season games

T^{Season}: wins in the season games

L^{Season}: wins in the season games

where $IPSA_t$ is the seasonally adjusted industrial production series. Industrial production is an official statistic compiled and published by the State Institute of Statistics of Turkey. It is computed on the basis of the survey data gathered from 913 firms with regard to 403 manufactured staple commodities. The base year of the index is 1997 and it summarizes nearly 73% of the total industrial establishments in Turkey.

For each month t, Z_t represents a vector of success variables for Fenerbahçe (Table 1 provides the full list of success variables), we denote the number of games won, tied, or lost with W, T, and L, respectively. A subscript of h refers to games played at Fenerbahçe home and d stands for the games played away, namely when it plays as guest. Absence of a subscript indicates that we aggregate data regardless of the home field. The superscript *All* is for all games; *Turkey* is for the games played in Turkey with Turkish teams regardless of the type of the tournament; *Europe* is for the games played in European tournaments; *Season* is for the games played in national-season; and *Non-season* stands for domestic games played outside national-season. If there is no superscript, then this denotes all games regardless of the type of the tournament and whether the game is played abroad or not. The actual game data is converted into the success variables simply by counting the number of wins, losses and ties for each month in prospective classification. The only exception is that a game actually played in month t is recorded for month $t + 1$ if the first workday after the game belongs to month $t + 1$.

A final component of our specification concerns the shocks to the economy: Turkey had experienced a devastating financial crisis in April of 1994, which adversely affected the real sector as well as the financial sector of the Turkish economy. In order to provide sufficient statistical control for this crisis, which decreased the industrial growth rate considerably, dummy variables denoted shortly by D_t are employed. In particular, the third, fourth, and fifth months of 1994 were controlled by using a dummy variable for each, D_{94-3}, D_{94-4}, and D_{94-5}, respectively.

5. Econometric specification and estimation method

The econometric specification of the model is given in Eq. (3). It is assumed that industrial production growth, g_t^Y, follows an autoregressive path; hence, it is regressed against its lags up to the fifth order and the success variables of Fenerbahçe. The inclusion of lags of the monthly rate of change in industrial production allows us to account for the dynamics of the original industrial production growth series. The optimal lag length for the growth of industrial production is determined by using the final prediction error (FPE) criterion. FPE criterion chooses the optimal lag length such that the residual terms in each time period are not autocorrelated.[3] In this way, the variance–covariance matrix of the estimated relationship is consistently estimated and the estimated parameters are unbiased and efficient.

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[3] Bayesian Information Criteria suggests the lag order to be 2. As a robustness test, we repeat the analysis with 2 lags. The results were robust. However, in order to save space, these results are not reported here.

The part of variation not explained by the autoregressive model for g^Y is attributed to Fenerbahçe by using the variables Z_{jt} as discussed above:

$$g_t^Y = \alpha_0 + \sum_{i=1}^{5} \alpha_i g_{t-i}^Y + \sum_{j=1}^{J} \gamma_j Z_{jt} + \delta D_t + \varepsilon_t \qquad (3)$$

In terms of Eq. (3), the values of α_k, $k = 0, \ldots, 5$, and γ_j are the parameters to be estimated. The set of variables Z_j are the success variables for Fenerbahçe and their lags are not included in the analysis, having observed that they were not statistically significant in the preliminary analysis, which is not reported in the article. The coefficient of D_t captures and controls for the effects of financial crises on industrial production. The ε_t's are the *i.i.d.* error terms.

The success variables in the 10 model specifications considered in this study can be demonstrated explicitly as follows, where Specification 1 is the most general model and subsequent specifications disaggregate the results by location and season,

$Z = [W, T, L]$ (Specification 1)

$Z = W^{\text{Turkey}}, T^{\text{Turkey}}, L^{\text{Turkey}}]$ (Specification 2)

$Z = [W^{\text{Europe}}, T^{\text{Europe}}, L^{\text{Europe}}]$ (Specification 3)

$Z = [W^{\text{Non-season}}, T^{\text{Non-season}}, L^{\text{Non-season}}]$ (Specification 4)

$Z = [W^{\text{Season}}, T^{\text{Season}}, L^{\text{Season}}]$ (Specification 5)

$Z = [W_{\text{h}}, W_{\text{d}}, T_{\text{h}}, T_{\text{d}}, L_{\text{h}}, L_{\text{d}}]$ (Specification 6)

$Z = [W_{\text{h}}^{\text{Turkey}}, W_{\text{d}}^{\text{Turkey}}, T_{\text{h}}^{\text{Turkey}}, T_{\text{d}}^{\text{Turkey}}, L_{\text{h}}^{\text{Turkey}}, L_{\text{d}}^{\text{Turkey}}]$ (Specification 7)

$Z = [W_{\text{h}}^{\text{Europe}}, W_{\text{d}}^{\text{Europe}}, T_{\text{h}}^{\text{Europe}}, T_{\text{d}}^{\text{Europe}}, L_{\text{h}}^{\text{Europe}}, L_{\text{d}}^{\text{Europe}}]$ (Specification 8)

$Z = [W_{\text{h}}^{\text{Non-season}}, W_{\text{d}}^{\text{Non-season}}, T_{\text{h}}^{\text{Non-season}}, T_{\text{d}}^{\text{Non-season}}, L_{\text{h}}^{\text{Non-season}}, L_{\text{d}}^{\text{Non-season}}]$
   (Specification 9)

$Z = [W_{\text{h}}^{\text{Season}}, W_{\text{d}}^{\text{Season}}, T_{\text{h}}^{\text{Season}}, T_{\text{d}}^{\text{Season}}, L_{\text{h}}^{\text{Season}}, L_{\text{d}}^{\text{Season}}]$ (Specification 10)

The models presented in Eq. (3) and the Specifications 1–10 are estimated using the ordinary least squares technique. The coefficients γ_j are of our interest Eq. (3). Using econometric terminology, these coefficients correspond to the transfer function that we estimate, which is the statistically estimated relationship that explains how an exogenous movement is transferred to an autoregressive endogenous variable. As the variable g_t^Y is assumed to follow an autoregressive process, this is interrupted by Z_{jt} in each period. The coefficients γ_j of the variables in Z_{jt} are tested under the null hypothesis (H_0: $\gamma_j = 0$). This type of specification is often used in the literature. For instance, Alesina and Sachs (1988), Heckelman and Berument (1998), Ito and Park (1988), and McCallum (1978) employ similar transfer function specifications in their analyses of political business cycles. Enders (2004, Chapter 5) can be accessed for an adequate discussion of the transfer function analysis. In recent literature, Ergun (2000) also used the transfer function analysis to investigate various Turkish macroeconomic variable aggregates, including industrial production. In this case, we study the effects of Fenerbahçe's success on Turkish industrial performance. Our work falls in the class of transfer function analyses by the definition of Z_{jt}.

One may suspect a two-way statistical connection between morale and productivity, suggesting simultaneity bias; our treatment of the variables of interest allows us to avoid such bias since it is unlikely that industrial production will affect the success of Fenerbahçe. In that sense, we do not have a simultaneity bias issue and the likelihood of having an accidentally significant statistical relationship is minimized at the design stage. Charemza and Deadman (1992, Chapter 6) can be seen for a discussion of the simultaneity bias.

5.1. Data

Data on industrial production reported by the State Institute of Statistics of Turkey were compiled from the electronic data delivery system of the Central Bank of the Republic of Turkey (it can be reached at http://tcmbf40.tcmb.gov.tr/cbt.html). Historical game records of the football performance of Fenerbahçe in international cups as well as in domestic games were compiled from Tanrikulu (2002) and the official website of the UEFA. (UEFA data are accessible at http://www.uefa.com.) The study period is from 1986:8 to 2002:5 and data is compiled or computed at monthly frequencies.

6. Results and commentary

6.1. Estimation results

We present the model estimates in Tables 2 and 3. The specifications of Table 2 hide the home-versus-away field information. In the specifications presented in Table 3, we distinguish between the home- and away games so as to find out whether the field is an important factor in translating the success of the team into workers' morale. The crisis dummies and the lags of the dependent variable are common to both tables, as well as the sum of squared residuals and coefficients of determination reported at the end of the estimation. A quick glance at the tables shows the negative impact of the April 1994 financial crisis. In all 10 specifications, the estimates of the dummy variables are significantly negative. The level of significance is 5% throughout the study unless otherwise noted.

Specification 1 of Table 2 provides us with statistically significant evidence that Fenerbahçe's total number of wins affects the growth rate of the seasonally adjusted industrial production (industrial production hereafter) positively. The magnitude of the corresponding coefficient estimate is 0.046 (0.046%). Therefore, Fenerbahçe's success is transformed into increased productivity.

Specifications 2 and 3 are designated to test whether the findings of Specification 1 stay the same when we separate games as domestic versus the international. When a team plays against foreign rivals, the effect on morale of a win is augmented by the enhancement of national identity; whereas, when it plays against a domestic rival, the effects might offset each other. Moreover, as the domestic rival loses, there is a possible cancelling out effect when the fans of rival team have bad moods, and the

Table 2
Estimates of the transfer function Specifications (1–5)

Explanatory variables	Specifications				
	1	2	3	4	5
Constant	0.198[*]	0.237[*]	0.311[*]	0.28[*]	0.262[*]
	(2.451)	(3.125)	(6.009)	(3.586)	(4.599)
D_{94-3}	−0.586[*]	−0.598[*]	−0.578[*]	−0.587[*]	−0.526[*]
	(−7.542)	(−7.523)	(−7.065)	(−7.061)	(−6.342)
D_{94-4}	−0.646[*]	−0.623[*]	−0.579[*]	−0.621[*]	−0.517[*]
	(−6.326)	(−6.090)	(−5.599)	(−5.817)	(−5.013)
D_{94-5}	−1.524[*]	−1.476[*]	−1.428[*]	−1.484[*]	−1.451[*]
	(−15.733)	(−14.309)	(−13.989)	(−14.218)	(−14.376)
W	0.046[*]				
	(2.141)				
T	0.013				
	(0.347)				
L	0.044				
	(1.236)				
W^{Turkey}		0.032			
		(1.392)			
T^{Turkey}		0.022			
		(0.543)			
L^{Turkey}		0.035			
		(0.767)			
W^{Europe}			0.251[*]		
			(3.769)		
T^{Europe}			−0.055		
			(−0.515)		
L^{Europe}			−0.036		
			(−0.678)		
$W^{\text{Non-season}}$				0.117[*]	
				(3.065)	
$T^{\text{Non-season}}$				0.029	
				(0.385)	
$L^{\text{Non-season}}$				0.079[*]	
				(2.037)	
W^{Season}					0.026
					(1.067)
T^{Season}					0.006
					(0.142)
L^{Season}					0.01
					(0.197)
g^Y_{-1}	0.288[*]	0.298[*]	0.302[*]	0.307[*]	0.306[*]
	(3.613)	(3.726)	(3.701)	(3.919)	(3.746)
g^Y_{-2}	0.277[*]	0.281[*]	0.298[*]	0.305[*]	0.283[*]
	(3.609)	(3.638)	(3.800)	(3.841)	(3.575)
g^Y_{-3}	0.012	0.000	0.019	0.006	0.001
	(0.144)	(0.000)	(0.205)	(0.069)	(0.013)
g^Y_{-4}	−0.049	−0.053	−0.065	−0.068	−0.054
	(−0.639)	(−0.688)	(−0.845)	(−0.879)	(−0.708)
g^Y_{-5}	0.193[*]	0.200[*]	0.178[*]	0.18[*]	0.189[*]
	(2.895)	(2.950)	(2.709)	(2.751)	(2.781)

(*continued on next page*)

Table 2 (*continued*)

Explanatory variables	Specifications				
	1	2	3	4	5
SSR	34.6	35.12	34.67	34.08	35.47
R^2	0.88	0.87	0.88	0.88	0.87
$\overline{R}^2$	0.55	0.54	0.55	0.56	0.54

Note: *t*-statistics are reported in parentheses under the corresponding estimated parameters.
* Denotes significance at the 5% level.

Table 3
Estimates of the transfer function Specifications (6–10)

Explanatory variables	Specifications				
	6	7	8	9	10
Constant	0.238*	0.257*	0.309*	0.277*	0.300*
	(3.162)	(3.264)	(5.979)	(5.209)	(3.755)
D_{94-3}	−0.695*	−0.691*	−0.581*	−0.526*	−0.699*
	(−6.466)	(−6.424)	(−7.081)	(−6.338)	(−5.847)
D_{94-4}	−0.604*	−0.595*	−0.576*	−0.499*	−0.595*
	(−5.536)	(−5.294)	(−5.538)	(−4.792)	(−5.239)
D_{94-5}	−1.503*	−1.482*	−1.425*	−1.397*	−1.491*
	(−14.123)	(−13.462)	(−13.854)	(−13.524)	(−13.268)
W_h	0.036				
	(0.864)				
W_d	0.065				
	(1.570)				
T_h	0.081				
	(1.226)				
T_d	−0.035				
	(−0.620)				
L_h	0.050				
	(0.960)				
L_d	0.003				
	(0.056)				
W_h^{Turkey}		0.021			
		(0.494)			
W_d^{Turkey}		0.058			
		(1.340)			
T_h^{Turkey}		0.082			
		(1.230)			
T_d^{Turkey}		−0.035			
		(−0.596)			
L_h^{Turkey}		0.050			
		(0.824)			
L_d^{Turkey}		0.016			
		(0.235)			
W_h^{Europe}			0.257*		
			(2.148)		

Table 3 (*continued*)

Explanatory variables	Specifications				
	6	7	8	9	10
$W_{\mathrm{d}}^{\mathrm{Europe}}$			0.264*		
			(2.001)		
$T_{\mathrm{h}}^{\mathrm{Europe}}$			−0.282*		
			(−2.077)		
$T_{\mathrm{d}}^{\mathrm{Europe}}$			−0.026		
			(−0.194)		
$L_{\mathrm{h}}^{\mathrm{Europe}}$			0.017		
			(0.148)		
$L_{\mathrm{d}}^{\mathrm{Europe}}$			−0.090		
			(−1.177)		
$W_{\mathrm{h}}^{\mathrm{Non\text{-}season}}$				0.178*	
				(1.936)	
$W_{\mathrm{d}}^{\mathrm{Non\text{-}season}}$				0.089	
				(0.814)	
$T_{\mathrm{h}}^{\mathrm{Non\text{-}season}}$				0.144	
				(1.218)	
$T_{\mathrm{d}}^{\mathrm{Non\text{-}season}}$				0.161	
				(1.485)	
$L_{\mathrm{h}}^{\mathrm{Non\text{-}season}}$				0.105	
				(1.139)	
$L_{\mathrm{d}}^{\mathrm{Non\text{-}season}}$				0.049	
				(0.559)	
$W_{\mathrm{h}}^{\mathrm{Season}}$					0.011
					(0.251)
$W_{\mathrm{d}}^{\mathrm{Season}}$					0.057
					(1.299)
$T_{\mathrm{h}}^{\mathrm{Season}}$					0.083
					(1.146)
$T_{\mathrm{d}}^{\mathrm{Season}}$					−0.055
					(−0.902)
$L_{\mathrm{h}}^{\mathrm{Season}}$					0.020
					(0.282)
$L_{\mathrm{d}}^{\mathrm{Season}}$					−0.007
					(−0.109)
g_{-1}^{Y}	0.262*	0.275*	0.302*	0.281*	0.279*
	(3.178)	(3.346)	(3.708)	(3.607)	(3.329)
g_{-2}^{Y}	0.298*	0.296*	0.300*	0.318*	0.304*
	(3.964)	(3.972)	(3.788)	(4.027)	(4.000)
g_{-3}^{Y}	−0.002	−0.009	0.019	−0.018	−0.007
	(−0.021)	(−0.108)	(0.209)	(−0.213)	(−0.079)
g_{-4}^{Y}	−0.064	−0.063	−0.069	−0.072	−0.066
	(−0.842)	(−0.827)	(−0.892)	(−0.909)	(−0.879)
g_{-5}^{Y}	0.207*	0.206*	0.179*	0.206*	0.195*
	(3.072)	(3.040)	(2.729)	(3.161)	(2.892)
SSR	34.21	34.58	34.58	33.63	34.79
R^2	0.88	0.88	0.88	0.88	0.88
$\overline{R^2}$	0.56	0.55	0.55	0.56	0.55

Note: *t*-statistics are reported in parentheses under the corresponding estimated parameters.
* Denotes significance at the 5% level.

low productivity of those fans could cancel out the high productivity of Fenerbahçe fans. In our statistical models, Specification 2 and Specification 3 are used to address these arguments.

Specification 2 suggests that the wins of Fenerbahçe against its domestic rivals have no statistically significant impact on productivity. As depicted by Specification 3, the effects on industrial production of Fenerbahçe's wins for games played in Europe turn out to be positive and statistically significant. The magnitude of the positive transfer from the number of wins to the monthly rate of industrial production growth is about 0.25%. Fenerbahçe's total impact will be proportional to the number of wins in a given month. That is, when Fenerbahçe wins twice as many games in a given month, the feedback to the industrial production is doubled in magnitude. Specification 3 also shows significant evidence that industrial production is adversely affected by Fenerbahçe's ties and losses in European games, meaning that the coefficient estimates have the expected signs though they are not statistically significant.

As might be predicted, the importance of each game is not the same. For example, the results of non-season games have no relationship to the eventual ranking for championship. These games are usually played before the season starts in order to increase and enhance team cooperation. In that sense, non-season games may have importance since they possess a kind of signaling effect on supporters. Specifications 4 and 5, in Table 2, report the corresponding estimates. Specification 4 is especially important since it demonstrates that Fenerbahçe's wins in domestic non-season games have a statistically significant positive impact on industrial production, the coefficient estimate having a magnitude of about 0.12. Fenerbahçe's losses in these games also positively affect the industrial production in a statistically significant manner with a coefficient of 0.079. The games that are classified as Non-season are the ones played between the popular football teams before the opening of the season. Therefore, this finding possibly reflects the initial boosting effects of the approaching new season. Moreover, as these are not crucial games for the new season, being the winner or loser does not matter considerably. Finally, in Specification 5 we observe that season games statistically do not matter for the case of monthly growth in the industrial production.

Specifications 1–5, above, suggest that Fenerbahçe's wins have significant positive effects on industrial production, especially when they are realized in European tournaments/cups or in non-season games. In order to deepen our understanding, we classified the game results further with respect to the venue of each match. It is clear that the likelihood of winning a game at home or away is not the same. Generally, it is more difficult to win at the rival's field, compared to the home field. Owing to this, we can expect wins at the rival's field to boost industrial production more when compared to wins at home. Consequently, in the specifications presented in Table 3, we further distinguish between games played at Fenerbahçe's home and away. In fact, Table 3 is the replicated version of Table 2 after we distinguish between home versus away games.

In Specification 6, there is no statistically significant evidence that winning either at home or away has explanatory power for industrial growth. The same evidence is also valid for the ties and losses of Fenerbahçe's games played at home or away.

Specifications 7 and 8 consider the games in terms of who the opposing team is. If the opponent is another Turkish team, the estimation of Specification 7 does not reveal any statistically significant evidence that score and location of the game have explanatory power for industrial production. The estimates in Specification 8 are both interesting and important. First, regardless of whether the game is played at home or away, Fenerbahçe's winning is associated with increased industrial production. This increase is slightly higher if the game is played away; both of the estimates are statistically significant. The increase in the monthly growth rate of industrial production due to Fenerbahçe's winning is around 0.26%. Second, ties in games played away decrease the monthly rate of industrial production growth, but this evidence is not statistically significant. On the other hand, ties for Fenerbahçe home games decrease the industrial production significantly. Losses do not change the industrial production in a statistically significant manner.

Specifications 9 and 10 are intended to measure the effects of non-season and season games separately. Specification 9 in Table 3 suggests that Fenerbahçe's wins in domestic non-season games have a positive impact on industrial production. In Specification 10, it can be seen that there is no statistically significant evidence that season games affect industrial production.

It may seem interesting that the season games won by Fenerbahçe have no statistically significant effect whereas the games won in European cups have positive feedback on industrial performance. As mentioned before, a possible cause for this difference is the exclusion of other football teams from our sample, such that whenever Fenerbahçe wins in national football season, some of the workers are induced to produce more with higher morale, while for the non-supporters of Fenerbahçe it has the opposite effect. There are no such offsetting effects regarding the games played by Fenerbahçe in European cups since it is a matter of national pride, identification and solidarity within the highly football-oriented Turkish society, as discussed by Sert (2000) and Bora and Erdogan (1993).

Possible sensitivity of the results to our choice of Fenerbahçe is an important point. For instance, the success of Fenerbahçe in the national football season, though not totally in a zero-sum fashion, means the failure of another team in any given week of the national season fixture. Thus, one may expect the industrial production boosting effects due to different football teams to offset each other. This is especially relevant when we consider the competition among the top-ranked teams for the championship. Even if these top-ranked teams do not play against each other in a given week, the success of one indicates increasing difficulty in the competition for the other one, keeping in mind that the national-season champion is determined on the basis of cumulative season points. However, the success of Fenerbahçe in games played abroad may induce higher productivity for the corresponding month. This is due mainly to the general tendency of Turkish people to relate foreign games to *national pride* and *identification*, as was previously mentioned.

In the above spirit, the performances of two other major football teams of Turkey, namely Beşiktaş and Galatasaray, are also examined as a robustness exercise. Their results also support our theory with regard to football performance and national identification, i.e., in the cases of both Beşiktaş and Galatasaray, games

won in the European games affect growth performance. The estimates of the specifications for Beşiktaş and Galatasaray are not provided in the paper in order to save space, but are available from the authors upon request.

Specifically, in the case of Beşiktaş, the findings are almost the same as those for Fenerbahçe, except that the wins of Beşiktaş in domestic games matter as well. The case of Galatasaray also resembles the one of the Fenerbahçe with the minor difference that in European games, the number of wins on an unbiased field increases the growth rate. As a matter of fact, Galatasaray's success on an unbiased field in European cups is of remarkable importance since the matches of UEFA Cup after the quarterfinals are played on unbiased fields, as required by UEFA rules.

There might be various reasons why Beşiktaş's domestic wins still affect industrial production. Fenerbahçe and Galatasaray are archrivals. Therefore, wins of either team in the domestic league may decrease the morale of the fans of the other team. Therefore, the possible positive effect on industrial production caused by better moods of Fenerbahçe (or Galatasaray) fans might be cancelled by the effect of the worse moods of the fans of the other team. However, this cancellation effect may not be present for Beşiktaş. Thus, we could observe the effect of Beşiktaş's success on domestic games, but not for the other two.

All in all, the results obtained for the other two top-ranked teams are parallel to those obtained for Fenerbahçe. It is necessary to note that there are significant effects in the domestic games only in the case of Beşiktaş. Overall, the effects in the European games are significant for all three teams, the UEFA Cup having the strongest relationship in the case of Galatasaray, supporting our claim that there is a connection between non-domestic games and the national identification and pride, which improves the morale of Turkish society.

We also performed the analysis with the success of the Turkish national team. The empirical evidence does not suggest that industrial production increases in a statistically significant fashion with wins. There might be various reasons for this. Firstly, pride and self-esteem will be higher with the success of individual teams because of national pride and social identification with a team. On the other hand, only the national pride will be present with the success of the national team. Thus, statistical evidence will be weaker. Secondly, the number of games an individual team plays is much higher than the number of games the national team plays. This may mean that the average spectator will associate himself/herself more with the individual team than with the national team. Lastly, the quality of the national team is not as high as the top ranked individual teams.[4] These two will decrease the social identification

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[4] There are two reasons for the lower quality of the national team. Firstly, there are various legal restrictions on the number of foreign nationals who can play in a single game. Note that the selection of foreign players will be made from a bigger pool than national players; therefore, individual teams must choose foreign players more carefully. Thus, the quality of the foreign players will be much higher. Note that foreign players cannot play in the national team. Therefore, the quality of the national team will be lower than the top ranked football teams. Secondly, the number of the games the national team plays will be lower than individual teams and the probability that the same player will be included to the same national team will be lower. These will suggest that cooperation and the harmony among national team players will be lower.

with the national team and lower the public's expectation from the game. Thus, wins of the national team will enhance the mood/self-esteem less.

7. Conclusion

Owing to the development of the football industry and the mass media in Turkey, we use the success of Fenerbahçe, the most popular Turkish football team, as a proxy for the morale of workers in Turkey. In a transfer function analysis framework, we measure how workers' morale affects industrial performance and find positive feedback from workers' morale on industrial growth. The magnitude of this positive feedback is a 0.26% increase in the monthly rate of industrial growth for the games won by Fenerbahçe in European cups. However, similar feedback is not observed for domestic games in a statistically significant manner.

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