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SUCCESS IN SOCCER AND ECONOMIC PERFORMANCE: EVIDENCE FROM BEŞİKTAŞ-TURKEY

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Abstract: *This paper investigates the connection between Turkish industrial production growth and the success of Beşiktaş, which is a popular Turkish soccer team. The empirical evidence provided in the paper suggests that industrial production growth tends to increase with the success of Beşiktaş in European cups. Moreover, if the winnings are in displacement, the increase in industrial production is higher than if the winnings are in the home field. On the other hand, findings on the effects of domestic games on industrial performance are not statistically significant. (JEL: C51, J28, L83)*

Keywords: *industrial production, sports economics, soccer*

1. Introduction

There has been considerable discussion in the literature about the connection between sports activities and economic performance. Even casual

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Beşiktaş, established in 1903, is one of the most popular soccer teams in Turkey. Detailed information about the team can be reached at <http://www.besiktasjk.com>

observations may reveal the fact that a considerable volume of economic activity is attached to professional sports. In almost every country, there are national leagues of several branches of professional games, which induce the movement of massive amounts of financial assets, possessed by either the private or the public sector. Furthermore, international contests, cups, and Olympic games help to extend these movements beyond national borders. Therefore, one is always curious about the possible effects of professional sports on the economy. Another important aspect of professional sports is probably their potential sociological and psychological effect on people. For instance, every professional team has a large number of faithful supporters. Hence, professional sports performance might have some effect on people's morale (see Berument and Yucel, 2005, for the effect of football on morale). Owing to these observations, the relationship between economic performance and professional sports performance is worth investigating.

The connection mentioned above was investigated in the literature with different points of view. Coates and Humphreys (1999), within an economic impact analysis framework, reject a positive correlation between the construction of sports facilities and economic development. Siegfried and Zimbalist (2000) also analyze the relationship between economic development and professional sports and cannot find the relationship between professional sports and economic development.

Another interesting study that deals with sports economics from the side of public budget, Coates and Humphreys (2002), reveals that public expenditures to finance professional sports cannot be justified after investigating the determinants of real income in cities with professional sports teams. However, Coates and Humphreys (2002) present statistical evidence that the home city of the winning team in the Super Bowl has higher real per capita income, probably pointing to increased productivity of workers in that city. Similarly, a positive relationship between growth performance and the *World Cup* success of selected countries is reported in the Federal Reserve Bank of St. Louis (2002) such that countries which are successful in the *World Cup* have higher growth performance relative to prior periods.

This paper investigates *the effect of soccer success on economic performance* from a different angle – happiness. Every soccer team has a huge number of supporters. If these supporters are affected by the success of their team, then their well-being will be affected. If this is the case, first their behavior then the economic outcomes will be affected (see Isen, 2000; and Frey and Stutzer, 2002, for a review of the literature). For example, Spector (1997) and Warr (1999) argue that employees who are satisfied with their

lives are more cooperative and helpful to their colleagues, tend to be more punctual, report fewer sick days, and remain employed for longer periods than dissatisfied employees. All these are factors that increase the productivity of workers. If this is realized for a large number of people, then it is likely to affect total productivity. By considering a sample of OECD countries, Kenny (1999) provides some empirical evidence that happiness increases income.

We investigate the relationship between Turkish industrial production performance and success of a popular Turkish soccer team, namely Beşiktaş. At first sight, our focus on the success of a popular soccer team (instead of any other explanatory variable) and on overall industrial performance (instead of the economic welfare of a specific region of the country) may not seem sophisticated enough. However, once we present our key observations about the soccer industry in Turkey as well as about Turkey's socio-economic structure, our empirical setup proves to be adequately formed.¹

The first set of our observations covers the structure of the Turkish soccer industry, which differs from its North American counterpart. First, there is an almost settled structure in Turkish soccer industry, i.e. almost every city has at least one associated team that does not change its location over time. In that respect, Turkish society is not familiar with the practice of a North American local administration to franchise a sports team. In Turkey, all sports teams are subsidized from the budget of the Ministry of Youth and Sports, yet the amounts of subsidy are pathetically symbolic. Second, new stadiums and other related facilities are rarely built. Based on these two major points, it seems more meaningful to analyze the impact of professional sports on the overall economic performance instead of focusing on local economies.

Our focus on soccer is due to a second set of observations regarding the meaning of soccer to Turkish society. First and probably the most important, the term *sports* possessed a narrower meaning in Turkey as far as the average perception of the society is considered. Sert (2000) argues that *soccer* has an almost perfect association with the more general term *sports* in Turkey. Second, sports news on TV broadcasts is almost totally related to soccer. Especially on weekends, soccer programs dominate nearly all TV channels and these programs have high audience ratings. In Turkey soccer turns out to be the topic that receives the interest of the majority of people.² The generally

¹ Economists might think that incorporating the psychological behaviour into decision making brings non-rationality into economic modeling. However, economists start to defend this kind of behaviour within a rational setting (see, for example, Hermalin and Isen, 2000).

² Miller (1999) can be visited for the "televisualization of sports", i.e. the process by which sports teams become media entities.

unstable economic performance and unstable political dynamics leave the morale of Turkish people to be basically directed by the success of the soccer team that they support. Third, in the eyes of the Turkish people, the term soccer has a strong connotation with the three biggest teams of the country, namely Beşiktaş, Fenerbahçe, and Galatasaray. Based on these observations, our focus on *soccer* instead of any other branch of sports can be justified.

On the basis of the two sets of observations which are briefly presented above, we are left with a setup in which we investigate the impact of Beşiktaş' success on Turkish industrial performance. Once we have set the importance of soccer in determining Turkish people's psychological well-being, we hypothesize that success in soccer affects the economic performance positively. Actually, psychologists argue the existence of similar relationships. The *happy-worker hypothesis* possesses key importance in the literature of industrial psychology.^{3,4} The well-being and performance of the workers constitute the subject of the hypothesis, such that an increasing level of happiness⁵, or job satisfaction, of workers is expected to increase their job performance. The level of job satisfaction is determined by the conditions of the external environment and the work environment. Here we follow a route that is different from that of the industrial psychology scholars in that we use the success of Beşiktaş as the sole determinant of workers' happiness since it is one of the top ranked soccer teams in Turkey, and has fanatical supporters with strong *team love*.

Using transfer function analysis, we demonstrate that the success of Beşiktaş in games played in European cups and tournaments affects the industrial performance positively, but not in domestic games. The increase in industrial production is higher if the success is observed in displacement. Section 2 describes the Turkish soccer game structure. In Section 3 – empirical analysis – we present our data, methodological framework and basic findings. Finally, we conclude the article in Section 4.

2. Turkish Soccer Game Structure

Turkish soccer teams play matches either among themselves in *Turkish National League* and *Turkish Cup* or with European teams in *Champions*

³ See for example Wright et al. (2002).

⁴ One may also look at Berument and Yucel (2005) for a social psychology approach to productivity increases.

⁵ The terms “happiness”, “morale”, “well-being” and “psychological well-being” are used interchangeably in the rest of the article.

League, *UEFA Cup* and *Cup Winners Cup*. In the past, unlike some European teams, Turkish teams did not play against another Turkish team in any of the European Cups. The *Turkish National League* started in 1959. At first, 16 teams were involved in a season; however, this number varied between 12 and 20 as time passed. For the sample that we consider, 16 teams played in the *Turkish National League* during the 1992-93 and 1993-94 seasons. After the 1994-95 season, this number was fixed at 18. The Turkish National League uses league status to determine the winner. All the teams play with each other and the winning team receives 3 points (it was 2 points before, but the rule was changed starting in the 1987-88 season), ties get 1 point and loser teams do not get any points. At the end of the season, the team that scores the highest wins the championship.

The teams playing in the *Turkish Cup* are determined by the Turkish Soccer Federation by considering the success of the team in the *Turkish Cup* in the previous season, and the success of the teams in the *Turkish National League* in the previous season. The number of the teams that play in the *Turkish Cup* changes every year. Unlike the *Turkish National League*, the *Turkish Cup* uses an elimination procedure.

Teams that represent Turkey in European tournaments are determined by games played among themselves. The first two teams in the *Turkish National League* participate in the *Champions League*. The winner of the *Turkish Cup* and the third, fourth and fifth teams participate in the *UEFA Cup*. Participants of the *Cup Winners Cup* are determined by the winners of each nation's Cups.⁶ For the 1992-2002 period, the number of teams participating in the *Champions Cup* in Europe was determined with a three-step procedure. The country points⁷ determine the number of teams that represent each country in the *Champions Cup*. Teams from the countries that have low points play in elimination games in order to enter the *Champions League*. There are 32 teams in the league and 8 groups. Each group has 4 teams. After the matches played with each other, the first and the second teams in each group qualify for the second tour. There are 16 teams in the second tour. These teams are divided into 4 groups and 4 teams exist in each group. After the matches played within the groups, the first and the second teams qualify for the quarter finals. The league status disappears with the starting of the quarterfinals and the elimination procedure is used. After two-match eliminations in quarter and semi-final matches, the final will be played in a single match and the winner will be determined.

⁶ After the 1998-99 season the *Cup Winners Cup* and the *UEFA Cup* were merged.

⁷ Country points are determined by UEFA and FIFA by considering the success of the national and individual teams of each country in Europe.

The status of the *UEFA Cup* is based on an elimination process. Country point status is also important in the *UEFA Cup* for determining the number of participants with respect to the countries. Every round has a two-match elimination procedure. After the quarter and semifinals, the final is played in a single game in a country determined by the *UEFA* before the beginning of the cup. Before the merging of the *UEFA Cup* and the *Cup Winners Cup*, the teams playing in the *Cup Winners Cup* were determined by the winners of each nation's Cups. The *Cup Winners Cup*, like the *UEFA Cup*, is based on an elimination process and after the quarter and semi-finals, the final is played in a single game within a country determined by the *UEFA* before the cup.

3. Empirical Analysis

3.1. *Modeling approach and variable definitions.* - We measure the industrial performance by g^y , which is the logarithmic first difference of the seasonally adjusted industrial production index. Following Ergun (2000), we assume that it follows an autoregressive process. Later, it is regressed against its lags⁸ up to the fifth order and variables that measure the success of Beşiktaş. The inclusion of lags of the monthly rate of change of industrial production allows us to handle the trend behavior of the original industrial production series. The part of variation not explained by the autoregressive model for g^y is attributed to Beşiktaş by using the variables Z_{jt} as shown in Equation 1:

$$(1) \quad g_t^y = \alpha_0 + \sum_{i=1}^5 \alpha_i g_{t-i}^y + \sum_{j=1}^J \gamma_j Z_{jt} + \varepsilon_t$$

In terms of Equation 1, the values of α_k , $k = 0, \dots, 5$, and γ_j are the parameters to be estimated. Z_{jt} denotes the j^{th} measure for the success of Beşiktaş at time t . The ε_t is the *i.i.d.* error term. In order to obtain a meaningful time-series for the Z_{jt} , we first classify the games played in each month on the basis of the host team's field. If the game is played at Beşiktaş' home field, then it is put in the category of *home* and when it is played at the rival's field it is classified as *displacement*. Second, the score of each game is translated into a *win*, *tie*, or *loss* from the Beşiktaş' point of view. We define our temporal rule as recording a game that is actually played in month t for

⁸ The optimal lag length used in the analysis is determined using the Final Prediction Error criterion.

month $t + 1$ if the first consequent workday belongs to month $t + 1$. We denote the number of games won, tied and lost with W , T , and L respectively. Subscript h refers to games played at Beşiktaş *home* and d stands for the games played in *displacement*. The absence of a subscript indicates that we consolidate the data regardless of the field information. Superscript *All* indicates all the games, *Turkey* is used for the games played in the domestic tournaments, *Europe* is for the games played in European tournaments, and *Season* is for the games played in the national-season.

The coefficients γ_j are of interest in Equation 1⁹. The variable g_t^y is assumed to follow an autoregressive process that is interrupted by Z_{jt} in each period. The coefficient γ_j of the variable Z_{jt} is tested under the null hypothesis ($H_0 : \gamma_j = 0$). This type of specification is often used in the literature¹⁰. (One may look at Enders, 1995, for the transfer function analysis). In the recent literature, Ergun (2000) also used the transfer function analysis to investigate various Turkish macroeconomic variable aggregates. In our case, we study the effects of Beşiktaş' success on Turkish industrial performance. Since we do not expect a feedback from industrial performance to performance of Beşiktaş as also supported by our preliminary analysis, the problem of endogeneity is not relevant.

The possible sensitivity of our results to our choice of including only Beşiktaş may be an important point. For instance, the success of Beşiktaş in the national soccer season, reminiscent of a zero-sum game, means the failure of another team in a given week of the national season fixture. Thus, one may expect that the productivity augmenting effects of different soccer teams offset each other. This is especially apparent 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 every given week, the success of one indicates increasing difficulty in the competition for the other ones.¹¹ On the other hand, the success of Beşiktaş in games played abroad may induce higher productivity for the corresponding month; since Turkish people have a tendency to entangle foreign games with national pride and

⁹ Using mathematical terminology, these coefficients correspond to the transfer function that we estimate. The "transfer function" is the statistically estimated relationship that explains how an exogenous movement is transferred to an autoregressive endogenous variable.

¹⁰ For instance, McCallum (1978), Alesina and Sachs (1988), Ito and Park (1988), and Heckelman and Berument (1998) employ similar transfer function specifications in their analyses of political business cycles.

¹¹ In a given week, each team plays with its rival according to the season fixture. If it wins, it gets 3 points, ties are assigned 1 point and losses receive no points at all. At the end, the champion is the team with the highest cumulative points.

identification.

Lastly, the financial crisis occurring in 1994 affected the Turkish economy adversely. Thus, it is necessary to include the 1994 crisis in empirical studies. Consecutively, the 3rd, 4th, 5th and 6th months of 1994 are controlled by using a dummy variable for each: D_{94-3} , D_{94-4} , D_{94-5} , and D_{94-6} respectively. Similarly, for the financial crises of 2000 and 2001, we define the dummy variables for November 2000 and February 2001, namely D_{00-11} and D_{01-02} .

3.2. *Data.* - Data on industrial production, which is the proxy of income in our study, is obtained from the data delivery system of the Central Bank of Turkey.¹² Historical game records of Beşiktaş are compiled from Tanrikulu (2002) and from the official website of the UEFA¹³. The study period is from 1992:08 to 2002:10. Recalling the definition of economic performance, individual income could be proxied in a more direct fashion using consumption data. However, neither a measure of this variable nor a proxy of it is available for Turkey at monthly frequencies. Hence, we cannot work on it.

Beginning in 1992, Turkish soccer teams began to improve their success rate in Europe. Galatasaray's achievements in the UEFA Champions League, which is a tournament where all the champions of the countries of Europe are gathered, positively motivated other Turkish soccer teams in European tournaments. Thus, we take that year as the beginning of our sample.

3.3. *Model estimates.* - We present our model estimates in two different samples. In the first series of regressions, we want to see the relationship between industrial production (growth) and the success of Beşiktaş for the period of 1992:08-2002:10. The second one uses the data between the two financial crises that Turkey experienced: 1995:01-2000:10.¹⁴ We present our estimates in the first series of regressions in Table 1 and Table 2.

¹² The Electronic Data Delivery System of the Central Bank of the Republic of Turkey is an appropriate medium for extracting economic data related to Turkey which is released by official data providers. The delivery system can be reached at <http://tcmbf40.tcmb.gov.tr/cbt.html>. The primary source of industrial production is *The State Institute of Statistics*.

¹³ UEFA data are accessible at <http://www.uefa.com>.

¹⁴ Berument and Kilinc (2003) argue that the dynamics of the industrial production between the financial crises is different from the full sample.

Table 1. Estimated models: 1992:08-2002:10 ^a

	SPECIFICATIONS		
	1.1	1.2	1.3
<i>Constant</i>	0.355 (3.586)	0.380 (3.509)	0.399 (4.431)
<i>D</i> ₉₄₋₃	-0.751 (-5.997)	-0.733 (-5.638)	-0.648 (-7.548)
<i>D</i> ₉₄₋₄	-0.587 (-5.076)	-0.523 (-4.120)	-0.587 (-5.703)
<i>D</i> ₉₄₋₅	-1.326 (-9.675)	-1.253 (-8.561)	-1.285 (-10.725)
<i>D</i> ₉₄₋₆	-0.681 (-4.122)	-0.723 (-4.078)	-0.712 (-4.424)
<i>D</i> ₀₀₋₁₁	0.180 (1.988)	0.215 (2.158)	0.243 (3.817)
<i>D</i> ₀₁₋₀₂	-0.046 (-0.359)	0.050 (0.367)	0.001 (0.012)
<i>W</i>	0.023 (0.918)		
<i>T</i>	-0.039 (-0.752)		
<i>L</i>	0.018 (0.479)		
<i>W</i> _{Turkey}		0.008 (0.317)	
<i>T</i> _{Turkey}		-0.021 (-0.380)	
<i>L</i> _{Turkey}		-0.032 (-0.628)	
<i>W</i> _{Europe}			0.155 (2.835)
<i>T</i> _{Europe}			-0.072 (-0.693)
<i>L</i> _{Europe}			0.044 (0.689)
<i>g</i> ₋₁ ^y	0.249 (2.583)	0.253 (2.520)	0.237 (2.338)
<i>g</i> ₋₂ ^y	0.405 (4.782)	0.406 (4.785)	0.377 (4.451)
<i>g</i> ₋₃ ^y	0.028 (0.290)	0.024 (0.251)	0.041 (0.422)
<i>g</i> ₋₄ ^y	-0.139 (-1.454)	-0.140 (-1.456)	-0.133 (-1.409)
<i>g</i> ₋₅ ^y	0.147 (1.862)	0.158 (2.008)	0.133 (1.770)
<i>SSR</i>	14.817	14.950	14.627
<i>R</i> ²	0.498	0.494	0.505
\bar{R}^2	0.433	0.428	0.441

^a We cover the whole data span but control for the crises by using dummies. We do not distinguish between the games played at home versus those in displacement. *t*-statistics are reported in parentheses next to the corresponding estimated parameters.

The specifications of Table 1 hide the home/displacement field information but classify the games as win, lose or tie. In the specifications presented in Table 2, we distinguish between the home/displacement field of the games so as to find out whether the home-field is an important factor in translating the success of the team into workers' morale. Crisis dummies to control the months of Turkey's financial crises and the lags of g^y are common to both tables, as well as the sum of squared residuals, R^2 and \bar{R}^2 . A quick glance at the tables shows the negative impact of the April 1994 financial crisis. In all six specifications, the effect of the dummy variables is significantly negative¹⁵. Increased liquidity on November 2000, which is

¹⁵ The level of significance is 5% unless otherwise noted.

represented by, D_{00-11} is positive in all six specifications. The February 2001 crisis has the same impact as the April 1994 crisis as suggested by Table 1 and Table 2, since all the coefficients associated with D_{01-02} are negative.

Specification 1.1 in Table 1 is the summary of all games played by Beşiktaş. Winnings seem to increase industrial production but the coefficients are not statistically significant. The statistical evidence suggests that ties and losses do not affect industrial production. Specification 1.2 contains the games played in Turkey and winnings increase industrial production growth. However, the evidence is not statistically significant. Ties and losses seem to have a negative impact on industrial production, but the relationship between industrial production and ties and losses in Turkey is not statistically significant.

Specification 1.3 is highly remarkable. The winnings of Beşiktaş in Europe increase industrial production by nearly 0.15%, and the estimated coefficient is a statistically significant finding. Ties have a negative impact on industrial production but this evidence is not statistically significant. The relationship between industrial production and losses in Europe is not statistically significant either.

In the specifications presented in Table 2, we distinguish between games played at home and in displacement. In Specification 2.1, we do not have statistically significant evidence that either winnings, ties or losses at home or in displacement have an explanatory power for the industrial growth.

Specification 2.2 decomposes the games into opposing teams: if the opponent is another Turkish team, there is no statistically significant evidence that the score and the location of the game have an explanatory power for industrial production. On the other hand, the estimates of Specification 2.3 suggest a statistically significant relationship between industrial production and the games Beşiktaş played in Europe. Regardless of the home-field of the game, the winnings of Beşiktaş are associated with the increased industrial production growth rate. This increase is slightly higher if the game is played in displacement, where both of the estimates are statistically significant. The increase in the monthly growth rate of industrial production due to the winnings of Beşiktaş at home is around 0.14%, and in displacement is around 0.39%. This higher effect further suggests that winning in displacement increases industrial production more than winning at home. Beşiktaş ties, whether at home or in displacement decrease industrial production, but this evidence is not statistically significant. Neither losses at home nor losses in displacement change the industrial production in a statistically significant manner.

Table 2. Estimated models: 1992:08-2002:10 ^a

	SPECIFICATIONS		
	2.1	2.2	2.3
<i>Constant</i>	0.368 (3.603)	0.368 (3.348)	0.413 (4.498)
<i>D</i> ₉₄₋₃	-0.755 (-5.910)	-0.739 (-5.372)	-0.644 (-7.436)
<i>D</i> ₉₄₋₄	-0.610 (-4.022)	-0.494 (-2.318)	-0.589 (-5.553)
<i>D</i> ₉₄₋₅	-1.320 (-9.288)	-1.255 (-8.347)	-1.289 (-10.594)
<i>D</i> ₉₄₋₆	-0.686 (-4.073)	-0.716 (-3.979)	-0.722 (-4.429)
<i>D</i> ₀₀₋₁₁	0.134 (1.346)	0.204 (1.855)	0.230 (3.112)
<i>D</i> ₀₁₋₀₂	-0.032 (-0.224)	0.054 (0.368)	-0.002 (-0.025)
<i>W</i> _{<i>h</i>}	0.020 (0.491)		
<i>W</i> _{<i>d</i>}	0.031 (0.617)		
<i>T</i> _{<i>h</i>}	-0.094 (-1.337)		
<i>T</i> _{<i>d</i>}	-0.010 (-0.169)		
<i>L</i> _{<i>h</i>}	-0.028 (-0.488)		
<i>L</i> _{<i>d</i>}	0.061 (1.185)		
<i>W</i> _{<i>h</i>Turkey}		0.011 (0.270)	
<i>W</i> _{<i>d</i>Turkey}		0.021 (0.407)	
<i>T</i> _{<i>h</i>Turkey}		-0.081 (-0.968)	
<i>T</i> _{<i>d</i>Turkey}		0.023 (0.361)	
<i>L</i> _{<i>h</i>Turkey}		-0.049 (-0.728)	
<i>L</i> _{<i>d</i>Turkey}		-0.010 (-0.111)	
<i>W</i> _{<i>h</i>Europe}			0.140 (1.956)
<i>W</i> _{<i>d</i>Europe}			0.396 (3.487)
<i>T</i> _{<i>h</i>Europe}			-0.038 (-0.395)
<i>T</i> _{<i>d</i>Europe}			-0.185 (-0.908)
<i>L</i> _{<i>h</i>Europe}			-0.018 (-0.125)
<i>L</i> _{<i>d</i>Europe}			0.061 (0.845)
<i>g</i> ₋₁ ^{<i>y</i>}	0.251 (2.643)	0.258 (2.628)	0.229 (2.227)
<i>g</i> ₋₂ ^{<i>y</i>}	0.409 (4.960)	0.407 (4.885)	0.378 (4.403)
<i>g</i> ₋₃ ^{<i>y</i>}	0.018 (0.196)	0.009 (0.103)	0.038 (0.381)
<i>g</i> ₋₄ ^{<i>y</i>}	-0.146 (-1.491)	-0.134 (-1.334)	-0.130 (-1.342)
<i>g</i> ₋₅ ^{<i>y</i>}	0.151 (1.917)	0.164 (2.075)	0.128 (1.706)
<i>SSR</i>	14.563	14.801	14.463
<i>R</i> ²	0.507	0.499	0.510
\bar{R}^2	0.427	0.418	0.431

^a We cover the whole data span but control for the crises by using dummies. We also account for where the game is played. *t*-statistics are reported in parentheses next to the corresponding estimated parameters.

It is worth mentioning that this time span includes the most devastating financial crises of Turkish economy, namely the ones of 1994 and 2001. Thus, one can always question the reliability of our empirical findings. In

order to handle such criticisms, e.g. checking for the robustness of our estimates in the first series of regressions, we run a second series of regressions in which we trim our data for the 1994 and 2001 crises. Table 3 and Table 4 report the estimates for the sample between January 1995 and October 2000. In Table 3, again we do not have any statistically significant correlations between the dependent variable and independent variables in Specifications 3.1 and 3.2. In Specification 3.3, winnings in Europe increase industrial production by 0.15%, which is also statistically significant. Ties and losses in Europe do not affect the industrial production index significantly.

Table 3. Estimated models: 1995:01–2000:10^a

	SPECIFICATIONS		
	3.1	3.2	3.3
Constant	0.315 (1.695)	0.321 (1.637)	0.406 (2.535)
W	0.022 (0.809)		
T	-0.063 (-1.089)		
L	-0.030 (-0.649)		
W_{Turkey}		0.006 (0.218)	
T_{Turkey}		-0.064 (-0.935)	
L_{Turkey}		-0.110 (-1.530)	
W_{Europe}			0.150 (2.218)
T_{Europe}			-0.111 (-0.974)
L_{Europe}			0.026 (0.372)
g_{-1}^y	0.166 (1.382)	0.132 (1.014)	0.135 (1.037)
g_{-2}^y	0.470 (4.419)	0.469 (4.438)	0.441 (3.866)
g_{-3}^y	-0.073 (-0.657)	-0.059 (-0.554)	-0.053 (-0.482)
g_{-4}^y	-0.070 (-0.559)	-0.057 (-0.451)	-0.100 (-0.845)
g_{-5}^y	0.285 (2.404)	0.334 (2.565)	0.250 (2.360)
SSR	7.783	7.645	7.721
R^2	0.366	0.378	0.371
\bar{R}^2	0.283	0.296	0.289

^a We estimate our model for the years between two major crises in the Turkish economy. We do not distinguish between the games played at home versus those in displacement. t -statistics are reported in parentheses next to the corresponding estimated parameters.

In Table 4 we cannot find any statistically significant relationships between dependent and independent variables in Specification 4.1 and 4.2. Nevertheless, there are some important results in Specification 4.3, which involves the games played in Europe. Winnings at home increase the industrial production index by 0.13%, which is a statistically significant

finding. Winnings in displacement in Europe slightly increase the production by 0.52% in a statistically significant manner. Winnings in displacement increase the industrial production more than winnings at home. Neither ties nor losses affect production in a statistically significant manner.

Table 4. Estimated models: 1995:01–2000:10 ^a

	SPECIFICATIONS					
	4.1		4.2		4.3	
Constant	0.348	(1.826)	0.299	(1.524)	0.447	(2.805)
W_h	0.012	(0.252)				
W_d	0.045	(0.715)				
T_h	-0.166	(-2.109)				
T_d	-0.016	(-0.240)				
L_h	-0.080	(-1.032)				
L_d	0.020	(0.381)				
$W_{hTurkey}$			0.005	(0.108)		
$W_{dTurkey}$			0.036	(0.553)		
$T_{hTurkey}$			-0.183	(-1.817)		
$T_{dTurkey}$			0.010	(0.152)		
$L_{hTurkey}$			-0.099	(-1.252)		
$L_{dTurkey}$			-0.129	(-1.108)		
$W_{hEurope}$					0.128	(1.670)
$W_{dEurope}$					0.517	(4.189)
$T_{hEurope}$					-0.109	(-1.086)
$T_{dEurope}$					-0.305	(-1.459)
$L_{hEurope}$					0.096	(0.550)
$L_{dEurope}$					0.022	(0.278)
g_{-1}^y	0.164	(1.418)	0.143	(1.195)	0.113	(0.837)
g_{-2}^y	0.472	(4.262)	0.462	(4.042)	0.439	(3.804)
g_{-3}^y	-0.105	(-1.004)	-0.098	(-0.955)	-0.049	(-0.430)
g_{-4}^y	-0.077	(-0.567)	-0.029	(-0.214)	-0.091	(-0.768)
g_{-5}^y	0.308	(2.582)	0.356	(2.720)	0.228	(2.194)
SSR	7.441		7.352		7.428	
R^2	0.394		0.402		0.395	
\bar{R}^2	0.280		0.288		0.281	

^a We estimate our model for the years between two major crises in the Turkish economy. We also account for where the game is played. *t*-statistics are reported in parentheses next to the corresponding estimated parameters.

4. Conclusion

In this study, we try to assess any relationship between economic performance and the success of a popular Turkish team: Beşiktaş. The success of a soccer team may motivate workers to be more productive and this may boost the economic performance. Thus, we study how workers' happiness affects industrial performance and present statistically significant evidence that there is a positive feedback from workers' happiness to industrial performance using a transfer function analysis. The magnitude of this positive feedback is an increase in the monthly rate of industrial growth for the games won by Beşiktaş in European cups. Moreover, this increase is higher if these wins occur in displacement (the home of the rival team). However, we are not able to find this positive feedback in *Turkish National League* games in a statistically significant manner. There is a canceling effect for the supporters of rival clubs of Beşiktaş, which may offset the positive effects of Beşiktaş in the national season.

The increase in labor productivity due to the effect of a popular Turkish team such as Beşiktaş, by supporting the happy worker hypothesis, makes us agree with Coates and Humphreys (2002).

There is room for further research using consumption data or some other determinants of industrial production. Finally, the investigation on the net macroeconomic effect due to Beşiktaş within a different economic framework is left for a future study.

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