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DO MANAGERIAL SKILLS MATTER? AN ANALYSIS OF THE IMPACT OF MANAGERIAL FEATURES ON PERFORMANCE FOR THE ITALIAN FOOTBALL

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Do managerial skills matter? An analysis of the impact of managerial features on performance for the Italian football

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Abstract

This paper studies the impact of a set of managerial features on performance in the top division of the Italian football league during seasons 2000/01-2009/10. Our set of coach characteristics includes indicators of skill, experience, innate features as well as empathy with the team. We find that some managerial features matter even when we control by club power and past results. Indeed, performance is positively correlated with the fact that the manager has experience abroad or has been a previous player of the team but negatively correlated with lack of previous managerial experience. Other features affect only some particular aspects of performance. In particular, Italian managers play a more defensive game in home matches while old managers are more defensive in away games. Also, changing a coach within the season has a negative impact on the defensive skill of the team in away matches.

Keywords: OR in sports**;** bi-ordered probit model; coach dismissals; endogeneity.
Jel Classification: C25, C35, L83, M11.

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1. Introduction

In many sorts of organizations, human capital resources are viewed as strategic assets and, more specifically, managers are often identified as a key source of comparative advantage, see for example Barney (1991) and Wright *et al.* (1994). Also, identifying the key managerial features that improve firm performance has become especially relevant after the last economic global crisis that from the end of 2008 has led many companies to perform significantly below their historical average. Typically, the decision to hire or sack a manager implies the consideration of aspects linked to environmental pressures, the importance of the experience and skill of the manager and the emotional empathy of the manager with the institution. Estimating the relative importance of these factors is an issue of great relevance in disciplines as diverse as operational research, management theory or economic psychology. However, this research is often complex and for this reason a quantitative instrument of analysis is required for an exhaustive appraisal of the decision to replace a manager.

Given the role played by managers, management turnover and features have been studied extensively, both in theoretical and empirical terms. Although a general consensus has been achieved on the fact that the likelihood of management replacement depends on firm performance, the impact of manager turnover on firm performance is still not so clear, and the empirical results of the effect of such events are mixed (Huson et al., 2004). However, a limitation of many studies has been the lack of information about the characteristics of the old and new managers. Since such limitations have been dramatically reduced by collecting large datasets, the role of the managers and the effect of their skills on firm productivity is being a topic of intensive research in the recent literature. For example, Bennedsen *et al.* (2006) using a database of 6,753 Danish firms between 1994 and 2002 find that the death of the manager or of an immediate family member has a significant negative impact on firm performance, measured as the ratio of earnings before interest and taxes to the book value of assets. Kaplan *et al.* (2008) estimate the importance of different managerial features by using a database of Chief Executive Officer (CEO) candidates for companies involved in buyout and venture capital transactions and relating these characteristics to subsequent performance. He finds that managers with general abilities and execution skills significantly improve firm performance. Tonidandel *et al.* (2012), using information from a

leadership development program, study the relative importance of different managerial skill dimensions, finding that administrative skills are the most important one.

In this paper, we contribute to the ongoing debate by examining firm performance changes ensuing from managers' characteristics and turnover. A central methodological issue concerns the measure of firm performance that can be calculated through different ways and approaches leading to different results. Sport economics (and the analysis of professional football particularly) provides a fertile environment in which it is relatively straightforward to analyze the impact of different managerial features on performance for a number of reasons. First, firms have unambiguous objectives that are measurable and publicly observable at a high frequency. Moreover, football operates under the strong spotlight of media coverage, so that it may be easier than in some other industries for researchers to directly observe coach characteristics. Of course, we acknowledge that a potential weakness of sport research is that it is not clear whether results can be easily generalized to other more conventional industries. However, it is also true that, in our particular context, results in most of the standard papers in the previous literature are not general because they either focus on some specific types of managers and/or on performance measures. Besides, using data on sport economics allow us to investigate the influence on managerial performance of some aspects, such as external pressure, by differenciating between at home and away matches, or the different impact of managerial features in defence and attack. Within this view, this paper estimates the impact of managerial features on match results for seasons from 2000/01-2009/10 in the Italian football league (Serie A) by specifying and estimating an ordered-probit model for the results obtained by the home team. The dependent variable (victory, draw and defeat) is modelled as a function of previous performance and an indicator of club power along with a dummy indicating whether the manager has been hired within the season and introducing also a set of characteristics of the coaches, like skill, background and empathy of the manager with the club. We find that some managerial qualities matter even when we control for club power and past results. In particular, performance is positively correlated with the fact that the manager has experience abroad or has been a previous player of the team but negatively correlated with lack of previous managerial experience. Furthermore, we find that managerial change does not have a significant impact on club performance, in line with a

recent study of De Paola and Scoppa (2012) for the Italian league. Although this has been an issue of intensive debate in the recent economic literature, there is no clear answer about the impact of a coach replacement on performance nor on the reasons that could explain the different results.[1] Of course, one possible explanation for these differences is that the impact of a manager replacement on performance may depend on individual aspects of each particular competition. However, it is also true that most of these studies are not comparable as they use different methodologies of estimation, different ways to deal with the fact that the decision to replace a manager is not a random event. Also, in many cases a reduced sample cannot ensure that the number of dismissals is high enough for a statistical test to be feasible on whether the strategy of firing typically works in terms of organisational objectives. In the present paper, we deal with the issue of endogeneity of managerial replacement by including in the model both indicators of past results and club power, which are potentially correlated with the decision to fire a coach. Finally, our estimation is based on a sufficient number of seasons (10 seasons, 3303 match results) to ensure that results can be treated as general.

A second contribution regards the analysis of the impact of manager turnover and characteristics on club strategy. We suppose that different coaches' features lead to different club attitude to defend and attack. All coaches have the same aim, that is to gain as many points as possible, but it might be expected that coach features can play a varying role in deciding how much effort to put into defence and attack, depending on whether the team is playing home or away matches. Club tactics are measured by the number of goals conceded and scored: the higher (less) the number of goals (conceded) scored by a club, the more devoted to attack (defence) the team is. To do this, we estimate a bi-ordered probit model to detect the impact of coach characteristics on club strategy controlling also for manager dismissals. Even if managerial

[1]For example, Audas et al. (2002), and Hughes et al. (2010) could identify no significant tendency for results of English teams to improve in the short run following a change of manager. Bruinshoofd and terWeel (2003) and Flores et al. (2012) find that managerial turnover has a significant negative impact on results for the Dutch and the Argentinean league, respectively. Also, Konning (2003) and Tena and Forrest (2007) find a positive effect for the Netherlands and Spain.

change does not seem to have a significant impact on aggregate performance, this approach allows to show that it has a significant negative impact on the number of goals conceded at away matches. Furthermore, Italian managers are more defensive in home games generally, while old managers are more defensive in away games.

In Section 2, we describe data on managerial features employed in our empirical work and draw inferences from them regarding typical circumstances in which dismissals occur in Italy. In Section 3, we present the estimation of the impact of managerial features on aggregate performance for the Italian league based on 3,303 match observations. Then, in Section 4 we disaggregate the previous analysis by estimating the impact of managerial features in goals scored and conceded at home and away matches. Conclusions appear in Section 5.

2. Data on managerial change

The data refers to the top Italian football league (Serie A) in the time span 2000/01-2009/10. For the period from 2000/01 to 2003/04, 18 clubs participate in the Serie A while 20 teams are listed in league from 2005-2010. We have collected data for 3,504 matches; for each match, our dataset contains the date of the match, the final result, the name of home and away team coaches and their individual characteristics. All data comes from the official web site of *Lega-Calcio* that promoted and regulated the two highest football leagues in Italy, namely Serie A and Serie B, from 1946 to 2010. During the period of analysis, Internazionale, Lazio, Milan, Roma and Udinese play all the seasons (10), while Ancona, Como, Treviso, Venezia and Vicenza only take part in one season.

The information collected about the team managers can be divided into three classes: personal data, previous footballer activity and past manager experiences. Table 1 illustrates some descriptive statistics.

For what concerns the first group, we collect age and nationality of the coach. On the one hand, the age can represent a (rough) proxy of manager experience in the sense that the older the coach, the stronger his experience should be. Hence, if experience is important, a positive correlation between coach age and team performance is expected.

Nationality could be a relevant feature because we might expect that Italian coaches have more knowledge and confidence about the Italian system and hence can be more successful than foreigners when training Italian clubs . But, on the other hand, it is reasonable to assume that only the best foreign managers are hired by Italian clubs: being the

cream of the crop, they can obtain, on average, higher performance than Italian rivals. Although the expected impact of this variable can be ambiguous, it is interesting to check the stereotype for Italian managers that might suggest that they focus more on the defence than on the attack side of the team.

Table 1. Descriptive statistics of managers characteristics

Variable	Obs	Mean	SD	Min	Max
Italian	304	0.94	0.24	0	1
Deputy manager	304	0.05	0.22	0	1
First experience as coach	304	0.11	0.31	0	1
Ex-football player	304	0.85	0.35	0	1
Home-club ex-football player	304	0.20	0.40	0	1
Last home-club ex-football player	304	0.07	0.25	0	1
Ex-football player (goalkeeper)	304	0.03	0.18	0	1
Ex-football player (defender)	304	0.25	0.43	0	1
Ex-football player (midfield)	304	0.53	0.50	0	1
Ex-football player (striker)	304	0.06	0.24	0	1
Experience abroad	304	0.14	0.35	0	1
Activity previous year	304	0.77	0.42	0	1
Age	304	50.52	6.89	36	69

Table 2. Manager dismissals statistics

Variable	Obs	Mean	SD	Min	Max
Quarrel	95	0.02	0.14	0	1
Supporters disagreement	95	0.02	0.14	0	1
Management disagreement	95	0.04	0.20	0	1
Poor results	95	0.89	0.31	0	1
Actual ranking	95	15.44	4.39	2	20
Ranking 1 year before	75	10.72	4.83	1	20
Difference in actual ranking w/r. to 1yr before	75	4.11	4.88	-12	18
Serie B (previous year)	95	0.17	0.39	0	1
Last results (points)	95	0.44	0.80	0	3
Last score difference	95	-1.08	1.15	-4	2
Last 4 results (points)	95	0.61	0.45	0	1.75

The second set of individual characteristics refers to the past activity of the manager during his career as footballer (if applicable). Firstly, we have created a dummy variable that indicates if the coach played in the same club that he is now training. Such variable could have a positive impact on team performance through two channels. On the one side, a manager can take advantages form past experience in a given club because he already knows the environment and, probably, its staff. On the other side, if a manager is already known by the supporters due to past footballer experience, he can have more fan support, thus increasing his chance of success. Then, we collect information on the role played by the manager during his football player activity (goalkeeper, defender, midfielder and striker). The intuition is that different roles in past experience can lead to different approaches and, consequently, to different results. This way, we try to control for this element.

The last set of manager characteristics describes his previous or recent training activity. More accurately, we observe if the manager has trained a team in any professional league or in *serie A* in the previous year. We expect that any inactive period could reduce the ability of the trainer to manage a club. Then, we measure the managerial experience of the coaches: a set of dummy variables measures if a manager is training for his first time in *serie A*, if he was a deputy before his appointment and if he has had training experiences abroad. Poor experience (in Italy and/or abroad) could be negatively correlated to team performance.

3. Match results model

We estimate an ordered probit model to account for the determination of First Division (Serie A) match results in the Italian league, employing data from games from season 2000/01 to 2009/10. The first four rounds of matches each season were excluded from the sample because results on teams' previous matches at home and away were used as regressors. 3,303 matches are thus included in the analysis. This is a considerably large and homogeneous data set that avoids some of the recent structural changes that potentially can have an impact on the dynamic evolution team performance such as the introduction of the European Champions league in 1992 and the Bosman ruling in 1996; see Flores *et al.* (2012).

In order to analyse the impact of managerial features on results we adopt the following specification:

$$y_i^* = \alpha_1 hh_i + \alpha_2 ha_i + \alpha_3 ah_i + \alpha_4 aa_i + \pi_1 m10_h + \pi_2 m10_a + \beta' x + e_i \quad (1)$$

where, e_i is a normal error term for the *i-th* match and the dependent variable, y_i^* is defined such that

$$y_i = 0 \; if y_i^* \leq \delta_1 \quad (2)$$
$$y_i = 1 \; if \delta_1 < y_i^* \leq \delta_2 \quad (3)$$
$$y_i = 2 \; if y_i^* > \delta_2 \quad (4)$$

The values 0, 1 and 2 indicate whether the home team lost, drew or won the *i-th* match. The variables hh_i, ha_i, ah_i and aa_i refer to results immediately preceding the *i-th* match. Specifically, hh_i is the result obtained by the home team in its previous home match and ha_i is the result obtained by the home team in its last away match, before match *i*. ah_i and aa_i are defined similarly for the away team. Results from these earlier games are denoted as "2" for a win, "1" for a draw and "0" for a defeat. These variables account for momentum in results and reversion to mean effects. $m10_h$ and $m10_a$ are the average number of points in the previous 10 matches for the home and away teams in that season. When the previous 10 matches had not been played at that point, these two variable are substituted by the average number of points in all the previous home and away matches played up to that moment respectively. We believe that these variables can be interpreted both as power index variables (for the home and away team) and also as an indicator for the current status of the team. However, we will test the robustness of our results to alternative measures of power.

Our focus is on x that is a vector including managerial features defined in the previous section: experience abroad, active, age, keeper, defender, midfielder, striker, first experience, previous team player, Italian, previous player, previous deputy-manager and whether he has replaced a previous coach within the season. In principle, for simplicity we impose the symmetry assumption between the home and away manager effect by defining these variables in differences. Hence, if they take value 1 (-1) it means that the feature is present only in the home (away) manager while if their value is zero it indicates that both managers have an identical value for that feature. This may seems a restrictive assumption and can be criticized on the grounds of the previous literature that suggests that supporters significantly influence the impact

of home manage features on results; see Tena and Forrest (2007) and Flores *et al* (2012). Indeed, this restriction will be relaxed in the following section.

Also note that specification (1) is comparable to that of previous authors analyzing the impact of managerial change, such as Audas et al. (2002), Tena and Forrest (2007) and Flores et al. (2012), in the sense that it also allows to estimate the impact of the new manager of match results in the long run. However, an advantage of the specification here is its simplicity and also the fact that it allows to control at the same time for other managerial features that could be potentially correlated with expected results. Indeed, including these variables in the specification is a way to cope with the potential endogeneity of manager dismissals as this decision is likely correlated with the features of the managers.

We present in Table 3 the marginal effects of the ordered probit estimation for a home win and a draw. The fact that previous results of home and away team exert no significant influence on the current result could be considered a puzzling at first sight. The reason for this is that in the regression we are also controlling for the impact of the last ten matches. Indeed, if the two variables accounting for the influence of the last ten matches are dropped from the regression, the impact of previous results by the home team is significant and positive. Hence, average points in the last team matches designed to capture differences in power between "weak" and "strong" teams have a strong predictive power in accounting for the pattern of results. Coefficients on our focus variables are only significant at the 5% level for experience abroad, first experience and previous team player. Results match our expectations. On the one hand, it is reasonable to assume that the skill of a manager is positively (negatively) correlated with foreign (first) experience as a coach. On the other hand, a coach that has been a former player of the club could be well identified with fan supporters and he will be more likely to put more effort in order to increase team performance. Moreover, we can suppose that former club players have much(formal and informal) information about their own club, probably collected during their previous experiences, and they are able to use such knowledge to improve the results of the team. Therefore, the human capital of managers seems to play a role in explaining differences in clubs performance. Interestingly, an involuntary managerial change within the season has a negative but not significant impact on performance.

Table 3. Marginal effects on match results evaluated at averaged values

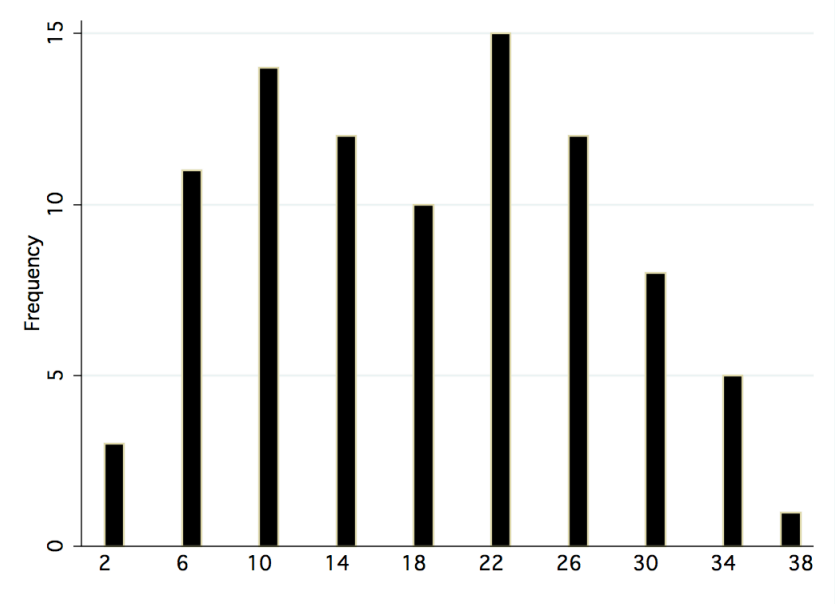
	on home win			on draw		
	dy/dx	**Se**	**|t|**	**dy/dx**	**Se**	***T***
Result of home team's last home match	-0.004	0.011	0.33	0.001	0.003	0.33
Result of home team's last away match	0.018	0.011	1.61	-0.004	0.003	1.61
Result of away team's last home match	-0.003	0.011	0.27	0.001	0.003	0.27
Result of away team's last away match	0.008	0.011	0.72	-0.002	0.003	0.72
Home team average points in the last ten matches	0.155	0.019	8.28	-0.037	0.005	7.18
Away team average points in the last ten matches	-0.164	0.018	8.93	0.040	0.005	7.62
Experience abroad	0.037	0.018	2.02	-0.009	0.004	2.00
Active	0.012	0.017	0.69	-0.003	0.004	0.69
Age	-0.001	0.001	1.28	0.000	0.000	1.27
Keeper	0.013	0.056	0.22	-0.003	0.014	0.22
Defender	-0.016	0.043	0.38	0.004	0.010	0.38
Midfielder	-0.017	0.041	0.42	0.004	0.010	0.42
Striker	0.011	0.048	0.23	-0.003	0.012	0.23
First experience	-0.098	0.026	3.80	0.024	0.006	3.67
Previous team player	0.046	0.015	3.05	-0.011	0.004	2.98
Italian	-0.045	0.029	1.55	0.011	0.007	1.54
Previous player	0.059	0.037	1.57	-0.014	0.009	1.56
Previous vice manager	-0.052	0.041	1.25	0.012	0.010	1.25
Managerial change	-0.027	0.015	1.74	0.006	0.004	1.73
LR chi2(19) ±	365.90 (p-value=0.00)					
Number of observations	3303					

Notes: ± Statistical test for the whole model specification.

Although our indicators of team power are significant in the regression, there are, of course, alternative ways of generating a proxy for club strength. In a study focussing on the issue of competitive balance, Koning (2000) took a very direct approach. The covariates in his ordered probit match results model were dummy variables representing each club which had taken part in the Netherlands Premier League. Here, as a robustness exercise, we re-estimate our model but instead of including the two variables carrying information on the last 10 matches, we allow for individual effects for each club at home and away. This amounts to the inclusion of 70 new parameters to be estimated. This specification is not a parsimonious specification and it restricts the power of each team to be similar across different seasons. In spite of it, we could still conclude that a new manager exerts a negative but not significant influence on results, the impact on home win (draw) is -0.017 (0.005) with z-statistics -1.03 (1.03).

It is also relevant to compare our results with a recent paper by De Paola & Scopa (2012), also for the Italian league. These authors propose an interesting discussion about the potential endogeneity problem and its influence on the analysis of managerial replacements. They argue that apart from the endogeneity problem due to mean reversion, that can be controlled by using lagged match results, there is some remaining endogeneity that derives from the fact that coaches are not fired randomly throughout the season and that may depend on the perceived improvement that may emerge. They focused on this form of endogeneity and treated it with an instrument that is correlated with the decision of firing a coach but uncorrelated with the error term of the model. They argued that the variable "remaining matches" in that season fulfils these two features. Although this variable is an interesting way to deal with this problem, we use a more extended sample and, at least for our dataset, the probability of dismissal is uncorrelated with the season calendar. Figure 1 shows the distribution of dismissals by round suggesting that their distribution is more or less uniform except at the very beginning and end of the season where the proportion of dismissals are particularly low. According to this result it makes sense to treat the potential endogeneity problem as we do in equation (1) by including lagged results, to account for mean reversion, and features of the different managers that explain the probability of coach dismissals.

Figure 1. Average number of managerial dismissals by round. Seasons 2000/01 to 2009/10



In spite of using different econometric specifications, our results in Table are comparable with those in De Paola and Scopa (2012): a managerial change has no impact on match results. Moreover, this result also upholds when we restrict our sample to the five seasons considered by De Paola and Scopa (2012), the estimated impact of a new manager on home victory (draw) is -0.02 (0.006) with associated z-statistics -1.04 (1.04).

4. Extending the basic model

Model (1) in the previous section is based on two important restrictions about the impact of managers on results. Namely, *(1)* the impact of home and away managers is symmetric; *(2)* managers also have a similar effect of goals scored and conceded. Relaxing these assumptions is important to understand the reasons why the different managerial features are important.

We adopt the following bivariate ordered probit model

$$g_h^{\bullet} = \gamma_{11} g_{hh_i} + \gamma_{12} g_{ha_i} + \pi_{11} m10_h + \pi_{21} m\mathbf{10}_a + \beta_{11}{}' h_x + \beta_{12}{}' a_x + e_{1,i} \quad \mathbf{(5)}$$

$$g_a^{\bullet} = \gamma_{21} g_{ah_i} + \gamma_{22} g_{aa_i} + \pi_{21} m10_h + \pi_{22} m10_a + \beta_{21}' h_x + \beta_{22}' a_x + e_{2,i} \quad (6)$$

Where $g_h^{\bullet}$ and $g_a^{\bullet}$ are associated to the observed number of goals (0 for no goals, 1 for one goal and 2 for more than one goal) scored by the home (g_h) and away (g_a) teams respectively according to

$$g_h = \begin{cases} 0 \; if g_h^* \leq c_{11} \\ 1 \; if c_{11} < g_h^* \leq c_{12} \\ 2 \; if c_{13} < g_h^* \end{cases} \quad g_a = \begin{cases} 0 \; if g_a^* \leq c_{21} \\ 1 \; if c_{21} < g_a^* \leq c_{22} \\ 2 \; if c_{23} < g_a^* \end{cases} \quad (7)$$

Variables g_{hh_i}, g_{ha_i}, g_{ah_i} and g_{aa_i} are the number of goals scored and conceded by the home and away teams respectively in their previous matches; h_x and a_x includes the same managerial features considered in model (1) from the previous section but defined for the home and away managers respectively. All these variables are dichotomous and take value 1 if the feature is present in the manager and 0 otherwise, except for age that always indicates the age of the manager expressed in years.

Note that models (5), (6) and (7) constitute a seemingly unrelated specification. The identification conditions as well as the estimation of these models is discussed by Sajaia (2012).

Tables 4 and 5 report the marginal impacts of the variables in the model for home and away goals. Results in the table indicate how the different managerial features affect the defensive and offensive skills of the team. When the manager is inexperienced, he has a negative impact on the numbers of goals that the team scores both at home and away. In principle, this is consistent with the view that a less experienced manager will have less ability to stimulate the creative team skills with new tactics as he has no experience in implementation. On the other hand, a manager who has been a previous team player significantly improves the defensive skill of the teams by conceding less goals to his rivals. This could be mainly due to the degree of commitment of the manager with the team, which makes them more concerned with their defence.

Table 4. Marginal effects on home goals evaluated at average values

	$g_{h_i} = 2, g_{a_i} =.$			$g_{h_i} = 0, g_{a_i} =.$		
	dy/dx	**Se**	**|z|**	**dy/dx**	**Se**	**|z|**
Goals scored by home team's last home match	0.006	0.011	0.58	-0.004	0.008	-0.58
Goals scored by home team's last away match	0.021	0.011	1.99	-0.015	0.008	-1.99
Home team average points in the last ten matches	0.115	0.017	6.86	-0.081	0.012	-6.84
Away team average points in the last ten matches	-0.102	0.015	6.75	0.072	0.011	6.72
Home match experience abroad	0.031	0.026	1.22	-0.022	0.017	-1.26
Away match experience abroad	0.010	0.025	0.41	-0.007	0.017	-0.42
Home active	0.008	0.024	0.35	-0.006	0.017	-0.35
Away active	0.008	0.024	0.33	-0.006	0.017	-0.32
Home age	-0.001	0.001	0.86	0.001	0.001	0.86
Away age	-0.001	0.001	0.68	0.001	0.001	0.68
Home keeper	-0.011	0.078	0.14	0.008	0.057	0.14
Away keeper	-0.064	0.076	0.84	0.049	0.063	0.78
Home defender	-0.075	0.058	1.28	0.056	0.046	1.21
Away defender	-0.054	0.060	0.9	0.040	0.046	0.87
Home midfielder	-0.061	0.056	1.08	0.042	0.039	1.09
Away midfielder	-0.084	0.057	1.47	0.059	0.039	1.5
Home striker	-0.039	0.065	0.61	0.029	0.050	0.58
Away striker	-0.091	0.064	1.43	0.071	0.055	1.3
Home first experience	-0.108	0.033	3.24	0.086	0.030	2.88
Away first experience	0.015	0.036	0.41	-0.010	0.025	-0.41
Home previous team player	0.012	0.021	0.56	-0.008	0.015	-0.57
Away previous team player	-0.045	0.020	2.19	0.033	0.015	2.12
Home Italian	-0.093	0.041	2.25	0.059	0.024	2.49
Away Italian	0.027	0.040	0.66	-0.019	0.030	-0.64
Home previous player	0.079	0.050	1.58	-0.060	0.041	-1.46

Away previous player	0.002	0.052	0.04	-0.001	0.037	-0.04
Home previous vice-manager	0.012	0.057	0.22	-0.009	0.039	-0.22
Away previous vice-manager	0.082	0.059	1.38	-0.053	0.035	-1.52
Home managerial change	-0.016	0.021	0.78	0.012	0.015	0.77
Away managerial change	0.046	0.021	2.21	-0.032	0.014	-2.28
Wald chi2(28)±	222.76(p-value=0.00)					
LR chi2(1)#	42.16 (p-value=0.00)					
Number of observations	3303					

Notes: ± Statistical test for the whole model specification; # LR test of independent equations.

Table 5. Marginal effects on away goals evaluated at average values

	$g_{h_i} = ., g_{a_i} = 2$			$g_{h_i} = ., g_{a_i} = 0$		
	dy/dx	**Se**	**|z|**	**dy/dx**	**Se**	**|z|**
Goals received by away team's last home match	-0.005	0.009	0.58	0.005	0.009	0.58
Goals received by away team's last away match	-0.016	0.009	1.85	0.017	0.009	1.85
Home team average points in the last ten matches	-0.069	0.013	5.21	0.073	0.014	5.21
Away team average points in the last ten matches	0.090	0.014	6.41	-0.096	0.015	-6.41
Home match experience abroad	0.015	0.022	0.67	-0.015	0.023	-0.68
Away match experience abroad	0.053	0.023	2.35	-0.054	0.022	-2.47
Home active	-0.038	0.022	1.74	0.039	0.022	1.80
Away active	-0.010	0.021	0.48	0.011	0.022	0.48
Home age	0.000	0.001	0.12	0.000	0.001	0.12
Away age	-0.003	0.001	2.34	0.003	0.001	2.34
Home keeper	-0.070	0.060	1.17	0.082	0.077	1.06
Away keeper	-0.090	0.057	1.58	0.108	0.078	1.39

Home defender	-0.033	0.051	0.66	0.036	0.057	0.64
Away defender	-0.007	0.052	0.13	0.007	0.056	0.13
Home midfielder	-0.023	0.050	0.45	0.024	0.052	0.46
Away midfielder	-0.050	0.051	0.99	0.052	0.052	1.00
Home striker	-0.032	0.055	0.58	0.035	0.063	0.56
Away striker	-0.017	0.057	0.3	0.019	0.063	0.30
Home first experience	0.032	0.033	0.98	-0.033	0.032	-1.02
Away first experience	-0.067	0.028	2.39	0.077	0.035	2.20
Home previous team player	-0.037	0.017	2.12	0.040	0.019	2.06
Away previous team player	0.014	0.018	0.78	-0.015	0.019	-0.79
Home Italian	-0.001	0.035	0.03	0.001	0.037	0.03
Away Italian	-0.027	0.036	0.75	0.028	0.036	0.77
Home previous player	0.007	0.045	0.16	-0.008	0.048	-0.16
Away previous player	0.068	0.042	1.62	-0.077	0.051	-1.50
Home previous dpty-manager	0.040	0.053	0.76	-0.040	0.050	-0.80
Away previous dpty-manager	-0.043	0.046	0.93	0.048	0.055	0.88
Home managerial change	-0.011	0.018	0.61	0.012	0.019	0.61
Away managerial change	-0.003	0.018	0.19	0.004	0.019	0.19
Wald chi2(28)±	222.76 (p-value=0.00)					
LR chi2(1)#	42.16 (p-value=0.00)					
Number of observations	3303					

Notes: ± Statistical test for the whole model specification; # LR test of independent equations.

However, results in this table allow us to discover some effects of managerial features that are masked in an aggregate analysis, where there is no distinction between performance at home and away or for defence and attack. For example, experience abroad and age matters, especially at away matches. In principle, an away match is a difficult situation for a team and having an experienced manager who trains players under these circumstances becomes especially important. Besides, although we have already seen in the previous section that being an Italian manager does

not have any significant effect on match results, the estimation here shows that a home Italian manager significantly reduces the probability of scoring home goals. This is, to our knowledge, the first empirical proof of the stereotype about the defensive orientation of Italian managers. Finally, although it has been shown that managerial change has no significant aggregate impact on results in the previous section, this analysis shows that the switch increases the probability of receiving goals at away matches. This is likely due to the fact that the new manager takes riskier decisions.

5. Concluding remarks

Analysing the influence of managerial replacements on the performance of a given organization is always a difficult task, given that both performance and managers' features are only imperfectly observed in applied works. Sport economics offers a fertile ground to test different hypothesis on this field given that the relevant information used in the analysis is unambiguously defined and can be freely obtained from the media.

We study this issue in the context of the Italian football league, finding that some managerial features have a significant influence on results even when we account for indicators of team power and recent results. Variables related to experience turn out to have a positive significant impact on performance. Also, the identification of the manager with the team, reflected in the variable "previous team player", positively influences team results. We find that cultural values are also important. In particular, being an Italian manager reduces the probability of scoring goals in home games.

The paper also estimate the impact on results of involuntary managerial change in a model that controls for both past results and managerial features that are correlated with the decision to change a manager. We find that a coach dismissal does not have a significant impact on aggregate performance although it negatives influence the probability of conceding goals in away matches.

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