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FOOTBALL MANAGER'S TURNOVER: A DEEP ANALYSIS BASED ON EMPIRICAL
FINDINGS

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Abstract

A football manager's job is always under great scrutiny, as the pressure of good results from the fans, the management and the media create a high turnover ratio in this position. This paper tries to measure, from a sample of 208 experiences of coaches in 54 different European clubs if certain variables such as the presence in the European Competitions, the Tier of the team or the timing (Midseason or not) of the sacking influence the job tenure of the manager and the short-term performance effect of the team after the sacking of a manager.

Keywords: Sports, Football, Management, Decision-Making Process

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Introduction

Football (or soccer in the US), with an estimated following of around 4 billion fans all over the globe is according to The Johan Cruyff Institute the most powerful sport in the world, as it is a spectacle that is constantly linking communities, stirring emotions and breaking down cultural barriers. However, what once was a mere and simple sport now has become a 25.5B\$-valued industry, according to the 2019 Deloitte's Football Money League Report, to an extent that the operations of almost every professional football club involves investment in players, managers, stadium, customer service, among others and return from revenues such as ticket prices, merchandise, sponsorship or broadcast rights.

As we are discussing about managing a club, and being a football club a business nowadays, in order to maximize your profits, one of the most common ways to achieve that goal is by making good match performances and eventually achieving the best possible classification. However, when those expectations are not met, and the team fails to reach the on-the-field objectives, the first person that everyone will blame is usually the coach of the team (Gowling et al., 2021). Comparing the reality of a manager with that of a player, for example, a run of sub-par performances on the pitch might see you dropped to the bench, but if you are the guy in the technical area then every bad period of results ramps up that feeling of uncertainty in the job. (Gowling et al., 2021).

There has been an increasing tendency in recent decades to sack football managers when the team does not perform to the stakeholders' expectations. Arsene Wenger, former Arsenal coach, once linked this job to "living on a volcano: any day may be your last". Even though the most common reason for a coach sacking is the lack of good match results, there can be other motives like a rocky relationship with the club owners or management, the poor relationship with the players or fans, or even the lack of on/off-the-field discipline. As management patience runs

out, one has always got to judge if the club's bad performances are necessarily the coach's fault, or even if sacking him and replacing him would deliver the better results that the CEO or board of directors are looking for.

Moreover, for fans in the U.S. raised on American football, basketball or baseball, the concept of the Sack Race - which in other words can translate to "which manager do you think will be sacked first?" - is not something as commonly featured in these sport's cultures as football. Referencing a study performed by the Business Insider in 2020, the median job tenure of all NFL coaches was three seasons, while the median of Premier League coaches was just a season and a half. To give a term of comparison with another professional football league, based on a study released by Observatório do Futebol (CIES), Liga Portugal's managers have also an average job tenure of 416 days. Therefore, these findings show that in these American sports there is a higher emphasis placed on stability and patience. For instance, an ESPN study from 2015 showed that the percentage of coaches replaced since 1996 is more than 30 points higher in the Premier League than in either the NFL or Major League Baseball. According to Balduck et al. (2010), the focus on midseason manager swap is a much more relevant concept in football as the coaching staff usually changes significantly between seasons due to a multitude of factors. And it is not only the fans, the board and sometimes even the team's own players that push for a manager change: Bell et al. (2013) findings suggest that sacking a poorly performing manager may even be welcomed by the markets as a possible route to better future match performance, as, on average, a managerial sacking results in a post-announcement day market-adjusted share price rise of 0.3%.

Bearing all this in mind, this paper has the goal of measuring if the sacking of a coach midseason has any short-term influence in the improvement of results. After that analysis, an assessment will be made of the real impact and influence that variables such as the timing of the sacking (whether it was during the course of the season or not), the presence in the European

Competition and the dimension of the club (referred in this paper as Tier) has in a football manager's job tenure (in number of matches played) and in the short-term performance effect from the sackings of the coaches. All the relevant data was gathered, and a statistical test was made in order to fulfil the purpose of this study.

Literature Review

Manager's Sackings – Tenure and Short-Term Performance Effect

Traditionally, there is the idea that the replacement of a coach improves the performance, since the change of coach in a team that has a series of bad results can provoke the necessary stimulus to break the sequence, that the change can induce positive psychological and motivational effects in the players of a certain team. It is believed that the change of coach, caused by poor sporting results, can break the internal relationships of an organization, motivating players to give a little more of themselves in order to conquer a place in the team. However, some researchers have highlighted the hypothesis that changing coaches has no impact on the performance of a football team, and that the dismissal of the coach is just a convenient means of controlling the frustrations of fans and shareholders.

CIES - Observatório do Futebol - published a study in 2020 analyzing the context of the coaching's job tenure in the 84 main football leagues in the world between January 2015 and December 2019, and the results show that a manager plays an average of 40.6 games before he is sacked, which is not encouraging. These findings go in line with Silvestre (2011), who concluded that there is a greater probability of the dismissal of a coach of the Portuguese first division during the first half of the season, similar to the results obtained for the Italian league by De Paola and Scoppa (2008), for the three main divisions of Belgian football by Balduck and Buelens (2007) or for the Dutch first league by Ter Weel (2011).

When looking at the data, the four-year mark appeared to be significant. SportsBettingDime found that a team's winning percentage is higher in all four professional leagues when you compare coaches with tenures below four years, and tenures above four years. The MLB saw the lowest difference between the two, with tenures of four years or less having a winning percentage of .476, and four years or more at .519. The NHL was next with a .441 winning percentage for the shorter coaching tenures, and .506 for the longer ones. Where you see the most discrepancy between winning percentages at the 4-year mark is in the NBA and NFL. In the NBA, head coaches with a tenure of four years or less had an average winning percentage of .438 compared to .566 when they were tenured longer than four years. For the NFL, the difference in winning percentages showed the largest spread, with .412 for the shorter tenure, and .568 for the longer tenure. In the same way, research from the MLB and the NFL (Bridgewater, 2010) also shows that when a manager is not sacked on those American leagues, performance seems to recover to values identical to those that would have existed had the board of directors decided to fire and hire a new coaching staff.

Haugen (2021) relies on a game theoretic model in order to demonstrate coherence between theory and practice in football coach succession, and the results found in that paper that the most rational decision for a football club in serious trouble is to replace their manager. Szimanski (2015) also states in his book "Money and Football – A Socceronomics Guide" that firing the manager seems to work in the short term, as results from his studies show that the number of points won in the first 3 games were around 50% better than the last 3 games with the previous coach. Likewise, Hughes et al. (2019) supports that theory by stating that the short-term adaptations in swapping managers create disruptions that temporarily suspend the performance decline. However, this suspension creates an illusion that masks greater weaknesses, as in the long term, these disruptions tend to normalize, and the performance issues tend to resurface over again. Similarly, Balduck et al. (2017) also points out in a test performed

in her studies that within four games under the management of a new coach, team performance improved. Those results are also corroborated by Gonzalez-Gomez et al. (2011), who found evidence to suggest that managerial change improves performance, particularly midseason. However, just like Hughes et al. (2019), Balduck et al. (2017) explained that this increase was due to regression to the mean and should be considered a deception from what might happen long-term.

On the other hand, Bruinshoofd and ter Weel (2003) found that performance would have improved more rapidly had organizations retained rather than replaced their managers. According to that paper, sacrificing managers may be a mistake for two reasons: (1) although short-term performance does not worsen, it does not greatly improve either; (2) in the long term after change, performance deteriorates again. The efficacy of manager dismissal versus manager persistence is therefore questionable. That goes in line with Kor (2003), who argues that longer tenures increase managers' knowledge of firm resources and improve opportunity identification, and with Van Ours (2016) who although recognizing in his studies that teams perform better in the short run after a manager turnover, data shows that the performance is also better than before for a control group of coach whose replacements did not happen.

Flint et al. (2014) showed that managerial changes in the Premier League led to an increase in points per match but did not necessarily lead to an improvement in final league position. The research examined showed that those making midseason changes increased their points to an average 1.17 per game, compared to 1.03 at the time of departure. The benefit of changing managers, however, was greater for relegation battlers than Champions League chasers, as further analysis revealed that when considering final league position, clubs in the bottom half of the table improved their final league position, while clubs in the top half did not. In addition to that theory, Frick et al. (2006) also pointed out in their study that the managers of clubs with relatively high team wage bills are the most likely to survive for shorter periods of time,

meaning that the average longevity of the coaching position is lower for top-tier clubs, as working with an expensive team makes the manager more vulnerable.

Audas, Dobson and Goddard (2002) also found that teams who sack their managers midseason show an underperformance in the 3 months after this change, with an increase in the variance of the non-systematic components of performance. From these results, the authors conclude that the high frequency of coach changes must be connected with a contemplation on the part of the clubs' management that the change of coach can lead to an improvement in performance in the short run that is sufficient, for example, to avoid the relegation of division.

Hypothesis

To sum up, and after going through this topic's related literature, the three main hypotheses of this paper were elaborated:

H1: Coaching a top-tier European team influences the manager's tenure at the club positively.

H2: Coaching a team in the European Competitions influences the manager's tenure at the club positively.

H3: The short-term effect in the performance of the team by changing managers midseason tends to be positive.

Data Collection

For this paper, to follow a complete, adequate and reliable analysis with the most appropriate data possible while maintaining some heterogeneity, the sample consisted of 54 clubs, from 7 different countries, accounting for 176 different managers and 207 total manager tenures, 167 of those who were cut to an abrupt end midseason. Since the purpose of this paper is to measure several parameters related with the sacking of football managers, in order to have a standard and uniform criterion in the selection of the sample, we've considered that every coach who is

released without a contract extension or renewal at the end of each football season is to be further considered as “sacking”. Only those who leave voluntarily due to signing for a different team or retiring are the ones we do not consider for the sample.

The data collected comprised information on the club (Country, Budget Cap, Presence in the European Competitions) and on the coach’s tenure (both Number of Matches Coached, Midseason Sack (binary variable) and Win Rate) in the period from 2009 to 2021. Moreover, the results from the last 5 games of each manager were gathered, while also collecting its comparison with the 5 results after the manager change (in other words, with the new coaching staff). Our sample also contained information on a minimum of 6 clubs in each of the top 7 leagues in Europe (according to UEFA’s League Coefficient in the beginning of the 2021-2022 season), gathering a mix between top-tier clubs and those whose expectations and performance were not as high. This meant, by league order: Athletic Bilbao, Levante, RCD Espanyol, Real Madrid CF, Real Sociedad and Valencia CF in La Liga (Spain); Arsenal, Aston Villa, Burnley, Chelsea, Crystal Palace, Leicester, Liverpool, Manchester City, Manchester United, Southampton and Tottenham in the Premier League (England); AC Milan, AS Roma, Bologna, Cagliari Calcio, Empoli, Inter Milan, Juventus, Lazio and Udinese Calcio in Serie A (Italy); Bayer Leverkusen, Bayern Munich, Borussia Dortmund, Eintrach Frankfurt, FC Koln, Mainz 05 and Stuttgart in Bundesliga (Germany); AS Monaco, FC Metz, FC Nantes, Montpellier, OGC Nice and PSG in Ligue 1 (France); Ajax, Heerenveen, PSV, Twente, Utrecht FC and Willem II Tilburg in Eredivisie (Netherlands); and finally Belenenses SAD, CS Maritimo, FC Porto, Moreirense FC, Paços de Ferreira, Rio Ave, SL Benfica and Vitória SC in Liga Portugal (Portugal).

All the gathered data was collected from the most various sources, including Transfermarkt, historical news regarding each sacking, Football Leagues’ public information and even Wikipedia.

Variable Description

Dependent Variables

For the first regression, the dependent variable selected was Tenure. For the second and third regression, the dependent variable selected was the Short-Term Effect (STEffect) in the team's performance after the sacking of the manager.

Tenure: Quantitative variable, representing the length of time a manager has worked for their respective clubs. Since a calendar schedule is different for each club, it was decided to measure this variable not by the number of days on the job, but by the number of games a manager has coached a specific team, being 1 the minimum value, and no theoretical maximum value.

Short-term effect: Quantitative value that describes the point-differential effect in the short-term performance of the team after the sacking of a manager. It is represented as the difference between the points gathered in the first 5 league games with the new coaching staff and the last 5 league games of the sacked coach. It has a minimum value of -15 and a maximum value of 15.

Independent Variables

Concerning independent variables, based on the analysis of the already stated literature and on the fact that is very difficult to characterize a club in only one variable, for regression I it was decided that three qualitative independent variables were chosen to be measured on the impact they had in the tenure of a manager in a football club. Additionally, for regression II, four variables were selected since the purpose of the test is to assess if there is any correlation between the short-term effect on the performance on the team in the next five games under the new coaching staff's guidance and both the independent variables mentioned in regression I and the variable Tenure itself. The endgame is to conclude if there is a relationship between two or more variables caused by something other than chance.

The independent variables are:

Champions League: Binary variable (0 or 1) that is used to describe if a specific club was being part of the European Competitions (UEFA Champions League or UEFA Europe League) during each manager's tenure coaching the team. If the value presented is 0 it means that the team was not taken part in the European Competitions during that specific manager's tenure, whether if the value is 1, then the club participated at least one season.

Tier: Binary variable (0 or 1) that aims to separate the top 50 teams in the UEFA ranking from the rest. The moment of analysis of the tier represents the last record of the rankings before the sacking of each manager. If the value presented is 0 it means that the team was below the top 50 when the manager's tenure at the club has ended, whether if the value is 1, then the club was inside the top 50.

Midseason: Binary variable (0 or 1) that aims to indicate if the manager has left during the course of the season, or if the sacking happened in the offseason, which in the major European football leagues runs from early May until early August. When the value recorded is 1, it means that the coach left his job midseason; if it is 0, then the sacking happened during the scheduled offseason.

Methodology

For this paper, it was decided to use Time and Club Fixed Effects regressions to properly analyze the data obtained and tested in Stata. This way, including fixed effects (represented as group dummies) in the regression will allow to control for the average differences across clubs in any observable or unobservable predictors, namely the differences with the quality of the players, dimension of the club, salary caps and transfer budgets, among others. Fixed effects are variables that are constant across individuals, therefore fixing by club makes different clubs having different expectations controllable, and that a good winning percentage in one club

might not be considered so good in any other team, for example. The fixed effect coefficients soak up all the across-group action and the panel data become more balanced in order to have more accurate and appropriate results.

Furthermore, in order to control for variables that are constant across entities but vary over time, time was also fixed. The remaining variation can then be used to 'identify' the causal relationships we are interested in to study our hypothesis. To summarize, the fixed variables selected were ClubID (in which each club from our sample was given a code from 1 to 54) and Year/Month of Sacking (from 2009.01 to 2021.12, for each club from our sample). Each of the regressions were developed in Stata 17 and the data had to be organized in a Panel Data, where longitudinal observations exist for the same subject and in which the behavior of entities which is observed across time had to be created in order. (See Table 1 for an example of the panel data used in this study).

Assumptions

Before entering the field of regression analysis, it should be mentioned that a prior analysis was made of the short-term performance effect of the swaps of each coaching team, in order to understand whether there was a positive relationship between the performance of a team in the 5 games after the dismissal of the coach and the comparison with the 5 previous games in the sample gathered. After making this analysis by performing a weighted average of all 207 short-term performance effects in our sample, we can assume that changing a manager will increase the number of points achieved in the first 5 games after the sacking by an average of 22% (Table 2). This is in line with the theories of Hughes et al. (2019) and Van Ours (2016), who refer to the existence of a short-term effect that, although temporary (since the team's performances can normalize in the long-term), these disruptions do in fact temporarily suspend the performance decline.

Moreover, the fixed effect regression is as following:

$$Y_{it} = \alpha + \beta_1 X_{it} + \varepsilon_{it} \quad i = 1, \dots, n \quad t = 1, \dots, T$$

And it is assumed that:

1. The error term ε_{it} has conditional mean zero, that is, $E(\varepsilon_{it} | X_{i1}, X_{i2}, \dots, X_{iT}) = 0$
2. $(X_{i1}, X_{i2}, \dots, X_{iT}, \varepsilon_{i1}, \dots, \varepsilon_{iT})$, $i = 1, \dots, n$ are i.i.d draws from their joint distribution
3. Large outliers are unlikely, i.e., $(X_{it}, \varepsilon_{it})$ have nonzero finite fourth moments
4. There is no perfect multicollinearity

Regression Analysis

Considering the hypothesis stated before, the first regression analyzed if Tenure of a manager in a football club could be significantly correlated with variables related with the club such as its presence (or not) in the European Competitions, the Tier of the club or even if the sacking happened midseason or not. In addition to that, the second regression uses these parameters and the variable Tenure itself to study whether they have any influence in the short-term performance effect on the team that is caused by the sacking and replacement of the coaching staff.

In this paper, the estimated model uses two main regressions:

Regression I:

$$Tenure_{it} = \alpha + \beta_1 EU_{it} + \beta_2 Tier_{it} + \beta_3 Midseason_{it} + \varepsilon_{it}$$

Regression II:

$$SEffect_{it} = \alpha + \beta_1 Tenure_{it} + \beta_2 EU_{it} + \beta_3 Tier_{it} + \beta_4 Midseason_{it} + \varepsilon_{it}$$

in which Tenure is the dependent variable in the first regression, while STEffect is the dependent variable in the second. Regarding the explanatory variables, we will consider, for both regressions, the variables Tier (separating the top 50 teams in the UEFA club's ranking from the rest), EUCompetition (describe if a specific club was being part of the European Competitions (UEFA Champions League or UEFA Europe League) during each manager's tenure coaching the team) and Midseason (which confers if the sacking of the manager happened in the middle of the season or at the end). Additionally, we have also analyzed the influence that the variable Tenure had in the Short-Term (performance) Effect of each sacking in regression II.

Discussion

In this section, the two above-mentioned regressions are run to study the different types of effects that these variables have in impacting the process of sacking a manager, by analyzing Tenure and STEffect. The coefficients that arise for each variable give us the type of relations with the dependent variable in study, in comparative terms to the omitted variable. The level of significance can be divided in three different categories: the 1-percent level, with a p-value under 0.01 (the most significant level); the 5-percent level, with a p-value under 0.05; and finally the 10-percent level, with a p-value under 0.1.

Table 1: Results from Regression I

tenure	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
tier	38.21121	55.08653	0.69	0.489	-70.63455	147.057
eucompetition	26.28879	15.20943	1.73	0.086	-3.763614	56.34119
midseasonid	-14.78519	9.442547	-1.57	0.120	-33.44277	3.872385
_cons	42.20045	19.91659	2.12	0.036	2.847157	81.55375
sigma_u	30.933896					
sigma_e	43.229609					
rho	.33864325	(fraction of variance due to u_i)				

Once the regressions in Stata were analyzed, we could observe some interesting results. Regarding Regression 1, the impact on the Tenure of the coach of variables such as the presence of the club in the European Competitions, the Tier of the club in UEFA rankings or the timing of the sacking (Midseason) was measured and analyzed. By studying the results, we can see that European Competition has a positive coefficient of 26.28 with a p-value of 0.086. This means that, with an 90% confidence interval, there is a significant relation between these two variables, and so we can verify that the presence in European Competitions is directly correlated with the tenure of a coach in a football team. That is, if a manager coaches a club that is participating, at some point, in European competitions, his coaching tenure at the team is more likely to be greater than that of a coach whose club does not make a single presence at the European competitions. However, both Tier and Midseason variables have a p-value of over 0.10, which tells that the job tenure of a football coach is not correlated with any of these variables.

Table 2: Results from Regression II

steffect	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
tenure	-.0546412	.4994925	-0.11	0.913	-1.041645	.9323625
tier	499.0152	337.5324	1.48	0.141	-167.9532	1165.984
eucompetition	137.5092	93.96586	1.46	0.145	-48.16861	323.1869
midseasonid	235.9223	58.23504	4.05	0.000	120.8491	350.9955
_cons	-183.5527	123.6498	-1.48	0.140	-427.8864	60.78101
sigma_u	339.34136					
sigma_e	264.45752					
rho	.62214247	(fraction of variance due to u_i)				

Considering regression II, in which the variable in study is the Short-Term Performance Effect, the results were not in line with the previous ones. In this test, the explanatory variable Midseason was found to be statistically significant with a p-value of 0.000 and a coefficient of 235.9. We can conclude, with a 99% confidence interval, that this variable is significantly related with the variable STEffect, which means that it is more likely to get a positive short-term performance effect from the sacking of a coach if the sacking happens during the course of the season instead of during the offseason. However, the explanatory variables EUCompetition, Tenure and Tier were found not significantly related with this effect, implying that the variable in study was not influenced by any of these factors.

Hypothesis Analysis

H1: Coaching a top-tier European team influences the board's patience positively.

As it was demonstrated in Regression I's results, the test found no statistical significance between the rankings of the football clubs and their respective manager's job tenures in the team. This finding indicates that there is insufficient evidence that identifies a consequential relationship between top-tier/low-tier clubs and the longevity (Tenure) of football coaching positions for the data investigated. These results go against the theory of Frick et al. (2006), who proclaims that there is a correlation between finishing with a better ranking and, more importantly, improving on previous team performance yields longer survival. Coaches of clubs with relatively high team wage bills (which one assumes that is related with the variable Tier) are likely to survive for shorter periods of time. Even though these were the literatures found on this matter, the fact is that we found no correlation between these variables, therefore we end up rejecting H1.

H2: Coaching a team in the European Competitions influences Tenure positively.

It was also demonstrated in Regression I's results that having coached a football club who is in the European Competitions tend to affect positively the manager's Tenure at the club. Since no specific reading was found that refers to this relationship between the club's presence in European Competitions and the longevity (Tenure) of a football coach position, one of the most adequate papers found that tries to explain this dynamic is the study by Flint et al. (2014), which indicates that the benefit of changing managers is greater for relegation battlers than Champions League chasers, as further analysis revealed that when considering final league position, clubs in the bottom half of the table improved their final league position, while clubs in the top half did not. This corroborates the theory that it might be better for the administration of a club, who are not irrational individuals (Audas, Dobson and Goddard (2002)), to be more patient and stick

with the current manager instead of sacking him and search for a short-term positive effect that may not be as much rewarding as one think. Concluding, we end up accepting H2.

H3: The short-term effect in the performance of the team by changing managers midseason tends to be positive.

Moreover, in regression II, we can assess by the results that the variable Midseason is positively correlated with the STEffect. Being Midseason a binary variable, it can be also said its contrary, which is that the short-term performance effect from the sacking of a coach will tend to be lower if the sacking happens during the offseason. This theory is supported by the studies of Hughes et al. (2019) that the short-term adaptations in swapping managers midseason create disruptions that temporarily suspend the performance decline. It makes more sense to feel this short-term shock effect midseason, as the players are the same but the morale, the methods and the tactics used might be different under the new coaching staff's guidance. Therefore, we end up accepting H3.

Limitations & Future Work

One major limitation that this paper has is that only the board itself can say what caused each of the analyzed manager change in the sample. We are assuming that every manager swap has been made with the sole purpose of improving the team performance both in the short and in the long run, but it was very difficult to understand, in several cases, whether the coach was sacked or quitted on his own, or even if something else happened backstage that catalyzed the managerial change. Since the purpose of this paper is to study whether certain club features can

influence both the length of a coach tenure and the success of the change in the team's coaching staff, having full knowledge of the reasons and logic behind each of the manager's swaps would be useful to obtain more accurate results.

Another limitation of this work is that, while the short-term effect can always be investigated as being good or bad, the long-term effect of a change in the coaching staff is very hard to be studied as it tends to always normalize itself. As stated by other researchers, the short-term effect in performance might be an "illusion" in assuming that the manager swap was a success. For future research, one should try to investigate and study why this short-term effect is only temporary and understand what variables appear to prevent this illusion from becoming a lasting reality in most teams.

Finally, this paper was based on the assumption that the tested explanatory variables influence coaches' longevity in clubs and the respective short-term effects from the sackings, ignoring all other potential impact factors. However, for future research, we should consider more factors to be included in the analyzed regressions (such as, for example, age, nationality (and if he is from the same country as the club), previous experiences, numbers of titles won, among other things) in order to have a more explanatory sample with more accurate and complete results.

Conclusion

The purpose of this paper was to measure the influence and the impact that variables such as the presence in the European Competitions, the timing (midseason or offseason) and the Tier of the club had in a football manager's job tenure (in days). After running the regressions, the results showed that the presence in the European Competition had a significant impact in the tenure of a manager. We conclude that, to our sample, teams who participate in the European Competitions are less likely to sack their managers.

Furthermore, we also had the goal of analyzing if the sacking of a coach midseason has any short-term influence in the improvement of results, and whether this short-term effect in the performance of the team was higher in clubs whose previous manager had a longer tenure, along with the explanatory variables EUCompetition and Tier. Results showed that there is a positive correlation between sacking a coach midseason and the improvement in the performances in the short run. We can conclude, based on the performed tests and the achieved results, that although some of the explanatory variables under study will not be correlated with the dependent variables, the fact is that hypotheses II and III were confirmed, and that the EUCompetition and Midseason variables are positively correlated with a manager's Tenure and Short-Term Performance Effect (STEffect)

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Appendix

Coach Name	Id	Stacked	Year of Signing	Tenure	Team	Team ID	Tier	IU Competition	Last 5 (out of 15)	% Last 5	Next 5 with new	% Next 5	STEffect	STEffect1	Left Midseason?	Midseason ID
Gennaro Gattuso	1	1	01/05/2019	83	AC Milan	1	1	1	12	0,800	6	0,400	-0,400	-40,000	No	0
Massimiliano Allegri	2	1	01/01/2014	178	AC Milan	1	1	1	5	0,333	7	0,467	0,133	13,333	Yes	1
Sinisa Mihajlovic	3	1	01/04/2016	38	AC Milan	1	1	1	2	0,133	8	0,533	0,400	40,000	Yes	1
Marcel Keizer	4	1	01/12/2017	24	Ajax	2	1	1	13	0,867	13	0,867	0,000	0,000	Yes	1
Unai Emery	5	1	01/11/2019	78	Arsenal	3	1	1	3	0,200	6	0,400	0,200	20,000	Yes	1
Leonardo Jardim	6	1	01/10/2018	233	AS Monaco	4	1	1	2	0,133	4	0,267	0,133	13,333	Yes	1
Leonardo Jardim (2)	7	1	01/12/2019	37	AS Monaco	4	1	0	10	0,667	4	0,267	-0,400	-40,000	Yes	1
Thierry Henry	8	1	01/01/2019	20	AS Monaco	4	1	1	2	0,133	11	0,733	0,600	60,000	Yes	1
Eusebio Di Francesco	9	1	01/03/2019	87	AS Roma	5	1	1	9	0,600	7	0,467	-0,133	-13,333	Yes	1
Zdenek Zeman	10	1	01/02/2013	26	AS Roma	5	1	0	2	0,133	10	0,667	0,533	53,333	Yes	1
Rudi Garcia	11	1	01/01/2016	118	AS Roma	5	1	1	7	0,467	10	0,667	0,200	20,000	Yes	1
Gaizka Garitano	12	1	01/01/2021	89	Athletic Bilbao	6	0	1	7	0,467	8	0,533	0,067	6,667	Yes	1
Eduardo Berizzo	13	1	01/12/2018	15	Athletic Bilbao	6	0	0	2	0,133	11	0,733	0,600	60,000	Yes	1
Robin Dutt	14	1	01/04/2012	37	Bayer Leverkusen	7	1	1	3	0,200	11	0,733	0,533	53,333	Yes	1
Sami Hyypia	15	1	01/04/2014	41	Bayer Leverkusen	7	1	1	4	0,267	13	0,867	0,600	60,000	Yes	1
Roger Schmidt	16	1	01/03/2017	125	Bayer Leverkusen	7	1	1	6	0,400	5	0,333	-0,400	-40,000	Yes	1
Helko Herrlich	17	1	01/12/2018	64	Bayer Leverkusen	7	1	0	10	0,667	12	0,800	0,133	13,333	Yes	1
Peter Bosz	18	1	01/03/2021	108	Bayer Leverkusen	7	1	1	4	0,267	10	0,667	0,400	40,000	Yes	1
Nico Kovac	19	1	01/11/2019	44	Bayern Munich	8	1	1	7	0,467	9	0,600	0,133	13,333	Yes	1
José Mota	20	1	01/03/2012	51	Belelenses SAD	9	0	0	7	0,467	5	0,333	-0,133	-13,333	Yes	1
Mitchell van der Gaag	21	1	01/09/2013	57	Belelenses SAD	9	0	0	3	0,200	6	0,400	0,200	20,000	Yes	1
Uto Vidgal	22	1	01/03/2014	42	Belelenses SAD	9	0	0	6	0,400	7	0,467	0,067	6,667	Yes	1
Ricardo Sá Pinto	23	1	01/12/2015	26	Belelenses SAD	9	0	1	3	0,200	8	0,533	0,333	33,333	Yes	1
Julio Velásquez	24	1	01/10/2016	31	Belelenses SAD	9	0	0	8	0,533	5	0,333	-0,200	-20,000	Yes	1
Quim Machado	25	1	01/04/2017	27	Belelenses SAD	9	0	0	5	0,333	7	0,467	0,133	13,333	Yes	1
Domingos Paciência	26	1	01/01/2018	28	Belelenses SAD	9	0	0	2	0,133	8	0,533	0,400	40,000	Yes	1
Silas	27	1	01/06/2019	61	Belelenses SAD	9	0	0	3	0,200	6	0,400	0,200	20,000	No	0
Pedro Ribeiro	28	1	01/01/2020	14	Belelenses SAD	9	0	0	4	0,267	6	0,400	0,133	13,333	Yes	1
Petit	29	1	01/10/2021	66	Belelenses SAD	9	0	0	4	0,267	4	0,267	0,000	0,000	Yes	1
Jorge Jesus	30	1	01/06/2015	321	Benfica	10	1	1	11	0,733	9	0,600	-0,133	-13,333	No	0
Rui Vitória	31	1	01/01/2019	180	Benfica	10	1	1	12	0,800	15	1,000	0,200	20,000	Yes	1
Bruno Lage	32	1	01/06/2020	76	Benfica	10	1	1	5	0,333	13	0,867	0,533	53,333	Yes	1
Filippo Inzaghi	33	1	01/02/2019	24	Bolonha	11	0	0	1	0,067	4	0,267	0,200	20,000	Yes	1
Delio Rossi	34	1	01/10/2015	18	Bolonha	11	0	0	3	0,200	10	0,667	0,467	46,667	Yes	1
Franco Colomba	35	1	01/08/2010	30	Bolonha	11	0	0	7	0,467	7	0,467	0,000	0,000	No	0
Lucien Favre	36	1	01/12/2020	110	Borussia Dortmund	12	1	1	4	0,267	10	0,667	0,400	40,000	Yes	1
Michael Frontzek	37	1	01/02/2011	61	Borussia Monchengladbach	13	0	0	6	0,400	7	0,467	0,067	6,667	Yes	1
Lucien Favre	38	1	01/09/2015	189	Borussia Monchengladbach	13	1	1	0	0,000	15	1,000	1,000	100,000	Yes	1
Andre Schubert	39	1	01/12/2016	62	Borussia Monchengladbach	13	1	1	4	0,267	10	0,667	0,400	40,000	Yes	1
Eddie Howe	40	1	01/10/2012	87	Burnley	14	0	0	5	0,333	9	0,600	0,267	26,667	Yes	1
Brian Laws	41	1	01/12/2010	44	Burnley	14	0	0	6	0,400	10	0,667	0,267	26,667	Yes	1
Gianfranco Zola	42	1	01/03/2015	11	Cagliari Calcio	15	0	0	1	0,067	1	0,067	0,000	0,000	Yes	1
Massimo Ficcadenti	43	1	01/11/2011	11	Cagliari Calcio	15	0	0	3	0,200	5	0,333	0,133	13,333	Yes	1
Leonardo Semplici	44	1	01/09/2021	19	Cagliari Calcio	15	0	0	2	0,133	5	0,333	0,200	20,000	Yes	1

Table 1: Incomplete example of our panel data used for this study

% Next 5	STEffect
0,467	-0,200
0,733	0,333
0,533	0,467
0,333	0,067
0,533	0,333
0,533	0,267
0,800	0,400
0,467	0,467
0,333	0,267
0,533	0,133
0,467	0,200
0,267	-0,067
0,800	0,333
0,200	-0,267
0,667	0,267
0,533	0,067
0,467	0,333
0,533	0,267
0,467	0,267
0,867	0,667
0,533	0,133
0,467	0,400
0,533	0,400
0,533	0,267
0,067	0,067
0,133	0,133
0,733	0,467
0,400	0,200
0,400	-0,067
0,600	0,333
0,667	0,267
Weighted Average:	0,22

Table 2: Calculation of the average short-term performance effect per each club of the sample

. xtreg tenure tier eucompetition midseasonid, fe

```

Fixed-effects (within) regression      Number of obs   =      207
Group variable: Club                  Number of groups =       54

R-squared:                            Obs per group:
    Within = 0.0465                    min =          1
    Between = 0.5231                   avg =         3.8
    Overall = 0.2822                    max =         13

corr(u_i, Xb) = -0.1193                F(3,150)        =       2.44
                                        Prob > F         =       0.0670

```

tenure	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
tier	38.21121	55.08653	0.69	0.489	-70.63455	147.057
eucompetition	26.28879	15.20943	1.73	0.086	-3.763614	56.34119
midseasonid	-14.78519	9.442547	-1.57	0.120	-33.44277	3.872385
_cons	42.20045	19.91659	2.12	0.036	2.847157	81.55375
sigma_u	30.933896					
sigma_e	43.229609					
rho	.33864325	(fraction of variance due to u_i)				

F test that all u_i=0: F(53, 150) = 1.24 Prob > F = 0.1576

Table 3: Full Regression I

