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NEW SEASON NEW HOPES: OFF-SEASON OPTIMISM

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Abstract

While literature on the relation between on-field sports performance and stock returns is ample, there is very limited evidence on off-season stage. Constituting around 3 months, off-seasons do not only occupy a significant part of the year but also represent totally different characteristics than on-seasons. They lack the periodic, unambiguous news events in on-seasons (match results), instead they are associated with highly uncertain transfer news and rumors. We show that this distinction has several impacts on the stock market performances of soccer clubs. Most notably, off-seasons generate substantially higher (excess) returns. After controlling for other variables, the estimated effect of off-season periods is as high as 38.75%, annually. In line with several seminal studies, we link this fact to increased optimism and betting behavior through uncertain periods; and periods prior to the start of a new calendar (in our case, new season). For all of the examined 7 clubs (3 from Italy and 4 from Turkey), mean excess returns over the market are positive (negative) in off-seasons (on-seasons). On-seasons are associated with increased trading activity due to more frequent news. Stocks of Italian clubs are evidently more volatile through off-seasons while volatility results for the stocks of Turkish clubs are not consistent.

Keywords: Off-season, On-season, Soccer Clubs, “Sell in May and Go Away”, Fan-investors, Optimism, Uncertainty

JEL Classifications: G11, G12, G14, G41

1. Introduction

There is a vast amount of studies on the sports performance (on-season) and stock market reaction relation. The performance of a soccer team may affect the mood of their fan investors which then will affect the stock prices of those clubs. However, the performance of soccer clubs will also influence the expected cash flows and revenues which will affect the stock prices. Therefore, the performance-stock return relation depends on both rational expectations and behavioral finance theory (Castellani et al. 2015). Scholtens and Peenstra (2009) find that wins (losses) lead a positive (negative) stock market response for 8 teams from 5 countries during 2000–2004. The response is significantly higher for losses compared to wins called as loss effect. The effect is stronger for matches in the European competition than for those in the national

competition. Palomino et al. (2009) show that stock market reacts strongly to game results by generating abnormal trading volumes and abnormal returns. The market's processing good news faster than bad news as the positive market reaction to a win is observed on the first trading day after the games, but not on the following days. They also aim to analyze whether market reactions to game results reflect rational expectations or an overreaction. However, their findings support both rational arguments and investor sentiment.

Stadtmann (2006) analyzes whether sporting success can explain stock prices of the German soccer club, Borussia Dortmund. After controlling the expectations by using betting odds, it is found that unexpected game results drive stock market prices. However, the impact of European matches is not different from domestic games. For 3 listed clubs of Turkey, Demir and Danis (2011) document an asymmetric stock market reaction to both wins and losses while a win in a European Cup does not affect clubs' stock returns. On the contrary to the expectations, the effect of a domestic win is significantly higher than the effect of a European Cup win. Using ARCH models, Benkraiem *et al.* (2011) show that there is an increase in the volatility of stock prices of listed clubs around the dates of matches meaning that investors change their portfolio composition after matches leading to a change in volatility and stock prices. Both wins and losses cause high volatility during the trading day following the match while no effect is found for draws. Moreover, defeats at home cause higher volatility than defeats away. The loss effect is also documented in line with the literature. By using a dataset of only international games, Bernile and Lyandres (2011) document that market's reaction to soccer games' outcomes is asymmetric. Reaction to losses is significantly negative while wins are followed by almost zero returns. They develop a proxy for investors' expectations based on contracts traded on betting exchanges and it is shown that investors are overly optimistic about their teams' performance ex ante and a contrary outcome results in a large negative postgame abnormal returns.

Bell et al. (2012) find that performance of teams affects their stocks' price however these effects are modest compared with the effects of other related variables. It is concluded that proportion of variation in stock prices explained by match results is very small for 19 English clubs. Demir and Rigoni (2017) are the first introducing the performance of the archrival on stock market reaction to soccer performance analysis for Italy. They find that when club supporters experience the negative performance of their team, the results of their archrival affect their investment decisions. It is concluded that the investors are driven by the sentiments conveyed by rivalry. For all 23 listed European soccer teams, Castellani *et al.* (2015) document that wins are followed by positive abnormal returns while ties and losses are followed by negative abnormal returns. And a loss effect is again observed. Wins and losses at home compared to away games lead a higher stock market reaction in magnitude. Godinho and Cerqueira (2016) investigate the relation between stock returns and results in national league matches for 13 clubs of six European countries by focusing on the unexpected component of match results. They find a significant link between the results and stock performance for 12 out of the 13 considered clubs.

On the contrary to this rich literature on examining the performance-stock return relation, to our knowledge, the impact of events in the off-season to stock prices of soccer clubs is rarely examined. Although the performance of teams can be weekly observed during on-seasons, teams complete their on-season preparations in the off-seasons such as transferring football players, choice of new managers, playing pre-season matches, and developing new tactics. Moreover, the fans (and fan investors) optimistically develop their expectations for the forthcoming season. The respective monthly circulation numbers for the most famous two sports newspapers of Turkey, namely *Pas Fotomac* and *Fanatik* was 2.5 million and 1.9 million in November, 2015. However, this number was around 2.8 million and 2.4 million in July 2015 when there are no news about the on-field performance of soccer teams. In the off-season, news is mostly about transfer rumors increasing the optimism of fans. For example, Babacan and Ozer (2014) show that the start of negotiations for a transfer positively affects stock prices of the related soccer club in Turkey. Fotaki *et al.* (2016) focus on the turnover in human resources by examining its effect on shareholder value for listed UK football clubs. It is found that acquisition of football players leads to a negative abnormal return on club stocks while player sales have an opposite effect. Most of the transfers are finalized in the off-seasons, which reflect the importance of these periods. Bernile and Lyandres (2011) show that investors are highly optimistic about their teams' performance ex

ante and a negative outcome leads to a strong negative postgame abnormal return in the on-season. Off-season is a period when fan investors hear about transfer rumors (even unrealistic ones) which then increase the optimism for the forthcoming season. Optimism can lead to overestimation of one's chances or the team that one supports (Page, 2009). Based on this, we comparatively analyze the performance of stock prices of listed clubs in the off-seasons and on-seasons.

The only study with a comparative analysis of on-seasons and off-seasons is Zuber *et al.* (2005) who examine stock returns and trading volumes in two periods separately. For the English Premier League teams, no significant difference is detected, although mean off-season return is relatively higher than the mean on-season return. Moreover, there does not exist a consistent pattern in trading volumes, either. The authors conclude that larger number of information events in on-seasons do not result in increased return or trading volume. The study is limited to British clubs and a relatively older dataset of 1997–2000. However, the findings signal an unexpected fact to be explored in more detail. Approaching to the analyses with a focus on on-season attributes, the study of Zuber *et al.* (2005) is not a close match to ours. In this study, we handle the case with a target to understand the distinction between two periods initiating from off-season characteristics.

We show that returns, both raw and excess over the market, are substantially higher in off-seasons. Annualized mean difference between off-season and on-season excess returns varies from 11.75% to as high as 54% for the included clubs' stocks. Moreover, regression results indicate that, after controlling for other variables, an off-season day is estimated to generate 0.155% (38.75%, annualized) higher return when compared to an on-season day. Each of the examined stocks of the Italian and Turkish soccer clubs yields positive excess returns through off-seasons while this fact is reversed through on-seasons. Since we link high off-season excess returns mainly to the increased demand from optimist fan-investors, lowered prices through on-seasons are an expected outcome. Specifically, prices getting far from their true levels experience a reversal when the level of behavioral biases is lower. In this context, our study relies on four important studies: Bouman and Jakobsen (2002) introducing "Sell in May and go away" puzzle; Kumar (2009a, 2009b) claiming that behavioral biases such as optimism are larger for hard to value stocks and when market wide uncertainty is higher; and Campbell and Hentschel (1992) who suggest that no-news is good news.

The remainder of the paper is organized as follows. Section 2 presents the utilized data. Section 3 explains our methodology in inquiring the characteristics of on-seasons and off-seasons. Section 4 reports our findings while the following section discusses in the related framework. Final section concludes.

2. Data

Employed dataset comprises of stock returns for seven football clubs from two countries, namely Italy and Turkey. Juventus FK, Lazio and Roma are the Italian clubs; Beşiktaş, Fenerbahçe, Galatasaray and Trabzonspor are the Turkish clubs examined in this study. The reasons underlying the selection of these clubs and countries are twofold. First, there is limited number of (22) football clubs listed on the stock exchanges. These clubs are included in STOXX Europe Football Index. While 15 of these clubs are from 4 countries (Italy, Turkey, Portugal and Denmark), remaining are from different countries. In our analyses, we aim at drawing conclusions based on the competitive environment. Thus, we narrow down the set of included clubs to the clubs of countries for which multiple clubs (also the major ones in those countries) are listed on an exchange. However, we exclude the Portuguese and Danish clubs due to infrequent trading. For large portion of trading days, no trade occurs, resulting in weak and misleading conclusions. The comparative results on the on-season and off-season performances highly depend on the numbers of no-trade days.[1] Consequently, we examine the performances of seven major football clubs from two countries. Data range for each club differs based on initial listing date. We include

[1] For example, on 1.3% of trading days no trading occurs for Lazio. This rate is much lower for the remaining 6 stocks. On the other hand, this rate is as high as 5% and 22% for Benfica and Sporting Lisbon, respectively.

all available seasons for each club. Dataset starts from the first full season for which the stock is listed. Specifically, dataset starts from 2001-2002 season for Roma; 2002-2003 season for Juventus, Galatasaray and Beşiktaş; 2004-2005 season for Lazio and Fenerbahçe; 2005-2006 season for Trabzonspor. Last season of analysis is same, 2015-2016, for all clubs. Daily adjusted stock returns are obtained from Yahoo-Finance. While returns are already adjusted for stock splits and dividends, we exclude days with absolute returns higher than 20%.[2]

Table 1. Descriptive Statistics

Panel (a)	**Country**	**No of seasons**	**No of days**	**Off-season**	**On-season**
JUVE	Italy	14	3554	1288	2266
LAZIO	Italy	12	3026	1107	1919
ROMA	Italy	15	3763	1263	2500
BJKAS	Turkey	14	3510	1132	2378
FENER	Turkey	12	3016	961	2055
GSRAY	Turkey	14	3515	1133	2382
TSPOR	Turkey	11	2758	878	1880
Panel (b): Total	**Mean**	**Median**	**Std. Dev.**	**Min.**	**Max.**
Return	0.019	0.000	2.996	-19.87	20.00
Market return	0.033	0.073	1.700	-12.48	12.89
Liquidity	2,715,890	410,200	9,398,806	0	235,845,419
Volatility	2.826	2.121	2.490	0	28.18
Panel (c): Italy					
Return	-0.039	0.000	2.873	-18.57	20.00
Market return	-0.006	0.040	1.577	-8.24	11.49
Liquidity	889,088	203,400	2,930,819	0	90,880,000
Volatility	3.149	2.469	2.772	0	28.18
Panel (d): Turkey					
Return	0.067	0.000	3.091	-19.87	20.00
Market return	0.065	0.096	1.793	-12.48	12.89
Liquidity	4,195,508	839,659	12,167,330	0	235,845,419
Volatility	2.566	1.887	2.202	0	28.01

Notes: Panel (a) describes statistics on the football seasons. JUVE, BJKAS, FENER, GSRAY and TSPOR refer to stocks of Juventus, Beşiktaş, Fenerbahçe, Galatasaray and Trabzonspor, in short, respectively. Last three columns stand for the number of trading days used for each soccer club; and their distribution between off-seasons and on-seasons. Panels (b) to (d) report descriptive statistics on the other variables. Return is the daily stock return for the analyzed clubs. Market return is the return on FTSE MIB index for Italy and BIST100 index for Turkey. Liquidity is daily turnover in euro. Volatility is the daily volatility proxy, calculated by quote range divided by mid-quote. Numbers in panels (b) to (d) are in percentages.

Panel (a) of Table 1 provides descriptive statistics involving the total number of trading days for the stocks of each club through both on-season and off-season periods. In addition to raw returns, we examine excess returns. As the representatives of market return, we use return on FTSE MIB index for Italy and return on BIST 100 index for Turkey.[3] Daily highest and lowest prices and daily trading volume, which are used in the calculations of liquidity and volatility

[2] This is in line with daily price limits applied in both stock exchanges. In total, we exclude 49 trading days for 7 clubs.

[3] FTSE MIB index involves approximately 80% of market capitalization in Italy. BIST 100 index constitutes for around 90% of the overall capitalization in Turkey.

variables, are also taken from Yahoo-Finance.[4] We obtain the on-season and off-season periods from the website, *Mackolik* by overviewing the listed dates of the matches in each season. Specifically, the time span between the first match of the season and last match prior to season break is defined as first half on-season. Similarly, starting from the first match after the break to the last match of the season is determined as second half on-season. Rest of the trading days is involved in the off-season periods. We include the trading day following the last match of each half of the season into the on-season period. This is because, the potential effect of the match result is expected in the nearest trading day.

Panel (b) of Table 1 presents descriptive statistics on the variables i.e. stock returns, market return, liquidity and volatility. We observe that mean daily return on the examined stocks is 0.019%, lower than the mean daily market return (0.033%). When we move on with the results in panels (c) and (d) of same table, we observe two different pictures for Italy and Turkey. As illustrated in panel (c), Italian teams' stocks as well as the Italian stock market yield a negative return through our examined time span. Moreover, investing in soccer club stocks generates larger losses when compared to investment in the index (annualized -9.75% vs -1.5%). On the other hand, panel (d) reflects that both examined stocks and overall market provide positive mean return in Turkey (annualized 16.75% and 16.25%, respectively). These suggest two differences between two countries. First, we find chance to make analysis of both a country where soccer clubs' stocks perform worse than the market and a country where the stock returns of the clubs are almost same with the market return. Second, we consider both a decreasing market and a market in an upward trend. Thus, our results are robust to these circumstances. Panels (c) and (d) of Table 1 also present that daily liquidity is much higher for the stocks of Turkish soccer clubs.

3. Methodology

This paper inquires the performance of football clubs' stocks within on-season and off-season periods. Literature mostly deals with on-season periods due to the fact that most of the activity within the clubs is performed through the on-seasons. We question whether this is a valid path by comparing the stock returns, volatility and liquidity components in both on-seasons and off-seasons.

We examine raw returns as well as excess returns over the market for on-season and off-season periods. For stock *i*, mean returns and mean daily excess returns over the market through the on-seasons and off-seasons can be expressed as below

$$R_i = \sum_{t=1}^{N} R_{i,t} \Big/ N \tag{1}$$

$$ER_i = \sum_{t=1}^{N} (R_{i,t} - R_{M,t}) \Big/ N \tag{2}$$

where, ER_i is mean excess return for stock *i* over *N* days; $R_{i,t}$ and $R_{M,t}$ are stock *i* return and market return on day *t*, respectively. We perform this analysis for each stock both over the full sample and season based.

Next, we investigate whether mean daily volatility and mean daily liquidity are significantly different in on-season and off-season periods. In doing this, we follow the same methodology. We simply compute the mean values by

$$VOLA_i = \sum_{t=1}^{N} VOLA_{i,t} \Big/ N \tag{3}$$

[4] An exception in data availability is highest and lowest prices for Lazio. We restrict our analysis on the volatility levels for Lazio to 2009-2010 season and onward due to the fact that previous data is missing.

$$LIQ_i = \sum_{t=1}^{N} LIQ_{i,t} \Big/ N \tag{4}$$

where, $VOLA_i$ and LIQ_i are mean volatility and liquidity for stock *i* over *N* days; $VOLA_{i,t}$ and $LIQ_{i,t}$ are stock i volatility and liquidity on day *t*, respectively.

As a common variable of short term volatility, we consider quote range and mid-quote on each day as below

$$VOLA_{i,t} = \frac{P_{i,t}^{max} - P_{i,t}^{min}}{(P_{i,t}^{max} + P_{i,t}^{min})/2} \tag{5}$$

where, $P_{i,t}^{max}$ and $P_{i,t}^{min}$ are the highest and lowest prices of stock *i* on day *t*. On the other hand, we use daily trading volume as a proxy for liquidity. Daily trading volume for the stocks of Turkish clubs, obtained in Turkish Lira (TL), are converted to Euro based on daily Euro/TL exchange rate declared by Central Bank of Turkish Republic.

We check whether differences between daily means of each variable through on-season and off-season are statistically significant or not. Initially, we employ Jarque-Bera normality test to search for any excess skewness and kurtosis. Test results suggest that almost all of the series we utilize are not normally distributed. Thus, rather than t-test, we implement non-parametric Mann-Whitney U test (or Mann-Whitney-Wilcoxon, MWW test) in order to check whether on-season and off-season series have significantly different values in general. Through assigning ranks to each observation in series under comparison, U test identifies the sample with larger values and whether the overall difference is significant.

In the regression analysis, we use two main models as represented in equations 6 and 7. First model estimates the stock return via market return, lagged returns of the stock, day of the week dummies and a dummy variable representing on-season or off-season. Second model is an extended one including liquidity and volatility as additional explanatory variables.

$$R_{i,t} = \alpha_0 + \alpha_1 R_{m,t} + \sum_{k=1}^{3} \alpha_{1+k} R_{i,t-k} + \sum_{n=1}^{4} \alpha_{4+n} DAY_{n,t} + \alpha_9 ONOFF_{i,t} + \varepsilon_{i,t} \tag{6}$$

$$R_{i,t} = \beta_0 + \beta_1 R_{m,t} + \sum_{k=1}^{3} \beta_{1+k} R_{i,t-k} + \sum_{n=1}^{4} \beta_{4+n} DAY_{n,t} + \beta_9 LIQ_{i,t} + \beta_{10} VOLA_{i,t} + \beta_{11} ONOFF_{i,t} + \varepsilon_{i,t} \tag{7}$$

where $R_{i,t}$ and $R_{m,t}$ are returns for stock i and overall market (as represented by defined indeces), respectively; $R_{i,t-k}$ is the lagged return for period $t-k\ for\ k = 1\ to\ 3$; $DAY_{n,t}$ for n=1 to 4 are the dummy variables for days Monday, Tuesday, Thursday and Friday; $ONOFF_{i,t}$ is the dummy variable being equal to 1 (0) if the trading day is within off (on) season; $LIQ_{i,t}$ and $VOLA_{i,t}$ stand for liquidity and volatility for stock i on day t, respectively. Lag order of 3 is determined based on the BIC (Bayesian Information Criteria). We also estimate each model by the inclusion of year and firm effects. Correlation coefficients are given in Table 2.

Table 2. Correlation coefficients

	Return	Market Return	Liquidity	Volatility
Market return	0.222			
Liquidity	0.112	-0.005		
Volatility	0.118	-0.082	0.306	
OnOff	0.019	-0.004	0.045	0.009

Notes: Table presents Pearson's correlation coefficients. Return is the daily stock return for the analyzed clubs. Market return is the return on FTSE MIB index for Italy and BIST100 index for Turkey. Liquidity is daily turnover in Euro. Volatility is the daily volatility proxy, calculated by quote range divided by mid-quote. OnOff is a dummy variable being equal to 1 (0) if a day is an off-season (on-season) day.

4. Findings

4.1. Cross section of returns

Table 3 presents and compares soccer clubs' stock returns in off-season and on-season. Panel (a) suggests that, mean daily returns in off-season are higher than returns in on-season for all of the examined clubs. Moreover, the difference is statistically significant at 10% level for 5 clubs out of 7. For Roma, mean daily difference between raw returns in off-season and on-season is 0.175% (43.75%, annually). As Panel (b) reflects, the results on the excess returns are even more intriguing. Mean excess return in off-season is positive for all clubs implying that return of soccer clubs' stocks is above the market return. On the contrary, all of the soccer clubs' stocks perform worse than the market when players are on the field. Annualized differences vary from 11.75% to as high as 54%. While all stocks generate higher returns than the market through off-seasons, the picture is upside down in the on-seasons.

Table 3. Comparative analysis of on-season and off-season stock returns

	Off-season	On-season	Difference (Off - On)	Annualized Diff.	Significance
Panel (a) – Raw returns					
JUVE	-0.013	-0.025	0.012	3.00	0.216
LAZIO	0.058	-0.057	0.115	28.75	0.187
ROMA	0.040	-0.135	0.175	43.75	0.068
BJKAS	0.182	0.025	0.157	39.25	0.057
FENER	0.145	0.038	0.107	26.75	0.051
GSRAY	0.167	0.017	0.150	37.50	0.067
TSPOR	0.159	-0.002	0.161	40.25	0.083
Panel (b) – Excess returns					
JUVE	0.014	-0.033	0.047	11.75	0.176
LAZIO	0.074	-0.064	0.138	34.50	0.088
ROMA	0.077	-0.139	0.216	54.00	0.073
BJKAS	0.108	-0.044	0.152	38.00	0.085
FENER	0.055	-0.018	0.073	18.25	0.361
GSRAY	0.092	-0.052	0.144	36.00	0.067
TSPOR	0.096	-0.053	0.149	37.25	0.099

Notes: The table documents comparative results on the soccer clubs' stock returns in off-seasons and on-seasons. JUVE, BJKAS, FENER, GSRAY and TSPOR refer to stocks of Juventus, Beşiktaş, Fenerbahçe, Galatasaray and Trabzonspor, in short, respectively. Raw returns in Panel (a) indicate daily stock returns while excess returns in Panel (b) are the excess returns over the market return. In calculation of excess returns, we subtract market return which is the return on FTSE MIB index for Italy and BIST100 index for Turkey from stock returns. Differences in third column are the differences between off-seasons and on-seasons. We annualize the differences via multiplying by 250, reported in column 4. Significance for whether daily differences are different from zero or not is checked by the non-parametric Mann-Whitney U test (also referred Mann-Whitney-Wilcoxon, MWW test) and reported in last column. In columns 1 to 4 of both panels, numbers are reported in percentages.

We further examine the differences between off-season and on-season stock returns on yearly basis. Table 4 reflects that for approximately two third (61/92) of the club/year pairs, mean daily off-season return is higher when compared to on-season. In addition, none of the negative difference values (off-season return minus on-season return) are statistically significant, while 4 (2) positive values are significant at 10% (5%) level.

Table 4. Differences in mean daily returns through seasons (Off - On)

	2001	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
JUVE	NA	-0.093	-0.111	0.208	-0.081	-0.127	-0.593	0.262
LAZIO	NA	NA	NA	0.122	0.067	0.254	-0.687	-0.075
ROMA	-0.139	0.556*	0.160	-0.266	0.213	0.297	-0.462	-0.145
BJKAS	NA	0.004	0.515	-0.339	0.118	0.217	0.036	-0.034
FENER	NA	NA	NA	0.110	0.113	0.288	-0.183	0.403
GSRAY	NA	0.215	0.462	0.111	0.283	0.369	-0.097	0.548
TSPOR	NA	NA	NA	NA	-0.355	0.039	-0.253	0.545
	2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	
JUVE	0.376	0.113	0.742*	-0.018	0.071	0.092	-0.106	
LAZIO	-0.056	-0.074	0.678	0.340	0.341	0.211	0.195	
ROMA	0.044	0.368	0.913**	0.896	0.198	0.455	0.495	
BJKAS	-0.157	0.507*	0.546	0.130	0.400	0.075	0.086	
FENER	-0.010	-0.145	-0.417	0.085	0.168	0.014	0.539	
GSRAY	-0.162	-0.156	0.287	-0.018	0.362	-0.273	0.100	
TSPOR	-0.218	0.221*	0.603	0.677**	0.504	0.088	-0.275	

Notes: The table reports season based comparative results on the soccer clubs' stock returns in off-seasons and on-seasons. JUVE, BJKAS, FENER, GSRAY and TSPOR refer to stocks of Juventus, Beşiktaş, Fenerbahçe, Galatasaray and Trabzonspor, in short, respectively. Differences in mean returns are obtained by subtracting on-season mean from off-season mean. Significance for whether differences in means are different from zero or not is checked by the non-parametric Mann-Whitney U test (also referred Mann-Whitney-Wilcoxon, MWW test). Numbers are reported in percentages. For this table, (*) and (**) indicates significance at 10% and 5% levels, respectively.

4.2. Trading activity through on-seasons and off-seasons

In addition to returns on the stocks of soccer clubs, we examine daily liquidity and volatility for these stocks through on-seasons and off-seasons. We inquire whether two periods are associated with different characteristics. Table 5 reflects that, for all clubs but Roma, daily liquidity, proxied by total turnover on a given stock is higher through on-seasons. Moreover, the difference is statistically significant for all clubs except one. Mean on-season liquidity is around two-fold mean off-season liquidity for the stocks of Beşiktaş and Lazio.

The fact that the overall liquidity is higher through on-seasons is in line with several previous studies. For example, Palomino *et al.* (2009) suggest that match results have a large effect on excess trading volume. Furthermore, the finding on higher liquidity through on-seasons also supports our previous finding on higher returns through off-seasons. Specifically, on-seasons characterized by more frequent, periodic and publicly available information attract larger turnover.

Table 6 shows the comparative results on volatility for the stocks of examined clubs in on-seasons and off-seasons. Presented in panel (a), for all three Italian clubs, we see higher mean daily volatility in off-season periods. Moreover, the differences are significantly different from zero. This is in line with our explanation on the higher level of behavioral biases through off-seasons. On the other hand, we do not observe consistent findings on volatility for Turkish clubs' stocks. We argue that two facts i.e. larger behavioral biases through off-seasons and arrival of more frequent, periodic news through on-seasons are affective in opposite directions resulting in inconsistent results. Panel (b) results on standard deviations of returns are parallel to the ones of daily volatility, not indicating clear cut conclusions.

Table 5. Comparison of liquidity in soccer clubs' stocks through on-seasons and off-seasons

	Off-season	On-season	Difference (Off - On)	Significance
JUVE	1,255,227	1,734,196.8	-478,969.8	0.000
LAZIO	112,446.4	259,791.3	-147,344.9	0.000
ROMA	947,210.8	730,770.5	216,440.3	0.000
BJKAS	3,120,317.1	6,075,783.6	-2,955,466.5	0.000
FENER	5,532,281.5	6,498,778.8	-966,497.3	0.824
GSRAY	2,226,131.7	2,878,855.1	-652,723.4	0.002
TSPOR	2,461,633.1	2,907,210.3	-445,577.2	0.002

Notes: The table documents comparative results on the liquidity of soccer clubs' stocks, proxied by daily turnover, in off-seasons and on-seasons. JUVE, BJKAS, FENER, GSRAY and TSPOR refer to stocks of Juventus, Beşiktaş, Fenerbahçe, Galatasaray and Trabzonspor, in short, respectively. Differences in third column are the differences between off-seasons and on-seasons. Significance for whether the differences are different from zero or not is checked by the non-parametric Mann-Whitney U test (also referred Mann-Whitney-Wilcoxon, MWW test) and reported in last column.

Table 6. Comparison of volatility in soccer clubs' stocks through on-seasons and off-seasons

	Off-season	On-season	Difference (Off - On)	Significance
Panel A – Daily volatility				
JUVE	3.153	2.836	0.317	0.000
LAZIO	4.121	3.982	0.139	0.012
ROMA	4.097	3.551	0.546	0.002
BJKAS	2.665	2.919	-0.254	0.035
FENER	2.359	2.235	0.124	0.165
GSRAY	2.434	2.540	-0.106	0.083
TSPOR	2.461	2.686	-0.225	0.740
Panel B – Standard dev.				
JUVE	2.504	2.448	0.056	
LAZIO	3.302	3.332	-0.030	
ROMA	3.682	3.085	0.597	
BJKAS	3.069	3.527	-0.458	
FENER	3.096	2.808	0.288	
GSRAY	2.917	3.127	-0.210	
TSPOR	3.100	3.206	-0.106	

Notes: The table documents comparative results on the soccer clubs' stock volatility in off-seasons and on-seasons. JUVE, BJKAS, FENER, GSRAY and TSPOR refer to stocks of Juventus, Beşiktaş, Fenerbahçe, Galatasaray and Trabzonspor, in short, respectively. Differences in third column are the differences between off-seasons and on-seasons. Panel (a) reports daily volatility, as measured by quote range divided by mid-quote on daily basis. Significance for whether the differences are different from zero or not is checked by the non-parametric Mann-Whitney U test (also referred Mann-Whitney-Wilcoxon, MWW test) and reported in last column. Panel (b) states standard deviation of returns on each of the club stocks. In columns 1 to 3 of both panels, numbers are reported in percentages.

4.3. Regression analysis

We also follow a regression analysis approach. Table 7 presents the results. First two columns stand for the results of the regression that estimates stock returns with its lags, market return, day of the week dummies and a dummy variable indicating on-season or off-season. Last two columns in the table demonstrate the results for the regression that additionally considers for the effects of

liquidity and volatility on the returns. As reported in second and fourth columns, we include season and club dummies for both models. In the extended model with additional control variables i.e. liquidity and volatility, we observe increased adjusted R-square values indicating a relatively better capture of stock returns.

Table 7. Regression estimations

	Model 1		Model 2	
	(a)	**(b)**	**(a)**	**(b)**
R_M	0.392**	0.393**	0.411**	0.410**
	(0.011)	(0.011)	(0.011)	(0.011)
R_{t-1}	0.053**	0.052**	0.040**	0.037**
	(0.006)	(0.006)	(0.006)	(0.006)
R_{t-2}	0.001	-0.001	-0.008	-0.011
	(0.006)	(0.006)	(0.006)	(0.006)
R_{t-3}	-0.025**	-0.026**	-0.033**	-0.036**
	(0.006)	(0.006)	(0.006)	(0.006)
Liquidity			0.054**	0.086**
			(0.009)	(0.013)
Volatility			0.150**	0.158**
			(0.008)	(0.009)
Monday	0.192*	0.191*	0.182*	0.180*
	(0.061)	(0.061)	(0.060)	(0.060)
Tuesday	0.090	0.090	0.081	0.080
	(0.060)	(0.060)	(0.060)	(0.060)
Thursday	0.157*	0.158*	0.159*	0.159*
	(0.061)	(0.061)	(0.060)	(0.060)
Friday	0.249**	0.249**	0.263**	0.266**
	(0.061)	(0.061)	(0.060)	(0.060)
OnOff	0.125*	0.130*	0.151**	0.155**
	(0.041)	(0.041)	(0.040)	(0.040)
Year and firm dummies	No	Yes	No	Yes
Observations	23,121	23,121	23,121	23,121
Adjusted R square	0.054	0.054	0.074	0.077
F-statistic	147.2**	45.2**	167.9**	61.0**

Notes: The table documents present regression estimation results. Coefficients are followed by standard errors in parenthesis. Dependent variable is the stock returns of soccer clubs. R_M is the abbreviated form for market return, represented by the return on FTSE MIB index for Italy and BIST100 index for Turkey. R_{t-n} for $n = 1\ to\ 3$ are lagged returns of the stock. Lag order is selected based on the BIC criterion. Liquidity is daily turnover in Euro. Volatility is the daily volatility proxy, calculated by quote range divided by mid-quote. Monday, Tuesday, Thursday and Friday are the days of the week dummy variables. OnOff is a dummy variable being equal to 1 (0) if a day is an off-season (on-season) day. Year and club dummies are included in two models, for which the results are reported in columns 2 and 4. The ratio variables i.e. stock return, its lags, market return and volatility are multiplied by 100 prior to the estimation process for simplicity. (*) and (**) indicate significance at 1% and 0.1% levels, respectively.

The results for all regressions are similar, indicating positive impact of off-seasons on the stock returns of soccer clubs. This effect is economically significant at 1% level in the first model and 0.1% level in the extended model. Focusing on the extended model also with season and club dummies (model 2b), we can point out that stocks of soccer clubs have an expected 0.155% higher return on an off-season trading day when compared to an on-season day, after controlling for included variables. This is an annualized premium of 38.75% which is quite parallel to the mean differences in raw returns and excess returns presented in Table 3. This rate of an effect is substantial and points out to the relevance of this study.

Stock return on the previous day and market return are important determinants of soccer clubs' stock returns. Both variables have positive effect, significant at 0.1% level. A one percentage point increase in market return expectedly leads to 0.41% increase in examined

stocks' daily returns. Interestingly, two period lagged return on the stocks have no significant effect on current returns while three period lagged returns have a significant negative impact. This implies that there is a price reversal effect within three days while there is a momentum effect in shorter run i.e. one day.

In line with this finding, we report coefficients for the weekdays but Wednesday since we expect that behavioral biases concerning fans of the clubs are higher close to the weekends. Through the on-seasons, matches mostly take place on weekends which is the main factor in our expectation. On the other hand, behavioral biases arising from the fans of the clubs should also be higher since fans are more interested in the club near the weekends.[5] Coefficients for all of the reported 4 days are positive indicating that returns on these days are higher on average when compared to Wednesdays. Besides, coefficients for Monday, Thursday and Friday are statistically significant. Coefficient for Friday is highest and significant at 0.1% while the one for Monday is the second highest and significant at 1% level. When compared to an ordinary Wednesday, a Friday (Monday) experiences a 0.27% (0.18%) higher mean return on the soccer clubs' stocks, keeping other variables unchanged. Consequently, we estimate an inverse bell shape within the weekly returns on clubs' stocks. Further research can be focused on weekly characteristics.

Liquidity and volatility are also shown to have positive impacts on the stock returns. Larger trading activity and higher daily volatility imply higher returns on the stocks of soccer clubs. Both increased trading and volatility can be associated with higher information asymmetry which may be an indicator of behavioral biases captured by rational investors, generating higher returns.

5. Discussion of the findings

Our results which suggest that soccer clubs' stock market performances tend to be higher through off-seasons contradict the case for the whole market. Annualized mean market return through off-seasons and on-seasons for Turkey are close to each other, 18.67% and 17.30%, respectively. For Italy, mean off-season market return is lower when compared to on-season (-9.23% and 0.93%, respectively). Similar results for market returns can be inferred from the relevant literature. Bouman and Jacobsen (2002) document that stock returns are higher in the November–April period than in the May–October period, known as "Sell in May and Go Away" puzzle.[6] For the time period of 1970-1998, the annualized mean return in November-April period (May-October period) is found to be 27.1% (-5.2%) for Italy; and 73.0% (51.3%) for Turkey. In the referred study, this fact is also valid for the World market (19.9% and 4.6%, respectively). Likewise, Andrade *et al.* (2013) report that on-season (off-season) annualized mean return in 1998-2012 period is 33.32% (8.59%) for Turkey and 54.05% (46.96%) for Italy. Our findings for soccer clubs contradict the well-known "Sell in May and Go Away" puzzle.

While several explanations such as the length and the timing of vacations and Seasonal Affective Disorder are made, Doeswijk (2008) proposes the optimism-cycle hypothesis as a potential explanation for the aforementioned puzzle. Through the end of the year, i.e. last quarter, investors start looking forward to the next calendar year and they behave too optimistically about the economic outlook. This optimism leads to an increase in stock returns. However, after a few months in the new-year, investors start to face the reality which makes them more pessimistic leading to a decrease in prices in the following months. In sum, from November through April, investors overweight equities while they underweight them during the six-month summer period.

Investors' optimism can be a relevant explanation for the premium in off-seasons as well. Thanks to the fact that soccer club fans tend to invest in the club's stock, through the off-season

[5] We check for the circulation numbers of leading Turkish sports newspapers (http://www.gazetetirajlari.com) through the days of the week both in the on-seasons and off-seasons. In addition to the expected fact that these numbers are higher in Friday-Monday period compared to the Tuesday-Thursday period in on-seasons, this result also applies in off-seasons when there are no matches on weekends.

[6] November-April and May-October periods are close representatives of on-season and off-season periods in our study. Football seasons usually start in September and end in late May.

(summer period), they may be optimistic about the club's performance in the upcoming season.[7] This is in line with the overall optimism in the market around year ends. The reality is experienced through the on-season where investors observe victories and defeats in the field. Therefore, we suggest that the "sell in May and go away" puzzle works as "buy in May and sell in September" for soccer clubs' stocks.

One essential difference between on-season and off-season periods is the nature of arriving news, i.e. type of news, arrival frequency, and uncertainty level. On-seasons are mostly associated with match results. These are periodical news about the performance of the soccer team signaling on the future value of the club. Match results are unambiguous, available to all investors at the same time (almost always out of the session hours). Moreover, when compared to other news on the companies listed in stock exchanges, they are relatively much easier to interpret. On the other hand, off-seasons are characterized by news including player transfer news and more frequently rumors on new transfers. This news is highly uncertain. First, before official announcement of such news, it is usually seen on the media. However, only small part of the transfer news seen in media is realized. Thus, there is a high level of information asymmetry concerning this news. Second, future effect of a new player or coach on the club value is also unclear. This difference is highly related with the studies of Kumar (2009a, 2009b) showing that behavioral biases are in larger amount (more frequent) when market wide uncertainty is higher and for the stocks which are harder to value. Therefore, existence of behavioral biases such as optimism and increased betting behavior through off-seasons should be related to the higher level of uncertainty through these periods. Consequently, we associate higher off-season returns for the stocks of soccer clubs to the emerged behavioral biases of investors. This makes sense especially if we consider the fact that significant part of the investors selecting these stocks are fans of the clubs. It is obvious that fans prefer stocks mostly with other motives than profit (see e.g. Zuber *et al*. 2005; Demir and Danis, 2011).

In addition to uncertainty concerns, the fact that there are rare solid news events over the off-seasons is positivity for the investors. According to Campbell and Hentschel (1992), no news is good news. Match results through on-seasons convey either good or bad signals to the market. On the other hand, in the absence of such solid events, rumors or announcements on new transfers dominate the market. These are mostly evaluated optimistically with the fans of clubs who are a significant part of investors in the stocks. This fact by itself implies a behavioral bias since a positive news should normally be a negative news for the other competing clubs. For example, Demir and Rigoni (2017) show the effects of rival team's performance on the fan investors of a team.

6. Conclusion

While soccer clubs' stock market performance has been studied extensively in the literature, majority of findings are focused on on-seasons. Examining 3 Italian clubs and 4 Turkish clubs, all being major clubs in two leagues, we show that off-seasons exhibit substantially higher (excess) returns when compared to on-seasons. The mean difference between off-season and on-season excess returns varies between 11.75% and 54%, annualized. In the regression estimations, we provide further evidence on higher returns through off-seasons. Specifically, after controlling for lagged returns of stocks, market return, liquidity, volatility and day of the week dummies, a change from an on-season day to an off-season day results in an estimated 0.155% (annualized 38.75%) rise in the returns of clubs' stocks. The results are robust to exclusion of market quality indicators, i.e. liquidity and volatility as well as to the use of time and individual stock dummies.

Moreover, we base this figure on the characteristic differences of two periods. While on-seasons are associated with frequent, periodic, and relatively easy to interpret news; off-seasons mostly involve rare solid news, high uncertainty, and transfer rumors usually incorporating positive signals leading to larger behavioral biases like optimism.

[7] Bernile and Lyandres (2011) provide evidence on the optimism in stock market prior to match dates. In this context, we can expect another form of optimism based on the upcoming season instead of a single match.

Our findings are relevant for at least three branches in the literature. First, we show that on-seasons and off-seasons differ from each other especially with regard to excess returns on soccer clubs' stocks. We expect further studies on the corporate performance of sports clubs to pay attention to the dual structure enlightened in this study. So far, to our knowledge, ours is the first study identifying this dual structure in detail. Second, in support of Kumar (2009a, 2009b), we provide evidence towards the emergence of behavioral biases such as optimism through uncertain periods with rare solid events. Third, we introduce a unique example related to the well-known puzzle, "Sell in May and go away" (Bouman and Jacobsen, 2002). Only in our case, times in the year are reversed due to cutting times between on-seasons and off-season

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