



MARKET REACTIONS TO FOOTBALL MATCH RESULTS: THE EFFECT OF VENUES AND COMPETITION TYPES

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Abstract:

This study seeks to investigate the stock market reaction to football match results in different venues and competition types, especially for three major football clubs: Manchester United, Juventus FC, and Borussia Dortmund. We use a parametric paired sample t-test. The findings show that investors take not only match results but also venues and competition types into consideration when making investment decisions. This study indicates the stock markets of football clubs are semi-strong efficient markets. Different market reaction to match results for each football club studied implies the importance of understanding the specific characteristics of those clubs in making investment decisions. The findings suggest the football club investors need to consider their clubs' competitive performance in different venues and competition types when making portfolio investment decisions. This study complemented the previous assumption on the importance of venues, and competition types match results in making investment decisions.

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INTRODUCTION

Sports have already become an industry, not only a game. According to Collignon, Sultan, and Santander (2011), today's sports industry is worth between €350 billion and €450 billion worldwide, while football contributes the most with the annual income of €28 billion. According to Worldatlas (2018), the third most popular sport in the world is field hockey, with 2 billion fans in European, Asian, and African countries. Cricket ranks second with 2.5 billion fans, and it is popular in former British colonies such as India, Sri Lanka, and Bangladesh (Singh, 2013). The most popular sport in the world is football, with 4 billion fans. Although it has been popular in the European and American continents (Love & Walker, 2013), it has been gaining increasing popularity in Asia and Africa.

Football is the most popular professional sport in Europe. It is also highly covered by the media and involves a vast amount of financial resources (Demir & Danis, 2011; Rowe & Gilmour, 2010).

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Clubs receive their revenues mainly from competitions in which they participate. However, they also receive a substantial amount of revenues from merchandising, sponsors, and media contracts (Demir & Rigoni, 2017). More intense domestic and international competitions motivate clubs to generate more revenues (Demir & Danis, 2011). Also, the rapid growth of the football industry encourages football clubs to be more profit-oriented and even publicly listed on stock exchanges (Berkowitz & Depken, 2017).

According to Demir & Rigoni (2017) and Gallagher & O'Sullivan (2011) financial markets enable clubs to transfer their risks to other parties by offering commensurate returns. Also, financial markets facilitate separation of ownership and control to create optimal allocations of scarce resources. Further, Sun and Wu (2015) argue that such termination enables clubs to generate funds to improve their financial positions.

In 1983, Tottenham Hotspurs was the first football club that listed on a stock exchange. Afterward, many other clubs followed. Accordingly, favorable match results likely lead to better financial performance because competitive success attracts media attention and sponsors (Sakinç, 2014; Bell, Brooks, Matthews, & Sutcliffe, 2012; Rowe & Gilmour, 2010). Similarly, a new information regarding the sporting success is able to help predicting subsequent changes in the stock price of Borussia Dortmund. Before 2000, there were 22 English Premier League clubs listed on the European stock exchanges. However, at present, based on Footballbenchmark (2017), there are only 22 clubs worldwide that listed on European stock exchanges.

Since the change of the century, 14 English football clubs have delisted because of significant share price drops (Wilson, Plumley, & Ramchandani, 2013). Different from other listed firms that publish their financial information at least quarterly, football clubs arguably inform their operational performance through their weekly match results (Basu & Sondhi, 2015).

In 2011, UEFA (the governing body of European football) issued a regulation called "Financial Fair Play" to ensure that football clubs' financial conditions were healthy. The rule regulates the clubs' maximum amount of expenses relative to their revenues. In this respect, costs refer to all charges, excluding stadium investments, young player development, and women's football development. Specifically, clubs are now allowed to have deficits (the difference between expenses and revenues) at most \$ 5 million per three seasons. According to UEFA (2015), using the nominal value of maximum deficit and not a percentage, and excluding long-term investments (such as investments for the stadium and young player development) in expense calculation offer opportunities for small clubs to grow. UEFA expects that the regulation facilitates clubs to have more stable financial conditions and to make better long-term investment projections.

Football clubs do not only deal with financial matters but also have to play football matches every week. Hence, this paper seeks to investigate the effect of football clubs' competitive sports performance (win or lose) on their stock market returns and trading volumes. Football clubs arguably participate in at least two competitions in a season, namely the domestic and international leagues, while the international or continental associations are more prestigious than the domestic ones. Consequently, fans will considerably expect that their football clubs win the international leagues rather than the domestic ones. According to UEFA (2015), continental leagues (UEFA Champions and Europa Leagues) offer clubs the revenues up to \$15.25 million only for their participation.

Football clubs will potentially receive more revenues depending on their performance in these competitions (Dimic, Neudl, Orlov, & Äijö, 2018). Match venues can also affect fans' expectations for their clubs' performance. Fans whose clubs play in their home countries expect more to have their clubs win the matches (Basu & Sondhi, 2015).



Demir and Danis (2011) analyze this issue before but with different results. In particular, Demir and Rigoni (2017) find that stock markets react more reliably to the effects of European competitions than to that of the domestic ones. However, Demir and Danis (2011) find that stock markets do not react differently to the results of the European and local (Turkey) leagues. Based on these inconsistent results, this paper aims to add empirical evidence to this issue and confirm previous findings. Additionally, we use football clubs from different countries considering that Wilson, Plumley, & Ramchandani (2013), Demir and Danis (2011), Demirhan (2013), Fung, Demir, Lau, & Chan (2015) only focus on single countries (England and Turkey, consecutively) and suggest future studies to use football clubs from other European country leagues.

Also, this paper analyzes match results' effects on football clubs not only with abnormal returns but also with trading volume. The inclusion of trading volume in this research since this issue is relatively understudied. To our best knowledge, only Benkraiem, Pryor, & Louhichi (2011) use trading volume in their analysis whereas according to O'Hara, Saar, & Zhong (2018), the trading volume provides information that cannot be provided by stock prices because it informs the process of stock returns. Hence, investors are motivated to use trading volume information to indicate market behaviors (O'Hara et al., 2018). As such, trading volume and abnormal returns have informational roles for investors' decisions (Benkraiem et al., 2011).

This paper aims to ask the following research questions. First, do stock markets react differently (in terms of abnormal returns and trading volume) to match results (win vs. loss) in the domestic and international leagues? Second, do stock markets react differently (in terms of abnormal returns and trading volume) to match results (win vs. loss) in home and away venues? It is expected that this study would potentially inform investors on making investment decisions in football clubs to respond to match results, since football clubs arguably have two unique investor types - the economic rationales investors (Duque & Ferreira, 2010).

The findings provide evidence on the importance of venues and competition types' match results in making investment decisions. The same match results (wins or losses) from different competition or venue types will prompt a different investors' reaction (Gerlach, 2011; Bernile & Lyandres, 2011; Dimic et al., 2018). Market reactions to winning at home matches are higher than winning at away events. However, markets react more to losing at away competitions than at home matches. In line with Fan, Lei, and Zhang (2018), we also find that investors are more sensitive to losses than winning the game.

LITERATURE REVIEW

Market Efficiency

An efficient market fully reflects all the information relevant to investors' decisions. This concept argues that investors always consider publicly available information in their investment decisions. In an efficient market, future income or cash flows reflect firms' stock values (Demir & Danis, 2011). In competitive capital markets, numerous interactions between buyers and sellers lead to price equilibriums. The presence of new information will create new equilibrium prices (Gitman & Zutter, 2014). Consequently, investors likely react to new information (Floros, 2014).

In this regard, football clubs offer a unique setting because investors arguably receive new information weekly from match results (Galloppo & Boido, 2020). The weekly match result information potentially has both direct and indirect effects on clubs' future income (Floros, 2014).



Hence, one can observe the stock market effects of football match results after the matches end. Accordingly, clubs' current share prices have already reflected the expected match results (Bell et al., 2012). Unexpected results will affect share prices because the investors did not anticipate the results beforehand (Demir & Danis, 2011). As such, stock prices contain three elements in an efficient market, namely all historical information, information on announced future events, and information on predicted future events (Floros, 2014). Also, there are three forms of market efficiency, namely the weak form, the semi-strong form, and the stable form of an efficient market (Marwala & Hurwitz, 2017).

Trading Volume Activity

Trading volume activity also indicates capital markets' reactions to information (Benkraiem et al., 2011) because it reflects the dynamic relations between informed and uninformed investors in arranging their trading strategies (Abuzayed, 2013). Technical analysis usually relies on trading volume in its strategy. High trading volumes indicate better market conditions (Dimic et al., 2018; Fung et al., 2015). Trading volume is a variation of the event study (Fung et al., 2015). Because the measure of trading volume activity divides the number of shares traded with the number of outstanding shares, investors can base their investment decisions by assuming that shares with high trading volume activities potentially offer high returns.

Abnormal Returns

Abnormal returns are excesses of actual returns over expected returns (Hartono, 2013). Positive (negative) differences indicate that real gains are higher (lower) than due returns. According to Hartono (2013), abnormal returns are affected by events. In our paper, we use football match results as the events to investigate.

Market Reaction to Football Match Results

Markets likely react to football clubs' match results (Castellani, Pattitoni, & Patuelli, 2013). Further, Demir and Danis (2011) observe the "loss effect" that refers to asymmetric market reaction to losses relative to wins. They also document that the market reacts differently to gains or losses from international and domestic matches. They further argue that clubs will generate more revenues when they win international competitive games than domestic ones, because the international leagues are more reputable than the domestic ones. Accordingly, higher league reputation will lead to higher fans' expectations and the market reacts differently to the results of international and domestic matches (Basu & Sondhi, 2015; Cottingham, 2012). In other words, fans expect more that their clubs win international matches than domestic ones. Consequently, the results of international matches will affect the market more than those of domestic ones (Basu & Sondhi, 2015). Based on these arguments, we propose the first hypotheses:

H1a: Market reactions to wins in the international leagues are higher than those to wins in the domestic matches.

H1b: Market reactions to losses in the international leagues are higher than those to losses in the domestic matches.



This study also predicts that markets react differently to wins or losses in away and home matches. Psychologically, the home-court advantage in professional sports matches motivates home teams more to win than away teams (Škrinjarić & Barišić, 2019). According to Jamieson (2010), more than 50% of home teams win professional sports games. The cheers from home fans highly motivate home teams to play better (Castellani et al., 2013). Home teams are also arguably more familiar with their venues so that they can perform better and more effectively. Also, teams often experience fatigue because they have to travel from their home countries. Fans expect that their football club will win when the teams play at home more than at away matches (Basu & Sondhi, 2015). In this regard, Demir and Danis (2011), Castellani, Pattitoni, & Patuelli (2013), Godinho and Cerqueira (2018) found the market reacts significantly to unexpected results. Based on the arguments, we propose the second hypotheses:

H2a: Market reaction to wins at home is higher than market reactions to wins at away matches.

H2b: Market reaction to losses at home is higher than market reactions to losses at away matches.

METHODOLOGY

This study uses stock market-related and match-results data. We generate match results data from the transfermarket.com database that collects match-related data (dates, venues, and results). Meanwhile, this study gathers stock market-related data from finance.yahoo.com, investing.com, and Bloomberg.com that includes daily trading volume, outstanding shares, and closing prices.

Further, the type of this research is a case study for the matches of the 2018/2019 season on three football clubs (Yin, 2014). We selected clubs for the analysis based on the following criteria: First, the club must have played in the European leagues in the 2018/2019 season. Second, the club has won titles in the domestic and European leagues. Third, the club must have come from the four most significant leagues based on the total market value as suggested by transfermarket.com. This criteria is used to filter the club with the same fans expectation to win the games or competition.

Table 1: Sampling Technique

No.	Criteria	Total
1	played in the european competitions in the 2018/2019 season	14
2	has won the domestic league and continental competitions	5
3	from 4 biggest leagues based on total market value	3
	final sample	3

Table 2: Research Sample

No.	Stock code	Club name
1	nyse.manu	Manchester United
2	juve.mi	Juventus
3	bvb.de	Borussia Dortmund



The data is analyzed using event study because event study analyzes the information content of events that leads to market reaction. As our study aims to investigate the market reaction on the event of football match results in different venues and competition types, we decided to apply event study as it best suits the study objective. These methods were also applied by Demir & Danis (2011) who studied / whose study examined issues regarding football match event.

We use one-day windows for the event period, i.e., one day ($t-1$) before and one day after the matches ($t+1$). Using a one-day event period is appropriate to mitigate the potential risk of overlapping events that confound the results (Berument & Ceylan, 2012; Castellani et al., 2013; Scholtens & Peenstra, 2009). One-day event periods are considered representative for investigating market reactions to particular circumstances and thus is common in the literature (Demir & Rigoni, 2017). This research does not include the trading volume and abnormal returns on the match days (t_0) since most matches are played on the weekends, and stock markets are closed during the weekend (Bell et al., 2012). In particular, we only focus on win or lose match results since Demir and Danis (2011) find that there's no significant effect of the draw results on market reaction.

We calculate abnormal returns and trading volume from the first trading day before and after the match days because most of the domestic matches are played on weekends (Saturday or Sunday). However, for the international events that are usually performed midweek (Wednesday or Thursday), the observation will start from the first trading day before and after the match days. This study focuses on the matches of the 2018/2019 season.

Further, abnormal returns are the differences between actual and expected returns. Following Hartono (2013), we calculate abnormal returns with the following formula.

$$AR_{it} = R_{it} - E[R_{it}] \quad (1)$$

Where:

AR_{it} = abnormal return i stock at t

R_{it} = actual return i stock at t

$E[R_{it}]$ = expected return i stock at t

Actual returns are returns that exist at a certain point in time and the differences between current prices and previous prices ($t-1$). Actual returns computed by using the following formula.

$$R_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}} \quad (2)$$

Where:

R_{it} = daily return i stock at t

P_{it} = daily price i stock at t

P_{it-1} = daily price i stock at $t-1$

Meanwhile, expected returns are returns expected by investors. We use the market-adjusted model to determine expected returns. The model uses market return index to predict stocks' returns that allows ones not to form estimation models. The following is the formula for calculating expected returns.



$$E[R_{it}] = Rm_t \quad (3)$$

Where:

$E[R_{it}]$ = expected return i stock at t

Rm_t = stock market return at t

The three clubs listed on three different stock markets, namely the New York Stock Exchange (NYSE), Borsa Italiana (FTSE.MIB), and Xetra Dax Stock exchange (DAX). The following is the formula for calculating stock market returns.

$$Rm_t = \frac{SPI_t - SPI_{t-1}}{SPI_{t-1}} \quad (4)$$

Where:

Rm_t = stock market return

SPI_t = stock price index at t

SPI_{t-1} = stock price index at $t-1$

We use the closing share prices to calculate actual returns on the day before the match days ($t-1$), and after the match days ($t+1$). We then calculate average abnormal returns to indicate stocks' reactions with the following formula.

$$AAR = \frac{AR_{it}}{N} \quad (5)$$

Where:

AAR = average abnormal return

AR_{it} = abnormal return

N = numbers of observed days

This study calculates trading volume by dividing the number of shares traded and outstanding shares.

$$TVA = \frac{\sum Traded\ Share}{\sum Outstanding\ Share} \quad (6)$$

Where:

TVA = average abnormal return

$\sum Traded\ Share$ = abnormal return

$\sum Outstanding\ Share$ = numbers of observed days



RESULTS AND DISCUSSION

This paper analyzes the matches of three clubs, namely Manchester United, Borussia Dortmund, and Juventus, in the domestic and international (European) competitive events in the 2018/2019 season. Tables 3-5 below display the descriptive statistics of those three clubs.

Table 3: Descriptive Statistics: Manchester United (NYSE.MANU)

Venue/ league type	Match result	Variable	N	Minimum	Maximum	Mean	Std. Deviation
Home	win	abr	22	-.0259764	.0308186	.001971424	.0124856939
		tva	22	.0004600	.0098400	.001853182	.0021456831
	lose	abr	12	-2.0103128	-1.9807113	-1.996471695	.0103805225
		tva	12	.0006100	.0043800	.001443333	.0010365970
Away	win	abr	24	-.0351680	.0435164	.002084506	.0167626217
		tva	24	.0004500	.0059000	.002029583	.0018315579
	lose	abr	18	-.0237183	.0540031	.001538821	.0189249688
		tva	18	.0004200	.0040100	.001347778	.0010452501
Domestic	win	abr	38	-.0259764	.0435164	.001895368	.0131007662
		tva	38	.0004600	.0098400	.002086316	.0021206990
	lose	abr	20	-2.0103128	.0389498	-.599380132	.9392407876
		tva	20	.0004200	.0036500	.001238500	.0007744354
International	win	abr	8	-.0351680	.0308186	.002671936	.0219813504
		tva	8	.0004500	.0022200	.001275000	.0007013864
	lose	abr	10	-2.0038466	.0540031	-1.194235891	1.0343914430
		tva	10	.0004900	.0043800	.001681000	.0014046862

Manchester United played 17 home matches with win and loss results. The table informs that the minimum value of Manchester United's abnormal returns for home matches is -2.0103, the one after they lost to Tottenham Hotspurs. Meanwhile, the maximum value of Manchester United's abnormal returns for home matches is 0.0308 just before they beat Young Boys. The mean value (standard deviation) of Manchester United's abnormal returns when they win their home matches is 0.0019 (0.0124). The table also informs that Manchester United played 21 away matches with win and loss results. The minimum value of Manchester United's trading activities for away matches is 0.0004 before they lose to Manchester City. Meanwhile, the maximum value of Manchester United's trading activities for away matches is 0.0059 before they win against Cardiff. The mean value (standard deviation) of Manchester United's trading activities when they win their away matches is 0.0020 (0.0018).

**Table 4:** Descriptive Statistics: Juventus (JUVE.MI)

Venue/ league type	Match result	Variable	N	Minimum	Maximum	Mean	Std. Deviation
Home	win	abr	36	-.0872857	.1684419	.017617766	.0494727762
		tva	36	.0057358	.0737788	.015725944	.0123265885
	lose	abr	4	-.1800351	.0385325	-.034048940	.0998283673
		tva	4	.0080084	.0664487	.031458465	.0249151872
Away	win	abr	30	-.0862160	.0499920	-.005823667	.0305375425
		tva	30	.0022582	.1488069	.016493842	.0259816149
	lose	abr	12	-1.0117988	.0279917	-.099379827	.2895587609
		tva	12	.0043525	.0437904	.016408087	.0129515418
Domestic	win	abr	54	-.0862160	.1613694	.009141981	.0376148846
		tva	54	.0022582	.0327188	.013806402	.0076291381
	lose	abr	8	-1.0117988	.0279917	-.126200298	.3583474342
		tva	8	.0043525	.0344787	.016739791	.0106246730
International	win	abr	10	-.0872857	.1684419	-.004057001	.0708757783
		tva	10	.0057358	.1488069	.029514420	.0466973742
	lose	abr	8	-.1800351	.0385325	-.039893912	.0720150433
		tva	8	.0050997	.0664487	.023601571	.0220664136

In the 2018/2019 season, Juventus played 20 home matches with loss and win results. Table 4 suggests that Juventus has 40 data (20 before the match days and 20 after the match days). The minimum value of Juventus' abnormal returns for home matches is -0.1800 after they lose to Ajax. Meanwhile, the maximum value of Juventus' abnormal returns for home matches is 0.1684, after they have won against Atletico Madrid. The mean value (standard deviation) of Juventus' abnormal returns when they win their home matches is 0.1761 (0.4947).

Table 5: Descriptive Statistics: Borussia Dortmund (BVB.DE)

Venue/ league type	Match result	Variable	N	Minimum	Maximum	Mean	Std. Deviation
Home	win	abr	32	-.0241014	.0445967	.005527546	.0151612343
		tva	32	.0016452	.0075516	.003998602	.0016016328
	lose	abr	4	-.1011456	.0042191	-.027022906	.0496520305
		tva	4	.0015730	.0135591	.005740424	.0053880869
Away	win	abr	22	-.0266678	.0438501	.003891087	.0161342348
		tva	22	.0016088	.0095233	.004742095	.0021812539
	lose	abr	10	-.1005046	.0165489	-.018793002	.0351244556
		tva	10	.0014832	.0135591	.005077828	.0034130872
Domestic	win	abr	46	-.0241014	.0445967	.004594769	.0146218545
		tva	46	.0016088	.0095233	.004104381	.0018903220
	lose	abr	8	-.1005046	.0087675	-.018454982	.0338654777
		tva	8	.0014832	.0135591	.004160483	.0039067988
International	win	abr	8	-.0266678	.0438501	.006390753	.0206478334
		tva	8	.0036338	.0075516	.005434981	.0014030099
	lose	abr	6	-.1011456	.0165489	-.024730298	.0458910166
		tva	6	.0034613	.0135591	.006742686	.0035633925



Borussia Dortmund played 18 home matches in the 2018/2019 season with win and loss results. The minimum value of Borussia Dortmund's trading volume for home matches is 0.0015, the day before they lost to Schalke 04. Meanwhile, the maximum value of Borussia Dortmund's trading volume for home matches is 0.0135, the day before they lose to Tottenham Hotspurs. The mean value (standard deviation) of Borussia Dortmund's trading volume when they lose their home matches is 0.0057 (0.0053).

Market Reactions to Wins (Losses) in the International Leagues and Domestic Matches

To test the first hypothesis, we run the parametric paired sample t-test or non-parametric Wilcoxon signed-rank test. The test investigates significant abnormal returns and trading volume differences between the day before and after the clubs win or lose in domestic or international matches. The significance values that are greater than 0.05 imply that the hypothesis is not empirically supported, and there are no significant differences in abnormal returns and trading volume.

Table 6: Market Reactions in the international leagues and domestic matches: Manchester United (NYSE.MANU)

League type	Match result	Variable	Mean difference	Sig. (2-tailed)
Domestic	win	abr	.0047242213	.310
International			-.0009463645	.964
Domestic	lose		.0102421076	.101
International			.0147886562	.347
Domestic	win	tva	.0004705263	.388
International			-.0001050000	.388
Domestic	lose		-.0004090000	.110
International			.0007460000	.416

Table 6 shows domestic and international matches are greater than 0.05. Hence, there are no significant differences in abnormal returns in domestic and continental leagues. For the win results, the abnormal returns difference of domestic matches is higher than that of international matches. Conversely, for the loss results, the abnormal returns difference of international leagues is higher than that of domestic leagues.

For trading volume, the results of the paired sample t-test and Wilcoxon signed-rank tests inform no significant differences in trading volume before and after both domestic and international leagues because all the significance values are higher than 0.05. For the win results, the trading volume difference of domestic matches is higher than that of international matches. Meanwhile, for the loss results, the trade difference of international leagues is higher than that of domestic leagues.

**Table 7:** Market Reactions in the international leagues and domestic matches: Juventus FC (JUVE.MI)

League type	Match result	Variable	Mean difference	Sig. (2-tailed)
Domestic	win	abr	-.0109675731	.237
International			.0203939264	.674
Domestic	lose		-.2422619130	.407
International			.0676581275	.308
Domestic	win	tva	.0001965726	.896
International			-.0410215060	.187
Domestic	lose		.0077133268	.146
International			-.0144704055	.416

Table 7 demonstrates all the significance values of Juventus' abnormal return and trading volume differences for both domestic and international leagues are higher than 0.05, implying that there are no significant differences in abnormal returns and trading volume before and after the domestic and continental matches. Wins at international (domestic) matches exhibit positive (negative) abnormal return differences. For the loss results, the abnormal return difference of domestic matches is higher than that of international matches, although the effect is negative. Meanwhile, the win results in international leagues exhibit higher trading volume differences (although negative) than winning in domestic leagues. For the loss results, the international matches have a higher trading volume difference than the domestic matches.

Table 8: Market Reactions in the international leagues and domestic matches: Borussia Dortmund (BVB.DE)

League type	Match result	Variable	Mean difference	Sig. (2-tailed)
Domestic	win	abr	-.0085624750	.010
International			.0204960493	.322
Domestic	lose		.0172822020	.531
International			-.0023169823	.969
Domestic	win	tva	-.0002427007	.524
International			.0010744383	.111
Domestic	lose		-.0033446438	.338
International			.0027284523	.478

The paired sample t-test and Wilcoxon signed-rank test for Borussia Dortmund find that almost all significance values are higher than 0.05, suggesting no trading volume and abnormal return differences before and after matchdays, both for domestic and international leagues. Based on Table 8, only winning at domestic matches exhibits significant abnormal return difference (significance value smaller than 0.05). Hence, abnormal returns are significantly different between the day before and after the matches. Further, the results reveal that winning at international matches has a more positive effect on Borussia Dortmund's abnormal returns than at domestic matches. For the loss results, losing at domestic matches has a more positive effect than at international matches. In terms of trading volume, winning at international matches exhibits a higher trading volume difference than at domestic matches. Also, this paper documents that the mean difference in the trading volume of losing at domestic matches is higher (negatively) than losing at international matches.



The findings demonstrate that market reactions to wins at international matches are greater than at domestic matches. However, the markets react differently (positively or negatively) to match results for each club. Thus, hypothesis 1a is supported. Meanwhile, hypothesis 1b is not supported because the markets react more to losing at domestic matches than at international ones. Also, for all clubs, the markets react negatively to losing at away matches. Our findings are thus consistent with Scholtens and Peenstra (2009).

Market Reactions to Wins (Loss) in the Home and Away Venues

To test the second hypothesis, we run the parametric paired sample t-test or non-parametric Wilcoxon signed-rank test. The test investigates significant abnormal return or trading volume differences between the day before and after losing or winning matches at home or away venues. The significance values that are greater than 0.05 imply that the hypothesis is not empirically supported, and there are no significant abnormal returns and trading volume differences.

Table 9: Market Reactions in the home and domestic away venues: Manchester United (NYSE.MANU)

Type	Condition	Variable	Mean difference	Sig. (2-tailed)
Home	win	abr	.0045630669	.490
Away			.0029817508	.690
Home	lose		.0044054683	.557
Away			.0166590608	.074
Home	win	tva	.0002200462	.722
Away			.0005091667	.526
Home	lose		-.0000033333	.996
Away			-.0000377778	.924

Based on Table 9, all of the significance values for Manchester United's abnormal return differences are greater than 0.05, implying that there are no significant abnormal return differences the day before and after the home and away matches. The mean difference in abnormal returns for winning at home matches (0.0045) is higher than at away matches (0.0029). Also, the abnormal return means the difference for losing at away matches (0.0044) is higher than at home (0.0166).

For the trading volume variable, all significance values are greater than 0.05, thus also indicating no significant trading volume differences between the day before and after home and away matches. The mean difference for winning at away matches (0.0002) is higher than at home (0.0005). However, for the loss results, the biggest decrease in trading volume (-0.00003) occurs when Manchester United lost at away matches. When losing at home matches, the trading volume of this club also decreases (-0.00000) but much lower than at away matches.

**Table 10:** Market Reactions in the home and domestic away venues: Juventus FC (JUVE.MI)

Type	Condition	Variable	Mean difference	Sig. (2-tailed)
Home	win	abr	-.0186858044	.213
Away			.0096164000	.448
Home	lose		.0734047075	.666
Away			-.1408707595	.451
Home	win	tva	-0.00403125	.528
Away			-0.00789665	.820
Home	lose		-.0115401260	.783
Away			-.0006580105	.934

Table 10 shows all significance values of abnormal returns of Juventus' home and away matches are higher than 0.05, implying no significant abnormal return differences the day before and after home and away matches. The market reacts positively to wins at away matches because the mean difference in abnormal returns is 0.0096. However, the market reacts negatively to wins at home matches because the abnormal return means the difference is negative (-0.0186). In sum, the market reacts most to wins at home matches, as indicated by the highest mean difference in abnormal returns.

Further, losing at away matches has a greater effect on abnormal return change than at home matches. The mean difference in abnormal returns for losing at away matches is negative (-0.1408), suggesting that the market reacts negatively to Juventus' loss at away matches. For trading volume, Table 13 illustrates that all significance values of mean differences at home and away matches are greater than 0.05. Hence, there are no significant differences in trading volume the day before and after home and away matches.

Table 11: Market Reactions in home and domestic away venues: Borussia Dortmund (BVB.DE)

Type	Condition	Variable	Mean difference	Sig. (2-tailed)
Home	win	abr	-.0052558599	.165
Away			-.0028053610	.328
Home	lose		-.0509004780	.522
Away			.0327957634	.183
Home	win	tva	-0.0001924588	.696
Away			.0001631797	.728
Home	lose		.0036512720	.599
Away			-.0024991524	.370

Juventus' trading volume is more affected by wins at away matches than at home matches. The mean difference in the trading volume of winning at away matches is -0.0078 while at home matches it is -0.0041. Thus, the market reacts more negatively to wins at away matches. When Juventus lost, the market reacted more negatively to losses at home matches. The mean difference trading volume of losing at home matches is -0.0115 and at away matches is -0.0006.

Table 11 shows all of the significance values of abnormal returns of Borussia Dortmund's home and away matches are greater than 0.05, suggesting no significant abnormal return differences the day before and after the home and away matches.



The market reacts more negatively to wins at home matches than at away matches. The abnormal return difference for wins at home matches is negative (-0.0052). Although the abnormal return difference for losses at away matches is also negative (-0.0028), the magnitude is smaller.

Our results also indicate that the market reacts differently to losses at home and away matches. When Borussia Dortmund loses at home, the mean difference in abnormal returns is negative (-0.0509). However, when Borussia Dortmund loses at away matches, the mean difference in abnormal returns is positive (0.0327).

For trading volume, the results of our paired sample t-test and Wilcoxon signed-rank test indicate no significant trading volume differences the day before and after home and away matches as indicated by all of the significance values of trading volume that are greater than 0.05. Winning at home negatively affects trading volume for Borussia Dortmund, as suggested by the negative trading volume mean difference (-0.0001). However, the market reacts positively to wins at away matches as the positive trading volume mean difference (0.0001). When Borussia Dortmund losses, the market reacts positively if the losses are at home matches (positive trading volume mean difference), but negatively to losses at away matches.

Abnormal returns and trading volume change at greater magnitudes when these three clubs win at home matches. The results support Benkraiem et al. (2011) who find abnormal returns for home-match wins but not away-match ones. However, the winning results of those clubs at home matches have different effects on abnormal returns and trading volume (Fung et al., 2015). Specifically, markets react positively to Manchester United and Juventus' wins at home matches, but negatively to Borussia Dortmund's. For losses, the market reacts stronger to losses at away matches (both in terms of abnormal returns and trading volume). However, market reactions to these three clubs' losses differ. Hence, these findings are different from Benkraiem et al. (2011) who observe that the market reacts more to losses at home matches. We also find that for these clubs, markets react stronger to wins and losses at away matches likely because of heterogeneous features of investors' opinions (Demir & Rigoni, 2017). The trading volume also changes because investors may revise their portfolio investment decisions following the match results (Fung et al., 2015).

Markets also react more to wins at international matches than at domestic ones (Fung et al., 2015). Our results are thus different from Demir and Danis's (2011) who document that winning at international matches does not significantly affect clubs' abnormal returns. In particular, we find that market reacts negatively to Manchester United's wins at international matches and positively to Borussia Dortmund's wins at international matches (both in terms of trading volume and abnormal returns). Meanwhile, Juventus' wins at international matches positively (positively) affect its abnormal returns (trading volume). This paper also finds that the market reacts differently to the losses of these three clubs. Specifically, the market reacts positively to Manchester United's losses at domestic matches at a greater magnitude and negatively to Borussia Dortmund's losses at domestic matches (both in terms of abnormal returns and trading volume). However, the market reacts stronger to Juventus' losses at domestic matches (in terms of abnormal returns) and international matches (in terms of trading volume). Hence, these findings complement Scholtens and Peenstra (2009) who cannot find market reactions to domestic matches.

This study shows market reactions to winning at home matches are higher than winning at away matches. Hence, hypothesis 2a is empirically supported. Our results support Benkraiem et al. (2009). However, hypothesis 2b is not supported because markets react more to losing at away matches than at home matches. Investors are more sensitive to losses. Thus, this research is in line with Fan, Lei, and Zhang (2018).



Because losses potentially predict future losses better than wins (Berkowitz & Depken, 2017), losses are a more credible signal than wins. Thus, our results support Bell et al. (2012). This paper also demonstrates that clubs' current share prices already incorporate expected results.

CONCLUSION

Sports have been a big and lucrative industry, with football as the biggest sport in terms of growth. Many football clubs opt to sell their shares publicly to support their financial needs. However, unlike shares of firms from other industries, football clubs' share prices also likely depend on other information such as match results. Hence, this paper investigates 113 matches of three large football clubs in the 2018/2019 season by focusing on the effects of the match results on abnormal returns and trading volume.

The findings demonstrate that market reactions to wins at international matches are greater than at domestic matches. However, the markets react differently (positively or negatively) to match results for each club. Meanwhile, the markets react more to losing at domestic matches than at international ones.

This study also shows that market reactions to winning at home matches are higher than winning at away matches. However, markets react more to losing at away matches than at home matches. We also find that investors are more sensitive to losses. As such, this research is in line with Fan, Lei, and Zhang (2018). Because losses potentially predict future losses better than wins (Berkowitz & Depken, 2017), losses are a more credible signal than wins. This paper also demonstrates that clubs' current share prices already incorporate expected results. Therefore, our results support Bell et al. (2012). The findings also indicate that the stock markets for these three football clubs are a semi-strong efficient market in which share prices reflect all historical information and public information such as match results.

We have observed that investors take match results into account when making investment decisions. Hence, the clubs need to play excellently to avoid negative shocks in market reactions (Payne, Tresl, & Friesen, 2018). Also, we support Dimic et al. (2018) who find that competition and venue types affect market reactions. These results confirm that football club investors consider their clubs' competitive performance when making portfolio investment decisions.

There are several limitations of this paper. This study does not classify the matches based on the importance of the match opponents and the expected results of the matches. Also, this research does not use any control variable in the analysis, such as betting odds. Lastly, using only three clubs in the analysis limits the generalizability of our results.

Accordingly, we suggest future studies to include control variables to gain a better understanding of the research issue. Next, we leave to future studies to incorporate rivalries between clubs and the importance of the matches into the analysis. Further, using more football clubs as the research sample will also increase the generalizability of the research results, as will using other country's football club that has already sold its shares publicly.



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TRŽIŠNE REAKCIJE NA REZULTATE FUDBALSKE UTAKMICE: UTICAJ MESTA DOGAĐAJA I VRSTE TAKMIČENJA

Rezime:

Cilj ovog istraživanja je da se istraži reakcija berze na rezultate fudbalskih utakmica na različitim mestima i vrstama takmičenja, posebno za tri glavna fudbalska kluba: Manchester United, Juventus FC i Borussia Dortmund. Koristimo parametarski upareni uzorak t-testa. Rezultati pokazuju da investitori uzimaju u obzir ne samo rezultate utakmica već i mesta održavanja i vrste takmičenja prilikom donošenja investicionih odluka. Ova studija pokazuje da su berze fudbalskih klubova polujaka efikasna tržišta. Različita tržišna reakcija na rezultate mečeva za svaki proučeni fudbalski klub podrazumeva važnost razumevanja specifičnih karakteristika tih klubova u donošenju investicionih odluka. Rezultati takođe sugerišu da investitori fudbalskih klubova moraju da uzmu u obzir konkurentne performanse svojih klubova na različitim mestima i vrstama takmičenja prilikom donošenja odluka o portfolio investicijama. Ovo istraživanje je dopunilo prethodnu pretpostavku o važnosti mesta održavanja, a tipovi takmičenja podudaraju se sa rezultatima u donošenju investicionih odluka.

Ključne reči:

abnormalni povrat,
obim trgovanja,
efikasna teorija tržišta,
fudbalski klubovi,
berze.