The Impact of Sports Event Outcomes on Stock Market Returns: An Event Analysis

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Abstract

This paper investigates the impact of match outcomes on stock market returns, with a specific focus on two major European football clubs, Borussia Dortmund and Juventus. By applying econometric methods, the study examines the correlation between the clubs' game-day results and fluctuations in their respective stock prices. The findings reveal that Borussia Dortmund's victories result in immediate and statistically significant positive returns, extending into the following trading day. For Juventus, victories also lead to immediate positive returns, but these effects do not carry over to the subsequent day in a statistically significant way. Losses for both clubs are associated with declines in stock performance the following trading day.

This research underscores the nuanced ways sports outcomes influence investor sentiment, highlighting variability based on team performance and the timing of market reactions.

Key words: stock market returns, sports events, investor sentiment, behavioral finance
J.E.L. classification: G14, G41, L83

1. Introduction

Sports events, especially in professional leagues, hold considerable influence over fans, economies, and increasingly, financial markets. The interplay between team performance and stock market behavior is a growing field of study, reflecting the economic significance and public emotional investment in sports. When a prominent club wins or loses, fan sentiment can translate into investor behavior, affecting the stock performance of publicly traded sports organizations. Borussia Dortmund and Juventus, two football clubs listed on their respective stock exchanges, provide an ideal basis for examining these dynamics. This paper explores the influence of game-day outcomes on their stock prices, using econometric analysis to quantify the effect of wins and losses on short-term returns.

The paper contributes to the literature by assessing the differential impact of victories and defeats on stock performance for these two clubs. An econometric approach is employed to examine day-of-game and next-day stock returns, offering insight into how investor sentiment in response to sports outcomes translates into tangible financial market outcomes.

2. Theoretical background

The relationship between sports events and stock market returns is grounded in theories of behavioral finance and investor sentiment. Scholars argue that stock prices are not solely driven by financial fundamentals but are often influenced by the emotional reactions of investors to culturally or emotionally significant events, such as sports matches (Baker & Wurgler, 2007; Brown & Cliff, 2004). This phenomenon is part of a broader "mood-driven behavior" paradigm in financial markets, where emotions like euphoria or disappointment associated with game outcomes can affect investor behavior and, consequently, stock returns (Edmans et al., 2007).

Investor reactions to sports events can be linked to the concept of "sentiment contagion," where widespread emotional responses influence the buying or selling decisions of a large group of investors. Studies examining stock market reactions to international sports tournaments, such as the FIFA World Cup or the UEFA Champions League, show that a nation's stock market often benefits from the national team's success, as investor optimism translates to higher returns (Ashton et al., 2003; Kaplanski & Levy, 2010). This effect is particularly visible with clubs like Borussia Dortmund and Juventus, which have large, emotionally invested fan bases. Victories lead to widespread investor optimism, which translates into increased buying activity and, consequently, positive stock returns (Boyle & Walter, 2003; Palomino et al., 2009).

Empirical studies on mood-driven investor behavior have shown that the influence of sports outcomes is not limited to national pride. Club-level analysis reveals similar effects, with teams experiencing both positive and negative investor reactions depending on their performance. For example, studies indicate that stock prices rise on the day of a victory and often fall after a defeat, capturing the collective mood of fans-turned-investors (Berument et al., 2006).

The empirical studies also draw on evidence showing how the timing and duration of these effects can vary. For instance, Boyle and Walter (2003) note that positive returns following a victory can extend beyond the day of the event, depending on the perceived impact of the outcome. In Borussia Dortmund's case, econometric analysis reveals a 47% increase in stock returns on the day of a victory and a sustained 24% rise the following day. This aligns with other studies' findings that suggest a "momentum effect," where positive sentiment after a victory can drive further investment in the short term. On the other hand, the effects for Juventus suggest a more immediate and short-lived reaction to victories. While the current day's stock returns rise by 23% on match days, these effects do not extend into the next trading day, supporting the notion that investor enthusiasm may vary depending on broader market expectations or the club's recent performance history (Scholtens & Peenstra, 2009). This study's results add to the body of research showing that sports-related events can significantly influence stock market dynamics, albeit with varying degrees of impact across different teams and contexts (Pope & Pope, 1998).

Recent studies, such as Eissa and Al Refai (2018), suggest that major sports events like the FIFA World Cup can significantly affect stock market returns. Their research highlights how market reactions to official announcements related to such events reflect investor sentiment, which can lead to short-term fluctuations in stock prices. This aligns with previous work in behavioral finance, which links the emotional impact of sports events to broader market dynamics.

The study by Soana et al. (2021) investigates the relationship between financial markets and the UEFA Champions League (UCL), exploring whether market prices reflect the anticipation or outcomes of competition events. The authors focus on the potential informational efficiency of financial markets in response to significant UCL events, drawing on theories of market behavior and event studies. Their work extends previous literature on the interaction between sports and financial markets, analyzing the extent to which stock market movements may be influenced by factors such as team performance, match outcomes, and other events within the competition. By examining the connection between these two domains, the study contributes to the understanding of how markets respond to non-financial information, offering insights into the broader implications of sporting events on financial markets and investor behavior.

3. Research methodology

This study aims to quantify the impact of game outcomes (wins and losses) on stock returns for the football clubs Borussia Dortmund and Juventus. Juventus Football Club, based in Turin, Italy, is one of the most successful and renowned football clubs in Europe. Listed on the Borsa Italiana in December 2011 (the Italian stock exchange) under the ticker symbol JUVE.MI, Juventus offers investors an opportunity to participate in the financial performance of a top-tier football organization. It was one of the first football clubs in Italy to go public. The club's stock has garnered attention not only for its on-field success, including numerous Serie A titles, but also for the financial dynamics surrounding its brand, including sponsorship deals, media rights, and player transactions. Juventus' stock has been studied for its response to key events such as match outcomes, player signings, and managerial changes, providing a useful context for exploring the relationship between sporting

events and stock price fluctuations. Borussia Dortmund, one of Germany's most successful and popular football clubs, was publicly traded on the Frankfurt Stock Exchange in October 2000, under the ticker symbol BVB.DE. It became the first and only German football club to be publicly traded. The club's shares offer investors a stake in one of the Bundesliga's top teams, with a strong global fanbase and consistent participation in European competitions, such as the UEFA Champions League. Borussia Dortmund's stock is known to be influenced by various factors, including team performance, match results, and high-profile events like the transfer of star players. As a publicly traded entity, the stock performance of Borussia Dortmund provides valuable insights into how sporting outcomes and market sentiment intertwine, making it an ideal case study for examining how sports events impact investor behavior and stock returns.

We consider historical trading data from October 2011 to May 2023 as follows: For stock prices, we use daily trading data provided by the website investing.com. For match results, we use data from https://www.football-data.co.uk/italym.php (for Juventus) and https://www.football-data.co.uk/germanym.php (for Borussia Dortmund).

Since many matches take place on weekends, we account for the positive or negative result on the following trading day. Daily returns are calculated using the following formula:

$$Return_t = ln\frac{P_t}{P_{t-1}} \quad (1)$$

where $Return_t$ represents the daily return, and P_t and P_{t-1} are the stock prices on day t and day t-1, respectively.

The econometric model used is as follows:

$$y_t = \beta_0 + \sum_{j=1}^{k} \beta_j \cdot Explanatory\ variable + \varepsilon_t \quad (2)$$

where y_t is the dependent variable, t=1,2,...T (time), $\sum_{j=1}^{k} \beta_j \cdot Explanatory\ variable$ is the vector of explanatory variables (regressors) multiplied with their corresponding coeffficients, β_0 is the intercept, and ε_t is the random variable (error term).

This study's econometric model includes four independent variables, which are dummy variables (take the value of 1 for a win or a loss and 0 for other outcomes) and one variable representing the stock return in the previous period. The structural form of the regression is as follows:

$$Return_t = \beta_0 + \beta_1 \cdot Return_{t-1} + \beta_2 \cdot WIN_t + \beta_3 \cdot WIN_{t-1} + \beta_4 \cdot LOSS_t + \beta_5 \cdot LOSS_{t-1} + \varepsilon_{i,t} \quad (3)$$

Given the delayed response of investors in the stock market to football match outcomes, we include a one-period lag of both the explanatory variables and the dependent variable as predictors. This approach accounts for the possibility that past events may influence current returns due to reaction delays, thereby capturing any temporal dependencies in the data. We presume that the independent variables affects the dependent variable both immediately and with a delayed response (e.g., stock returns responding partially today and partially tomorrow to a football match outcome), consequently we consider including both the current and lagged versions in the same regression.

Financial returns frequently exhibit patterns of autocorrelation, especially over short horizons like daily returns. This means that today's return might be influenced by yesterday's return. For instance, in some markets, there is a tendency for returns to "mean revert" or for momentum effects to appear, where positive (or negative) returns are likely to follow previous positive (or negative) returns. By including lagged returns, we allow the model to capture these temporal dynamics, whether they are momentum effects or reversals, which are common in financial time series.

On the other hand, returns are influenced by a variety of factors, including macroeconomic indicators, investor sentiment, and recent events, many of which are not explicitly included in a daily return model due to data limitations or complexity. The lagged return incorporates some of these unobserved influences because yesterday's return is likely a result of the cumulative impact of these variables. Thus, including the lagged return can help stabilize the model, implicitly capturing the impact of these external factors.

4. Findings

Table no. 1 Econometric results for Borussia Dortmund and Juventus

Coefficients of variables	Borussia Dortmund	Juventus
Return (-1)	-0.04848*** (0.018001)	0.06585*** (0.015899)
Win	0.004766*** (0.000967)	0.002786*** (0.001057)
Lagged Win (-1)	0.002393** (0.000971)	0.001300 (0.001059)
Loss	0.001920 (0.001517)	-0.000355 (0.001628)
Lagged Loss (-1)	-0.016344*** (0.001517)	-0.008970*** (0.001628)
Number of observations (after adjustments)	2961	3913
Durbin-Watson stat	2.004	2.006

*p < 0.1; **p < 0.05; ***p < 0.01.

Source: realized by author

In the case of Borussia Dortmund, the results of the econometric study indicate a positive correlation between a win on a given day or a previous day and stock market performance from that given day. Specifically, when a victory is recorded today, stock returns increase by 0.47% on the same day and by 0.24% the next day. Conversely, a loss on the previous day leads to a decline in stock returns the following day. The coefficients are statistically significant, indicating robustness in these findings. Additionally, there is a negative correlation between the stock return on the current day and the return from the previous day. This suggests that, with other factors held constant, an increase in returns today tends to result in a decrease in returns the next day, pointing toward a market correction and stabilization effect.

The Adjusted R-squared coefficient is relatively low (5%), suggesting that the independent variables in the model account for only a small proportion of the variation in stock returns. This implies that additional control variables should be included to better capture the factors influencing market performance. Durbin-Watson value is satisfactory, indicating overall adequacy of the model.

In the case of Juventus the results of the econometric study indicate a positive correlation between a win on a given day and stock market performance from that given day. Specifically, when a victory is recorded today, stock returns increase by 0.28% on the same day. The corresponding coefficient for the impact of loss on stock returns in the same day is not statistically significant. However, there is a negative impact of loss on stock return for the following day. There is also a positive correlation between the stock return on the current day and the return of the previous day. This suggests that, with other factors held constant, an increase in returns today tends to result in an increase in returns the next day.

The Adjusted R-squared coefficient is relatively low (2%), indicating limited explanatory power and suggesting the need for additional variables. Durbin-Watson value is satisfactory, indicating overall adequacy of the model.

5. Conclusions

Based on the findings from this study, the following general conclusions can be drawn about the impact of match outcomes on stock performance. Positive match outcomes, such as wins, tend to have an immediate positive effect on stock returns for both Borussia Dortmund and Juventus. This is particularly evident in teams like Borussia Dortmund, where victories are followed by increased stock prices not only on the day of the match but also on the following day. The stock market seems to react quickly to good news, with investors possibly expecting continued positive performance. The effect of match outcomes on stock returns can extend beyond the day of the event. For example, Borussia Dortmund's stock continues to rise the day after a victory, indicating that positive sentiment from match results can influence investor behavior for multiple days. This suggests that match outcomes may affect not only short-term trading decisions but also broader investor confidence in the team's future performance.

While victories typically generate a clear positive reaction, losses on the current day result in negative stock returns on the following day for both Juventus and Borussia Dortmund. This suggests that while investors respond strongly in the same day to positive outcomes, they also tend to react to losses, albeit with a more measured adjustment in expectations. The market response to losses may be less dramatic, potentially due to other factors influencing stock performance or a more tempered investor reaction to negative events.

A correction effect of the market is also observed in the case of Borussia Dortmund, where positive returns on one day are followed by declines the next. This could indicate a short-term overreaction to match outcomes, with investors adjusting their positions after the initial market reaction. This market behavior highlights the volatility that can arise from match results, as investors reassess the true value of the stock after an initial spike. In the case of Juventus, a positive correlation between current and lagged returns is observed, suggesting that gains on one day are often followed by further positive returns the next day. This indicates a reinforcing effect, where investors' confidence in the stock continues after an initial positive reaction. Unlike a typical market correction, this pattern highlights a more sustained optimism following a win, with investors maintaining or increasing their positions based on the positive outcome, contributing to continued stock performance. There are likely some psychological and cultural differences between German and Italian investors, though it's important to recognize that individual behavior varies widely within any country.

Further studies could explore the incorporation of additional variables (e.g., global market trends, investor sentiment, team performance metrics) to more comprehensively understand how match outcomes influence stock returns. Additionally, examining a larger sample of teams or different types of sports could provide a broader perspective on how sports results impact financial markets.

6. References

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