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RESEARCH ARTICLE

Britain's Biggest Railway Labor Strike and Stock Market Outcomes

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ABSTRACT

In this paper, we investigate whether strike events affect stock market outcomes. Specifically, we employ the event study technique to examine the impact that Britain's biggest rail strike in 30 years had on stock market returns. In employing this technique, we use two methods: mean-adjusted returns and the market model. The results indicate that the event had a significant negative effect on stock market returns: the average cumulative abnormal returns (CARs) ranged from negative 108.2 basis points to negative 23,137 basis points using the mean-adjusted returns method. Alternatively, employing the market model, average CARs ranged from negative 54 basis points to negative 156 basis points, also suggesting that the event had a significant negative effect on stock market returns. The findings show a negative trend in CARs among the components of the FTSE 250, implying a significant negative impact of Britain's rail strike. Such findings can provide insights for policymakers and governments to inform strategies and regulations to avoid such disturbances to the economy in the future.

INTRODUCTION

The stock market responds to key actions. Preceding studies have addressed several incidents that have had an impact on stock market outcomes, such as war (Hudson & Urquhart, 2015; Sayed, 2024), political uncertainty (Bash & Alsaifi, 2019), pandemics (Al-Awadhi et al., 2020), and labor strikes (Bhana, 1997; Dinardo & Hallock, 2002; Greer et al., 1980; Nelson et al., 1994; Neumann, 1980; Wisniewski et al., 2020). However, the extent to which labor strikes could affect stock market returns is not as well understood:

Tens of thousands of workers walked out on the first day of Britain's biggest rail strike in 30 years on Tuesday, with millions of passengers facing days of chaos as both the unions and government vowed to stick to their guns in a row over pay. (Maclellan & Suleiman, 2022)

According to a poll by research firm YouGov, 37% of people supported the strike and 45% were opposed (Maclellan & Suleiman, 2022). The strike took place on June 21, 23, and 25, 2022, severely

disrupting the rail network, with most services cancelled and major stations left vacant. According to the unions, the strikes were considered the beginning of a "summer of discontent," with teachers, doctors, garbage collectors, and even barristers threatening to strike as inflation approached 10% (Maclellan & Suleiman, 2022).

The organizer behind the strike was Mick Lynch, general secretary of the National Union of Rail, Maritime and Transport Workers (RMT) (Mallinder, 2022). Lynch said:

RMT members are leading the way for all workers in this country who are sick and tired of having their pay and conditions slashed by a mixture of big business profits and government policy. (Maclellan & Suleiman, 2022)

Nearly 40,000 Network Rail employees, 14 rail firms, and RMT members participated in the strike (Abdul, 2022). The strike was instigated when union officials rejected Network Rail's offer of a 4% wage increase for the remainder of 2022 and a potential 4% pay increase the following year if employees agreed to adjustments in working conditions (Abdul, 2022), which was considered insufficient. The RMT union claimed that it required salary increases to keep up with living expenses (Abdul, 2022).

Our study is motivated by the principal novelty of examining the effect of an exceptional event—Britain's biggest rail strike in 30 years—on stock market returns. To do this, we collected data from the London Stock Exchange for the period July 6, 2021 to July 19, 2022 on all the stocks included in FTSE 250. We used an event study approach, which is a classical methodology used to examine the effect of an event. We employed this approach to investigate the effect of the strike on cumulative abnormal returns (CARs). We found that CARs were significantly negatively affected by this event with average CARs ranging from negative 108.2 basis points to negative 23,137 basis points under mean-adjusted returns, and average CARs ranging from negative 54 basis points to negative 156 basis points under the market-model.

These results contribute to the behavioral finance literature by demonstrating the extent to which a labor strike could affect stock market returns. Behavioral finance provides an alternative explanation to events that cannot be explained in terms of the efficient market hypothesis (EMH). According to the EMH, stock prices should quickly reflect the impact of events.

The implications obtained from these results, such as the negative effect of the strike on stock market returns, can provide numerous insights for stakeholders. For example, investors may need to either reallocate their funds to another stock market to avoid financial risk or diversify their portfolios in such a way that the diversification provides a hedge against the adverse effect of such strikes. In addition, railway firms may explore new procedures to lessen the effects of operating disruptions on their work and corporate social responsibility. For instance, they may invest in new technologies such as artificial intelligence to minimize the effect of a strike. Improving the tools used for communication with stakeholders would also be advisable to enable those stakeholders to feel confident about the actions undertaken that address issues related to work hours. Last, policymakers in the UK may propose new strategies and regulations that keep strikes to a minimum, and if they do occur, the effect on stakeholders is minimal. For example, policymakers could suggest offering a dispute resolution system to resolve strike issues. These could range from mediation to arbitration methods. We think it is essential for policymakers to evaluate the effects of strikes on the economy from a macro perspective. Such an evaluation would help to mitigate any adverse impacts on the economy.

The remainder of this paper is structured as follows: in Section 2, we review the literature; in Section 3, we present the data and methodology; in Section 4, the results are discussed; and we conclude the paper in Section 5.

LITERATURE REVIEW

For a long time, there has been ongoing debate about the relationship between labor strikes and the volatility of the stock market, as well as the returns. This topic has received a remarkable amount of consideration by both academic researchers and traders.

A number of studies have investigated this relationship. Neumann (1980) postulated that equities that have encountered leadership disruptions, such as strikes and unanticipated changes in the management team, tend to trade abnormally. The findings indicate that strikes have an adverse effect on stock prices and drive investors to lose confidence and sense a rise in risk. Becker and Olson (1986) evaluated the effect of strikes on the equity value by quantifying the associated change in stock prices. Using data from 1962 to 1982, the study revealed that strikes have a significant impact on equity value, finding that a median strike involving 1,000 or more employees causes a 4.1% decline in equity value. Strike costs differ significantly between industries.

During a pre-strike period, it has been observed that the equity market continually undervalues the financial impact of the strike on shareholders. A study undertaken by Brown and Zmijewski (1987) investigated the influence of labor strikes on the predictive ability and informational value of quarterly earnings figures. The study aimed to investigate two pertinent issues pertaining to the superiority of financial analyst forecasts (FAFs). First, it sought to examine whether the superiority of FAFs is augmented in the event of a strike. Second, it endeavored to ascertain whether this increase in FAF superiority persists immediately following the termination of the strike.

Nelson et al. (1994) examined the effect of Canadian company strikes on stock prices by analyzing information from the Toronto Stock Exchange. Between 1983 and 1989, 100 separate strikes were included in the dataset. The statistics show that the average shareholder's worth drops by 2.1% in the 50 days leading up to a strike date. Additional data shows that, whereas shareholders of firms experiencing strikes of a shorter duration incur a loss of 6.2% in the 50 days leading up to a strike date, shareholders of firms engaging in lengthy strikes realize a gain of 2.8% during the same period.

The study conducted by Persons (1995) examined the influence of automotive strikes on the share prices of steel providers. This research employed stock market information spanning from 1965 to 1990 and concluded that the announcement of automobile strikes resulted in negative returns for steel suppliers that were comparable to the negative returns observed by the affected automobile manufacturers. The research indicates that considerable adverse inter-industry consequences have been linked to extensive strikes involving multiple plants, compared with strikes involving a single plant. Further, these detrimental effects were more notably pronounced during the latter years of the sample period, characterized by a relatively weak financial state, in contrast with the previous years, which were marked by an improved financial condition.

Bhana (1997) investigated the influence of strikes on the stock prices of a variety of firms traded on the Stock Exchange of Johannesburg in the period 1984 to 1993. Strikes have a detrimental effect on stock prices, according to the research, and the losses sustained throughout the duration of a strike are not offset by positive excess returns once the strike ends. According to the research, capital markets can generally predict whether a contract expiration could end in a strike or a settlement. Nevertheless, the market for securities frequently undervalues the cost of a strike to shareholders during a pre-strike period, since roughly 70% of the entire decrease in returns happens after the strike is declared.

Dinardo and Hallock (2002) analyzed the impact of strikes on the stock market from 1925 to 1937. The research incorporated information from labor historians and financial methodologies to evaluate the pivotal strikes in American history, as determined by labor historians. More lengthy strikes, strikes that brought about union recognition, strikes where the unions prevailed, violent strikes, industry-wide strikes, and strikes that resulted in substantial wage rises led to greater

adverse stock price responses than other strikes, according to the study. The analysis also demonstrated that the majority of strike-related news appeared to be assimilated very early on. It also revealed that the stock market usually anticipated that the labor organizations would lose, but union successes were perceived as significant factors in the proportion of company earnings going to stockholders.

Kramer and Hyclak (2002) evaluated the viability of three strikes hypotheses using new and extant empirical evidence. The researchers examined the current capital market evidence and concluded that information concerning the impacts of inter-industry announcements of strikes against factories is required. This was accomplished by employing the event study technique to investigate a selection of strikes that occurred between 1982 and 1999. The evidence, when compared with that of previous research, confirmed the legitimacy of Hick's hypothesis that strikes are a consequence of negotiating errors, misperceptions of bargaining objectives, or disparities between the expectations of union leadership and rank-and-file members.

King and Soule (2007) used data on activist demonstrations relating to US firms between 1962 and 1990 to examine the impact of protests on typical stock price returns, a measure of investors' responses to a focused event. The research concluded that demonstrations have more weight when they obtain widespread media attention and when they focus on the problems affecting key stakeholder groups such as workers and consumers. It was found that, if a company has already received a lot of media attention before a demonstration, that company is less likely to be targeted. Investors now have access to information from the media that may contradict the statements aired by demonstrators. Peress (2014) examined global newspaper strikes in numerous nations to determine the causal influence of the press on trade and price formation. According to the findings, during a strike period, trading volume drops by 12% and the volatility of the stock returns drops by 7%, except for cumulative returns, which do not change.

Wisniewski et al. (2020) studied the effect of large-scale strikes against the government and their effect on stock market behavior. They found that the existence of a strike negatively affects the value of the stock market, since the index drops by 6.11%. The existence of a strike is also linked to an increase in risk measured by variance of returns and the value-at-risk measures.

Ramelli et al. (2021) investigated the effect of the global climate strikes in 2019 on European companies' stock prices. They found that the share price of firms that use carbon declined greatly following the success of the strike. Such a finding was attributed to the greater focus on the need for decision-making with reference to climate change. This has also led analysts to lower their profitability expectations for carbon-intensive firms in the long run.

Using short and long period of time, Ghaly et al. (2021) addressed the question of whether labor unionization affects option-implied firm risk, finding that unionization has no effect on firm risk. In contrast, Kim et al. (2021) studied whether unionization has an influence on stock price crash risk. They discovered that unionization helps to minimize crash risk because unions improve the flow of information, minimize risk-taking, and limit overinvestment.

The latest research related to Britain's rail strike was conducted by Dong and Tse (2023), who investigated the effect of the strike on public perception on social media platforms such X (formerly Twitter) using a text analysis approach. They found that approximately 85% of tweets exhibited negative emotions regarding the rail strike, and this was attributed to the inconvenience as well as the dissatisfaction it generated.

In a nutshell, although there are papers that have investigated the impact of labor strikes on stock markets, the effect of rail strikes on stock market yields is still considered a field that is yet to be substantially explored. Estimating the exact influence of a rail strike on stock market returns is a challenging task, given the various factors that can contribute, such as the length of the strike, the

degree of the interruption to industries, and the response of traders. Moreover, the potential influence of a rail strike on the stock market could be transient, as the prices may recover promptly following the resolution of the strike. Further investigation is required to fully comprehend the correlation between rail strikes and stock market yields in the UK. According to Rostan (2022), the UK economy has recently suffered two economic shocks, Brexit and the COVID-19 pandemic. We believe that if rail strikes continue to persist, this will be another adverse effect to be added to the shocks experienced by the UK economy.

DATA AND METHODOLOGY

We used firm-level data from the London Stock Exchange, obtained from Bloomberg, for the period July 6, 2021 to July 19, 2022—specifically, the constituents of the FTSE 250. In comparison with the FTSE 100 Index, the FTSE 250 better reflects the health of the UK economy because it includes more domestic firms (Barnett, 2022).

We designated June 21, 2022—the day the strike began—as the event day. We calculated the daily simple arithmetic returns from the closing stock prices. Following both mean-adjusted returns and market model event study methodologies, we computed the daily abnormal returns (ARs) and the CARs for every stock and day in the event window, including the event day (June 21, 2022). The summation of daily ARs in the event window is denoted by CARs. Event studies assess the effect of a particular event on a company's stock price using data available from the stock market. According to the EMH, in a rational stock market, stock prices should quickly reflect the impact of events. Therefore, stock price data relating to a short period of time can be used as a reliable indicator of the event's economic impact (Mackinlay, 1997).

The selection of 250 days as the estimation period represents the days before the event date and serves as a proxy for the number of trading days in an annual calendar. This number denotes a period before the event date that is appropriately long enough to qualify as a defined parameter approximation of the selected return-generating method and is used similarly to that employed in prior studies (Bhagat & Romano, 2002). In addition, the selection of six event windows [−1, 1], [−3, 3], [−6, 6], [−10, 10], [−10, 15], and [−10, 20] is also similar to those in prior studies using the event study methodology (see Bash & Al-Awadhi, 2023). It is also important to note that using additional event windows would only slightly enrich the analysis.

Mean-Adjusted Returns

The classical mean-adjusted returns event study methodology of Brown and Warner (1985) calculates the ($AR_{i,d}$) for stock i at day d as follows in Equations (1) and (2):

$$AR_{i,d} = R_{i,d} - \bar{R}_i \quad (1)$$

$$\bar{R}_i = \frac{1}{239}\sum_{d=-250}^{-11} R_{i,d} \quad (2)$$

where $R_{i,d}$ is the return of stock i at day d, and $\bar{R}_i$ represents the mean return of stock i during the daily estimation period (−250, −11)?

Market Model

The classical market model event study methodology of Dodd and Warner (1983), and Brown and Warner (1985) calculates the ($AR_{i,d}$) for stock i at day d as follows:

$$AR_{i,d} = R_{i,d} - (\alpha_i + \beta_i R_{m,d}) \quad (3)$$

where $R_{i,d}$ is the return of stock i at day d, $R_{m,d}$ denotes the return of the FTSE 250 index, and α_i and β_i are the ordinary least squares (OLS) estimates for the estimation period (−250, −11).

RESULTS AND ANALYSIS

Figure 1 presents the results of the mean-adjusted returns methodology for the $AR_{i,d}$ and the $CAR_{i,d}$ of the constituents of the FTSE 250 during Britain's rail strike on June 21, 2022. Figure 2 shows the results of the market model methodology for the $AR_{i,d}$ and the $CAR_{i,d}$ of the same 250 stocks during the same strike event period. Both Figure 1 and Figure 2 indicate a negative $CAR_{i,d}$ trend.

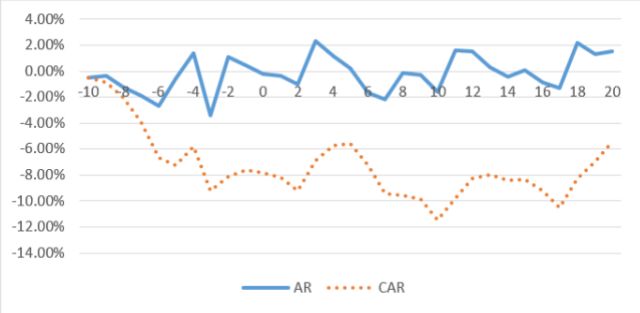

Figure 1. Abnormal returns and cumulative abnormal returns using mean-adjusted returns around the time of the strike.

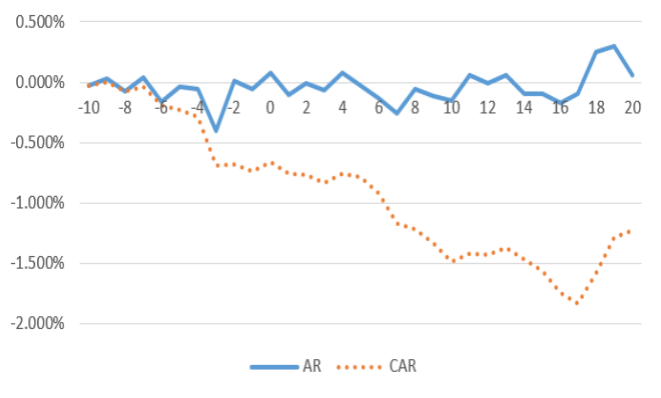

Figure 2. Abnormal returns and cumulative abnormal returns using market model around the time of the strike.

Table 1 displays the $AR_{i,d}$ descriptive statistics for both mean-adjusted returns and the market model during Britain's rail strike event. Table 1 demonstrates that the $AR_{i,d}$ distribution in general is negatively skewed for several days after the event under both methodologies, indicating the existence of negative outliers. The $AR_{i,d}$ distribution is leptokurtic for the event day, indicating

extreme values under both methodologies. The same conclusion can be drawn from Table 2, which shows the descriptive statistics of the $CAR_{i,d}$ using mean-adjusted returns and the market model during Britain's rail strike event.

Table 1. Descriptive statistics

	Mean-adjusted returns $AR_{i,d}$					***Market model*** $AR_{i,d}$			
	Mean	***Median***	***Skewness***	***Kurtosis***		***Mean***	***Median***	***Skewness***	***Kurtosis***
−10	*−0.0050*	*−0.0043*	*6.6731*	*85.0860*		*−0.0003*	*0.0003*	*7.0337*	*90.7624*
−9	*−0.0035*	*−0.0034*	*−0.5601*	*6.7844*		*0.0003*	*0.0003*	*−0.4372*	*6.0936*
−8	*−0.0119*	*−0.0092*	*−3.1601*	*27.2144*		*−0.0008*	*0.0008*	*−3.2877*	*29.7680*
−7	*−0.0190*	*−0.0204*	*1.9131*	*10.2197*		*0.0004*	*−0.0008*	*2.8382*	*16.0224*
−6	*−0.0271*	*−0.0256*	*−0.7240*	*1.7446*		*−0.0016*	*−0.0011*	*−0.0131*	*2.4498*
−5	*−0.0060*	*−0.0061*	*0.6400*	*5.1710*		*−0.0004*	*−0.0012*	*0.7247*	*5.5640*
−4	*0.0142*	*0.0136*	*0.3247*	*1.1039*		*−0.0006*	*−0.0007*	*0.1158*	*1.8176*
−3	*−0.0339*	*−0.0324*	*−4.1008*	*39.8211*		*−0.0040*	*−0.0043*	*−4.7087*	*49.4554*
−2	*0.0112*	*0.0096*	*1.0326*	*4.3003*		*0.0002*	*−0.0010*	*0.8796*	*3.8009*
−1	*0.0044*	*0.0027*	*4.0708*	*41.1704*		*−0.0006*	*−0.0013*	*4.0137*	*40.1368*
0	***−0.0019***	***−0.0013***	***1.6579***	***15.0742***		***0.0008***	***0.0007***	***1.7919***	***15.6038***
+1	*−0.0035*	*−0.0013*	*−1.9148*	*15.3271*		*−0.0010*	*0.0001*	*−1.7954*	*14.6816*
+2	*−0.0101*	*−0.0095*	*−0.8302*	*3.7110*		*−0.0001*	*−0.0001*	*−0.6029*	*2.9943*
+3	*0.0229*	*0.0242*	*-0.3746*	*0.4118*		*−0.0006*	*0.0029*	*−1.3099*	*3.7331*
+4	*0.0115*	*0.0111*	*0.4347*	*2.1675*		*0.0007*	*0.0018*	*0.2339*	*2.0593*
+5	*0.0019*	*0.0023*	*−0.2024*	*2.6949*		*−0.0003*	*0.0007*	*−0.2234*	*2.3851*
+6	*−0.0169*	*−0.0144*	*−0.5920*	*2.5273*		*−0.0013*	*0.0001*	*−1.4206*	*10.2682*
+7	*−0.0215*	*−0.0191*	*−0.7746*	*1.8520*		*−0.0025*	*−0.0020*	*−0.6133*	*2.0298*
+8	*−0.0016*	*−0.0015*	*−0.4742*	*4.7729*		*−0.0005*	*−0.0002*	*−0.2774*	*4.7370*
+9	*−0.0029*	*−0.0012*	*−0.9578*	*4.1205*		*−0.0011*	*0.0004*	*−0.9463*	*4.1697*
+10	*−0.0159*	*−0.0144*	*−0.6229*	*1.2080*		*−0.0015*	*−0.0013*	*−0.4313*	*2.0168*
+11	*0.0163*	*0.0155*	*2.1222*	*21.0810*		*0.0006*	*0.0006*	*1.9220*	*19.6075*
+12	*0.0155*	*0.0135*	*0.6083*	*5.7856*		*−0.0001*	*−0.0020*	*0.3531*	*6.9093*
+13	*0.0032*	*0.0013*	*1.3802*	*7.8920*		*0.0006*	*−0.0011*	*1.2906*	*7.5704*
+14	*−0.0044*	*−0.0024*	*−1.1596*	*4.8612*		*−0.0009*	*0.0012*	*−1.1744*	*5.0789*
+15	*0.0005*	*0.0010*	*−0.7490*	*3.4655*		*−0.0010*	*−0.0007*	*−0.7218*	*3.6337*
+16	*−0.0088*	*−0.0101*	*1.5139*	*12.4091*		*−0.0017*	*−0.0028*	*1.7210*	*13.0560*
+17	*−0.0127*	*−0.0094*	*−2.8432*	*19.3270*		*−0.0009*	*0.0017*	*−2.7718*	*20.1155*
+18	*0.0222*	*0.0214*	*4.7128*	*49.2208*		*0.0025*	*0.0019*	*4.4474*	*49.2528*
+19	*0.0132*	*0.0089*	*6.4734*	*77.9887*		*0.0030*	*−0.0006*	*6.3091*	*75.6399*
+20	*0.0152*	*0.0141*	*0.8267*	*28.8142*		*0.0006*	*−0.0009*	*0.0418*	*34.9258*

Table 2. Descriptive statistics

	Mean-adjusted returns $CAR_{i,d}$					*Market model* $CAR_{i,d}$			
	Mean	***Median***	***Skewness***	***Kurtosis***		***Mean***	***Median***	***Skewness***	***Kurtosis***
−10	*−0.0050*	*−0.0043*	*6.6597*	*85.1532*		*−0.0003*	*0.0003*	*7.0337*	*90.7624*
−9	*−0.0085*	*−0.0081*	*2.9016*	*38.2420*		*0.0001*	*−0.0007*	*3.2550*	*41.8487*
−8	*−0.0204*	*−0.0171*	*0.5708*	*16.9932*		*−0.0007*	*0.0011*	*0.8684*	*19.6305*
−7	*−0.0394*	*−0.0387*	*0.8415*	*9.4092*		*−0.0003*	*−0.0029*	*1.6414*	*14.5882*
−6	*−0.0665*	*−0.0631*	*0.3010*	*4.8664*		*−0.0019*	*−0.0045*	*1.3877*	*10.4105*
−5	*−0.0724*	*−0.0650*	*−0.1722*	*3.1979*		*−0.0023*	*−0.0046*	*0.5808*	*5.2679*
−4	*−0.0582*	*−0.0503*	*−0.3984*	*4.1666*		*−0.0029*	*−0.0014*	*0.1928*	*5.1975*
−3	*−0.0921*	*−0.0780*	*−1.4520*	*8.3603*		*−0.0069*	*−0.0034*	*−1.4394*	*12.9261*
−2	*−0.0808*	*−0.0730*	*−0.6843*	*4.3142*		*−0.0068*	*−0.0021*	*−0.5003*	*6.3057*
−1	*−0.0764*	*−0.0684*	*−0.1885*	*5.4397*		*−0.0074*	*−0.0070*	*0.1295*	*7.2774*
0	*−0.0783*	*−0.0680*	*−0.2084*	*5.9872*		*−0.0066*	*−0.0065*	*0.1635*	*7.9806*
+1	*−0.0818*	*−0.0729*	*−0.1714*	*5.4279*		*−0.0076*	*−0.0045*	*0.1440*	*7.0063*
+2	*−0.0919*	*−0.0805*	*−0.0574*	*4.2523*		*−0.0077*	*−0.0056*	*0.2680*	*5.6003*
+3	*−0.0690*	*−0.0550*	*−0.3634*	*4.7127*		*−0.0083*	*−0.0007*	*−0.1165*	*5.4935*
+4	*−0.0575*	*−0.0446*	*−0.5252*	*4.6113*		*−0.0076*	*−0.0025*	*−0.3773*	*5.2980*
+5	*−0.0556*	*−0.0455*	*−0.5685*	*4.2029*		*−0.0079*	*−0.0016*	*−0.4116*	*4.8151*
+6	*−0.0725*	*−0.0620*	*−0.6612*	*3.0715*		*−0.0091*	*−0.0015*	*−0.4971*	*3.4885*
+7	*−0.0940*	*−0.0803*	*−0.7104*	*2.3883*		*−0.0117*	*−0.0039*	*−0.4929*	*2.4871*
+8	*−0.0956*	*−0.0828*	*−0.6995*	*1.8647*		*−0.0122*	*−0.0013*	*−0.5479*	*2.2094*
+9	*−0.0985*	*−0.0847*	*−0.7379*	*1.7241*		*−0.0133*	*−0.0057*	*−0.4866*	*1.5542*
+10	*−0.1145*	*−0.1008*	*−0.7864*	*1.7494*		*−0.0148*	*−0.0065*	*−0.5626*	*1.9085*
+11	*−0.0981*	*−0.0801*	*−0.9730*	*2.1095*		*−0.0142*	*−0.0062*	*−0.7448*	*2.2723*
+12	*−0.0826*	*−0.0686*	*−0.6833*	*1.8477*		*−0.0143*	*−0.0081*	*−0.4381*	*1.8742*
+13	*−0.0794*	*−0.0714*	*−0.6027*	*1.9342*		*−0.0137*	*−0.0114*	*−0.3214*	*1.8621*
+14	*−0.0838*	*−0.0732*	*−0.7484*	*2.0354*		*−0.0147*	*−0.0102*	*−0.4472*	*1.8542*
+15	*−0.0833*	*−0.0713*	*−0.8240*	*2.0216*		*−0.0156*	*−0.0117*	*−0.5592*	*1.8970*
+16	*−0.0921*	*−0.0795*	*−0.8288*	*2.1529*		*−0.0174*	*−0.0128*	*−0.4988*	*2.0479*
+17	*−0.1048*	*−0.0915*	*−0.8165*	*2.0992*		*−0.0183*	*−0.0165*	*−0.4899*	*2.0876*
+18	*−0.0827*	*−0.0707*	*−0.7888*	*2.1493*		*−0.0158*	*−0.0135*	*−0.5548*	*2.2563*
+19	*−0.0695*	*−0.0603*	*−0.5131*	*2.4759*		*−0.0128*	*−0.0136*	*−0.2252*	*2.4278*
+20	*−0.0542*	*−0.0462*	*−0.5728*	*2.4352*		*−0.0123*	*−0.0105*	*−0.3943*	*2.2962*

Table 3 reveals the results of the mean and median equality tests for the $CAR_{i,d}$ using the mean-adjusted returns model. The results of both the mean and median equality tests in Panels A and B of Table 3 show a significant negative market reaction to the event during the [−3, 3], [−6, 6], [−10, 10], [−10, 15], and [−10, 20] event windows. The results indicate that the event had a significant negative effect on stock market returns: average CARs range from negative 108.2 basis points to negative 23,137 basis points.

Table 3. Mean and median equality tests for cumulative abnormal returns $(CAR_{i,d})$ using mean-adjusted returns.

Panel A: Mean Equality Test		
Event window	***Mean***	**t-test**
[−1, 1]	*−0.001*	*−0.441555*
[−3, 3]	*−0.01082*	*−3.215040****
[−6, 6]	*−0.03315*	*−7.906961****
[−10, 10]	*−0.11445*	*−17.10018****
[−10, 15]	*−0.08329*	*−12.56460****
[−10, 20]	*−2.31373*	*−15.35087****
Panel B: Median Equality Test		
Event window	***Median***	**W/M**
[−1, 1]	*−0.00188*	*−1.010843*
[−3, 3]	*−0.00732*	*−3.326111****
[−6, 6]	*−0.02256*	*−7.502210****
[−10, 10]	*−0.10155*	*−12.56697****
[−10, 15]	*−0.07181*	*−10.88106****
[−10, 20]	*−2.00868*	*−12.20746****

Note: "t-test" refers to the Satterthwaite–Welch t-test, which measures equality between two groups; W/M = Wilcoxon–Mann–Whitney signed-rank median test.
*Statistical significance at the 10% level; **statistical significance at the 5% level; ***statistical significance at the 1% level.

Conversely, Table 4 shows the results of the mean and median equality tests for the $CAR_{i,d}$ using the market model. The results of the mean equality tests in Panel A of Table 4 show a highly significant negative market reaction to the event during the [−6, 6], [−10, 10], [−10, 15], and [−10, 20] event windows. The results of the median equality tests in Panel B of Table 4 also show a highly significant negative market reaction to the event during the [−6, 6], [−10, 10], [−10, 15], and [−10, 20] event windows. The results show that the event also had a significant negative effect on stock market returns with the average CARs ranging from negative 54 basis points to negative 156 basis points. These results from Table 3 and Table 4 strongly indicate that the London Stock Exchange reacted negatively to the rail strike.

Table 4. Mean and median equality tests for cumulative abnormal returns ($CAR_{i,d}$) using the market model.

Panel A: Mean Equality Test		
Event window	***Mean***	***t-test***
[−1, 1]	−0.0008	*−0.356517*
[−3, 3]	−0.0054	−1.611275
[−6, 6]	−0.0088	*−2.174261***
[−10, 10]	−0.0148	−2.546374**
[−10, 15]	−0.0156	−2.583093**
[−10, 20]	−0.0123	−1.986276**
Panel B: Median Equality Test		
Event window	***Median***	***W/M***
[−1, 1]	−0.0019	*−0.906064*
[−3, 3]	−0.0022	−1.551754
[−6, 6]	−0.0037	*−1.702910**
[−10, 10]	−0.0065	−1.949304*
[−10, 15]	−0.0117	−2.179096**
[−10, 20]	−0.0105	−1.799895*

Note: "*t*-test" refers to the Satterthwaite–Welch *t*-test, which measures equality between two groups; W/M = Wilcoxon–Mann–Whitney signed-rank median test.
*Statistical significance at the 10% level; **statistical significance at the 5% level; ***statistical significance at the 1% level.

Our findings are similar to those obtained by other researchers (Becker & Olson, 1986; Bhana, 1997; Nelson et al., 1994; Persons, 1995; Ramelli et al., 2021; Wisniewski et al., 2020) in that we found that the labor strike had a negative impact on stock market returns. This negative reaction adversely affects investors as well as pension funds that are not internationally diversified. Trade unions and governments should raise their concerns about this issue since it will severely affect retirement portfolios. Therefore, it is proposed that alternative solutions be sought by both parties instead of resorting to walkouts, and that governments should be cautious of circumstances that can arouse employee ire to avoid expensive economic friction. Similarly, labor unions should carefully consider the effects on the welfare of their members before organizing large-scale strikes.

The results obtained suggest that investors are concerned and fearful of the effect of a rail strike on the UK economy, given its adverse effect on supply chain activities. Such concern and fear could lead investors to sell off their holdings of some shares and allocate their funds toward other safe-haven assets. Such action would drag the price of shares down further. However, the negative impact would differ in strength and effect, depending on conditions such as the timing of the strike and the firms

involved in the strike. For instance, the stock market may experience little effect if the strike were short-lived without affecting the supply chain and policymakers intervened rapidly.

It is worth noting that companies that are not involved in the strike may also be affected by those concerned investors who move their funds out of the stock market. As mentioned earlier, the strength of the effect would depend on many conditions, such as the timing of the strike, the length of the strike, and the firms involved.

Our paper has several limitations. First, we did not examine the variables that could influence the CARs, such as company- and country-specific variables. Second, we employed only two methods in our study: mean-adjusted returns and the market model. Future research might consider examining the variables that affect the CARs as well as using other methods, such as the capital asset pricing model, the Fama–MacBeth regression, or a controlled portfolio to calculate the CARs. In addition, as in Peress (2014) and Wisniewski et al. (2020), the volatility of stock market returns and trading volumes could be investigated in future studies using the event study methodology. Future research could also analyze the effect of the strike on different sectors of the stock market and determine whether such strikes could have a domino effect on other sectors. We also suggest examining whether spending by rail companies on labor unions, in the form of employee stock options, or corporate social responsibility would help to minimize the likelihood of strikes being initiated.

CONCLUSION

In this paper, we examined whether strike events have an effect on stock market outcomes. In particular, we employed the event study technique to investigate the effect that Britain's biggest rail strike in 30 years had on stock market returns. In using this technique, we employed two methods: mean-adjusted returns and the market model. The results showing the average cumulative abnormal returns (CARs) ranging from negative 108.2 basis points to negative 23,137 basis points under mean-adjusted returns revealed that the event had a significant negative effect on stock market returns. Conversely, using the market model, the event also had a significant negative effect on stock market returns, with average CARs ranging from negative 54 basis points to negative 156 basis points. These findings displayed a negative trend in CARs among the components of the FTSE 250, implying that Britain's rail strike had a significant negative impact. Such findings can provide insights for policymakers and governments to use when launching new strategies and regulations to avoid such disturbances to the economy in the future.

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