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### **ANALYZING THE IMPACT OF EXTERNAL FACTORS ON STOCK MARKET PERFORMANCE IN THE FAST FOOD INDUSTRY DURING BOYCOTT MOVEMENTS USING MULTIPLE LINEAR REGRESSION**

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#### **ABSTRACT**

This study examines the impact of boycott movements on the stock market performance of McDonald's and Pizza Hut from October 2023 to January 2025. Using Multiple Linear Regression (MLR), the research analyzes key factors affecting stock prices, including war-related news, boycott-related news, trading volume, and boycott duration. The findings indicate that historical stock prices significantly influence both companies' stock performance, with McDonald's showing an R-squared value of 83.0% and Pizza Hut 67.7%. War-related and boycott-related news were measured based on weekly article frequency, trading volume was obtained from official stock data, and boycott duration was calculated as the number of days since the boycott announcement, measured weekly. Trading volume was found not to be statistically significant in affecting McDonald's stock price at the 99% confidence level. At the same time, other factors, such as boycott-related news and war-related news, do not have a significant impact on either company. The results suggest that investors prioritize historical stock trends over external socio-political events. This study provides insights into the financial consequences of consumer activism and can assist investors, policymakers, and business strategists in understanding market reactions to boycott movements.

**Keywords:** Boycott, McDonald's, multiple linear regression, Pizza Hut, stock market performance.

## INTRODUCTION

Boycotting is a protesting action when an individual refuses to purchase products, engages with businesses or companies, or be involved in activities. The boycott activities aim to express strong disapproval and have a rich history of influencing social and economic change. The term "boycott" originated from the Irish land conflict in 1880 when Charles Stewart Parnell proposed a rent reduction to British estate manager Charles Cunningham Boycott. When Boycott refused, Irish tenants followed Parnell's suggested code of conduct and ostracized him (The Editors of Encyclopaedia Britannica, n.d.-c). Throughout the past century, boycotts have been a famous and effective way to bring about changes to improve the world. Many boycotts are organized similarly but may be used for different reasons.

One significant boycott movement is linked to the Israel-Palestine conflict. The conflict traces back to the early 20th century, notably with Britain's Balfour Declaration in 1917, which promised a national home for Jewish people in Palestine. Between 1918 and 1947, the Jewish population in Palestine increased dramatically, leading to tensions and violent conflicts. In 1948, the establishment of Israel resulted in the displacement of over 750,000 Palestinians, known as the Nakba. Despite the Oslo Accords of 1993, which aimed for peace, Israeli settlements continued to expand on Palestinian land, exacerbating tensions.

In 2007, Hamas gained control in Gaza, responding to Israeli actions, such as attacks on the Al-Aqsa Mosque, with retaliatory operations. Israel, in turn, imposed severe restrictions on Gaza, cutting off essential supplies. The conflict escalated further in October 2023, leading to widespread violence and loss of life (Haddad & Chughtai, 2023). The death toll from 2008 to 2023, as recorded by Berker and Abushamala (2023), highlights the disproportionate impact on Palestinians. While Israel claims self-defence against Hamas, critics argue that such actions amount to genocide (Bouranova, 2024).

The Boycott, Divestment, and Sanctions (BDS) movement was founded in 2005, inspired by the South African anti-apartheid movement. It aims to raise awareness and apply economic pressure to challenge Israeli policies against Palestinians. The movement is supported by over 170 Palestinian civil society organizations (BDS Movement, 2023) and consists of three primary actions: boycotts, divestment, and sanctions. Boycotts target companies complicit in human rights violations, divestment encourages financial institutions to withdraw funding from Israeli-affiliated businesses, and sanctions urge governments to cut economic ties with Israel (BDS Movement, 2023). The BDS movement demands that Israel end its occupation of Arab lands, grant full equality to Palestinian citizens, and recognize the right of Palestinian refugees to return (BNC, 2024). Due to Israel's continued violations of international law, the BDS movement has expanded rapidly.

Consumer boycotts have emerged as one of the most effective strategies within BDS. Many individuals refuse to support brands that endorse Israel's actions. Lists of companies to boycott circulate widely on social media. However, sustaining an extensive boycott over an extended period can be challenging. Activists strategically target specific brands to maximize pressure. Notably, McDonald's and Pizza Hut have been identified as targets due to their alleged support for Israeli military operations. McDonald's Israeli franchisee provided free meals to Israeli forces, leading to a global boycott campaign initiated by BDS in October 2023 (BDS Movement, 2024). Similarly, Pizza Hut Israel faced backlash after its franchisee posted an Instagram story showing soldiers with Pizza Hut pizzas, implying the company's support for Israeli troops (Fontanez, 2024).

Boycott movements significantly impact financial markets and consumer behaviour, often leading to changes in stock performance. The stock market facilitates trading securities, including stocks and

bonds, providing transparent valuation mechanisms for public companies (Tretina, 2023). A boycott can disrupt these valuations, influencing investor sentiment and market stability. Understanding these dynamics is crucial for investors, businesses, and policymakers.

This study analyzes the impact of boycotts on stock market performance by examining relevant factors using Multiple Linear Regression (MLR). Stock market analysis is a significant research area, with techniques such as regression models, neural networks, ARIMA, and data mining used to predict market trends (Aggarwal et al., 2017). MLR, a statistical method that models the relationship between multiple independent variables and a dependent variable, will examine the relationship between boycott-related factors and stock performance (Boonkrong et al., 2020; Tranmer et al., 2020).

This study aims to:

- 1) Identify the factors that affect the stock market performance due to the boycott.
- 2) Analyze the proposed factors that affect the stock market performance, specifically in fast-food companies, including McDonald's and Pizza Hut, using Multiple Linear Regression.
- 3) Compare these two fast-food companies (McDonald's and Pizza Hut) on the significant factors that affect their stock market performances due to boycotts.

This research is significant for investors who are assessing financial risks associated with social and political movements. By applying MLR, the study provides a structured approach to analyzing market responses to boycotts. The findings will also help businesses formulate strategies to mitigate the financial impact of boycotts and maintain consumer trust. Furthermore, policymakers can leverage these insights to develop measures that address economic disruptions caused by activism. Academically, this study contributes to the literature on the intersection of social movements and financial markets.

The remainder of this paper is organized as follows. Section 2 reviews the relevant literature, discussing previous studies on boycotts and stock market performance. Section 3 details the methodology, explaining data collection and the MLR approach. Section 4 presents the results and discussion, highlighting key findings. Section 5 concludes the study with recommendations for future research.

## **LITERATURE REVIEW**

### **Concept of Boycott**

Gannon (2001) defines a boycott as a withdrawal from commercial or social relations, including the refusal to buy or handle goods as a form of punishment or protest. Buheji and Ahmed (2023) propose classifying boycott lists by country, sector, and service to sustain the momentum. They recommend identifying alternative products from supportive countries, particularly those of comparable quality products. Additionally, they suggest prioritizing boycotts against brands significantly involved in Israeli settlements through the "take one-do one-finish one" approach. Products with health risks, environmental concerns, or fair-trade violations should also be boycotted in favour of safer, local alternatives.

### **Stock Market Reaction to Boycotts**

Koku et al. (1997) argue that boycotts and boycott threats do not typically cause financial losses for targeted firms; sometimes, these firms experience wealth gains. However, boycotts can still serve as an effective negotiation tool, as public sympathy and reaction levels vary. Neureiter and Bhattacharya

(2021) note that politically motivated boycotts often trigger counter-boycotts, which can either increase or decrease sales. Meanwhile, Brune et al. (2015) find that heightened war likelihood tends to depress stock market prices consistently across different conflicts over the past century.

Kurilets (2014) examines stock market reactions to corporate social responsibility (CSR) announcements in major U.S. fast-food companies. The study finds a positive effect on McDonald's stock returns and a negative impact on YUM! Brands, and no reaction for Wendy's. This suggests that investor perceptions of CSR initiatives vary. Teoh et al. (2021) highlight the importance of closing stock prices for short-term traders, as they provide key insights into investor sentiment and asset management strategies. To assess the impact of boycotts on stock performance, this study will use monthly closing stock prices in a multiple linear regression (MLR) analysis.

## **Factors Affecting the Impact of Boycotts on the Stock Market**

### ***War-related News***

Izzeldin et al. (2023) analyze the impact of the Russia-Ukraine war on global stock market volatility, comparing it with past crises like COVID-19 and the 2008 financial crisis. Similarly, Brune et al. (2015) use New York Times data to quantify war-related news coverage by counting articles containing keywords like "war" and "Iraq."

### ***War-Related Social Media***

Jiao et al. (2020) find that high social media coverage at the stock level predicts return volatility and trading activity. Their "total buzz" metric aggregates daily mentions of stocks alongside emotion-related terms. This provides insight into how social media discussions shape investor sentiment.

### ***Boycott-related News***

Friedman (1985) highlights how major newspaper or television reports on boycotts can become significant events in themselves, influencing consumer and investor behaviour. King (2011) categorizes corporate disruption from social movements into market disruption (affecting finances) and mediated disruption (damaging reputation through media coverage). Ding et al. (2018) developed two measures: NEWS\_GENOCIDE (articles linking a firm to the term "genocide") and NEWS\_SUDAN\_DIVEST (articles mentioning both "Sudan" and "divestment").

### ***Boycott-related Social Media***

Sarkar et al. (2023) confirm that social media sentiment influences stock closing prices. Neureiter and Bhattacharya (2021) describe how the Nike boycott gained traction through hashtags like #burnyournikes and #boycottnike. Agarwal et al. (2021) bypassed Twitter API limitations using custom Python scripts to collect 16.4 million tweets related to Nifty50-listed companies.

### ***Company Size***

Matthew and Odularu (2009) and Prasad and Shrimal (2014) find a positive correlation between firm performance and market capitalization, indicating that larger firms may be more resilient to boycott effects.

### ***Trading Volume***

Chordia et al. (2001) define trading volume as a key market activity indicator, where high volume signals strong investor interest. Heilmann (2015) suggests that boycott effects on trade volume vary by market, potentially leading to decreased or increased investor engagement.

### ***Duration Since Boycott Announcement***

Pruitt and Friedman (1986) report that boycott announcements significantly decrease target firms' market value, averaging a loss of over \$120 million within two months.

### **Statistical Methods in Stock Market Analysis**

MLR is a widely used statistical method for predicting financial trends and analyzing stock market behaviour. Boonkrong et al. (2020) emphasized that MLR effectively models relationships between independent variables - such as social movements, market fluctuations, and stock prices. Tranmer et al. (2020) elaborated on MLR's application in finance, noting its utility in understanding the interplay between boycott-related variables and stock market performance. This study builds on previous research by employing MLR to analyze how factors like war-related news, boycott-related news, trading volume, and boycott duration influence the stock prices of McDonald's and Pizza Hut.

To address autocorrelation in MLR, methods like the Durbin-Watson test, Generalized Least Squares (GLS), and the Cochrane-Orcutt procedure are used (Wooldridge, 2019; Gujarati & Porter, 2020). Including lagged dependent variables can help reduce autocorrelation but may introduce endogeneity (Baltagi, 2021).

### **Boycotted Companies**

#### ***McDonald's***

Ishak et al. (2018) frame boycotts as temporary emotional expressions or acts of solidarity against human rights violations. Ahmad Suhaimi and Sulaiman (2013) explore Malaysian youths' boycott intentions toward McDonald's, analyzing factors like human rights awareness and religiosity. Jasmin et al. (2024) examine the prolonged impact of the 2023 BDS boycott against McDonald's, noting that previous response strategies were ineffective.

Abdullah (2024) documents McDonald's Malaysia's severe revenue losses during the 2014 boycott, facility damage, and employee resignations. Ghazali et al. (2019) discuss McDonald's adaptation strategies, including franchise policy revisions and public relations efforts to counter boycott-related misinformation.

#### ***Pizza Hut***

Mike and Slocum (2003) describe Pizza Hut's corporate restructuring under Yum! Brands to enhance operational efficiency. Teoh et al. (2021) identify taste, promotions, and social media presence as key drivers of consumer choice. Mohl (1991) recounts a historical boycott of PepsiCo's franchises, including Pizza Hut, due to its apartheid-era ties to South Africa.

In conclusion, this chapter reviews the impact of boycotts on stock market performance, considering factors like media coverage, trading volume, and company size. While some research suggests boycotts have limited financial effects, others highlight their potential to disrupt corporate reputations and market

performance. Due to its interpretability, MLR remains a preferred method for analyzing boycott-related stock price changes. Additionally, case studies on McDonald's and Pizza Hut illustrate the real-world implications of boycotts, emphasizing the need for firms to develop effective response strategies.

## METHODOLOGY

### Variables and Data Collection

The variables were selected based on a comprehensive review of prior studies that analyzed market responses to socio-political events, such as war and boycott movements, and their relevance to capturing both investor sentiment and trading behavior during the boycott period.

#### *Dependent variable*

The dependent variable (DV) is the stock's closing price (CLOSE\_PRICE). Closing price data for McDonald's (MCD) and Yum! Brands (YUM), which owns Pizza Hut, was retrieved from Yahoo Finance. In Yahoo Finance, the weekly data available starts from Monday. To get the closing price of October 1, 2023 (Sunday), we collected the data from September 25, 2023, Monday). Therefore, the dataset collected was from September 25, 2023, to January 31, 2025, with a weekly frequency.

#### *Independent variables*

The independent variables (IVs) consist of four variables, which are war-related news, boycott-related news, trading volume, and duration since the boycott announcement. Table 1 summarizes the independent variables, definitions, and data collection sources.

**Table 1**

#### *Summary of Variables and Data Collection*

Variable	Definition	Data Collection Sources
WAR_NEWS	War-related news	War-related news data was collected using the SerpApi service from Google News. Relevant articles were extracted using keyword searches such as "Israel Palestine War", "Israel Palestine Conflict", "Israel Hamas War", and "Israel Hamas Conflict".
BOYCOTT_NEWS	Boycott-related news	Boycott-related news data was collected using the SerpApi service from Google News. Relevant articles were extracted using keyword searches such as "McDonald's Boycott", "McDonald's Israel Boycott", "McDonald's Palestine Boycott", "McDonald's BDS Movement," and "McDonald's January 2025 Boycott."
TRADE_VOL	Trading Volume	Trading volume data for McDonald's (MCD) and Yum! Brands (YUM) were retrieved from Yahoo Finance using the yfinance library. The dataset spans from September 25, 2023, to January 31, 2025, with weekly frequency.
DURATION_BOYCOTT	Duration since boycott announcement	The duration since the boycott announcement was collected from news sources identifying each company's first day of the boycott. The duration of boycott was calculated from the first day of the boycott until the present date, measured in days. A weekly dataset was generated by computing the duration at the start of each week.

## Multiple Linear Regression Analysis

In achieving the second objective, MLR analysis was conducted to analyze how war-related news, boycott-related news, trading volume, and the duration since the boycott announcement influenced the stock market performance of McDonald's and Pizza Hut.

### *MLR Model Specification*

The MLR models for McDonald's and Pizza Hut were developed to analyze the relationship between DV and IVs. Initially, the regression equation for each company was formulated as in Equation 1.

$$\begin{aligned} CLOSE\_PRICE_t & \\ &= \beta_0 + \beta_1 WAR\_NEWS_t + \beta_2 BOYCOTT\_NEWS_t \\ &+ \beta_3 TRADE\_VOL_t + \beta_4 DURATION\_BOYCOTT_t + \varepsilon_t \end{aligned} \quad (1)$$

Where:

- $CLOSE\_PRICE_t$  = Weekly closing price of the stock (dependent variable)
- $WAR\_NEWS_t$  = Number of war-related news articles in each week
- $BOYCOTT\_NEWS_t$  = Number of boycott-related news articles in each week
- $TRADE\_VOL_t$  = Weekly trading volume of the stock
- $DURATION\_BOYCOTT_t$  = Duration (in weeks) since the boycott announcement
- $\beta_0$  denotes the intercept.
- $\beta_1, \beta_2, \beta_3, \beta_4$  denote the coefficients representing the impact of each independent variable on stock prices.
- $\varepsilon_t$  denotes an error term.

### *Modification to the Model*

During assumption testing, it was found that the initial model did not meet the assumption that the values of the residuals are independent. To address this issue, a lagged closing price ( $LAG\_CLOSE\_PRICE_{t-1}$ ) was added as a predictor. The revised model was specified as in Equation 2.

$$\begin{aligned} CLOSE\_PRICE_t & \\ &= \beta_0 + \beta_1 WAR\_NEWS_t + \beta_2 BOYCOTT\_NEWS_t + \beta_3 TRADE\_VOL_t \\ &+ \beta_4 DURATION\_BOYCOTT_t + \beta_5 LAG\_CLOSE\_PRICE_{t-1} + \varepsilon_t \end{aligned} \quad (2)$$

Where:

- $LAG\_CLOSE\_PRICE_{t-1}$  = Closing stock price from the previous week.
- $\beta_5$  denotes the coefficient for the lagged variable.

### *Assumption Testing*

Before interpreting the regression results, diagnostic tests were conducted to ensure the regression model meets the fundamental assumptions of MLR. These tests were carried out using SPSS to verify the validity and reliability of the analysis. The assumptions and their testing methods are detailed below:

1. The relationship between IVs and DV is linear.

This assumption is to ensure that the relationship between the IVs and the DV is linear. We tested this assumption by looking at the scatterplots of the standardized residuals against the

standardized predicted values. For the assumption to be met, the scatterplots should show a random scatter of points with no obvious patterns, curvature, or systematic structure. A random scatter indicates that the model adequately captures the linear relationship between the IVs and DV.

2. There is no multicollinearity in the data.

This assumption is to ensure that the predictors are not highly correlated with one another. We tested this assumption by looking at the Variance Inflation Factor (VIF) and Tolerance values in the Coefficients table. For the assumption to be met, VIF values should be below 10, while tolerance values should exceed 0.2.

3. The values of the residuals are independent.

This assumption is to ensure that the residuals are independent (uncorrelated) across observations. We tested this assumption by looking at the Durbin-Watson value in the Model Summary table. The Durbin-Watson value should be close to two to indicate no significant autocorrelation.

4. The variance of residuals is constant (homoscedasticity).

This assumption is to ensure that the residuals have constant variance across levels of predictors (no heteroscedasticity). We tested this assumption by looking at the scatterplots of the standardized residuals against the standardized predicted values. For the assumption to be met, the scatterplots should appear as a random array of dots with no funnel-shaped patterns.

5. The values of the residuals are normally distributed.

This assumption is to ensure that residuals are approximately normally distributed. We tested this assumption by looking at the P-P plot and histograms of the residuals. For the assumption to be met, the points in the P-P plot should align closely with the diagonal line, while the histogram should approximate a normal curve.

6. There are no influential cases biasing the model.

This assumption is to detect any significant outliers or influential data points that may bias the regression results. We tested this assumption by looking at each data point's Cook's Distance values. Cook's Distance values greater than 1 indicate influential cases.

### ***Interpretation of MLR Output***

Once the assumptions of MLR were validated, the output generated from the regression analysis in SPSS was interpreted to address the research objectives. The analysis was conducted at a 99% confidence interval (CI), corresponding to a significance level ( $\alpha=0.01$ ). The interpretation process focused on understanding the following key components of the regression output:

1. Significance of the Overall Model (F-test)

The significance of the overall regression model was assessed to determine whether the IVs collectively explain a statistically significant proportion of the variation in the DV. It was evaluated by analyzing the F-statistics and its corresponding p-value from the ANOVA table. A significant F-test ( $p<0.01$ ) indicates that the IVs, as a group, significantly contribute to explaining the variation in the DV.

2. Statistical Significance of Predictors (p-Values)

The statistical significance of predictors was assessed to identify which IVs significantly contribute to explaining the DV. It was evaluated by analyzing each predictor's p-values from the Coefficients table. Predictors with  $p<0.01$  were considered significant.

3. Contribution of Predictors (Unstandardized Coefficients, B)

The unstandardized coefficients (B) were assessed to determine the direct impact of each IV on the DV. These coefficients, collected from the Coefficients table, indicate how much the DV (closing stock price) changes with a one-unit change in each IV while holding all other

predictors constant. Positive B values indicate that as the IV increases, the DV also increases. Meanwhile, negative B values indicate an inverse relationship between the IV and the DV.

#### 4. Model Fit (R-Squared)

The fit of the regression models was assessed using R-squared from the Model Summary table, which evaluates how well the IVs collectively explain the variability in the DV. Higher R-squared values indicate that the model accounts for more variation in the dependent variable.

### **Comparison between McDonald's and Pizza Hut**

In achieving the third research objective, a systematic approach was taken to ensure fairness and consistency in the analysis. Separate MLR models were built for each company, allowing for an independent analysis of their stock price behaviours. This approach was justified as McDonald's and Pizza Hut differ in terms of market presence, brand perception, and customer base, which may influence their sensitivity to external socio-political factors. By modeling them separately, the analysis accounted for these company-specific dynamics, enhancing the accuracy and relevance of the findings. The comparison was based on the following steps:

#### 1. Model Development

Independent MLR models were developed for McDonald's and Pizza Hut using the same set of predictors, ensuring consistency in the variables analyzed. Apart from that, the dependent variable in both models was the weekly closing stock price.

#### 2. Key Metrics for Comparison

- Model Fit (R-Squared)

The R-squared was used to evaluate how well the predictors explained the variation in stock prices for each company.

- Significance of Predictors (p-Values)

The p-values were analyzed to identify which predictors significantly influenced the stock prices of each company.

- Unstandardized Coefficients (B)

The B values were compared to assess the magnitude and direction of the relationships between the predictors and stock prices.

#### 3. Data Consistency

Both models used data from the same period (October 2023 to January 2025) and relied on consistent data sources, such as Yahoo Finance for stock prices and SerpApi for news-related data. This ensured that the temporal or data source inconsistencies did not affect the comparison.

This approach provided a fair and comprehensive comparison of McDonald's and Pizza Hut, focusing on how both internal and external factors influenced their stock prices. Internal factors refer to company-specific elements, such as past stock performance using lagged closing prices, while external factors include war-related news, boycott-related news, trading volume, and boycott duration. By analyzing the model's side by side, the study aimed to uncover unique patterns in how each company responded to boycotts and external news.

In summary, this chapter outlines the methodology used to analyze the impact of boycotts on the stock market performance of McDonald's and Pizza Hut. The research follows a structured approach, including data collection from Yahoo Finance and SerpApi, with stock prices as the dependent variable and factors such as war-related news, boycott-related news, trading volume, and boycott duration as independent variables. MLR is used as the primary analytical method, with assumption testing ensuring model validity. The inclusion of a lagged stock price variable addresses autocorrelation issues. A

comparative analysis between McDonald's and Pizza Hut provides insights into how each company's stock reacts to external factors. The next section presents the results and interpretation of the analysis.

## RESULTS AND DISCUSSIONS

### McDonald's Regression Analysis Results

#### *Assumption Tests*

Before interpreting the results of McDonald's, the assumptions of MLR were tested to ensure model validity. The summary of the assumption test results, along with the corresponding test values, is presented in Table 2.

**Table 2**

*Assumption Test Results for McDonald's Regression Model*

Assumption	Test	Output (Initial)	Status (Initial)	Output (After Adding Lag Variable)	Status (After Adding Lag Variable)
Linearity	Scatterplot of residuals vs predicted values	No curvature observed	Met	No curvature observed	Met
No Multicollinearity	VIF and Tolerance	All VIF < 2, Tolerance > 0.8	Met	All VIF < 2, Tolerance > 0.7	Met
Independence of Residuals	Durbin-Watson statistic	0.355	Not met	2.340	Met
Homoscedasticity (Constant Variance)	Scatterplot of residuals vs predicted values	Random pattern observed	Met	Random pattern observed	Met
Normality of Residuals	P-P plot and histograms of the residuals	Normal distribution observed	Met	Normal distribution observed	Met
No influential cases are biasing the model.	Cook's Distance	Maximum value = 0.453	Met	Maximum value = 0.852	Met

Following the initial assumption testing, the Durbin-Watson statistic was found to be 0.355, indicating positive autocorrelation in the residuals. To address this issue, a lag variable was introduced into the model. After incorporating the lag variable, the Durbin-Watson value increased to 2.340, confirming that the assumption of independent residuals was now satisfied.

Furthermore, after adding the lag variable, all other assumptions remained met. The maximum Cook's Distance showed an increase (with all values remaining below 1), confirming that influential cases biasing the model were still not an issue in the final model. This confirms that the final regression model meets all the necessary MLR assumptions, ensuring the reliability of the subsequent analysis.

#### *Significance of the Overall Model (F-test)*

To assess the overall effectiveness of the regression model, the F-test from the ANOVA table was analyzed. A significant F-test ( $p < 0.01$ ) indicates that the independent variables collectively explain a statistically significant portion of the variation in McDonald's closing price. The output is presented in Table 3.

**Table 3**

*Significance of the Overall McDonald's Model*

Model	F-statistic	P-value	Significance Status
McDonald's model	62.676	<0.001	Significant

Since the p-value is below 0.01, the overall model is statistically significant, confirming that the independent variables, as a group, contribute to explaining the variation in McDonald's closing price.

**Statistical Significance of Predictors (p-values)**

The significance of each predictor was assessed based on its p-value. Predictors with  $p < 0.01$  were considered statistically significant. The output is presented in Table 4.

**Table 4**

*Statistical Significance of Predictors for McDonald's Model*

Variable	P-values	Significance at 99% Confidence Level
WAR_NEWS	0.269	Not significant
BOYCOTT_NEWS	0.360	Not significant
TRADE_VOL	0.053	Not significant
DURATION_BOYCOTT	0.937	Not significant
LAG_CLOSE_PRICE	<0.001	Significant

The findings indicate that only the past closing price (LAG\_CLOSE\_PRICE) significantly influences McDonald's stock price at the 99% confidence level. In contrast, trade volume (TRADE\_VOL), war-related news, boycott-related news, and boycott duration do not show statistically significant effects.

**Contribution of Predictors (Unstandardized Coefficients, B)**

To understand the specific impact of each predictor, the unstandardized coefficients (B) were examined. These coefficients indicate the direction and magnitude of influence that each IV has on McDonald's closing price. The output is presented in Table 5.

**Table 5**

*Contribution of Predictors for McDonald's Model*

Predictor	Unstandardized Coefficient (B)	Interpretation
Constant	37.098	When all predictors are zero, the estimated stock price is \$37.10.
WAR_NEWS	0.194	Each additional war-related news article is linked to a \$0.194 increase, but the effect is not statistically significant.
BOYCOTT_NEWS	-0.091	More boycott news is associated with a \$0.091 decrease in price, but the impact is not significant.
TRADE_VOL	-3.261E-7	A 1-unit increase in trade volume slightly lowers the stock price, but the effect is very small.

DURATION_BOYCOTT	0.004	The duration of the boycott has almost no effect on stock price (\$0.004 increase per unit).
LAG_CLOSE_PRICE	0.885	A \$1 increase in the past closing price leads to a \$0.885 increase in the current price, showing strong dependence.

The results indicate that the past closing price (LAG\_CLOSE\_PRICE) has the strongest influence on current stock prices, while other predictors exhibit minimal and statistically insignificant effects.

### ***Model Fit (R-Squared)***

To evaluate how well the regression model explains the variation in McDonald’s closing price, the R-squared was analyzed. The output is presented in Table 6.

**Table 6**

#### *Model Fit for McDonald’s Model*

Model	R-Squared	Interpretation
McDonald’s model	0.830	The model explains 83.0% of the variation in McDonald’s stock price, indicating strong explanatory power. The remaining 17% of variation is due to other external factors not included in the model.

A high R-squared value suggests that the chosen predictors effectively capture the key drivers of McDonald's closing price fluctuations.

### ***Interpretation of Findings***

The regression analysis highlights key factors influencing McDonald's closing price. The overall model is statistically significant, indicating that the selected independent variables collectively explain a substantial portion of the price variation. However, when examining individual predictors, only past closing price (LAG\_CLOSE\_PRICE) shows statistical significance at the 99% confidence level. The strong influence of past closing prices suggests that McDonald's stock follows a historical pattern, meaning its previous price movements heavily dictate its current value. Although trade volume (TRADE\_VOL) demonstrates marginal significance at the 90% level, it is not statistically significant under the 99% threshold used in this study, and therefore, its influence should be interpreted cautiously.

In contrast, war-related news, boycott-related news, and boycott duration do not significantly affect McDonald's closing price. This suggests that while these events generate media attention, they do not translate into immediate or measurable changes in stock performance. The model's high R-squared value (83.0%) confirms that most of the price fluctuations are explained by the included variables, though external factors not captured in this study still account for the remaining variance. These findings provide insights into stock market behaviour during boycott periods, reinforcing the importance of historical price trends over short-term news coverage.

## **Pizza Hut Regression Analysis Results**

### ***Assumption Tests***

Before interpreting the results of Pizza Hut, the assumptions of MLR were tested to ensure model validity. The summary of the assumption test results, along with the corresponding test values, is presented in Table 7.

**Table 7**

*Assumption Test Results for Pizza Hut Regression Model*

Assumption	Test	Output (Initial)	Status (Initial)	Output (After Adding Lag Variable)	Status (After Adding Lag Variable)
Linearity	Scatterplot of residuals vs predicted values	No curvature observed	Met	No curvature observed	Met
No Multicollinearity	VIF and Tolerance	All VIF < 2, Tolerance > 0.9	Met	All VIF < 2, Tolerance > 0.8	Met
Independence of Residuals	Durbin-Watson statistic	0.449	Not met	2.038	Met
Homoscedasticity (Constant Variance)	Scatterplot of residuals vs predicted values	Random pattern observed	Met	Random pattern observed	Met
Normality of Residuals	P-P plot and histograms of the residuals	Normal distribution observed	Met	Normal distribution observed	Met
No influential cases are biasing the model.	Cook's Distance	Maximum value = 0.150	Met	Maximum value = 0.279	Met

To ensure the validity of the Pizza Hut regression model, assumption tests were conducted. The initial Durbin Watson value of 0.449 suggested autocorrelation. This issue was resolved by introducing a lag variable, which increased the value to 2.038. All other assumptions, including linearity, absence of multicollinearity, homoscedasticity, normality of residuals, and lack of influential cases, were satisfied both before and after the adjustment. This confirms that the final model meets all the necessary conditions for MLR analysis.

***Significance of the Overall Model (F-test)***

To evaluate the overall fit of the regression model for Pizza Hut, the F-test from the ANOVA output was examined. A low p-value (below 0.01) indicates that the combination of predictors used in the model significantly explains the variation observed in the closing stock prices.

**Table 8**

*Significance of the Overall Pizza Hut Model*

Model	F-statistic	P-value	Significance Status
Pizza Hut model	26.855	<0.001	Significant

As shown in Table 8, the F-value of 26.855 and the corresponding p-value of <0.001 confirm the model's statistical significance. This suggests that the predictors, when considered together, meaningfully contribute to explaining the price movements of Pizza Hut's stock.

***Statistical Significance of Predictors (p-values)***

To determine which predictors significantly impact the DV, the p-values of the independent variables were assessed. Predictors with  $p < 0.01$  were considered statistically significant. The output is presented in Table 9.

**Table 9**

*Statistical Significance of Predictors for Pizza Hut Model*

Variable	P-values	Significance at 99% Confidence Level
WAR_NEWS	0.255	Not significant
BOYCOTT_NEWS	0.232	Not significant
TRADE_VOL	0.788	Not significant
DURATION_BOYCOTT	0.985	Not significant
LAG_CLOSE_PRICE	<0.001	Significant

The findings indicate that only the past closing price (LAG\_CLOSE\_PRICE) significantly influences Pizza Hut’s stock price. Other variables, including war-related news, boycott-related news, trade volume, and boycott duration, do not have a statistically significant effect on stock performance.

***Contribution of Predictors (Unstandardized Coefficients, B)***

The unstandardized coefficients (B) reveal how each independent variable relates to Pizza Hut’s closing stock price. The analysis shows that only the lagged closing price has a notable and statistically significant influence, indicating a strong dependence on prior stock performance. Other variables, such as war-related news, boycott-related news, trade volume, and boycott duration, have very limited influence on price movements, as reflected by their low coefficients and lack of statistical significance. Table 10 provides the detailed coefficient values for each predictor.

**Table 10**

*Contribution of Predictors for Pizza Hut Model*

Predictor	Unstandardized Coefficient (B)	Interpretation
Constant	27.379	When all predictors are zero, the estimated stock price is \$27.38.
WAR_NEWS	-0.092	A unit increase in war-related news reduces the stock price by \$0.092, but the effect is not significant.
BOYCOTT_NEWS	-0.289	A unit increase in boycott-related news lowers the stock price by \$0.289, but not significant.
TRADE_VOL	4.651E-8	A slight positive impact, but not significant.
DURATION_BOYCOTT	0.000	No impact on the stock price.
LAG_CLOSE_PRICE	0.798	A \$1 increase in the previous day's price leads to a \$0.798 increase today (significant).

The results indicate that the past closing price (LAG\_CLOSE\_PRICE) has the strongest influence on the current stock price, while other predictors exhibit statistically insignificant effects.

***Model Fit (R-Squared)***

The R-squared statistic was used to assess how effectively the regression model captures the variation in Pizza Hut’s stock price. With a value of 0.677, the model demonstrates a reasonable ability to explain fluctuations in the dependent variable. This means that approximately 67.7 percent of the stock price movement can be attributed to the predictors included in the model. The remaining variation may be influenced by other variables or market conditions not captured in this analysis. Table 11 summarizes the model fit results.

**Table 11**

*Model Fit for McDonald’s Model*

Model	R-Squared	Interpretation
Pizza Hut model	0.677	The model explains 67.7% of the variation in Pizza Hut’s stock price, indicating moderate explanatory power.

**Interpretation of Findings**

The regression results for Pizza Hut indicate that the model is statistically valid and provides useful insights into factors affecting its stock performance. Among all variables examined, only the previous closing price (LAG\_CLOSE\_PRICE) emerges as a significant predictor. This underscores the reliance of Pizza Hut’s stock on its own historical pricing trends, where current values appear to be primarily shaped by preceding price movements.

Other factors, such as war-related news, boycott coverage, trading volume, and the duration of boycotts, do not show a significant impact on Pizza Hut’s stock price during the study period. Despite the public and political attention these events may receive, their lack of statistical influence suggests that investor behavior for this company is more stable and less reactive to short-term socio-political developments. The R-squared value of 67.7 percent supports a moderate level of explanatory power, indicating that while the model captures a meaningful share of the price variance, other unmeasured influences may also play a role. These results contribute to a broader understanding of market reactions in the fast-food industry during activist movements and periods of geopolitical tension.

**Comparison between McDonald’s and Pizza Hut**

To compare the impact of external factors on McDonald’s and Pizza Hut’s stock prices, the results of the MLR models for both companies were examined side by side. Both models were statistically significant, as indicated by their respective F-tests ( $p < 0.01$ ), confirming that the independent variables collectively explained a significant portion of stock price variation for each company. The comparison focuses on three key aspects: model fit (R-squared), the significance of predictors (p-values), and the magnitude of predictor effects (unstandardized coefficients, B). The findings are summarized in Table 12.

**Table 12**

*Comparison of MLR Results for McDonald’s and Pizza Hut*

McDonald’s Model	Aspect	Pizza Hut Model
0.830 (Strong explanatory power)	Model Fit (R-Squared)	0.677 (Moderate explanatory power)
LAG_CLOSE_PRICE	Significant Predictors ( $p < 0.01$ )	LAG_CLOSE_PRICE
Unstandardized Coefficients (B)		
0.194	WAR_NEWS	-0.092
-0.091	BOYCOTT_NEWS	-0.289
-3.261E-7	TRADE_VOL	4.651E-8
0.004	DURATION_BOYCOTT	0.000
0.885	LAG_CLOSE_PRICE	0.798

### ***Interpretation of Findings***

The results highlight key differences between the two models. McDonald's model has a stronger explanatory power (R-Squared = 0.830) compared to Pizza Hut (R-Squared = 0.677), suggesting that the chosen predictors explain McDonald's stock price fluctuations more effectively.

For both companies, LAG\_CLOSE\_PRICE is the only statistically significant predictor, with a coefficient of 0.885 for McDonald's and 0.798 for Pizza Hut. This indicates that for each unit increase in the lagged closing price, the current stock price increases by approximately \$0.885 for McDonald's and \$0.798 for Pizza Hut. These results highlight the strong historical dependence of both companies' stock prices on their previous closing prices.

Although TRADE\_VOL appears in both models with differing coefficient signs (negative for McDonald's, positive for Pizza Hut), it is not statistically significant in either case. Therefore, no conclusive interpretation can be made regarding its influence on stock prices.

Other predictors, such as war-related news (WAR\_NEWS), boycott-related news (BOYCOTT\_NEWS), and boycott duration (DURATION\_BOYCOTT), do not have a statistically significant effect on closing prices for either company.

### **Discussion**

The results of this study provide valuable insights into how McDonald's and Pizza Hut's stock prices were influenced by external factors, particularly boycott-related events. While both companies experienced some level of impact, the nature of this impact differed.

The comparison of the models revealed that McDonald's stock price was significantly influenced by past closing prices and trade volume, suggesting that historical trends and investor trading behaviour played a dominant role in its price movements. Meanwhile, Pizza Hut's stock price was primarily driven by its past closing prices, indicating a strong reliance on historical patterns rather than external factors like news sentiment.

The variation in R-squared values further supports these findings. The higher R-squared for McDonald's indicates that the chosen predictors explained a substantial portion of its stock price fluctuations, whereas Pizza Hut's lower R-squared suggests that additional factors outside the model may have contributed to its price changes. However, since boycott-related news was not a significant predictor for Pizza Hut, it suggests that external media coverage had a limited direct effect on its stock price during the observed period.

These findings have important implications for investors and businesses. For investors, understanding that McDonald's stock movements are more predictable based on past performance, while Pizza Hut's stock price is also largely determined by historical trends, can aid in risk assessment and decision-making. Companies facing consumer boycotts can use this information to evaluate their market resilience and adjust their financial and communication strategies accordingly.

It is important to acknowledge that stock price movements are influenced by a variety of factors beyond the scope of this study. Macroeconomic conditions, industry trends, and broader market sentiment all contribute to price changes. Although this study provides valuable insights into how boycotts affect stock performance, further research incorporating additional variables, such as social media engagement and alternative financial indicators, could offer a more comprehensive understanding of these dynamics.

## CONCLUSION

This study examined the impact of boycott movements on the stock market performance of McDonald's and Pizza Hut from October 2023 to January 2025. By applying MLR, the analysis explored the effects of key external factors—including war-related news, boycott-related news, trade volume, and boycott duration—on stock price fluctuations.

The results indicate that historical stock prices (LAG\_CLOSE\_PRICE) are the most influential factor in determining current stock prices for both McDonald's and Pizza Hut. This suggests a strong dependency on past trends rather than immediate reactions to external events. Trade volume (TRADE\_VOL), while included in both models, did not show statistical significance for either company, indicating that investor trading activity alone does not meaningfully impact short-term stock price movements.

McDonald's model demonstrated a higher explanatory power (83%) compared to Pizza Hut (67.7%), suggesting that the selected factors better explain McDonald's stock price movements. This may be attributed to differences in brand perception, market structure, or investor behaviour between the two companies.

While the study provides meaningful insights, it is subject to limitations, including the focus on only two companies, reliance on publicly available data sources, and the use of weekly stock price data. These limitations highlight the need for future research to explore a broader range of industries, incorporate additional data sources (such as sentiment analysis on social media), and refine analytical models by integrating forecasting techniques or adjusting data precision to a daily level.

In conclusion, this research contributes to the understanding of how boycott movements impact stock market performance, particularly within the fast-food sector. The findings are relevant to investors, business strategists, and policymakers, offering insights into market behaviour during periods of social and political activism. Future research can expand on these findings by applying more advanced modelling techniques and considering long-term implications on brand value and consumer behaviour.

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## CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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