The Impact of Post-COVID-19 Tech Layoffs on Stock Price Movements: A Case Study of Tesla and Comparable Firms

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Research Question

How are post-COVID-19 layoff announcements by major tech companies like Tesla correlated with short-term stock price movements, and how does this impact vary between Tesla and other comparable tech firms? Additionally, does the timing of these layoff announcements (e.g., during quarterly earnings releases or market downturns) influence their effect on stock price performance?

Purpose of the Study

The purpose of this project is to study the impact of layoffs announced by large technology companies such as Tesla on short-term stock price volatility in the post-COVID-19 period. Specifically, this study aims to explore the correlation between layoffs announcements and stock price volatility, while assessing whether the timing of such announcements (e.g., during the release of quarterly earnings or during broader market downturns) affects their impact on investor reactions. By comparing Tesla's stock market performance following layoffs announcements with that of other major technology companies, this project seeks to identify unique patterns, if any, and determine how the market perceives these companies differently during layoffs. In addition, we attempted to locate the career paths of some of the employees laid off by these companies as an indication of trends. Ultimately, this study sought to shed light on investor reactions to layoffs and restructuring in the technology sector and the impact of timing choices on managing market perceptions.

Data Sources

1. Layoff Announcements and Data

- **Source**: Primarily collected from Layoffs.fyi, focusing on data such as company names, layoff dates, number of employees laid off, layoff percentage, industry, company development stage, location, and country. These variables will serve as key predictors in our model, helping us analyze the impact of layoffs on company stock performance. Additionally, the site provides LinkedIn profiles for some laid-off employees from certain companies. We will attempt to leverage this data to track reemployment trends among these individuals.

2. Stock Price Data

- **Source**: Stock price data will be primarily gathered from Yahoo Finance, with Google Finance as a secondary source. Yahoo Finance offers extensive API support through tools

like the yfinance library, allowing easy access to historical prices, real-time data, trading volumes, and more. Yahoo Finance is widely used within the online community, providing reliable and comprehensive data for our analysis

3. Company Filings

- **Source**: As a supplemental reference, the EDGAR API will be used to access official company filings, such as 8-K forms, which may disclose significant events like layoffs, restructuring, or financial performance changes. This source allows us to cross-verify layoff announcements from other sources and provides additional context on the financial health and strategic decisions of companies. We will utilize CIKs (e.g., Tesla's CIK: 0001318605) to retrieve relevant documents for selected companies.

Way to obtain the data

1. Layoff Data

- We will scrape data from Layoffs.fyi, which provides detailed information on company names, layoff dates, number of employees laid off, layoff percentage, and additional variables like industry and location. This source also includes LinkedIn profiles of some laid-off employees, allowing us to track reemployment trends where possible.

2. Stock Price Data

- Stock prices will primarily be scraped from Yahoo Finance using tools compatible with yfinance library structures. Google Finance will be used as a secondary source if necessary. This data will allow us to analyze stock performance in response to layoff announcements.

3. Company Filings

- We will scrape relevant data from the EDGAR database, focusing on official company filings (e.g., 8-K forms) to verify layoff announcements and access additional financial context. CIK identifiers will be used to streamline access to specific companies' documents.

Methods

1. Data Wrangling

- We plan to merge the collected layoff data from Layoffs.fyi with stock price fluctuation data from Yahoo Finance to create a comprehensive dataset. This combined dataset will allow us to analyze the relationship between layoffs and stock performance. Following the merge, we will conduct data cleaning and processing to ensure consistency and accuracy, standardizing variables related to employment transitions and financial metrics.

2. Stock Price Impact Visualization

- Create visualizations to examine the relationship between layoffs and stock price changes, focusing on core independent variables such as layoff numbers, layoff percentage, industry, company development stage, and fundraising amounts. Additional variables like company location, country, and layoff date will also be incorporated where relevant. Stock price movement serves as the dependent variable in these analyses.

3. Predictive Modeling

- Develop a regression model to forecast stock price trends in the absence of layoffs, serving as a baseline for evaluating actual post-layoff performance. Unexpected deviations will be flagged if they exceed a ±5% threshold.

4. Timing Analysis

- Analyze the timing of layoff announcements (e.g., during earnings releases or economic downturns) to see if specific timing affects stock reactions. Layoff events will be grouped by timing to identify patterns in stock price fluctuations.

Definition of Success

The success of this project will be defined by our ability to effectively analyze and visualize stock price fluctuations of major tech companies like Tesla in response to layoff announcements.

- **Primary Goal**: Produce a detailed visualization of stock price changes before and after layoffs, ideally complemented by additional data, such as weekly revenue or net profit trends. We will prioritize acquiring higher-frequency financial data where possible, defaulting to quarterly data if weekly or monthly data is unavailable, to ensure consistency in our analysis.
- **Regression-Based Forecast Model**: Develop a regression-based stock price forecast model that predicts financial trends in the absence of layoffs, allowing us to compare this forecasted data with actual post-layoff performance. This comparison will be visually represented on the same chart, highlighting any contrast between expected and actual outcomes.
- **Quantifying Surprising Findings**: Establish a threshold for stock price movement to identify "surprising" results. For example, if the actual stock price change is within a ±5% range or significantly deviates from expectations, it will be identified as a surprising result. This quantitative approach will allow us to clearly define unexpected trends in our conclusions.
- **Timing Analysis**: Investigate how the timing of layoff announcements (e.g., during quarterly earnings releases or market downturns) affects stock price reactions by grouping layoffs based on different time points. This approach will enable us to determine whether layoffs during specific market conditions lead to more pronounced stock price fluctuations.