

Stock Price Reactions to Dividend Announcements from Major Mining Companies like BHP and Rio Tinto on the Australian Securities Exchange (ASX)

Introduction:

In the changing realm of the stock market, many investors rely on different factors, like company performance, financial reports, and overall market outlook, to guide their decisions. Among these factors are corporate updates, such as changes in leadership, mergers and acquisitions, and most importantly, dividend declarations, all of which can significantly impact stock prices. Dividends are payments given by companies to their shareholders from their profits in a specific sequence of events, such as the announcement date, ex-dividend date and payment dates. The announcement of dividends holds significance as it serves as a direct communication of management's outlook on the company's future growth and financial stability (Lintner, 1956). The way companies announce their dividends can greatly influence how investors view them and affect the buying and selling of their own shares of the company in the stock market. This research project investigates how dividend announcements impact the stock prices of mining companies such as BHP and Rio Tinto trading on the Australian Securities Exchange (ASX). The study focuses on analysing how the market reacts to these decisions by studying stock price movements during dividend announcement periods.

Motivation:

It's important to understand the link between dividend declarations and fluctuations in stock prices for key reasons. For instance, insight into the effectiveness of financial markets by showing how swiftly and accurately fresh information influences stock prices. Based on The Efficient Market Hypothesis (EMH) share prices reflect all available information where consistent alpha generation is impossible, indicating that the announcement of new dividend payments should not have any effect on the stock price (Fama, 1970). Also, the Dividend Irrelevance Theory (Modigliani & Miller, 1961), posits that dividend policy is irrelevant to a company's value in perfect capital markets. According to this theory, in an ideal world without taxes, transaction costs, or asymmetric information, investors are indifferent to whether a company pays dividends or reinvests profits, as the total returns would remain the same.

Many research studies have presented doubt on the Efficient Market Hypothesis (EMH) by showing cases where stock prices do not promptly adjust to information like dividend declarations. For instance, Poterba and Summers (1984) developed a "traditional view" of dividends, which includes the idea that dividends can signal private information about a company's profitability. The paper supports the idea that dividend announcements can impact stock prices, particularly when dividends are increased, which is seen as a signal of good news about the company's financial health and future prospects (Bhattacharya, 1979). This brings up concerns about how markets operate, especially in industries which have distinctive features, such as mining. This research will specifically examine the significance of the dividend announcement date in this context. As per the Efficient Market Hypothesis (EMH) and Dividend Irrelevance Theory, the announcement of dividend payments should not lead to changes in stock prices. However, real-life scenarios frequently challenge this theory.

Despite the amount of research done on this subject in advanced economies, there is still a shortage of in-depth studies focusing on the mining industry, particularly within the Australian setting. Considering the role of mining in the Australian financial system and the substantial market value of corporations such as BHP and Rio Tinto, this investigation intends to address this gap by examining how stock prices react to announcements regarding dividends. The results will help enhance our comprehension of market efficiency and investor actions within the ASX mining industry by examining the significance of dividends as a tool.

Dataset:

For this research, two major mining companies listed on the Australian Securities Exchange (ASX) were selected: BHP Group Limited (BHP) and Rio Tinto Limited (RIO). These companies are prominent players in the mining sector and have significant market capitalizations in Australia, making them ideal candidates for analysing the impact of dividend announcements on stock prices. The dataset contains daily stock price data for both BHP and Rio Tinto over the past five years, specifically from August 14, 2019, to August 14, 2024. The data includes the following variables for each trading day: open, high, low, close, adjusted close, and trading volume. This data was sourced from Yahoo Finance (Yahoo Finance, 2024). To analyse the broader market trends and control for market-wide movements, historical data for the S&P/ASX 200 (AXJO) market index was collected for the same period. The S&P/ASX 200 index represents the top 200 companies listed on the ASX by market capitalization and serves as a benchmark for the Australian stock market. This data was obtained from Investing.com (Investing.com, 2024).

Methodology:

This research utilizes an event study methodology to evaluate the impact of dividend announcement on BHP and Rio Tinto stock price. Event study methodology is a well established statistical technique used to analyse the impact of specific events on the stock prices. It involves calculating abnormal returns, which are the differences between actual returns and expected returns, over a specified event window.

For this study, the event window is set to 51 trading days, encompassing 25 days before and 25 days after the dividend announcement date. During this period, we calculate the Average Abnormal Return (AAR) and the Cumulative Average Abnormal Return (CAAR). The AAR represents the average difference between the actual stock return and the expected return, while the CAAR represents the AARs over the ± 25 day period to measure the total impact of the event on stock prices. This analysis relies exclusively on the market model which provides a more favourable comparison to other models (Cable and Holland, 1999).

Experimental setup:

To analyse the stock price reactions of BHP and Rio Tinto to dividend announcements, we calculated the Abnormal Return (AR), Average Abnormal Return (AAR) and Cumulative Average Abnormal Return (CAAR) for both companies within an event window of ± 25 days around each dividend announcement. The process is as follows,

1. For each dividend announcement by BHP and Rio Tinto, we calculated the Abnormal Returns (ARs) for each day in the ± 25 days event window. The ARs represent the difference between the actual returns and the expected returns based on a market model.

$$AR_{it} = R_{it} - E(R_{it})$$

Where:

Actual Return (R_{it}): The return of stock i on day t .

Expected Return ($E(R_{it})$): The expected return of stock i on day t estimated using Market Model

2. We calculated the Average Abnormal Return (AAR) for each day t in the ± 25 days event window by taking the average of the ARs across all dividend announcements for BHP and Rio Tinto. The formula used for this calculation is:

$$AAR = \frac{1}{N} \sum_{i=1}^N AR_{it}$$

where:

AAR represents the Average Abnormal Return for BHP on day t ,

N is the total number of dividend announcements for BHP,

AR_{it} denotes the Abnormal Return

- To compare the market reactions of the two companies, we conducted a day-by-day comparison of their AARs. Additionally, to assess the general market reaction to dividend announcements from both companies, we calculated a combined AAR for each day t .

$$AAR_{Combined,t} = \frac{AAR_{BHP,t} + AAR_{Rio,t}}{2}$$

- To further analyse the stock price reactions in long term of BHP and Rio Tinto to dividend announcements, we calculated the Cumulative Average Abnormal Returns (CAARs) for both companies within an event window of ± 25 days around dividend announcement day (0 day). The formula used for this calculation is:

$$CAAR_{i,t} = \sum_{k=-25}^t AAR_{i,k}$$

where:

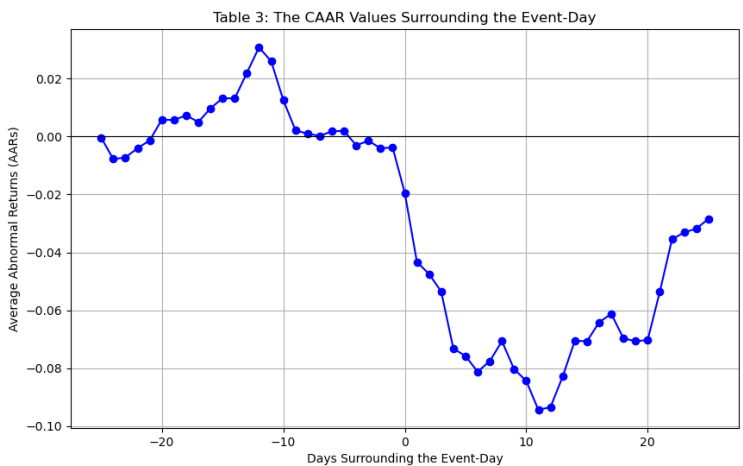
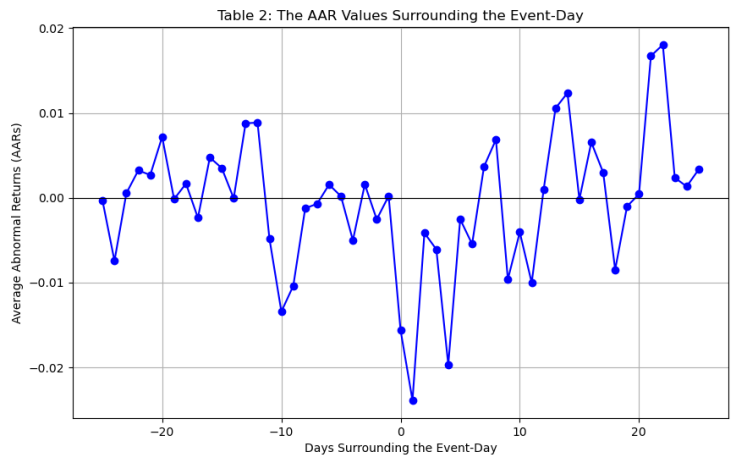
$CAAR_{i,t}$ represents the Cumulative Average Abnormal Return for companies up to day t

$AAR_{i,k}$ denotes the Average Abnormal Return for company i on day k .

Results:

Table 1: AAR and CAAR of BHP and Rio Tinto

| Days | AAR_Combined | CAAR_Combined | 0 | -0.01562 | -0.01944 |
|------|--------------|---------------|----|----------|----------|
| -25 | -0.00036 | -0.00036 | 1 | -0.02388 | -0.04332 |
| -24 | -0.00744 | -0.0078 | 2 | -0.00415 | -0.04747 |
| -23 | 0.00054 | -0.00726 | 3 | -0.00608 | -0.05355 |
| -22 | 0.00323 | -0.00403 | 4 | -0.01969 | -0.07324 |
| -21 | 0.00268 | -0.00135 | 5 | -0.00253 | -0.07577 |
| -20 | 0.00718 | 0.00583 | 6 | -0.00546 | -0.08123 |
| -19 | -0.00016 | 0.00567 | 7 | 0.00368 | -0.07755 |
| -18 | 0.00167 | 0.00734 | 8 | 0.00686 | -0.07069 |
| -17 | -0.00237 | 0.00497 | 9 | -0.00962 | -0.08031 |
| -16 | 0.00475 | 0.00972 | 10 | -0.00406 | -0.08437 |
| -15 | 0.0035 | 0.01322 | 11 | -0.01002 | -0.09439 |
| -14 | -0.00006 | 0.01316 | 12 | 0.00096 | -0.09343 |
| -13 | 0.00878 | 0.02194 | 13 | 0.01056 | -0.08287 |
| -12 | 0.00886 | 0.0308 | 14 | 0.01236 | -0.07051 |
| -11 | -0.00482 | 0.02598 | 15 | -0.00019 | -0.0707 |
| -10 | -0.01342 | 0.01256 | 16 | 0.00654 | -0.06416 |
| -9 | -0.01038 | 0.00218 | 17 | 0.00296 | -0.0612 |
| -8 | -0.00124 | 0.00094 | 18 | -0.00848 | -0.06968 |
| -7 | -0.00071 | 0.00023 | 19 | -0.00101 | -0.07069 |
| -6 | 0.00155 | 0.00178 | 20 | 0.00043 | -0.07026 |
| -5 | 0.00018 | 0.00196 | 21 | 0.01672 | -0.05354 |
| -4 | -0.00502 | -0.00306 | 22 | 0.01804 | -0.0355 |
| -3 | 0.00158 | -0.00148 | 23 | 0.00237 | -0.03313 |
| -2 | -0.00255 | -0.00403 | 24 | 0.00133 | -0.0318 |
| -1 | 0.00021 | -0.00382 | 25 | 0.00332 | -0.02848 |



The AARs are negative for 12 days and positive for 13 days before the announcement of the event. After the announcement, AARs remain negative for 12 days and positive for 13 days. Over the entire event period, AARs are negative for a total of 24 days and positive for 26 days. CAARs are negative for 9 days and positive for 16 days before the announcement of the event. After the announcement, CAARs are negative for all 25 days. On the day of the event itself, the AAR and CAAR both are negative.

In table 2 several days before and after the event day, the AAR shows minor positive and negative values, indicating no clear consensus among market participants about the potential impact of the upcoming event. A sharp drop in AAR around the event day is observed. This sharp decline suggests the "ex-dividend date effect," occurs because the stock is traded without the value of the declared dividend.

In table 3 the CAAR shows an initial upward trend leading up to the event day, indicating that cumulative investor sentiment was becoming more positive over time. This reflects optimism or favourable expectations about the upcoming dividend announcement. As the event day approaches, the CAAR begins to flatten, suggesting that the market starts to stabilize or that early optimism is met with caution as the actual event approached. However, there is a gradual recovery in CAAR towards the end of the observation period, indicating a potential stabilization or partial recovery in investor sentiment. This recovery suggests that while the initial reaction to the dividend announcement was negative due to "ex-dividend date effect", subsequent information or market re-evaluation led to a moderated view.

Conclusion:

The trends observed in both AAR and CAAR indicate a market that responds promptly to news updates and takes time to reassess its stance well. The significant initial drop seen in both measures following the event day signifies an initial reaction; meanwhile the gradual rebound, in CAAR implies that investors took time to reconsider the initial information over time and responded more cautiously. For investors reading this analysis it points to the importance of being cautious when interpreting dividend announcements. The markets initial response might seem exaggerated at first due to an overreaction tendency. However subsequent periods could present chances for adjustments or re-entry provided the strong long-term fundamentals hold steady in place. It would be useful to examine any additional news or market events that occurred in the post-event period that could have influenced the CAAR's recovery. Additionally, a more granular analysis of the company's financial health, the sector's overall performance, or broader economic conditions could provide further insights into the observed patterns.

These results challenge the Efficient Market Hypothesis (EMH) and the Dividend Irrelevance Theory, both of which suggest that dividend announcements should not affect stock prices in an efficient market. The observed price fluctuations imply that investors react to dividend announcements, possibly viewing them as signals of a company's financial health and future prospects. The findings also align with theories suggesting that dividends convey private information about a company's profitability, thus influencing investor behaviour. Further research could explore the impact of other corporate events on stock prices and extend the analysis to other sectors and markets to provide a more comprehensive understanding of market efficiency and investor behaviour.

References:

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Appendix:

My feedback for my project proposal was regarding my analysis, specifically suggestion to generalize the overview of the impact of different factors on stock prices. I considered the feedback and changed my methodology for examining the data. Previously, I had planned to use all available variables present in the dataset, which could create bias and complicate the identification of any correlations between the variables in my paper. This approach could have led to ineffective and inefficient data analysis. Therefore, instead of considering all variables, I selected only the most necessary ones that are relevant to my theory. This led to more precise results and conclusions.

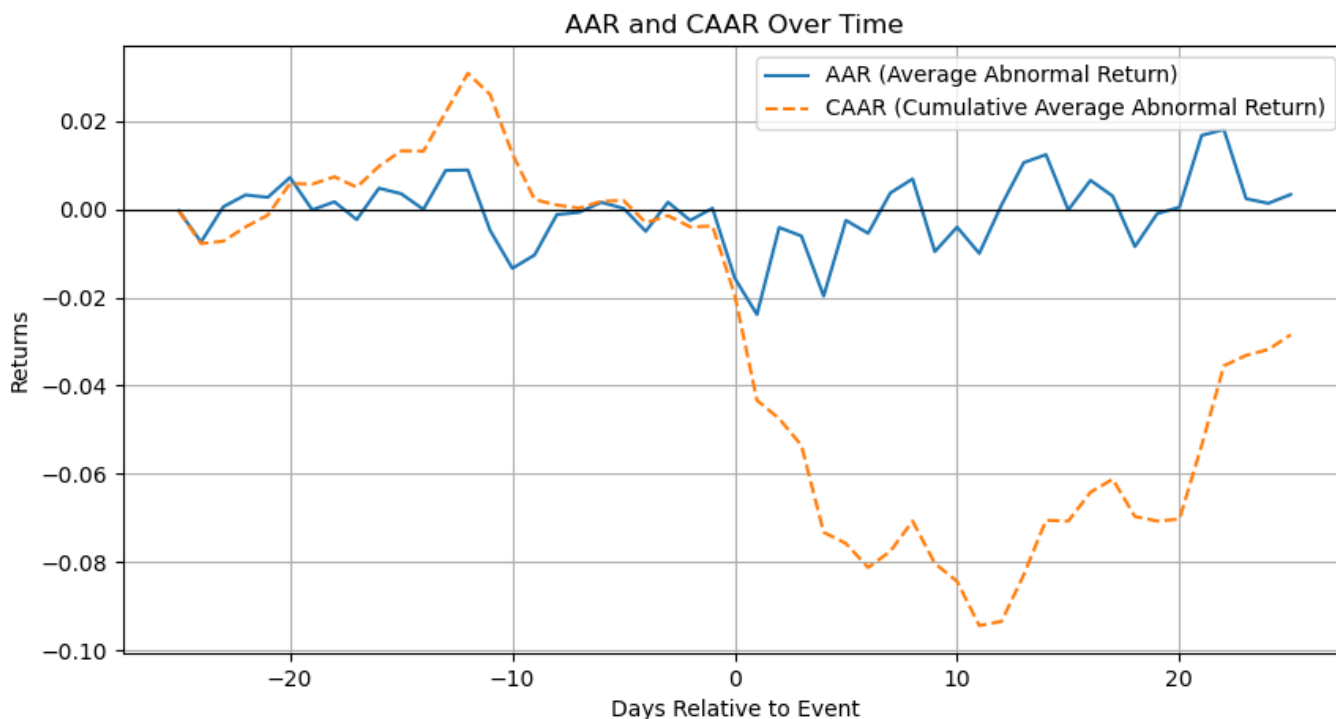


Table 1: AAR and CAAR Detailed Calculation of BHP and Rio Tinto

| Days | AAR_BHP | AAR_RIO | AAR_Combined | CAAR_Combined |
|------|----------|----------|--------------|---------------|
| -25 | -0.00005 | -0.00067 | -0.00036 | -0.00036 |
| -24 | -0.00239 | -0.01249 | -0.00744 | -0.00780 |
| -23 | 0.00269 | -0.00161 | 0.00054 | -0.00726 |
| -22 | -0.00464 | 0.01110 | 0.00323 | -0.00403 |
| -21 | 0.00158 | 0.00377 | 0.00268 | -0.00135 |
| -20 | 0.00104 | 0.01332 | 0.00718 | 0.00583 |
| -19 | -0.00008 | -0.00023 | -0.00016 | 0.00567 |
| -18 | 0.00326 | 0.00009 | 0.00167 | 0.00734 |
| -17 | -0.00503 | 0.00029 | -0.00237 | 0.00497 |
| -16 | -0.00089 | 0.01039 | 0.00475 | 0.00972 |
| -15 | 0.00769 | -0.00068 | 0.00350 | 0.01322 |
| -14 | -0.00146 | 0.00134 | -0.00006 | 0.01316 |
| -13 | 0.00537 | 0.01218 | 0.00878 | 0.02194 |
| -12 | 0.00964 | 0.00808 | 0.00886 | 0.03080 |
| -11 | -0.00883 | -0.00080 | -0.00482 | 0.02598 |
| -10 | -0.01570 | -0.01115 | -0.01342 | 0.01256 |
| -9 | -0.00922 | -0.01155 | -0.01038 | 0.00218 |
| -8 | -0.00442 | 0.00195 | -0.00124 | 0.00094 |
| -7 | 0.00365 | -0.00507 | -0.00071 | 0.00023 |
| -6 | -0.00082 | 0.00391 | 0.00155 | 0.00178 |
| -5 | 0.00232 | -0.00197 | 0.00018 | 0.00196 |
| -4 | -0.00597 | -0.00407 | -0.00502 | -0.00306 |
| -3 | 0.00360 | -0.00044 | 0.00158 | -0.00148 |
| -2 | -0.00376 | -0.00134 | -0.00255 | -0.00403 |
| -1 | -0.00537 | 0.00578 | 0.00021 | -0.00382 |
| 0 | -0.01072 | -0.02053 | -0.01562 | -0.01944 |
| 1 | -0.02570 | -0.02206 | -0.02388 | -0.04332 |
| 2 | 0.00184 | -0.01014 | -0.00415 | -0.04747 |
| 3 | -0.00561 | -0.00655 | -0.00608 | -0.05355 |
| 4 | -0.01816 | -0.02122 | -0.01969 | -0.07324 |
| 5 | -0.00058 | -0.00448 | -0.00253 | -0.07577 |
| 6 | -0.00355 | -0.00736 | -0.00546 | -0.08123 |
| 7 | 0.00777 | -0.00040 | 0.00368 | -0.07755 |
| 8 | 0.00206 | 0.01166 | 0.00686 | -0.07069 |
| 9 | -0.01541 | -0.00382 | -0.00962 | -0.08031 |
| 10 | -0.00779 | -0.00034 | -0.00406 | -0.08437 |
| 11 | -0.01523 | -0.00481 | -0.01002 | -0.09439 |
| 12 | -0.00411 | 0.00603 | 0.00096 | -0.09343 |
| 13 | 0.01360 | 0.00753 | 0.01056 | -0.08287 |
| 14 | 0.01758 | 0.00715 | 0.01236 | -0.07051 |
| 15 | -0.00160 | 0.00123 | -0.00019 | -0.07070 |
| 16 | 0.00302 | 0.01007 | 0.00654 | -0.06416 |
| 17 | 0.00285 | 0.00307 | 0.00296 | -0.06120 |
| 18 | -0.00726 | -0.00969 | -0.00848 | -0.06968 |
| 19 | 0.00008 | -0.00211 | -0.00101 | -0.07069 |
| 20 | 0.00439 | -0.00353 | 0.00043 | -0.07026 |
| 21 | 0.01836 | 0.01507 | 0.01672 | -0.05354 |
| 22 | 0.02206 | 0.01403 | 0.01804 | -0.03550 |
| 23 | 0.00410 | 0.00063 | 0.00237 | -0.03313 |
| 24 | 0.00216 | 0.00050 | 0.00133 | -0.03180 |
| 25 | 0.00214 | 0.00450 | 0.00332 | -0.02848 |