Assessment Task 1: Data Visualisation Foundations

JB Hi-Fi (JBH)

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Summary of Data Collection Process and Dataset Characteristics

The data collection process was relatively straightforward. The data was sourced from a website called DatAnalysis Premium which is an Australian premier research tool used to access information on companies listed on the Australian Securities Exchange. The preparation process was brief since all collected data from DatAnalysis is drawn directly from the ASX, meaning there was no need for any preprocessing such as duplicates or missing values.

The data pertaining to JBH is primarily financial data, more specifically, data relating to JB-HI-FI's stock performance over the course of the previous financial year (ranging from July 1, 2024, to June 30, 2025). There are several data types including:

- Interval Data (Logical rank order relationship) → Date
- Ratio Data (Numbers where differences and ratios make sense and there is a true zero) → Open, high, close, volume, etc
- Nominal: ASX Code, Company name

The dataset is structured as a time series, allowing for analysis of stock price movements, returns, and other performance related metrics over time. Delving deeper, we can find information in form of categories, currencies, numbers, and percentiles.

JBH 2024 Stock Performance Analysis

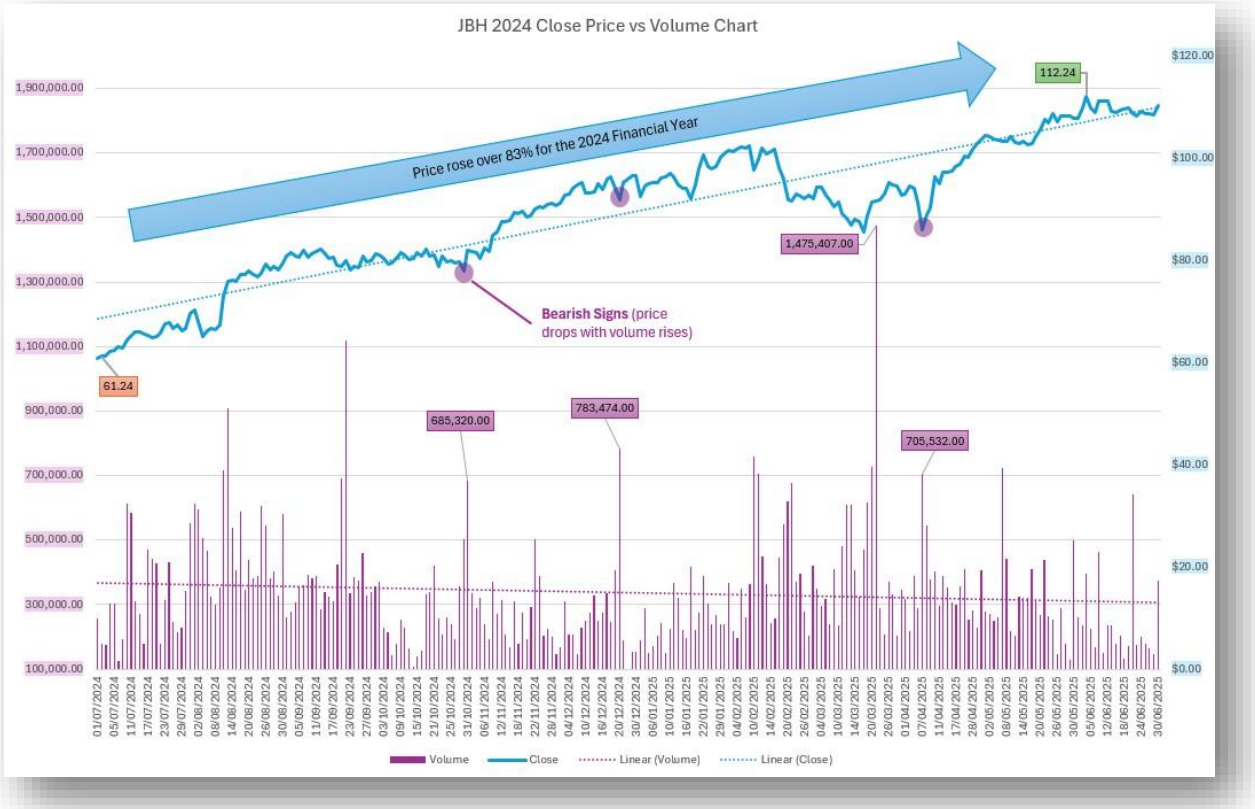


Figure 1. Close Price vs Volume Analysis

The visual is based on data drawn from the following:

- Volume: total number of JBH shares traded for a certain day, reflecting the levels of market activity and interest.

- Closing Price: the final price that JBH shares were traded at by the end of the day.
- Dates: specific points in time selected within the dataset to track performance across a certain period.

Type of chart chosen, why, and what was done to achieve the visual? The selected chart type is a Combo Chart, displaying Volume as a Stacked Column and Closing Price as a Line. This format was chosen as it clearly demonstrates the relationship between trading activity and share price movements, allowing patterns such as increased trading volume during price shifts to be easily observed. To enhance interpretation, key annotations were included to highlight important points, such as spikes in Volume, the highest and lowest Closing Prices, and the overall percentage increase across the financial year. Colour coding and highlights were applied to distinguish between the two data series and to draw attention to critical insights without overwhelming the viewer. The axes were reformatted to avoid overlap, with separate scales on the left and right, ensuring each dataset could be read accurately. Together, these design choices improve clarity, focus, and the overall effectiveness of the visualisation.

Analysis of the visual. Overall, JBH had a standout year, as shown by the strong upward trend in its share price. From July 2024 to June 2025, the closing price climbed more than 83 percent, coming close to doubling in value. Up until February 2025, JBH saw a steady rise, reaching just over $100.00. But when tariffs were introduced, the stock took a noticeable dip, like many others in the market. During that drop, trading volume spiked to its highest point for the year at over 1.45 million, suggesting a lot of investor interest and speculation. That was followed by a sharp rebound, with the closing price hitting its peak of $112.24 not long after. JBH seems to be a stable stock overall, but there are a few bearish signs to keep in mind. There were several points where the closing price fell while volume increased, which can be a sign of weakening momentum.

Challenges: Since this was my first attempt at visualisation, I encountered a few minor challenges, particularly with formatting the axes to prevent the data features from overlapping. Initially, I adjusted the bounds without properly analysing the layout or considering the correct values. After taking time to understand the chart structure and experimenting through trial and error, I was able to identify suitable minimum and maximum bounds that clearly separated the Line Chart from the Columns, improving the overall clarity of the visual.

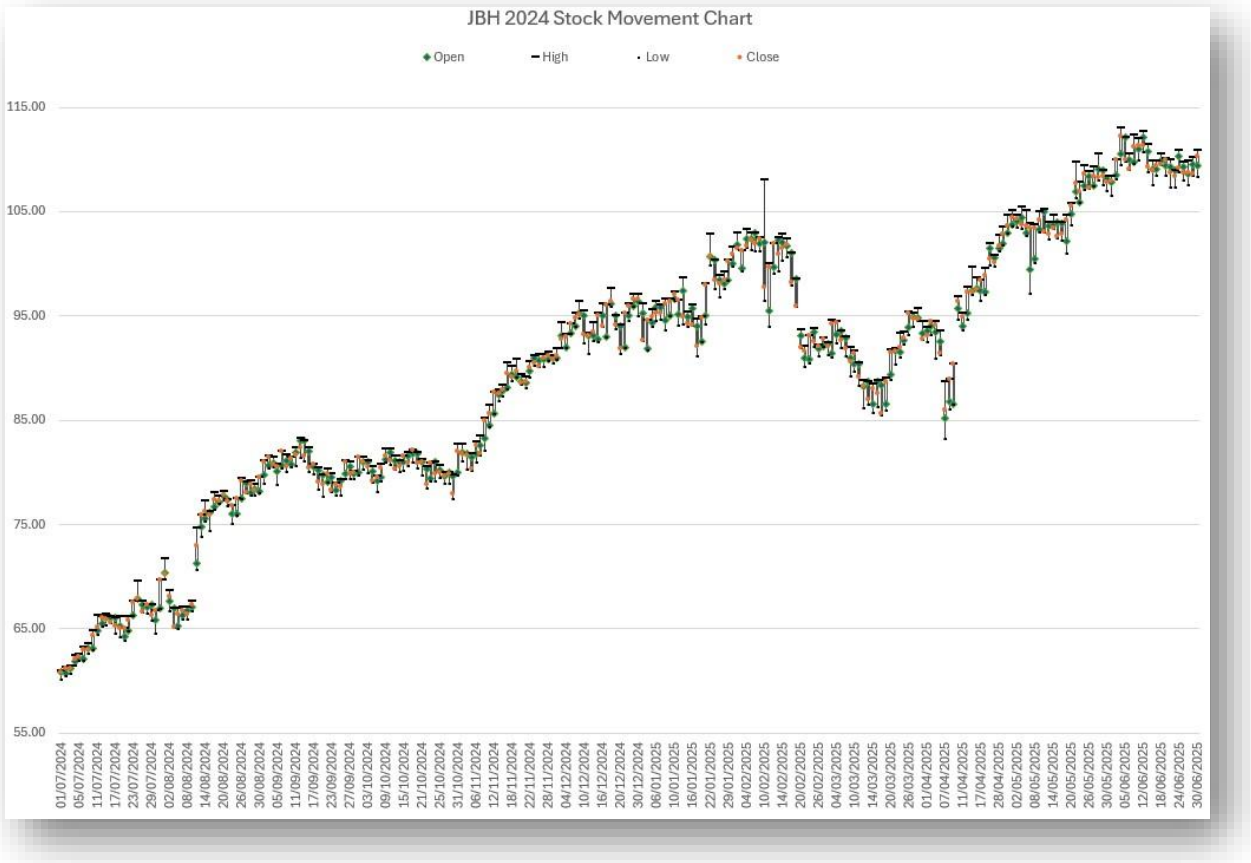


Figure 2. Stock Movement Analysis

What data was chosen for this visual? The visual is based on data drawn from the following:

- Open Price: the price a stock first trades at when the market opens for the day.
- High: the maximum price a stock reaches during the trading day.
- Low: the lowest price a stock reaches during the trading day.
- Closing Price: the final price that JBH shares were traded at by the end of the day.
- Date: specific points in time selected within the dataset to track performance across a certain period.

Type of chart chosen, why, and what was done to achieve the visual? The selected chart type for this analysis is a Stock: Open-High-Low-Close (OHLC) Chart, a widely used option for evaluating a stock's performance over a specific timeframe. I chose this chart because it's the most effective at showing how a stock behaves throughout the day, making it easier to spot patterns, assess volatility, and interpret various financial metrics. To create this visualisation, I first formatted the data labels into distinct shapes and colours to clearly differentiate between Open, High, Low, and Close values. Once that was done, I adjusted the axes to remove the extra empty space in the chart, improving its overall clarity.

Analysis of the visual. For much of the financial year, JBH experienced significant increases in price. This growth is stunted twice however:

- Once from around September 2024, up until November 2024, JBH goes through a low-growth period, not reaching its previous high of $83.30 (Aug 12), until mid-November.
- During the introduction of tariffs, where the price reached a high of $108.08 in February 2025, before plummeting to a 5-month low of $83.32.

JBH has shown its ability to rebound, rising over 35% shortly after the significant drop highlighting its relevancy in Australia's economy. Overall, JBH has shown to be a relatively safe and profitable investment, and it appears that it will continue to do so as the years progress.

Challenges: The most challenging aspect of this visualisation was adjusting the candlesticks to resemble a standard Stock Movement Chart. Specifically, I needed to figure out how to change the icon and colour of each data label based on its category (Open, High, Low, Close). Initially, I wasn't sure how to apply distinct formatting to each group, which made the chart appear inconsistent. To resolve this, I watched a YouTube tutorial on creating Stock Movement Charts. That's when I discovered that you can select all data labels within a specific category and customise them individually. This allowed me to assign appropriate colours and icons to each label, resulting in a clearer and more professional looking chart.

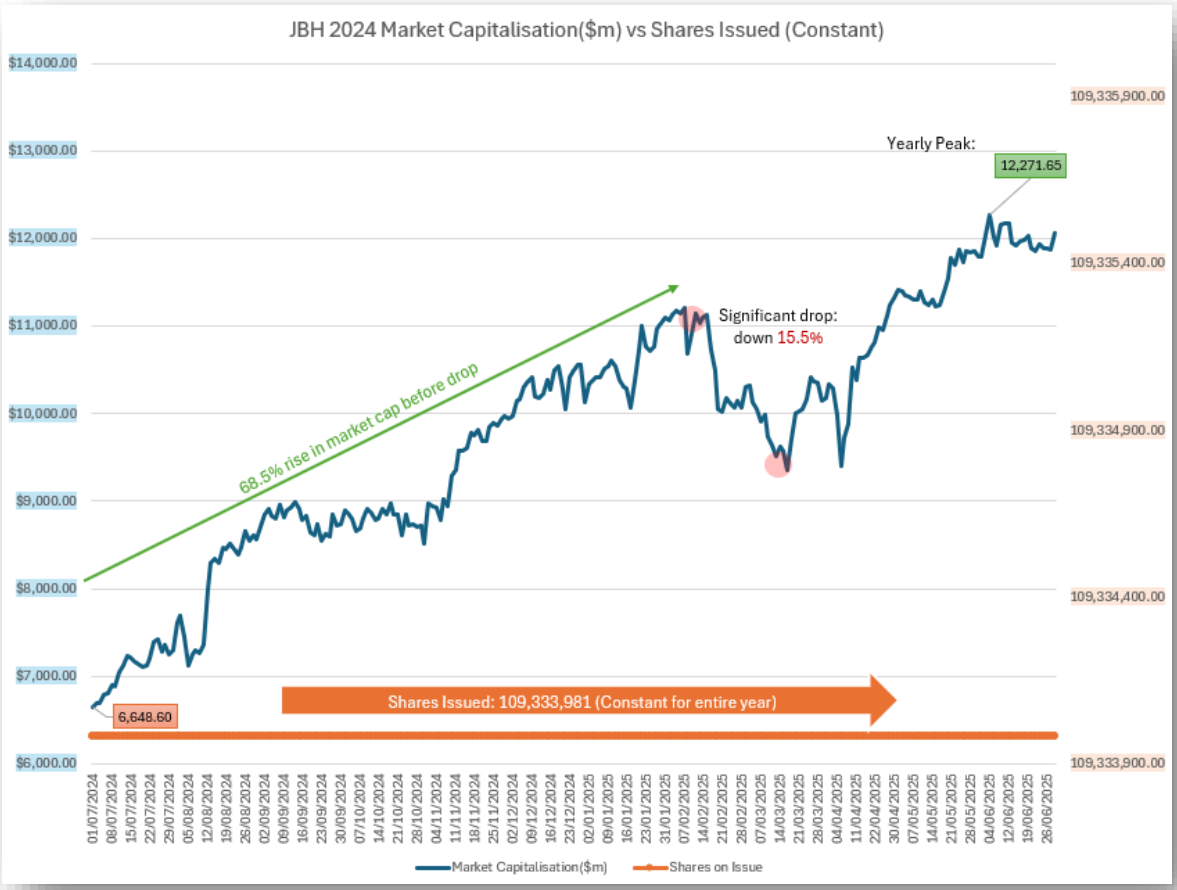


Figure 3. Capital vs Issued Shares Analysis

What data was chosen for this visual? The visual is based on data drawn from the following:

- Date: specific points in time selected within the dataset to track performance across a certain period.
- Market Capitalisation ($m): total value of a company's outstanding shares, reflects JB-HI-FI's overall size and market value.
- Shares on Issue: total number of shares that a company has issued to investors and currently held by stakeholders.

Type of chart chosen, why, and what was done to achieve the visual? A combo chart was also used here. However, both the Shares Issued, and Market Capitalisation are visualised using Line Charts. Originally Shares Issued was a Stacked Column Chart, however I found it quite unappealing since the value of Shares Issued was constant (109, 333, 981). Several arrows were used to indicate a data features direction within the dataset,

followed with relevant annotations to highlight key trends. Yearly lows and highs are also highlighted, and a significant drop period was outlined using two red circles to gain the readers attention. These dots quickly help visualise where exactly the drop starts and concludes, and the use of red helps reinforce that is an event with negative effect. The axis' have also been formatted to ensure minimal wasted space within the chart, as well as colour coding to help distinguish which value belongs to which chart.

Analysis of the visual. The chart shows a strong upward trend in market capitalisation throughout the financial year. Starting at $6648 in July 2024, it rose to a yearly peak of $12271 for an increase of 84.6%. In addition, the number of shares issued remained the same across the entire year at 109, 333, 981, indicating that the rise in market capitalisation was not driven by dilution. There were also a few short-term dips in market capitalisation, however a significant drop can be observed around the start of February, plummeting 15.5%. This period exhibits extremely volatile behaviour, with market capitalisation dropping significantly, followed by a steep rise, and another drop, followed by one last rise taking it to over $12000 for the year.

Challenges: The constant value of Shares Issued presented a challenge during the construction of this chart. I wasn't initially sure whether this figure was meant to remain unchanged, so I downloaded data from another stock on DatAnalysis to investigate whether this was a common occurrence. Once I confirmed that it was, I needed to find a way to display the Shares Issued in a visually appealing manner. At first, I opted for a Stacked Column Chart, but this proved difficult to interpret. The automatic axis bounds caused the column to occupy nearly half the chart space, resulting in a large orange section that overwhelmed the visual. To improve clarity, I reformatted the right axis to position the Shares Issued closer to the bottom of the chart. Determining the appropriate bounds took some time, but through trial and error I was able to identify values that achieved a cleaner and more effective visual outcome.

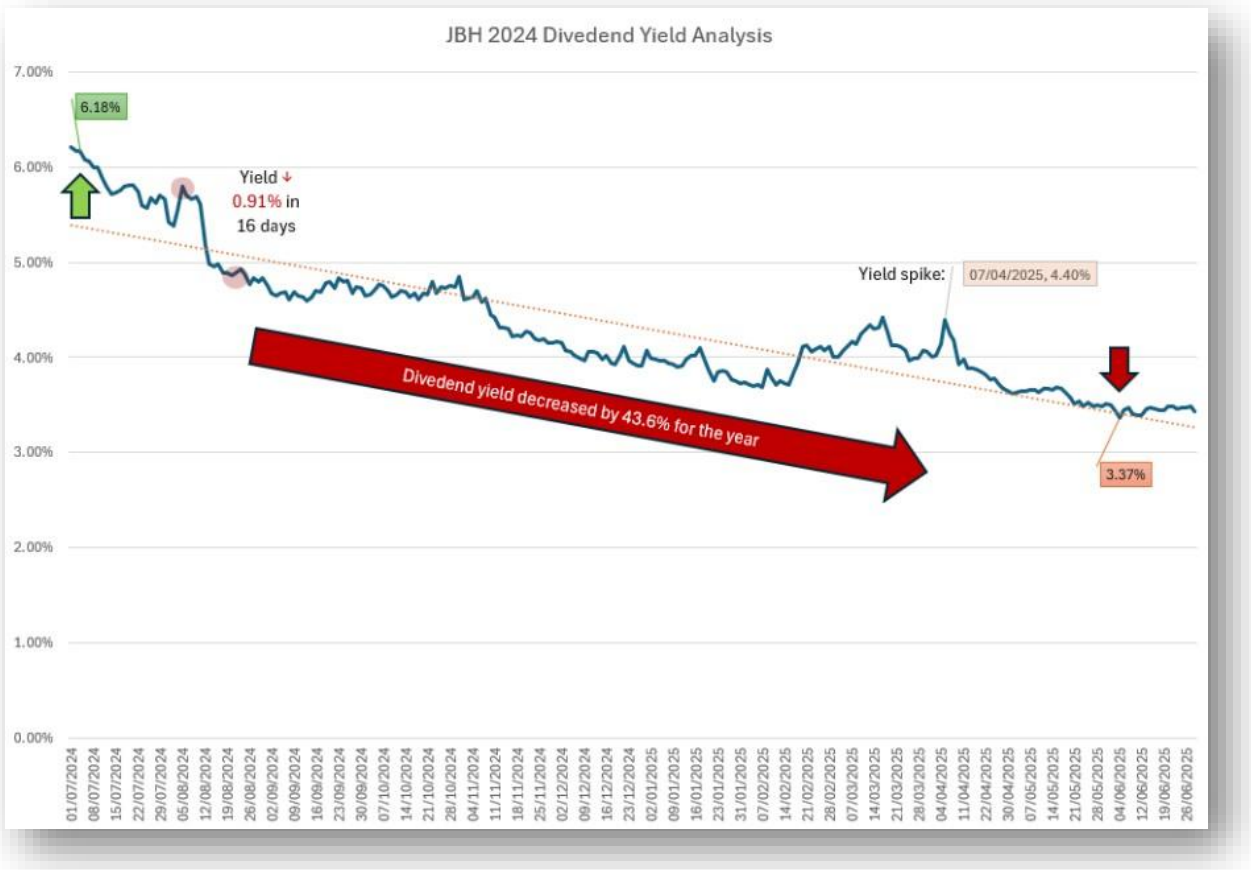


Figure 4. Dividend Yield Analysis

What data was chosen for this visual? The visual is based on data drawn from the following:

- Date: specific points in time selected within the dataset to track performance across a certain period.
- Dividend Yield: quantifies how much a company pays out in dividends each year relative to its share price as a percentage.

Type of chart chosen, why, and what was done to achieve the visual? The Dividend Yield was visualised using a Line Chart, as this format is typically the most suitable for illustrating changes over time. Since the core purpose of a Dividend Yield Analysis is to track its movement across a defined period, a Line Chart offered the clearest representation. To create the visual, I calculated the Dividend Yield by dividing the Dividend by the Closing Price, then plotted the resulting values against the Dates column. The annual peak and trough were highlighted to pinpoint when the yield reached its highest and lowest levels. These were colour-coded and annotated with directional arrows to reflect their respective impact, either positive or negative. Significant spikes were also flagged, alongside a prolonged period of low yield, which was marked using red circles for emphasis.

Analysis of the visual. Unlike the previous charts, we can observe a stable decrease in the yield with an annual decline of 43.6% from 6.16% to just 3.37%. The consistent downtrend is accompanied by an absence of recovery. There are several upward spikes showing a willingness to rebound; however, they are inevitably followed by another downwards push. The prominent spikes suggest potential undervaluation, market volatility, or potential financial stresses that warrant further exploration.

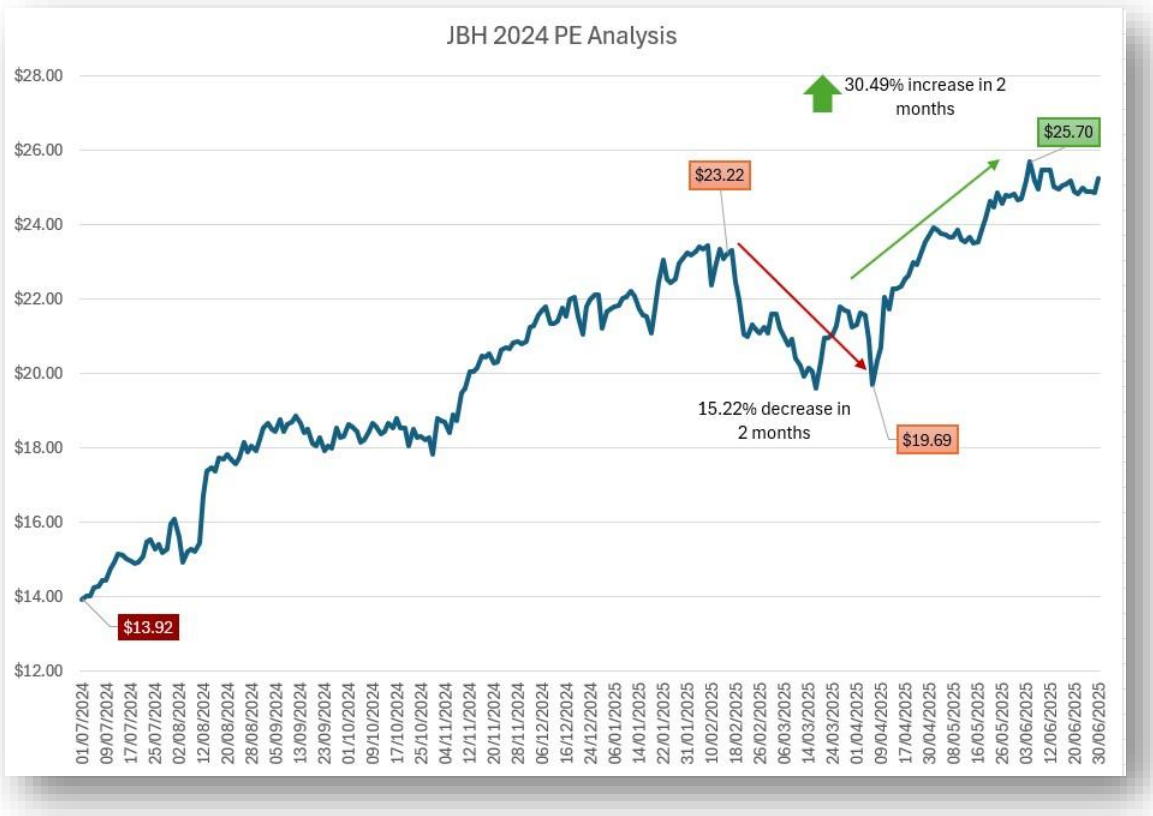


Figure 5. PE Analysis

What data was chosen for this visual? The visual is based on data drawn from the following:

- Date: specific points in time selected within the dataset to track performance across a certain period.
- PE Ratio: a measure that compares a company's share price to its EPS (earnings per share). Calculated by taking the close price and dividing it by the EPS. Often used to assess whether a stock is overvalued or undervalued in relation to its earnings performance.

Type of chart chosen, why, and what was done to achieve the visual? A line chart was selected for the PE analysis, as this type of visual is well-suited to identifying trends over an extended period. It clearly shows how a company's valuation shifts over time and is easy to interpret, making patterns more visible. To calculate the PE ratio, the Closing Price was divided by the Earnings Per Share (EPS), and the resulting values were plotted against the corresponding dates. The vertical axis was adjusted to range from $12 to $28, which helped magnify the chart by reducing empty space and focusing attention on key movements. The highest and lowest PE points were identified and colour-coded to support pre-attentive processing, allowing viewers to quickly recognise extremes. Annotations and arrows were added to highlight important trends and guide interpretation. A distinct V-shaped recovery was also outlined to emphasise the sharp shift from decline to rebound.

Analysis of the visual. The PE for JBH performed extremely well in the previous financial year, jumping approximately 84.63%. Prior to February 2025, the PE had a stable incline reaching a 66.81% increase where it then decreased to $19.69 in the span of two months. Nevertheless, this decline was short lived since the PE reached its annual high of $25.70. If the growth from prior to February had continued, it would have reached $28.54 by June, however the five-month stretch stalled that momentum, breaking the trend, and highlighting the destructive impact of the imposed tariffs.

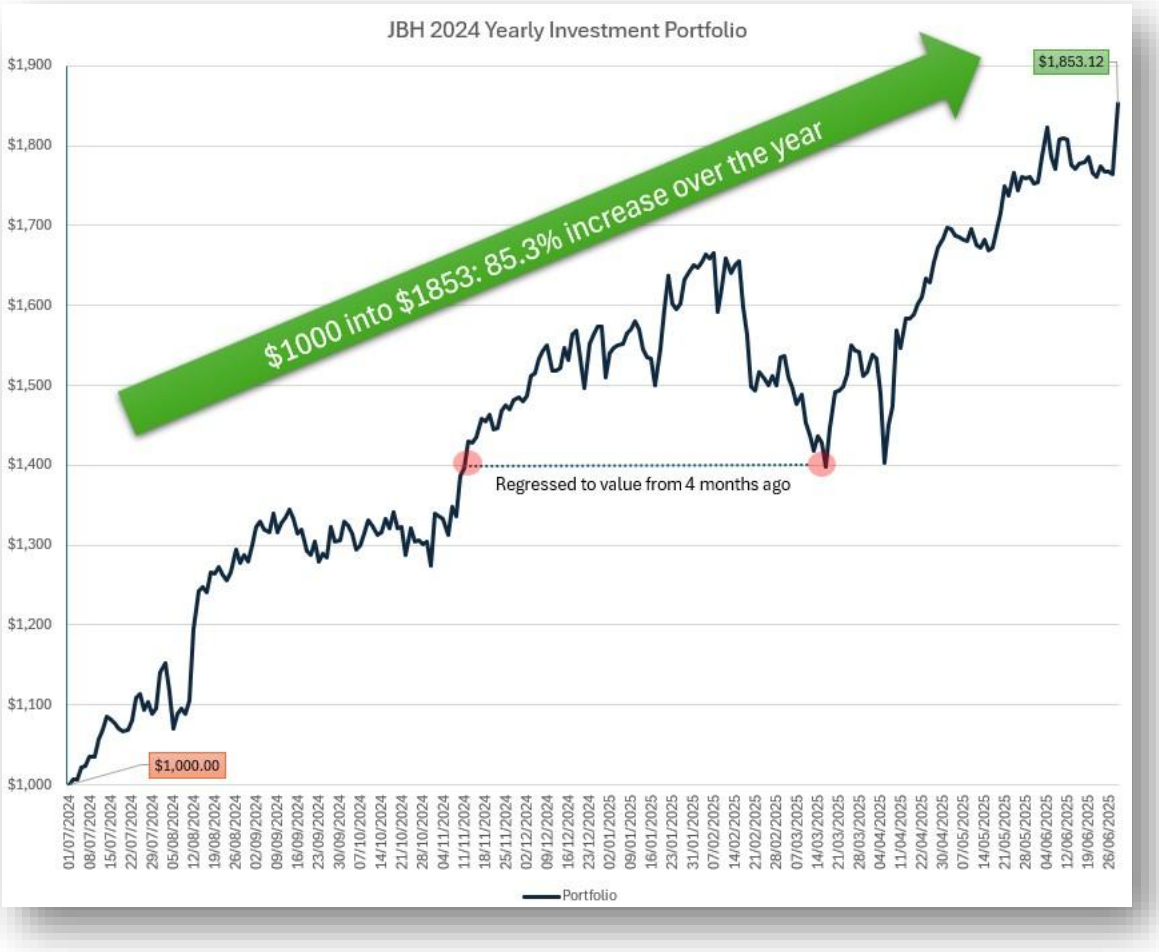


Figure 6. Yearly Portfolio Analysis

What data was chosen for this visual? The visual is based on data drawn from the following:

- Date: specific points in time selected within the dataset to track performance across a certain period.
- Market Value: total value of a shareholder's holdings in JBH, calculated as the number of owned shares multiplied by current share price.

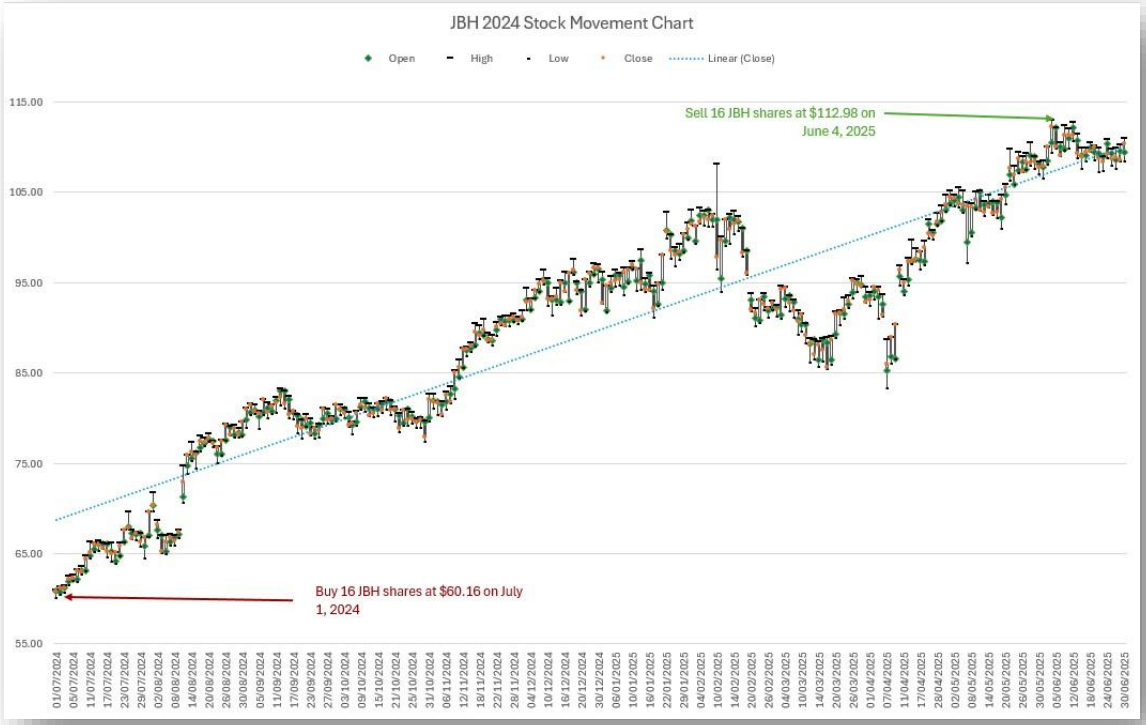
- Portfolio: represents total value of a shareholders account, including market value, cash balance, and accumulated dividends.
- Close: the final price that JBH shares were traded at by the end of the day.
- Total Dividend: sum of all dividends received from a stock over a period, representing the income generated from ownership of shares.

Type of chart chosen, why, and what was done to achieve the visual? A line chart was the chosen chart type, since we want to observe the performance of a yearly investment portfolio. A line chart clearly shows value trends over time, making it easy to track growth, volatility, and performance shifts. To achieve this visual I first had to calculate the Portfolio value. This was done by:

1. Calculating number of obtainable shares from $1000 on July 1, 2024 (buy 16 shares and hold until June 30, 2025)
2. Obtaining the market value by multiplying number of shares and Closing Price
3. Determine Cash Balance on Day 1 by subtracting Market Value from $1000 (amount left with after buying 16 shares)
4. Calculate Portfolio value by adding Cash Balance to Market Value
5. Identify Total Dividends by multiplying Dividend Per Share and Number of Shares
6. Add the Total Dividends value to the Portfolio value for the last date

Once the Portfolio values were gathered, I plotted them against their corresponding dates onto a Line Chart. The starting value of $1000 and final Portfolio value are highlighted to quickly identify the final amount of our investment. Periods of little to no growth were outlined and a large arrow annotation was added to swiftly point determine how much profit was made as a percentage.

Analysis of the visual. A single investment of $1000 performed extremely well, recording a final amount of $1853.12 (85.3% increase). The rise to our final Portfolio value was not swift as we can see multiple prolonged periods where the value experienced no growth. Notably, a five-month span was identified showing extreme volatility. From November 2025 the investment grew to $1658 in February, before regressing to its value from five months ago in March. This timeframe was shortly followed by another short, volatile period before climbing to its final and absolute highest point of $1853.12. The overall trajectory reflects a non-linear growth pattern with sharp rises, dips, and flat stretches. Having said this, much like the previous charts, the $1000 investment into JBH exhibits a resilient performance, making it a strong candidate for those seeking long term growth with the ability to withstand short term volatility.


JBH 2024 Stock Movement Chart
Open
High
Low
Close
Linear (Close)
Sell 16 JBH shares at $112.98 on June 4, 2025
Buy 16 JBH shares at $60.16 on July 1, 2024
115.00
105.00
95.00
85.00
75.00
65.00
55.00

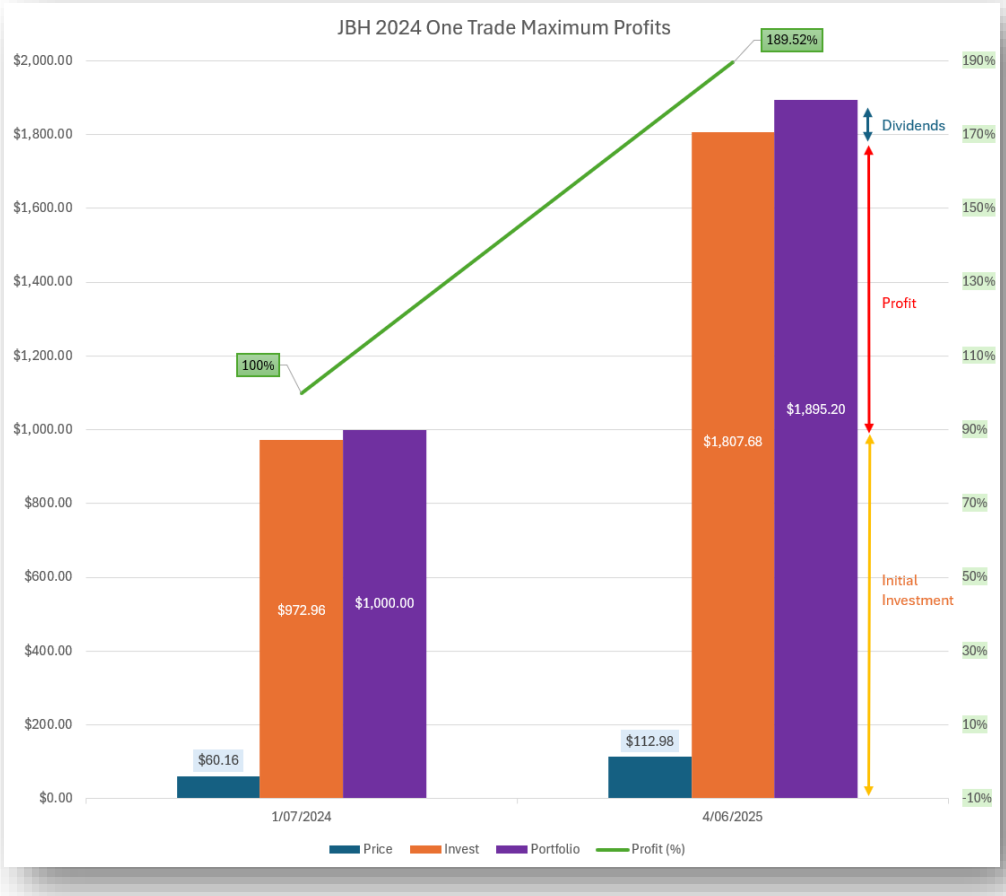

JBH 2024 One Trade Maximum Profits
189.52%
100%
$2,000.00
$1,800.00
$1,600.00
$1,400.00
$1,200.00
$1,000.00
$800.00
$600.00
$400.00
$200.00
$0.00
190%
170%
150%
130%
110%
90%
70%
50%
30%
10%
-10%
Dividends
Profit
Initial Investment
$60.16
$972.96
$1,000.00
$112.98
$1,807.68
$1,895.20
1/07/2024
4/06/2025
Price
Invest
Portfolio
Profit (%)

Figure 7 and 8. Single Trade for Maximum Profits Analysis

What data was chosen for this visual?

The visual is based on data drawn from the following:

- Date: specific points in time selected within the dataset to track performance across a certain period.
- Price: target share price at which an investment of $1000 would yield maximum profit for a single trade.
- Invest: the amount of money allocated to achieve a single trade with maximum profit potential.
- Portfolio: represents total value of a shareholders account, including market value, cash balance, and accumulated dividends.
- Profit: the gain or loss realised from a trade.

Type of chart chosen, why, and what was done to achieve the visual? For the first chart, I have taken the previously made Stock Movement Chart to help visualise when an investor would buy and sell shares. I elected a Combo Chart for the second chart type as evident by the clustered columns and line chart. This allows for clear comparison between total amounts and returns over time, highlighting trends in a single visual. The goal was to find the most optimal timeframe to invest $1000 and sell to achieve the maximum profits. To achieve this:

1. First pinpointed the lowest Closing Price date in the dataset and determined how many shares I could purchase with $1000.
2. This left me with an Invest value of $972.96 with a remaining Cash Balance of $27.04 and a total Portfolio value of $1000.
3. At this point I also calculate the Profit which is 100% since we are yet to lose money. This inevitably does not go below 100 since we are investing at the single lowest Closing Price.
4. We then locate the highest Closing Price and its value. At $112.98 we sell 16 shares to get the updated Invest value.
5. The Cash Balance, Portfolio, and Profit values are consequently updated.
6. Finally, we add the total dividend value to the Cash Balance and Portfolio.

Once the relevant values were obtained, I plotted the buy and sell dates along the X-axis, with currency values on the left and percentages on the right. For each date, the chart displays the share price, the investment amount allocated, and the total portfolio value. Each of these columns was assigned a distinct colour to aid visual differentiation, as indicated in the legend. Data labels were positioned above the Price column to maintain readability, as placing text within the column itself would have been impractical due to its small size. The Profit line was formatted to avoid visual conflict with the columns and was coloured green to represent its positive contribution, while also standing out from the other chart elements. On the far-right column, I included annotations to help viewers interpret the breakdown of their portfolio, specifically the portions attributed to the initial investment, accumulated profit, and dividends. These components were also colour-coded individually to enhance clarity and distinction.

Analysis of the visual. The results gathered from this chart are almost identical to the previous chart due to the low being at the start of July 2024, and the high (selling point), being positioned towards the lower end of the financial year. In terms of percentage increases, this chart houses one of the highest of all the charts, presenting a 189.52% increase from $1000 with Dividends included. It is also worth noting that every Column for the second date experienced an 85% increase from the previous date.

Challenges: The most challenging obstacle throughout all the charts for me was formatting the Y axis in the second chart so that it would only display the two dates in the middle. Initially it would display the two dates, as well as all the other dates between the two, leaving the chart with large amounts of empty space. After spending some time experimenting with the axis, I found under the “Format Axis” tab an option to change axis type to Text Axis. By doing this, Excel treats the dates as categories instead and spaces them evenly across the axis.

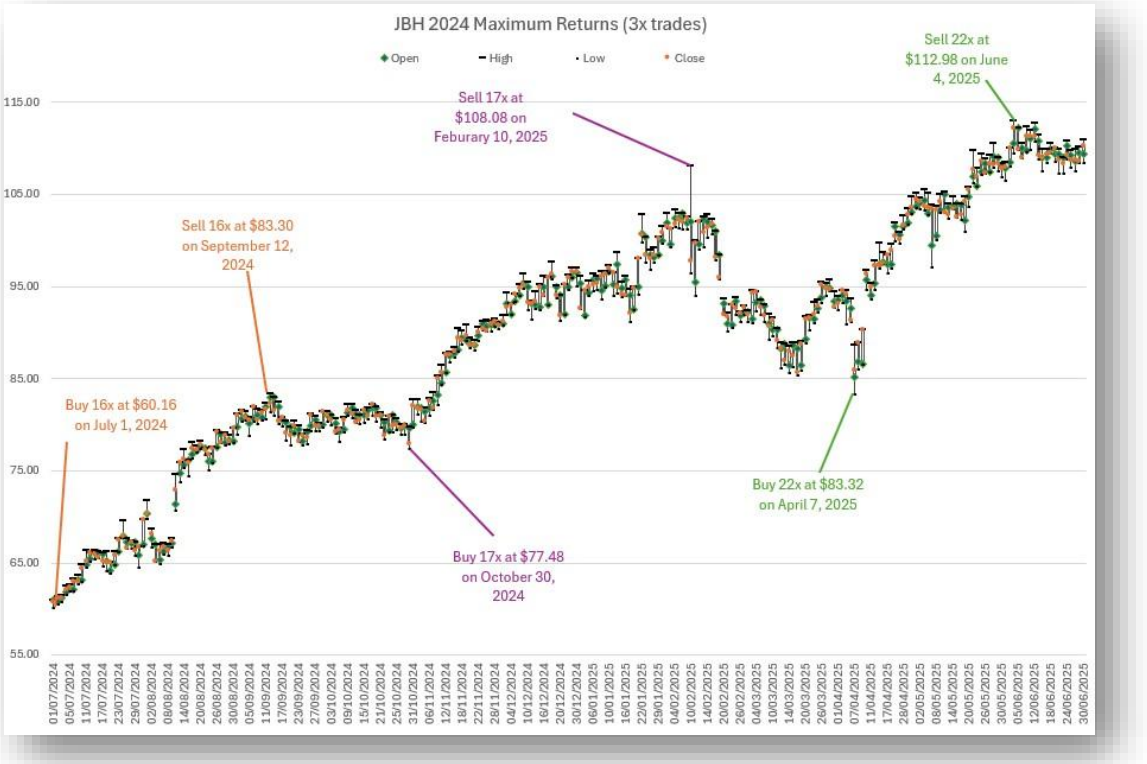


Figure 9 and 10. Multiple Trades for Maximum Profits Analysis

What data was chosen for this visual?

The visual is based on data drawn from the following:

- Date: specific points in time selected within the dataset to track performance across a certain period.
- Price: target share price at which an investment of $1000 would yield maximum profit for a single trade.
- Invest: the amount of money allocated to achieve a single trade with maximum profit potential.
- Cash Balance: amount of liquid funds available in an account, representing money currently invested and available for trading and withdrawal.
- Profit: the gain or loss realised from a trade.

Type of chart chosen, why, and what was done to achieve the visual? Since the objective was a similar task to the previous one, the same charts have been used. The Stock Movement Analysis chart again helps investors picture the exact points in which they would make multiple investments. As for the accompanying chart, I chose a Combo Chart to compare data features for multiple dates, allowing for easy interpretation and trend highlighting. To achieve this visual I first had to:

1. Identify a low point on the Stock Movement chart, and its corresponding peak before the price dropped again. This was done multiple times and was dependent on the time frames of each period.
2. Calculated how much to invest for the first purchase date, as well as the Number of Shares and current Cash Balance.
3. Then took the sell date (current high) and determined how much the Number of Shares would sell for at the current price where I then updated the Cash Balance.
4. Repeat this process for the remaining buy and sell dates, until you have the final Cash Balance with the Total Dividends included.

Taking the data into account, I added six annotations using three distinct colours to illustrate when an investor should make multiple investments to maximise returns. Each annotation includes details such as the share price at the time of purchase or sale, along with the relevant date. The second chart provides insights into the actual dollar amounts and profits generated, based on the investment strategy outlined in the first chart. For each date, a Clustered Column is used to represent both the share price and the investment amount. These are colour-coded to clearly differentiate between the cost per share and the total capital invested. Above each group of dates, the corresponding profit is highlighted to show how much the investment has grown over short periods. Data labels have been added to every component of the graph to present a complete picture of the three investment cycles, offering potential investors a clear and informative overview.

Analysis of the visual. The returns on each investment cycle follow an upwards pattern as indicated by the trend line. This pattern is reiterated through the Profits for each cycle, with an average profit of 37.35%. The greatest jump in Profit was during the second trading cycle where we grew our investment by $520. Our initial investment of $972 performed extremely well, increasing by 155.5% for a final value of $2485.56. The percentage increase for Price performed much like the Profit percentages, with the Price increasing on an average of 37.9% for each investment cycle.

Conclusion

Based on the comprehensive analysis of JBH's performance during the most recent financial year, potential investors can draw several insights to inform their investment decisions. The stock showed an 83% increase in Closing Price over the year, rising from approximately $61.24 to a peak of $112.24, reflecting a strong upward trend and almost doubling in value, making it a market leader in Australia's retail sector. This growth was consistent until February 2025, when the introduction of tariff's triggered a major dip to a five-month low of $83.22, accompanied by a record trading volume spike over 1.45 million in March. However, JBH demonstrated resilience with a rebound of over 35%, emphasizing its relevance and stability in the economy. This suggest that JBH is a relatively safe and profitable long-term investment despite occasional bearish indicators, such as price drops with rising volume.

On the investment front, a $1000 initial investment grew to $1853.12 (85.3% increase), though growth was non-linear with prolonged flat periods and volatility, notably a five-month span from November 2024 to March 2025

where values fluctuated between $1658 and a regression to earlier months before reaching its peak. This resilience through short term volatility reinforces JBH's appeal for long term growth seekers. The Maximum Profit Analysis also showed an upward trend with an average profit of 37.5% and a standout 155.5% increase from $972 to $2485.56, with price increases averaging nearly 40% per cycle, highlighting consistent profitability.

For potential buyers, JBH presents a great opportunity due its strong historical performance, ability to recover from setbacks, and solid returns across various investment scenarios. From an investor's perspective, it is best to consider a strategic long term investment approach, monitoring quarterly earnings and market conditions to capitalise on low price opportunities. Overall, JBH is a robust option for portfolio growth within the Australian market and is likely to remain so as it progresses in the retail sector and capitalises on emerging technological advancements within its products.

Summary of my visualisation approach vs AI and how they conveyed information.

The visualisation approaches I employed in Excel for my report, supported by detailed analysis, offered several distinct advantages over AI-generated alternatives, with AI assistance limited to calculating percentage increases or decreases. Firstly, Excel's manual chart creation, such as the Stock: Open-High-Low-Close (OHLC) Chart, Close Price vs. Volume Chart, dividend yield trend, investment performance, and returns cycle visuals, provided precise control over design elements like data labelling, colour coding, and axis adjustments. This hands-on approach allowed me to tailor each chart, for example, annotating key price points from $61.24 to $112.24 and volume spikes like 1.45 million, to highlight specific trends and outliers, such as the 83 percent price rise (calculated with AI assistance) and the tariff-induced dip, which might be less customisable in AI tools that prioritise automation over nuanced adjustments. Secondly, Excel's widespread familiarity and accessibility as a financial analysis tool ensured compatibility and ease of sharing with stakeholders, contrasting with AI systems that may require specialised platforms or interpretation, potentially limiting accessibility.

These visualisations effectively conveyed critical information by delivering a clear, structured narrative of JBH's financial year. The OHLC Chart illuminated daily price volatility and patterns, aiding in spotting bearish signals like the September-November 2024 low-growth period. The Close Price vs. Volume Chart integrated price trends with volume context, effectively highlighting the 35 percent rebound (AI-calculated) after the February 2025 tariff dip and the significance of high-volume trading days. The dividend yield trend visualisation underscored the 43.6 percent decline (computed with AI help), prompting further investigation into financial stability, while the investment performance and returns cycle charts demonstrated profitability, such as the 85.3 percent growth from $1,000 to $1,853.12 and the 155.5 percent increase from $972 to $2,485.56 (both AI-assisted calculations), reinforcing JBH's investment potential. Unlike AI, which might generate generic visuals lacking contextual depth, Excel's customisation enabled me to integrate specific annotations and trends, such as the tech industry growth parallels with stocks like NVIDIA, ensuring the visuals were both informative and actionable for investors. This combination of manual control, clarity, and relevance, supplemented only by AI for percentage calculations, made Excel a superior choice for my analysis, effectively supporting the report's conclusions as of the current date.