Impact on Stock Market Performance for the Companies that Contributed to the Chandrayaan-3 Project

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Abstract

Purpose : The study focused on the performances and investment opportunities of the companies that contributed to the Chandrayaan 3 Project.

Methodology : The study was conducted for the 10 companies that contributed to Chandrayaan 3. The six months' stock prices from February 2023 to August 2023 were taken for the study. The research design was descriptive. We analyzed the data using tools like Tobin's Q ratios, moving averages, RSI, MACD, candlestick charts, and parabolic SAR.

Findings : The study showed the investment opportunities in the 10 companies, the future forecast, and the growth level of the stock prices. Tobin's Q ratio results in the overvaluation or undervaluation of a company's physical assets, which helps to identify the buy and sell strategies of these companies' assets.

Practical Implications : The study suggested that the technical tools help the investors to identify better investment opportunities in the company's equity based on the market risk exposure.

Originality : The study was performed to know how far the launch of Chandrayaan 3 has implications on the stock price movements of the companies that contributed to the Chandrayaan 3 Project.

Keywords : **stock market, Tobin *Q* ratio, technical analysis, investment, valuation, risk**

JEL Classification Codes : G1, G110, G10, G11

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The companies that have contributed to the Chandrayaan-3 project are expected to experience a boost in their stock market performance, as it is a prestige mission for India. This is due to the fact that the mission's success will highlight India's prowess in the space industry and draw additional attention to the participating companies. Among the benefits that a successful Chandrayaan-3 landing could have on the stock market performance of the companies involved are increased government investment, increased investor confidence, and increased interest from overseas investors. This study question asks whether these happy feelings cause people to make rash stock market investments or whether there are underlying causes that affect

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how people respond monetarily to such encouraging national happenings. The objectives of this study are focused on the performance of the stock prices of the ten companies that contributed to Chandrayaan 3. The impact of stock volatility and the buy or sell signal is monitored based on the technical charts. To identify the company's assets valuation. The limitation of the study is the data taken for analysis six months price. The stock market is volatile, and results may be biased.

Literature Review

Tobin's 1968 Q model is used to calculate the ratio of a company's book value of assets to its market value of shares and a book value of debts. This study aims to create a correlation between Tobin's Q and cash flows from operating and investing operations in order to provide market participants with meaningful information (Salehi, 2009). Vector autoregressive analysis is used to evaluate quarterly data from 1951 Q4 to 2012 Q4. Tobin's Q ratio variations are the causal cause of the observed decrease in the PE ratio, as confirmed by the Granger-causality test. According to Sum (2014), the analysis showed that the PE ratio significantly decreased after the shock of Tobin's Q ratio shift. The issue of the utility of technical analysis in equities research and its practical influence on investors and brokers is covered in a study on the significance of technical analysis in identifying trading signals in Indian equity markets (Chandrappa & Triveni, 2017). The study by Anh and Gan (2021) discovered that although the pre-lockdown phase negatively impacted stock returns, the subsequent lockdown had a favorable influence on the market as a whole and different economic sectors in Vietnam.

We analyzed market capitalization, trade volume, price-to-book ratios, the daily adjusted closing price of the BSE Sensex, and variables associated with the coronavirus, such as the number of daily confirmed cases and deaths between January 30, 2020, and December 8, 2020. The study evaluated the impact of the outbreak on stock market performance using pooled ordinary least square regression. The results indicated that both daily confirmed cases and fatality rates had an impact on the stock market (Veeravel et al., 2021). The researcher suggested a hybrid approach for predicting stock trends that blends sentiment and technical analysis. Finbert was utilized to recognize emotional content in financial textual content, historical stock transaction data was gathered, and the TTR program was utilized to create technical indicators. Yang et al. (2022) found that the LASSO–LSTM model, which integrates sentiment and technical indicators, outperformed the regular LSTM model by 8.53%, underscoring the importance of previous transactions. This study used a probit model, the full-sample Granger causality test, and the modern bootstrap approach to examine the bidirectional Granger causality between investors' emotions and momentum tactics. The results showed unanticipated dynamics over time. Nakhli (2022) revealed that ADS and VIX increased the likelihood of investor sentiment influencing momentum strategy, while gold reduced this influence. It used bootstrap rolling-window Granger causality tests.

The pandemic has affected companies in different ways, both positively and negatively. A considerable proportion of businesses have seen a drop in performance throughout the pandemic, even though others have been able to hold onto their market share (McLaughlin, 2022). The present research assessed the influence of board structure and working capital management on Thai-listed enterprises' Tobin's Q ratio. This two-step generalized method of moments (two-step GMM) model was applied to 319 Thai-listed companies. According to Chancharat and Kumpamool's (2022) analysis, a firm's Tobin's q ratio decreases when it has a diversified board of directors, a considerable net working capital, longer trade cycles, or an assertive attitude to working capital investment. Tohidi (2022) conducted a study whose purpose was to determine whether market sentiment and the Tehran Stock Exchange Price Index (TEPIX) volatility were related. A composite sentiment index was created using principal component analysis, and TEPIX volatility was simulated using ARIMA-E-GARCH hybrid models. GLS regression showed that optimistic and pessimistic emotions had minor impacts on TEPIX volatility, with inflation and liquidity having a more significant influence. The stock market affects investment and consumption and is vital to an economy. A study was carried out to look into individual investors' knowledge of

stock market investment. Data was collected from 120 retail investors in Delhi-NCR using a Google survey questionnaire. The analysis revealed higher male involvement and disparities in awareness of stock market trading based on demographic characteristics such as income groups and academic qualifications (Chand, 2022). The study proposes a methodology that combines investor expertise with a long- short-term memory (LSTM) algorithm to forecast stock prices. Investors provide technical indicators, which are then employed. The researchers' recommended methodology outperforms other strategies, including randomly selecting technical indicators, in a simulation involving 100 stocks (Ku et al., 2023).

The study looked at five different countries' deposit interest rates, stock market returns, and inflation. It was discovered that in nations without equilibrium, there was a causal relationship between residual buying power and the consumer price index. It recommended implementing appropriate policies to address economic issues like inflation and deflation (Routh, 2023). In this study, the researcher presented a comprehensive framework to ascertain the correlation between news sentiment indices, the stock market, and technical analysis. The approaches and results highlighted the critical significance of behavioral finance in stock market analysis by demonstrating strong correlations between the news sentiment index and the stock market (Dumiter et al., 2023). The stock market is a major driver of economic growth. A recent study found that more publications about investors' attention to the stock market have been released. The 632 research publications from 1994 to 2022 were examined using bibliometric analytic tools in this study. The majority of this research was conducted in China, the UK, the USA, and Australia. Leading subjects and important media outlets were identified (Lohan et al., 2023).

A study examined the effects of COVID-19 lockdown announcements on corporate stock returns and credit ratings across several Indian industries. The outcomes demonstrated that the influence differed throughout sectors. While textiles, financial services, construction, cement, and autos were the industries most negatively impacted, telecom, pharmaceuticals, chemicals, FMCGs, and textiles had favorable anomalous returns. Smaller enterprises were more susceptible, and foreign corporations and the government's subsidiaries outperformed privately held businesses (Sharma et al., 2023). This study evaluated scientific production and publication trends in the field of decision support tools for investments in the capital market, with a focus on fundamental analysis, technical analysis, and Ichimoku dynamics. Almeida and Vieira (2023) concluded that the researcher's thorough evaluation demonstrated an increasing trend of research on this topic, correcting information gaps and adding to scientific understanding, especially in the sparse literature on Ichimoku. The research assessed the effect of COVID-19 on emerging economies' stock markets. The information suggested that the reaction of the stock market was not substantial. The researcher hoped the findings would be beneficial to financial decision-makers worldwide. The study used the ARDL model and the Wilcoxon signed-rank test. The COVID-19 pandemic had a statistically insignificant negative link with Pakistan's stock returns, according to a study by Qadri et al. (2023), and it reduced the nation's net profit returns by 52.85%.

Research Methodology

The methodology for the research acts as the study's guide. In this study, a descriptive research design was paired with an analytical technique. Both primary and secondary sources of data were consulted in the collection process; the bulk of the data came from secondary sources and included financial statements and six months' worth of stock prices from February to August 2023. The goal of technical analysis, which examines past price and volume data to identify patterns and possible entry and exit points, includes technical indicators such as MACD, RSI, and others. Tobin's Q ratio, which compares a company's market value to its book value, aids in determining its relative valuation.

Analysis and Results

Technical Chartings

The technical schematics of the companies that contributed to the Chandrayaan 3 Mission are displayed in Tables 1 to 10 and Figures 1 to 10. Godrej Aerospace and Linde India were identified through the use of technical indicators, including MACD, parabolic SAR, and candle stick negative market, where prices tend to decrease in the future and exhibit purchase signals using moving average and RSI. On the other hand, some companies, such as Walchandnagar Industries, BHEL, HAL, MTAR Tech, Centum Electronics, Mishra Dhatu Nigam, Paras Defence & Space Technologies, Larsen & Turbo, and Walchandnagar Industries, use technical tools like the candle stick, parabolic SAR, and MACD to indicate bull markets, and their prices usually rise in the future.

Table 1. ***Technical Chart Identification of Larsen and Toubro***

Technical Chartings	Identification
RSI	Overbought
MACD	Bullish
Parabolic SAR	Bullish
Moving Average	Buy Signal
Candle Stick	Bullish Engulfing and Harami

Table 2. ***Technical Chart Identification of Hindustan Aeronautics***

Technical Chartings	Identification
RSI	Oversold
MACD	Bullish
Parabolic SAR	Bullish
Moving Average	Buy and Hold
Candle Stick	Bullish Engulfing and Spinning Top

Table 3. ***Technical Chart Identification of Bharat Heavy Electricals***

Technical Chartings	Identification
RSI	Overbought
MACD	Bullish
Parabolic SAR	Bullish
Moving Average	Buy
Candle Stick	Bullish Engulfing and Harami

Table 4. ***Technical Chart Identification of Mishra Dhatu Nigam***

Technical Chartings	Identification
RSI	Overbought
MACD	Bearish
Parabolic SAR	Bullish
Moving Average	Buy
Candle Stick	Bullish Engulfing and Shooting Star

Table 5. ***Technical Chart Identification of Walchandnagar Industries***

Technical Chartings	Identification
RSI	Overbought
MACD	Bullish
Parabolic SAR	Bullish
Moving Average	Buy
Candle Stick	Bear Harami

Table 6. ***Technical Chart Identification of Centum Electronics***

Technical Chartings	Identification
RSI	Overbought
MACD	Bullish
Parabolic SAR	Bullish
Moving Average	Buy
Candle Stick	Bull Spinning Top and Bull Engulfing Pattern

Table 7. ***Technical Chart Identification of Paras Defence***

Technical Chartings	Identification
RSI	Overbought
MACD	Bearish
Parabolic SAR	Bullish
Moving Average	Buy
Candle Stick	Bear Engulfing

Table 8. ***Technical Chart Identification of MTAR Technologies***

Technical Chartings	Identification
RSI	Overbought
MACD	Bullish
Parabolic SAR	Bullish
Moving Average	Buy
Candle Stick	Bull Harami

Table 9. ***Technical Chart Identification of LINDE India***

Technical Chartings	Identification
RSI	Overbought
MACD	Bullish
Parabolic SAR	Bullish
Moving Average	Buy
Candle Stick	Bull Engulfing

Table 10. ***Technical Chart Identification of Godrej Aerospace***

Technical Chartings	Identification
RSI	Oversold
MACD	Bearish
Parabolic SAR	Bearish
Moving Average	Buy
Candle Stick	Bear Engulfing

Figure 1. ***Technical Chart of Larsen & Toubro***

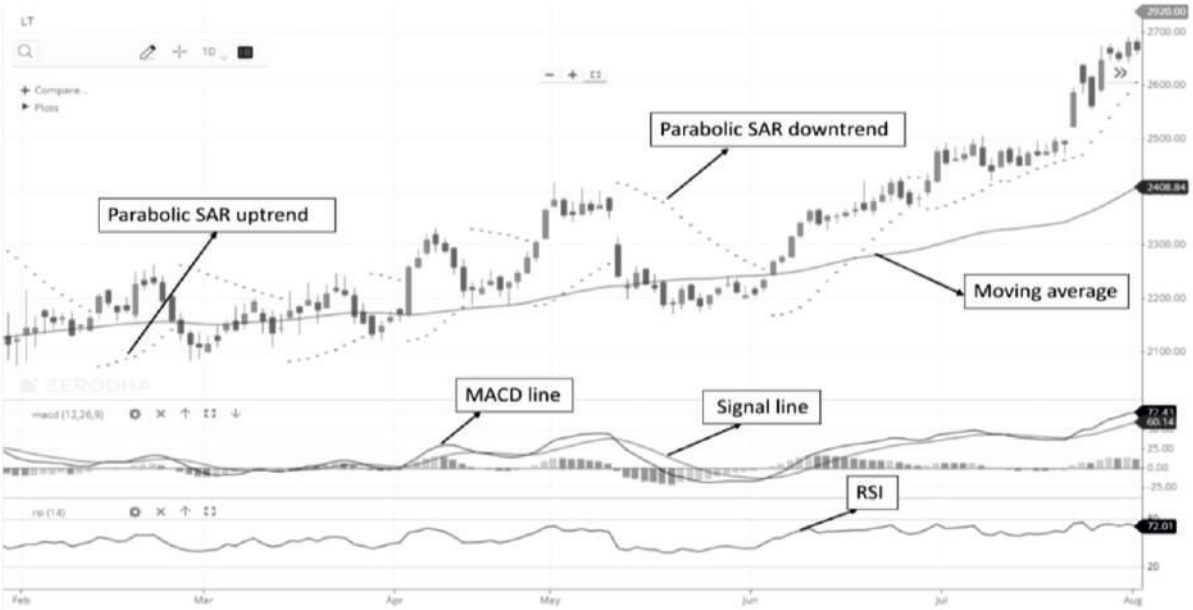


Figure 2. ***Technical Chart of Hindustan Aeronautics***

Figure 3. ***Technical Chart of Bharat Heavy Electricals***

Figure 4. ***Technical Chart of Mishra Dhatu Nigam***

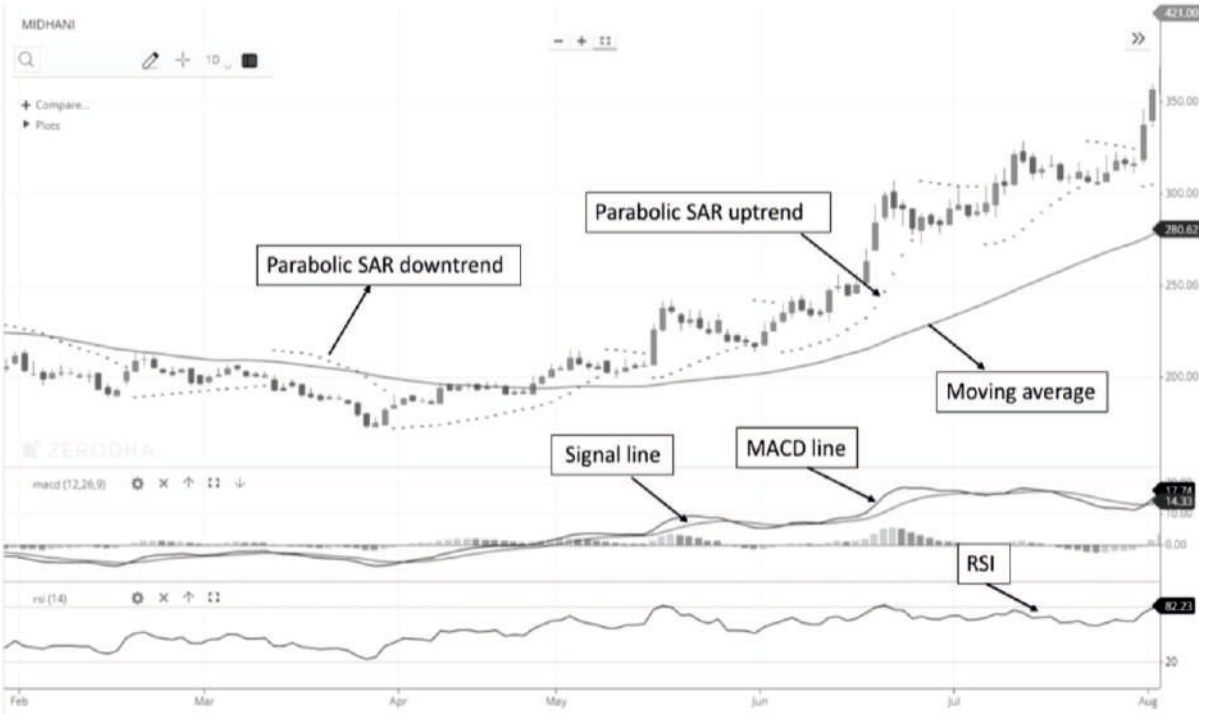


Figure 5. ***Technical Chart of Walchandnagar Industries***

Figure 6. ***Technical Chart of Centum Electronics***

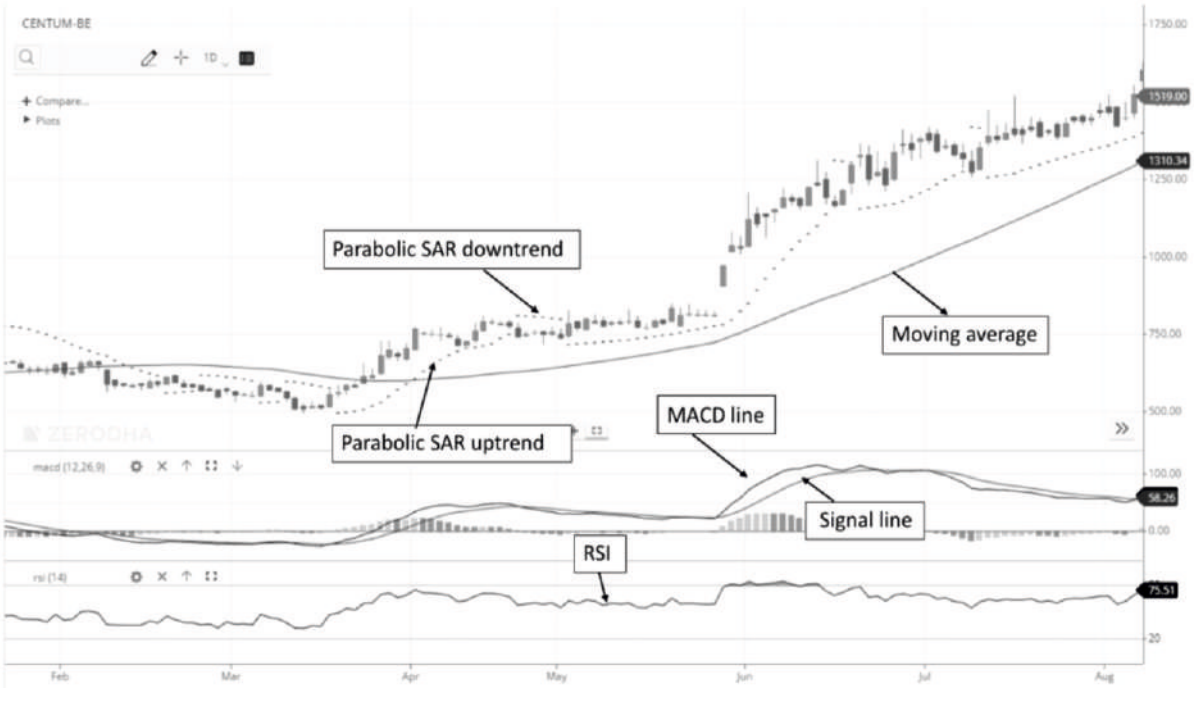


Figure 7. ***Technical Chart of Paras Defence and Space Technologies***

Figure 8. ***Technical Chart of MTAR Technologies***

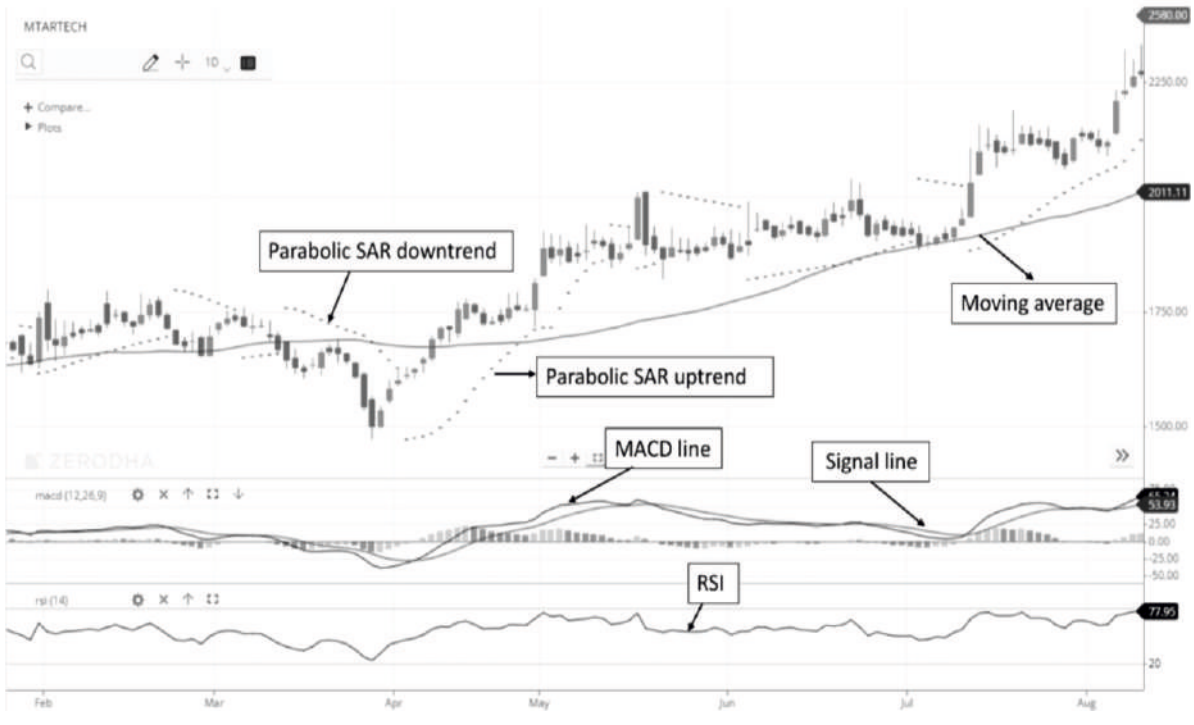
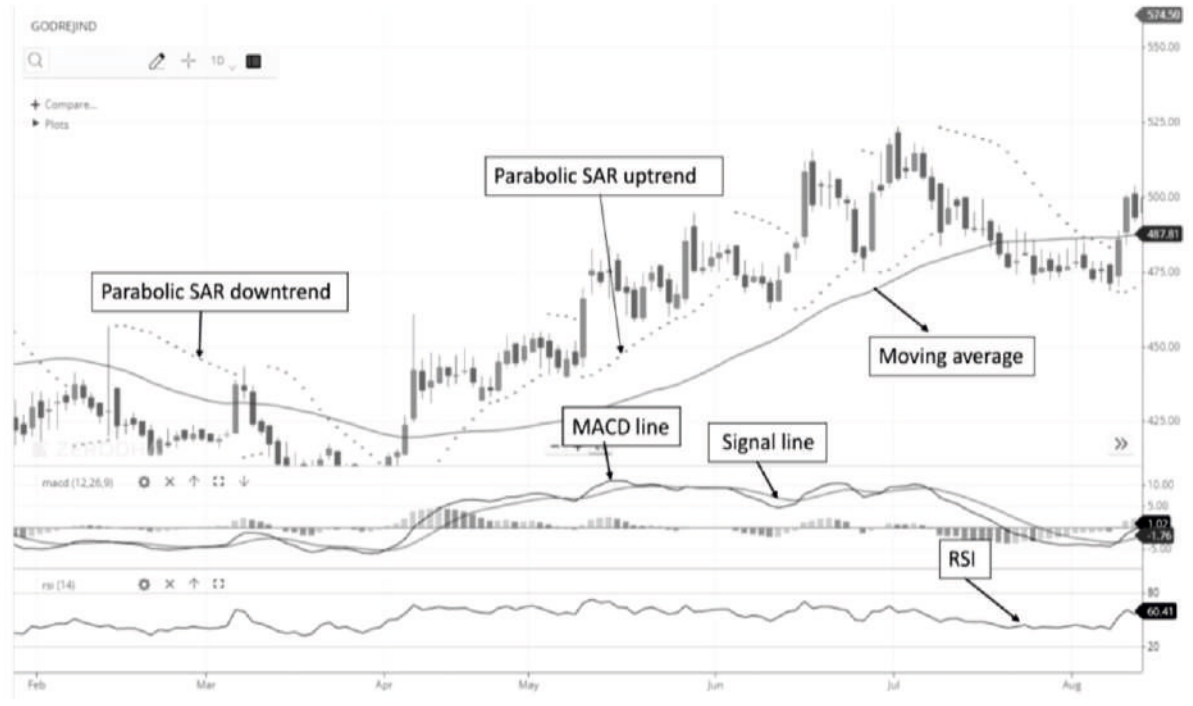


Figure 9. ***Technical Chart of LINDE India***

Figure 10. ***Technical Chart of Godrej Aerospace***



Tobin's Q Ratio

Tobin's Q Ratio = (Market Capitalization + Total Debt)/Total Assets

When a ratio is higher than 1, it means that the market worth of the business exceeds the cost of replacing its assets, raising the possibility that the business is overpriced. A ratio of less than 1 implies that the market worth of the business is lower than the cost of replacing its assets, which raises the possibility that the business is undervalued.

The companies that donated to the Chandrayaan 3 expedition in July and October are shown in Table 11 according to Tobin's Q ratio. In July, Tobin's Q ratio was less than 1, which indicates that Godrej Aerospace, Paras Defence & Space Technologies, Mishra Dhatu Nigam Limited, and Larsen & Turbo (L&T) are undervalued. Tobin's Q ratio is more than 1, indicating that Linde India, MTAR Technologies, Walchandnagar Industries, Bharat Heavy Electronics, and Hindustan Aeronautics Limited are overvalued. In October, the following companies were undervalued: Godrej Aerospace, Centum Electronics, Bharat Heavy Electronics Limited, Hindustan Aeronautics Limited, Mishra Dhatu Nigam Limited, Walchandnagar Industries, and L&T. The overvaluation of MTAR Technologies and Linde India.

Table 11. ***Tobin's Q Ratio***

Company	Tobin's *Q* Ratio July	Valuation	Tobin's *Q* Ratio October	Valuation
Linde India*	1.23	Overvalued	1.43	Overvalued
Godrej Aerospace*	0.87	Undervalued	0.95	Undervalued
MTAR Technologies*	1.14	Overvalued	1.14	Overvalued
Paras Defence & Space Technologies*	**0.87**	**Undervalued**	**0.87**	**Undervalued**
Centum Electronics*	**1.00**	**Fairlyvalued**	**0.91**	Undervalued
Walchandnagar Industries Limited*	**1.25**	Overvalued	**0.93**	Undervalued
Mishra Dhatu Nigam Limited*	**0.85**	Undervalued	0.86	Undervalued
Bharat Heavy Electronics Limited*	**1.51**	Overvalued	0.99	**Undervalued**
Hindustan Aeronautics Limited*	1.05	Overvalued	0.97	Undervalued
Larsen & Turbo*	0.95	Undervalued	0.98	Undervalued

Note. The significance value is 1.00.

When the stock prices of the undervalued firms rise, it is recommended that one invest in them since this will enhance Tobin's Q ratio. A ratio larger than one, increased rivalry for an overpriced company, earnings per share exceeding replacement expenses, and a suggestion that the time is not ideal to invest in these kinds of companies.

Investors are advised to invest in the following companies as per the technical charts results and Tobin's Q ratio:

Godrej Aerospace, Paras Defence & Space Technologies, Mishra Dhatu Nigam Limited, Walchandnagar Industries, Centum Electronics, Bharat Heavy Electronics Limited, Hindustan Aeronautics Limited, and L&T. Investors are advised to wait and plan theirs in MTAR Technologies and Linde India. As these companies contributed to the Chandrayaan 3 project, the stock market had volatility and the stock prices of these companies increased and showed a bull market.

Conclusion

The successful launch and landing of Chandrayaan-3 is a significant achievement for India's space program and could positively impact the stock market performance of the project's participating firms. The success of the

mission demonstrates the capabilities of Indian companies in the space sector and is likely to attract more attention from domestic and foreign investors. This can lead to increased investment in the companies involved and higher stock prices. Some of the specific companies that could benefit from the success of Chandrayaan-3 include L&T, Hindustan Aeronautics Limited (HAL), MTAR Technologies, etc. The success of Chandrayaan-3 is expected to help not only these particular enterprises but also the Indian space sector as a whole. Positive sentiment surrounding the companies involved in the Chandrayaan-3 project is expected to result in higher stock prices should the mission be successful, while a positive impact on stock prices is not a given. Investors should carefully consider their investment goals and risk tolerance before making any kind of investment, including those related to the Chandrayaan-3 project.

Authors' Contribution

Dr. P. Kowsalya conceived the idea and developed qualitative and quantitative designs to undertake the empirical study. D. Akshaya extracted research papers with high repute, filtered these based on keywords, and generated concepts and codes relevant to the study design. A. Valarmathi verified the analytical methods and supervised the study. The numerical computations were done by Dr. P. Kowsalya using MS Excel. Dr. P. Kowsalya wrote the manuscript in consultation with both authors.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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