

Raytheon Technologies (RTX)
Price Forecast Analysis



COMP0105 - Financial Institutions and Markets Coursework

Group 5 - A Chowdhury, M Gunewardena, M N Lubis, N Menon, S Hadaf

Contents

Background.....	3
External factors that may affect the share price of RTX.....	3
Historical Market Behaviour of Raytheon Technologies.....	5
Trends	5
Volatility	6
Price/Earnings Ratio	7
Supply and Demand Zones	7
Three Month Bearish Factors.....	8
Three Month Bullish Factors	10
Price Prediction.....	11
Discounted Cash Flow & Discounted Dividend Model	11
Put-Call Ratio	12
Option Delta and Moneyness	12
Linear Regression Prediction	13
References.....	14
Appendix:.....	17

Background

Raytheon Company and United Technologies, founded in 1922 and 1934, respectively, pushed science to improve global connectivity and security through aviation, defence, and space innovation [1].

The all-stock merger of equals between United Technologies (UTX) and Raytheon Company (RTN) created Raytheon Technologies (RTX) on April 3 2020 [2]. Four subsidiary companies; Collins Aerospace, Pratt & Whitney, Raytheon Intelligence & Space, and Raytheon Missiles & Defence help both corporations achieve their goals [3].

The company's full-year sales rose 14% to \$64.4 billion in 2021. Sales were led by Collins Aerospace, followed by Pratt and Whitney, Raytheon Missiles, and Defence & Raytheon Intelligence & Space at \$18.3, \$18.1, \$15.3, and \$15.1 billion, respectively. The company's market capitalization is \$143.29 billion, and its net income was \$3.9 billion in 2021 [4][5]. Looking into future development plans, the company intends to develop products such as:

- A new spacesuit for astronauts with advanced carbon dioxide removal technology.
- A high-resolution climate monitoring system.
- Hybrid electric propulsion jet engines, as well as improving efficiencies of current engines.
- Faster land and satellite missile detection and defence systems.

External factors that may affect the share price of RTX

The US-based Raytheon Technologies Corporation does 62% of its business in the US [6]. The US economy, including pandemic-driven inflation and geopolitical conflicts, heavily impacts its share price (RTX). Phase 1 in Figure 1 depicts slower economic growth due to rising interest rates from the Federal Reserve, which directly affects companies. Since the returns on fixed-income instruments are often inversely proportionate to interest rates and the risk-to-reward ratio makes equities less appealing, when inflation is high, investors prefer to shift their holdings to debt-based assets [7]. Figure 2 shows that in some historic cases RTX fell when CPI rose. On the other hand, it must be considered when market uncertainty develops, major institutions and investors invest in defence stocks due to their non-cyclical behaviour.

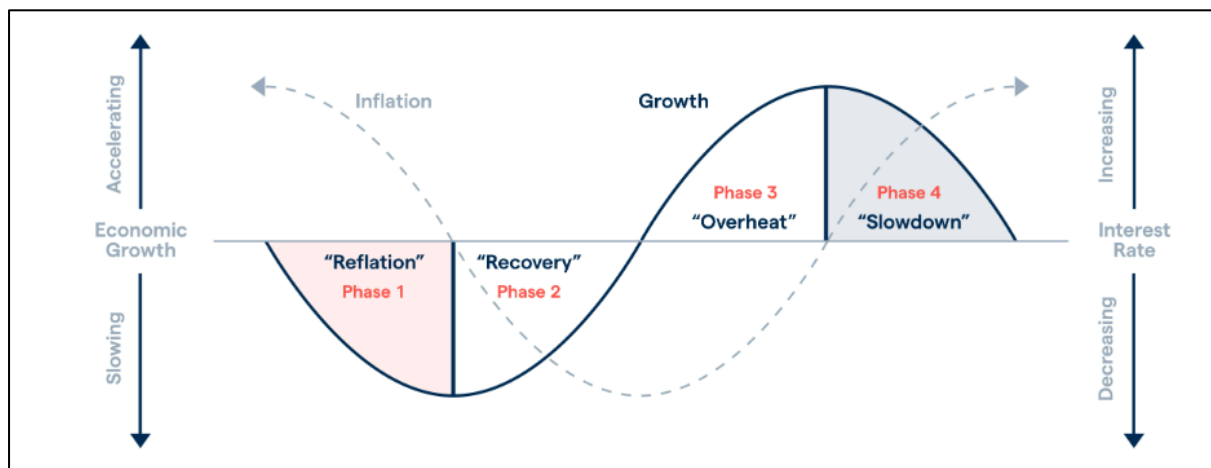


Figure 1: Economic Cycle [8]

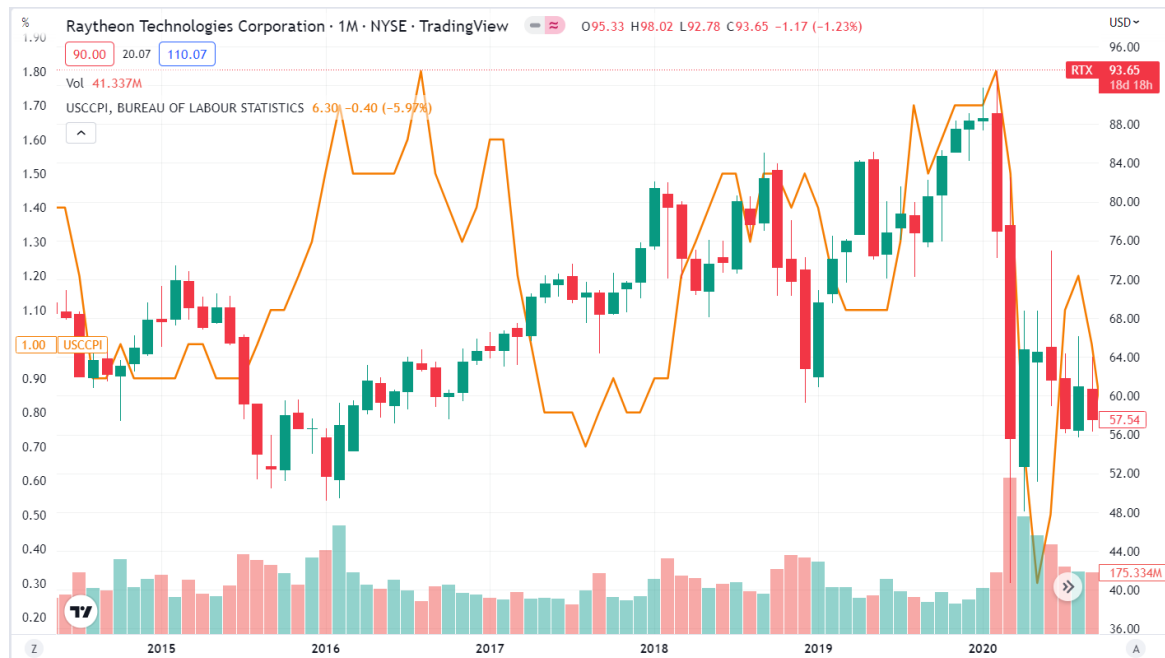


Figure 2: RTX vs CPI [9]

65% of Raytheon's revenues come from the defence industry while the remaining 35% comes from the commercial aerospace industry. Government policies on military spending are a major contributor to RTX price fluctuations [6]. The USA, which has the largest military defence budget, shows to have a strong relationship between economic growth and defence spending [10], which would positively impact RTX share price. A global conflict which reminds nations to strengthen their military capabilities and increase military spending will also positively impact RTX price. A study shows that defence companies perform better with greater geopolitical volatility and greater conflict potential [11]. However, occasionally defence companies may have to halt businesses done in or with nations that are deemed to be the aggressor in a conflict, resulting in a negative impact on the stock price [12].

RTX price will be influenced by commercial aerospace industry economics. RTX prices will fall if passenger numbers fall or fuel prices rise, indicating Raytheon's potential customers' decreasing purchasing power. RTX stock fell 34.6% in the first half of 2020 due to United Technologies' merger, which serves only the pandemic-stricken commercial aviation industry [13].

News, investor sentiment, supply chains, competition and politics also affect RTX pricing. Due to the strong association between political candidates who promise to boost defence expenditure and excess returns in defence stocks, Raytheon has spent \$12.7 million on federal lobbying alone [14]. Supply chain disruptions can lower inventory turnover, making investors think the company's profit margins will fall, lowering RTX price. Figure 3 shows that industrial rivalry threatens Raytheon and due to the niche market, customers have more power in contract dealings. Nevertheless, Raytheon can sustain the duopoly battle with Lockheed Martin as its an industry leader with cutting-edge technologies which gives it economic moats and the impression of a differential advantage.

Table 1: Summary of External Factors

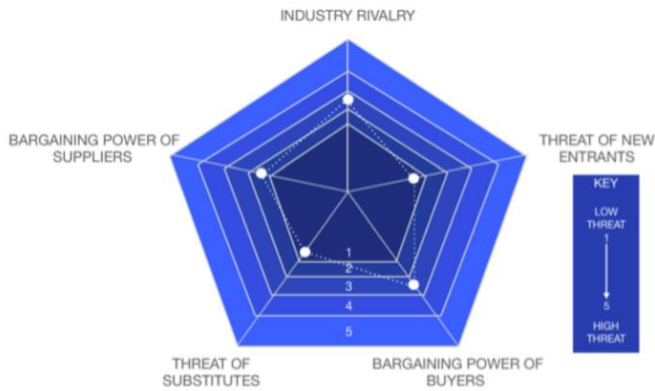


Figure 3: Porters Five Choices [15]

Rising Federal Reserve's interest rate	↗
United States Dollars inflation	↘
Increase in United States' defence budget	↗
Geopolitical tension and military conflict	↗
Trade ban	↘
Increasing number of air travel passengers	↗
Increasing fuel prices	↘
Supply chain disruptions	↘
New Political Leader backing defence	↗

Historical Market Behaviour of Raytheon Technologies

Trends

Trend analysis on the monthly chart in Figure 4 shows that the price is respecting a bullish channel, where the presence of higher highs and lows are also respecting the trend lines. From 2008 to 2020 there have been clean tests of support with an immediate buyback in addition to clean tests of resistance with a clear selloff. However, in March 2020 the trend line was broken but the price pushed back up, hence this can be classed as a deviation. This similar deviation pattern occurred in 2022 but broke above the trend line and deviated down.



Figure 4: Historic market trends of RTX showing bullish channel, and volume [9]

Volatility

From the historical share prices shown in Figure 4, it can be said that RTX volatility is more pronounced during the bear markets due to the substantial increase in trading volume. This implies significantly higher selling pressure versus buying, which leads to volatile negative price actions. Figure 5 shows the stock's volatility over the past ten years using the annual trading price standard deviations of RTX, which were derived using Equation 1 [16].

$$\sigma = \frac{\sqrt{\sum_{i=1}^n (x_i - \mu)^2}}{n - 1} \quad eq(1)$$

Where σ = standard deviation, μ = mean closing price, x = closing price,
 n = Number of years

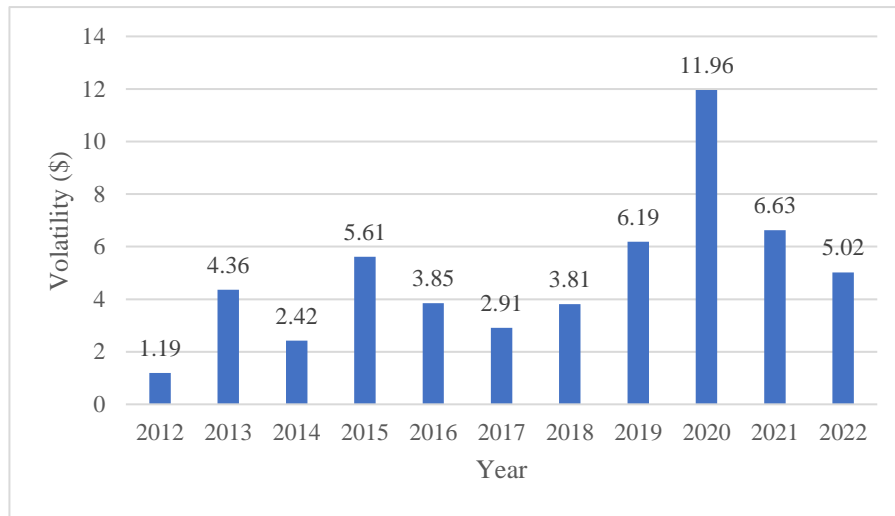


Figure 5: Annual trading price standard deviation graph depicting volatility [4] [16]

Up until 2019, the volatility would remain below \$6 but drastically increased to \$11.96 in 2020. This was because as stated previously during the merger, United Technologies' aerospace division faced heavy exposure to the aviation industry by supplying aircraft engines via Pratt & Whitney, and aircraft interior products through Collins Aerospace; the COVID-19 pandemic severely impeded these businesses [13][17][18]. As shown in Figure 6, the stock price plummeted from a 52-week high of \$91.55 on 11th February 2020 to a 52-week low of \$44.16 on 23rd March 2020.



Figure 6: RTX Chart 52-Week Highs and Lows [9]

It eventually recovered and rose 9% on the day Russia invaded Ukraine (24th February 2022), ultimately leading to a 52-week high of \$106.02, highlighted in Figure 6. With the COVID-19 Pandemic being an anomaly, the volatility of RTX is minimal with a current annual trading price standard deviation, of \$5.02, especially in comparison to its competitor, Lockheed Martin Corporation (LMT), with a current annual trading price standard deviation of \$39.29 [19]. This is also supported by its 5Y Monthly beta of 0.8, which is lower than the beta of 1 for the S&P 500 [20].

Price/Earnings Ratio

RTX currently has a trailing P/E of 31.74x which is higher than the Aerospace & Defence Industry with a P/E of 26.46 [21]. This indicates a possible overvaluation, most likely caused by the bullish outlook of RTX due to the Russo-Ukrainian War. Meanwhile, the forward P/E of RTX is 17.3 [4]. This forecasts a positive EPS as analysts predict an increase in revenue from the war. A reason the trailing P/E may show a sign of overvaluation is that the stock price has increased noticeably since RTX's last quarterly earnings report showing that the trailing P/E may not reflect the current growth.

Supply and Demand Zones

Figure 7 shows key levels discovered whilst analysing Raytheon's price movements. These were a supply zone between \$90-\$92 and a demand zone between \$80-\$83. The price moved between these key levels in 2021, however, the supply zone was broken due to the invasion of Ukraine, causing the stock to rally. This eventually became a demand zone, and the stock was consolidating in that region. This was eventually broken, and the price fell to the previous demand zone, where it was rejected. The rejection's momentum resulted in the supply zone being broken again. At its current price, it may be difficult to predict whether this will rally further or fall and move sideways between the two zones. With the help of the relative strength index, it can be easier to predict future movement.



Figure 7: RTX supply and demand zones with RSI [9]

Three Month Bearish Factors

From Figure 7, we can see the relative strength index (RSI) value is currently inflated at 64.67, indicating that it is reaching overbought territory. There are also several upcoming resistances, which may prove to be difficult to break in the coming months. Looking at the historical market behaviour in Figure 4, there is also a possibility that if the price retest the upper trend line of the bullish channel, it may lead to a bear market spanning a minimum of two to three months.

The tumultuous state around the world is likely to affect the share price within the next three months. Figure 8 depicts major geopolitical events and the drawdowns experienced by the S&P 500. Unexpected conflicts tend to have the largest impact on the stock market which can be seen by the Pearl Harbour Attack having a recovery period of 307 days but conflicts which are expected to start to tend to increase stock prices are deemed as the “war puzzle” which is summarized in Figure 9. Even though there are short-term losses in the share prices, the market has always recovered as seen in Figure 10 and tends to be stable during and after a period of war [22].

Market Shock Events	Event Date	S&P 500 Index		Calendar Days To	
		One-Day	Total Drawdown	Bottom	Recovery
Iranian General Killed In Airstrike	1/3/2020	-0.7%	?	?	?
Saudi Aramco Drone Strike	9/14/2019	-0.3%	-4.0%	19	41
North Korea Missile Crisis	7/28/2017	-0.1%	-1.5%	14	36
Bombing of Syria	4/7/2017	-0.1%	-1.2%	7	18
Boston Marathon Bombing	4/15/2013	-2.3%	-3.0%	4	15
London Subway Bombing	7/5/2005	0.9%	0.0%	1	4
Madrid Bombing	3/11/2004	-1.5%	-2.9%	14	20
U.S. Terrorist Attacks	9/11/2001	-4.9%	-11.6%	11	31
Iraq's Invasion of Kuwait	8/2/1990	-1.1%	-16.9%	71	189
Reagan Shooting	3/30/1981	-0.3%	-0.3%	1	2
Yom Kippur War	10/6/1973	0.3%	-0.6%	5	6
Munich Olympics	9/5/1972	-0.3%	-4.3%	42	57
Tet Offensive	1/30/1968	-0.5%	-6.0%	36	65
Six-Day War	6/5/1967	-1.5%	-1.5%	1	2
Gulf of Tonkin Incident	8/2/1964	-0.2%	-2.2%	25	41
Kennedy Assassination	11/22/1963	-2.8%	-2.8%	1	1
Cuban Missile Crisis	10/16/1962	-0.3%	-6.6%	8	18
Suez Crisis	10/29/1956	0.3%	-1.5%	3	4
Hungarian Uprising	10/23/1956	-0.2%	-0.8%	3	4
N. Korean Invades S. Korea	6/25/1950	-5.4%	-12.9%	23	82
Pearl Harbor Attack	12/7/1941	-3.8%	-19.8%	143	307
Average		-1.2%	-5.0%	22	47

Figure 8: Drawdown's on the stock market after major geopolitical events [23]

	Stock market reaction to:		
	Increasing probability 0–99 %	Expected start 99–100 %	Surprising start 0–100 %
World War II (start in Europe)	↘	↗	
World War II (Pearl Harbor)			↘
Korean War			↘
Vietnam War	↘	↗	
Gulf War (Kuwait invasion)			↘
Gulf War (“desert storm”)	↘	↗	
Afghanistan War	*	↗	
Iraq War (2003)	↘	↗	

* indicates a lack of data in order to investigate this point

Figure 9: Stock Market Reaction to Conflict [24]

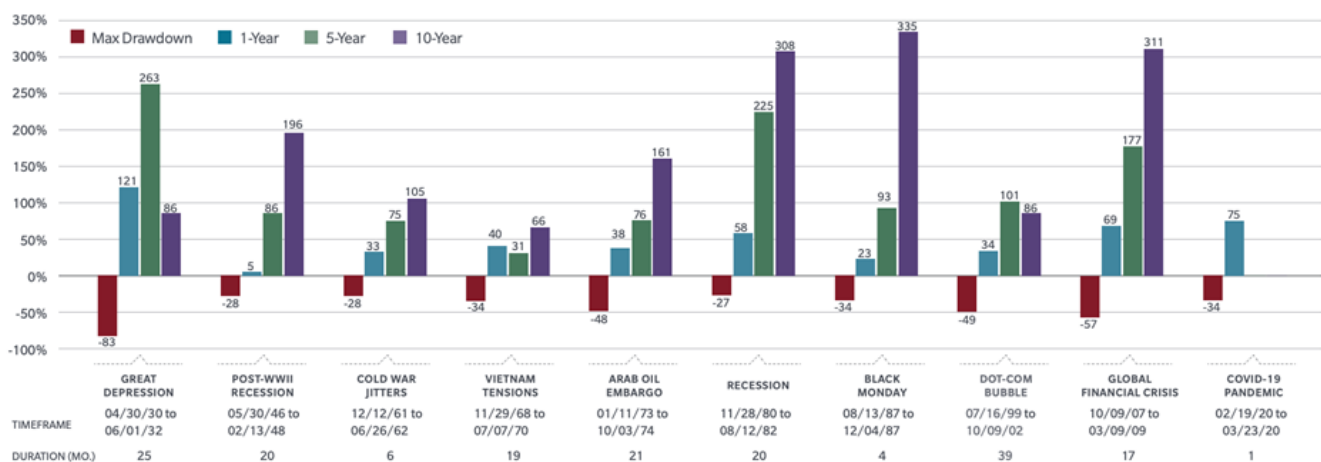


Figure 10: Market Recovery After Conflicts [25]

Raytheon Technologies has an ROE of 6.40%. This is lower than the ROE of 10% for the defence and aerospace industry [26], which in conjunction with a relatively high pay-out ratio of 70.67% might slow the future growth of the company since consistent dividend payments may become unsustainable. The next ex-dividend date is due on 16/11/22 which means investors are no longer eligible for the dividend payment after this date making the stock undesirable and thus should see a share drop equivalent to the dividend payment [27].

Three Month Bullish Factors

Though some technical indicators suggest possible bearish factors, some also indicate bullishness. Figure 4 shows a strong bullish indication as it appears that the price may consolidate at the top of the bullish channel, this in turn will most likely cause a breakout from the trendline as more tests of resistance will result in fewer sell orders. If the Moving Average Diverging/Convergence Indicator (MACD) also crosses over, this will be a secondary confirmation.

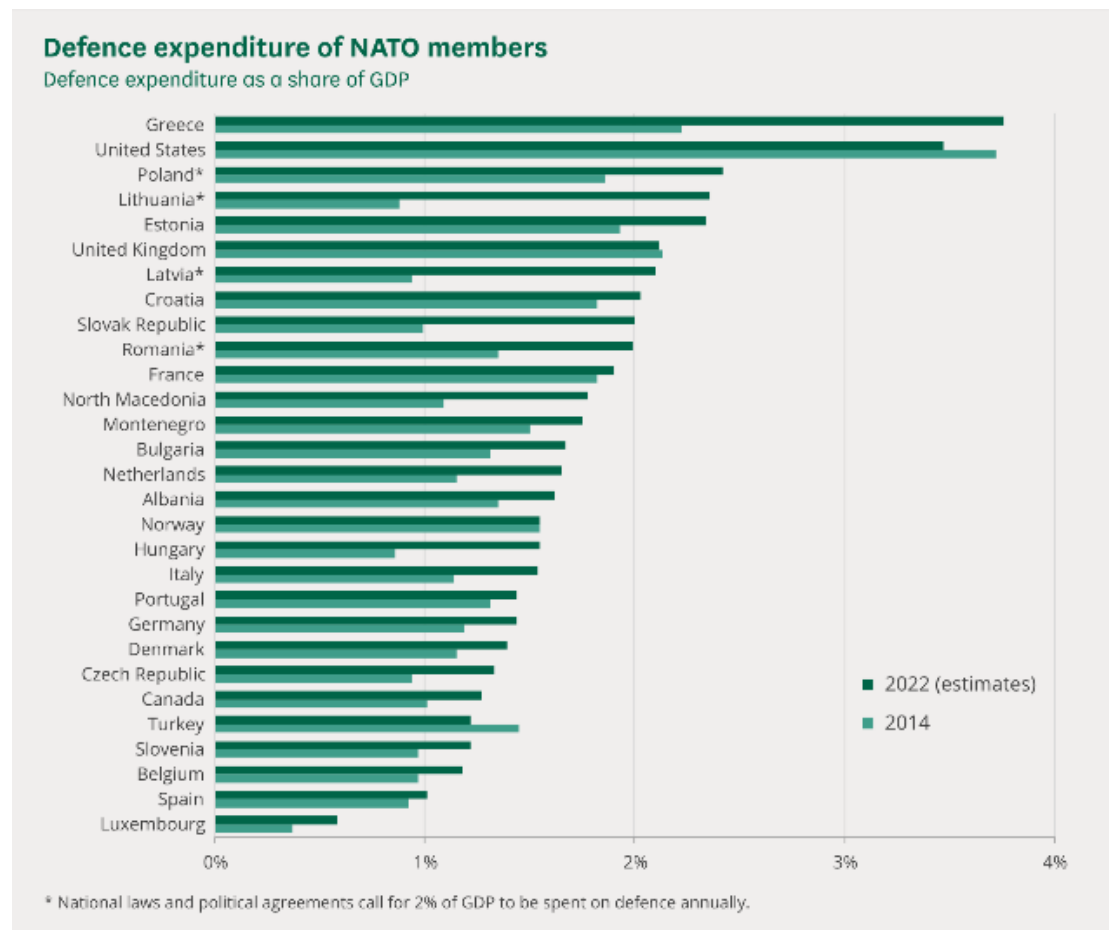


Figure 11: Defence expenditure of NATO members [28]

The relentless US-China and Russia-Ukraine conflicts have prompted increases in NATO defence spending contributions as shown in Figure 11. Specifically, the DoD saw a significant increase in their allocated 2023 fiscal year budget of 4.1% to \$773 billion [29]. Further direct spending contributions towards providing arms to Ukraine have also increased. For example, the DoD authorized a further \$725 million to meet Ukraine's critical defence needs. Raytheon therefore will likely see an increase in sales and revenue in the short term, which may lead to dividends and the share price increasing [30]. According to a study done by the PWC, in 2022, the number of air travel passengers surged 115.9% compared to 2021 and will continue rising due to the easing of travel restrictions. Consequently, in 2024 Boeing and Airbus will deliver about 30% more jets, and revenues will trickle down to suppliers such as Raytheon [31].

Price Prediction

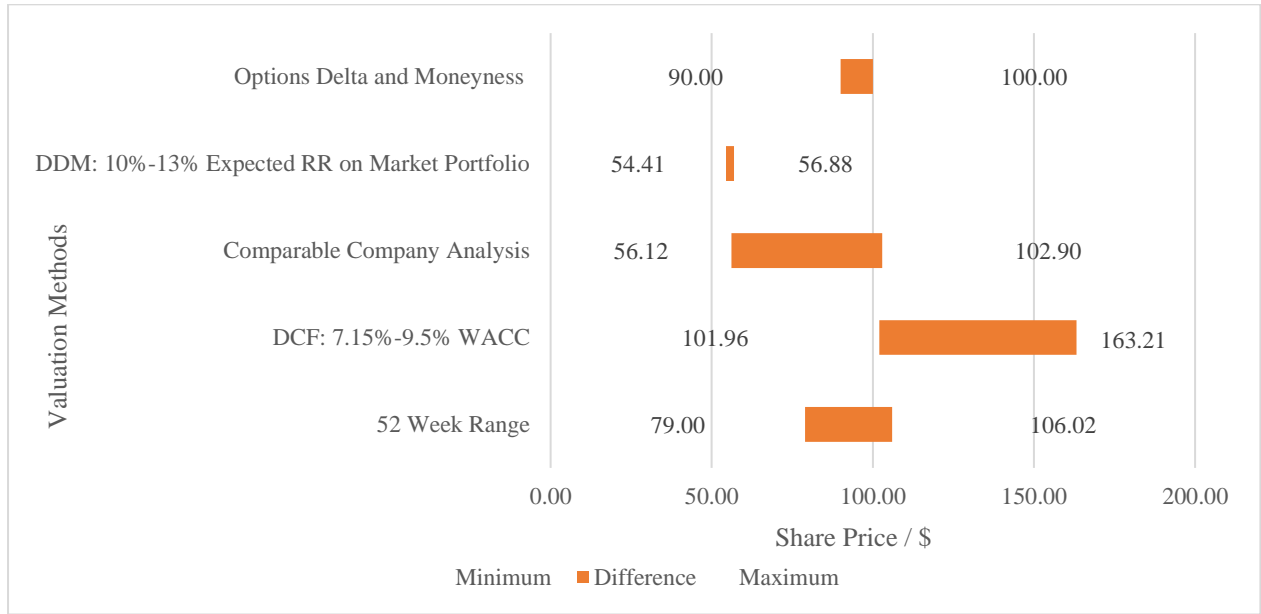


Figure 12: Football field chart depicting valuation methods of RTX [4]

Figure 12 depicts the valuation techniques used to aid in the validation of the price prediction computed (calculations in appendix). Assuming the DDM value to be an anomaly, the valuation methods estimate the long-term share price to be between \$90-\$103 per share. Key equations used to evaluate these valuations are listed below.

Discounted Cash Flow & Discounted Dividend Model

Discounted Cash Flow:

$$DCF: \sum_{n=1}^x \frac{CF_n}{(1+i)^n} \text{ eq(2)}$$

$$\text{Fair Market Value Estimate: } \sum_{n=1}^x \frac{CF_n}{(1+i)^n} + \frac{TV_x}{(1+i)^x} \text{ eq(3)}$$

where CF = cash flow, i = discount rate, n = time period from $1 \rightarrow x$,
 TV = terminal value

Dividend Discount Model:

$$CAPM: E(R_i) = R_f + \beta_i(E(R_m) - R_f) \text{ eq(4)}$$

where $E(R_i)$ = capital asset expected return, R_f = risk free return,
 β_i = market risk, $E(R_m)$ = expected return of market

$$\text{Gordon Growth Model for DDM: } P_0 = \frac{D_0(1+g)}{r-g} \text{ eq(5)}$$

where P_0 = intrinsic stock value, D_0 = current annual dividend per share,
 r = required annual rate of return, g = annual dividend growth rate

A major drawback of the DDM analysis is that it does not consider the buyback of shares, hence providing a conservative value. Raytheon announced on 25th January 2022 that since their \$6 billion buyback programme was announced in 2020, they have already bought back \$2.3 billion of RTX shares [32]. A drawback of the DCF is that it is extremely sensitive to changes in assumptions, hence the range for the WACC resulted in a big difference [33]. Additionally, the Comparable Company Analysis shows a wide range since it utilises different multipliers. DCF and DDM are also for long-term valuations.

Put-Call Ratio



Figure 13: Graph depicting 90-day put-call ratios [34]

$$PCR = \frac{\text{Number of active puts}}{\text{Number of active calls}} \quad eq(6)$$

The open interest put-call ratio is obtained through Equation 6. A high or increasing PCR shows that traders are buying more puts than calls and implies that there is a growing interest to sell. The converse is true for low or falling PCRs. In Figure 13, the PCR for 90-day options is currently at 0.4931 and has remained below 1 for almost the entire year (2022). This, therefore, is a bullish indicator for the next 3 months.

Option Delta and Moneyness

$$\Delta_{call} = \frac{\partial V_{call}}{\partial S} = N(d_1) \quad eq(7)$$

$$d_1 = \frac{\ln\left(\frac{S_t}{K}\right) + \left(R_f + \frac{1}{2}\sigma^2\right)T}{\sigma\sqrt{T}} \quad eq(8)$$

Equation 7 shows the option's sensitivity to price changes of the underlying asset. As the price of the underlying S_t increases, Equation 8 tells us that the delta similarly increases. As $N(d_1)$ is a cumulative normal probability density function, in the money (ITM) call options have higher deltas (closer to 1) than out of the money (OTM) options. Therefore, the delta is often used as a probability that the option will expire ITM [35].

Table 2: Options for RTX expiring February 2023 [36]

Calls						Puts				
Delta	Gamma	Rho	Theta	Vega	Strike	Delta	Gamma	Rho	Theta	Vega
0.7344	0.0222	0.1412	-0.0305	0.1515	90	-0.2356	0.0244	-0.0572	-0.0215	0.1436
0.6114	0.0292	0.1220	-0.1220	0.1780	95	-0.3753	0.0327	-0.0917	-0.0236	0.1769
0.4536	0.0328	0.0930	0.0301	0.1846	100	-0.5520	0.0366	-0.1365	-0.0216	0.1839
0.2901	0.0303	0.0607	-0.0241	0.1598	105	-0.7287	0.0323	-0.0183	-0.0151	0.1532

Table 2 shows various options expiring in February 2023. We notice high deltas for calls with strikes at \$90 and \$95. This implies that there is a higher probability of the underlying share price being higher than or equal to \$90 and \$95.

Linear Regression Prediction

To predict the exact price of RTX on March 31st 2023, the linear regression model was used to logically pinpoint a price that RTX could close at. Figure 14 presents the closing price of RTX from January 2021 to November 2022, along with predicted prices.

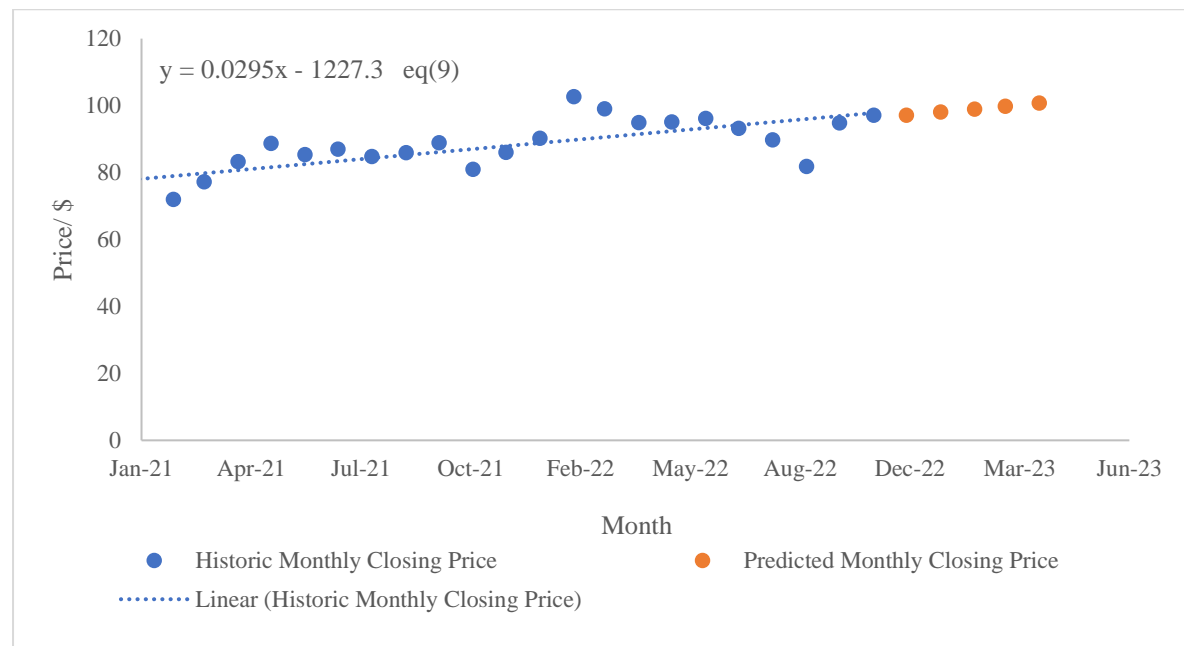


Figure 14: Linear regression graph for price per share of RTX [4]

The model predicts a bullish uptrend, aligning with the high deltas for prices above \$90-\$95, the PCR, and majority of the valuation models. Since the historical closing prices were graphed monthly, this means these were the closing prices on the first day of each month. As a result, the closing price on 1st April 2023 will be the closest to the price on 31st March 2023. Using Equation 9 on the graph, this was calculated to be \$100.70. In conclusion, if no fundamental events severely impact the stock within this one-day gap, the share price of RTX is predicted to be **\$100.00**.

References

1. Raytheon Technologies, "100 years of era-defining innovation," 06 07 2022. [Online]. Available: <https://www.rtx.com/news/2022/07/01/raytheon-100-anniversary#:~:text=Raytheon%20Company%2C%20originally%20known%20as,an%20engineer%20and%20businessperson%3B%20Dr.> [Accessed 20 11 2022].
2. Raytheon Technologies, "United Technologies and Raytheon Complete Merger of Equals Transaction," 03 04 2020. [Online]. Available: <https://www.rtx.com/news/2020/04/03/united-technologies-and-raytheon-complete-merger-of-equals-transaction>. [Accessed 20 11 2022].
3. Raytheon Technologies, "Explore Our Businesses," [Online]. Available: <https://www.rtx.com/our-company/our-businesses>. [Accessed 20 11 2022].
4. Yahoo Finance, "Raytheon Technologies Corporation (RTX)," 25 11 2022. [Online]. Available: <https://finance.yahoo.com/quote/RTX/>. [Accessed 27 11 2022].
5. Raytheon Technologies, "Raytheon Technologies Reports 2021 Results, Announces 2022 Outlook," 25 01 2022. [Online]. Available: <https://www.rtx.com/news/news-center/2022/01/25/raytheon-technologies-reports-2021-results-announces-2022-outlook>. [Accessed 20 11 2022].
6. Raytheon Technologies, "Raytheon Technologies 2021 Investor Day," 2021.
7. "Stocks VS Bonds comparison", Investopaper, [Online] <https://www.investopaper.com/news/stocks-vs-bonds/> [Accessed 7 November 2022].
8. T. Joubert, "ig.com," IG Markets Limited, [Online]. Available: <https://www.ig.com/uk/trading-strategies/how-does-inflation-affect-the-stock-market-210423#information-banner-dismiss>. [Accessed 10 November 2022].
9. "TradingView," 2022. [Online]. Available: <https://www.tradingview.com/chart/6tHbQEzC/?symbol=NYSE%3ARTX>. [Accessed 6 November 2022].
10. H. S. A. & M. J. Mueller, "Defence Spending and Economic Growth," *Defence and Peace Economics*, vol. 2, no. 1, pp. 19-27, 1990.
11. A. H. A. M. Constantin Gurdgiev, "The budgets of wars: Analysis of the U.S. defense stocks in the Post-Cold War era," *International Review of Economics & Finance*, vol. 82, pp. 335-346, 2022.
12. M. S. Nilanjana Basu, "Raytheon cuts revenue forecast as suspension of Russia business hits sales," Reuters, 29 April 2022. [Online]. Available: <https://www.reuters.com/business/aerospace-defense/raytheon-cuts-revenue-forecast-impact-russia-business-suspension-2022-04-26/>. [Accessed 10 November 2022].
13. L. Whiteman, "Here's Why Raytheon Technologies Shares Are Down 34% Year to Date," The Motley Fool, 2 July 2020. [Online]. Available:

- <https://www.fool.com/investing/2020/07/02/heres-why-raytheon-technologies-shares-are-down-34.aspx>. [Accessed 10 November 2022].
14. W. L. R. B. P. H. & M. H. Ghassem Homaifar, "American presidential elections and returns of defence industry stocks," *Applied Economics*, vol. 20, no. 7, pp. 985-993, 1998.
 15. E. Wallace, D. Jones and C. Craig, "Raytheon: No Competitors And Increases In U.S. Defense Spending," *Seeking Alpha*, 9 10 2017. [Online]. Available: <https://seekingalpha.com/article/4112534-raytheon-no-competitors-and-increases-in-u-s-defense-spending>. [Accessed 10 11 2022].
 16. "Raytheon Technologies Corporation Stock Volatility," *Netcials*, 2022. [Online]. Available: <https://www.netcials.com/stock-volatility-nyse/RTX-Raytheon-Technologies-Corporation/>. [Accessed 8 November 2022].
 17. A. Ajmera and M. Stone, "Raytheon commercial business hurt by COVID-19, shares fall on weak outlook," *Yahoo Finance*, 27 October 2020. [Online]. Available: https://uk.finance.yahoo.com/news/raytheon-commercial-business-hurt-covid-161001185.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2x1LmNvbS8&guce_referrer_sig=AQAAACZ_dy6eWbkdzI2fxqLUGpphqAJpJqEmgAeqAeqX78NKUaY1Z6oUysJ59stehWLILBZ_EYlZgMfMmbDNCZol8. [Accessed 10 November 2022].
 18. L. Whiteman, "Why Shares of Raytheon Fell in March," *Nasdaq*, 2 April 2020. [Online]. Available: <https://www.nasdaq.com/articles/why-shares-of-raytheon-fell-in-march-2020-04-02>. [Accessed 10 November 2022].
 19. "Trading Price Standard Deviation (1 year) for Lockheed Martin Corporation," *FINBOX*, 2022. [Online]. Available: https://finbox.com/FINBOX:LMT/explorer/asset_price_stddev_1y. [Accessed 10 November 2022].
 20. "All about alpha, beta, and smart beta," *Fidelity*, 2022. [Online]. Available: <https://www.fidelity.com/learning-center/investment-products/etf/smart-beta#:~:text=The%20beta%20of%20the%20S%26P,tandem%20with%20the%20S%26P%20500>. [Accessed 14 November 2022].
 21. "USA Stock Market: Overview - Sector & Industry Performance," *Guru Focus*, [Online]. Available: <https://www.gurufocus.com/industry/usa>. [Accessed 12 November 2022].
 22. Financhill, "Do Stocks Go Up During War Times?," 2022. [Online]. Available: <https://financhill.com/blog/investing/do-stocks-go-up-during-war-times>. [Accessed 18 11 2022].
 23. Iplresearch, "How Stocks Do During Geopolitical Events," 08 01 2020. [Online]. Available: <https://iplresearch.com/2020/01/08/how-stocks-do-during-geopolitical-events/>. [Accessed 24 11 2022]
 24. T. H. M. O. R. M. W. Amelie Brune, "Springer," 03 04 2014. [Online]. Available: <https://link.springer.com/content/pdf/10.1007/s12232-014-0215-7.pdf>. [Accessed: November 26, 2022].

25. MFS Fund Distributors, "MFS," 30 12 2021. [Online]. Available: https://www.mfs.com/content/dam/mfs-enterprise/mfscom/sales-tools/sales-ideas/mfse_resdwn_fly.pdf. [Accessed: November 22, 2022].
26. S. W. St, "Yahoo Finance," 14 09 2022. [Online]. Available: <https://uk.sports.yahoo.com/news/poor-financial-prospects-dragging-down-191548438.html>. [Accessed 19 11 2022].
27. US Securities and Exchange Commission, "Ex-Dividend Dates: When Are You Entitled to Stock and Cash Dividends," 2022. [Online]. Available: <https://www.investor.gov/introduction-investing/investing-basics/glossary/ex-dividend-dates-when-are-you-entitled-stock-and>. [Accessed 21 11 2022].
28. UK Parliament, "Defence spending pledges by NATO members since Russia invaded Ukraine," 11 08 2022. [Online]. Available: <https://commonslibrary.parliament.uk/defence-spending-pledges-by-nato-members-since-russia-invaded-ukraine/>. [Accessed 23 11 2022].
29. U.S. Department of Defense, "The Department of Defense Releases the President's Fiscal Year 2023 Defense Budget," 28 03 2022. [Online]. Available: <https://www.defense.gov/News/Releases/Release/Article/2980014/the-department-of-defense-releases-the-presidents-fiscal-year-2023-defense-budget/>. [Accessed 26 11 2022].
30. U.S. Department of Defense, "\$725 Million in Additional Security Assistance for Ukraine," 14 10 2022. [Online]. Available: <https://www.defense.gov/News/Releases/Release/Article/3189571/725-million-in-additional-security-assistance-for-ukraine/>. [Accessed 26 11 2022].
31. Global Aerospace and defense: Annual performance and outlook (2022) PwC's global aerospace and defense: Annual performance and outlook. PwC. Available at: <https://www.pwc.com/us/en/industries/industrial-products/library/aerospace-defense-review-and-forecast.html> (Accessed: November 24, 2022).
32. Hake, M.R. (2022) Raytheon will likely rise thanks to buybacks and a dividend hike, InvestorPlace. Available at: <https://investorplace.com/2022/03/rtx-stock-will-rise-from-a-dividend-hike-and-raytheons-6b-buybacks/> [Accessed: November 26, 2022].
33. Maverick, J.B. (2022) What are the drawbacks the Dividend Discount Model (DDM)?, Investopedia. Investopedia. Available at: <https://www.investopedia.com/ask/answers/042315/what-are-drawbacks-using-dividend-discount-model-ddm-value-stock.asp#:~:text=The%20downsides%20of%20using%20the,of%20income%20only%20from%20dividends>. [Accessed: November 26, 2022].
34. "Put-Call Ratio Raytheon Technologies," Alpha Query, [Online]. Available: <https://www.alphaquery.com/stock/RTX/volatility-option-statistics/90-day/put-call-ratio-oi>. [Accessed 25 november 2022].
35. S. K. Parameswaran and S. Basu, "The Black-Scholes Merton Model—Implications for the Option Delta and the Probability of Exercise," *Theoretical Economics Letters*, vol. 10, pp. 1307-1313, 2020.

36. NASDAQ, "RTX Option Chain Greeks," 11 2022. [Online]. Available: <https://www.nasdaq.com/market-activity/stocks/rtx/option-chain-greeks>. [Accessed 26 11 2022].

Appendix:

DCF Excel Tables (WACC 7.15% and Final Year Growth Rate of 2.5%):

Year	2018	2019	2020	2021	2022	2023	TV
Free Cash Flow / \$	1,203.00	3,953.00	2,539.00	5,008.00	7,011.93	12,798.21	282,111.15
Present Value / \$					6,544.03	11,147.18	245,717.39

Sum of Future FCFs	\$ 263,408.60
Debt	31327
Cash	7832
Equity Value	\$239,913.60
Shares Outstanding (Billion)	1470
Price Per Share	\$163.21
Current Price	\$96.85

DCF Excel Tables (WACC 9.5% and Final Year Growth Rate of 2.5%):

Year	2018	2019	2020	2021	2022	2023	TV
Free Cash Flow / \$	1,203.00	3,953.00	2,539.00	5,008.00	7,011.93	12,798.21	187,402.41
Present Value / \$					6,403.59	10,673.85	156,295.66

Sum of Future FCFs	\$ 173,373
Debt	31327
Cash	7832
Equity Value	\$149,878.10
Shares Outstanding (Billion)	1470
Price Per Share	\$101.96
Current Price	\$96.85

DDM Excel Table (10% expected rate of return):

Year	Value	DPS(t) or TV(t)	Growth Rate	Present value at 10.00%
0	2018	2.82		
1	2019	2.96	5%	
2	2020	1.90	-36%	
3	2021	2.01	6%	
4	2022	2.16	8%	
5	2023	2.31	7%	
5	TV	61.82		56.88
Intrinsic value of Raytheon Technologies Corporation Common stock (per share)				\$56.88
Current Price				\$96.85

DDM Excel Tables (13% expected rate of return):

Year	Value	DPS(t) or TV(t)	Growth Rate	Present value at 13.00%
0	2018	2.82		
1	2019	2.96	5%	
2	2020	1.90	-36%	
3	2021	2.01	6%	
4	2022	2.16	8%	
5	2023	2.31	7%	
5	TV	61.82		54.41
Intrinsic value of Raytheon Technologies Corporation Common stock (per share)				\$54.41
Current Price				\$96.85

Comparable Company Analysis:

Company Name	Enterprise Value / bn \$	Market Cap / bn \$	Total Debt / bn \$	Net Income / bn \$	Revenue / bn \$	EBITDA / bn \$	Share Price / \$	Shares Outstanding	Equity Value / \$
Lockheed Martin Corporation	135.8	126.7	45.9	6.2	64.0	8.3	483.5	2.6E+08	1.3E+11
General Dynamics	79.9	69.3	52.5	3.3	38.9	5.3	253.8	2.8E+08	7.0E+10
Northrop Gruman	93.3	81.2	58.3	7.0	35.2	8.7	527.8	1.5E+08	8.1E+10
Honeywell International	156.9	147.9	71.9	5.5	34.4	8.7	220.1	6.7E+08	1.5E+11
L3 Harris	50.4	43.1	31.1	1.9	16.4	3.5	228.7	1.90E+08	4.4E+10

Company Name	P/E	P/B	EV / Revenue	EV / EBITDA
Lockheed Martin Corporation	20.33	11.9	2.1	16.4
General Dynamics	21.37	3.96	2.1	15.2
Northrop Gruman	11.59	6.29	2.6	10.7
Honeywell International	26.70	8.07	4.6	18.0
L3 Harris	23.54	2.28	3.1	14.6

	P/E	P/B	EV / Revenue	EV / EBITDA
Average	20.71	6.50	2.9	15.0
Median	21.37	6.29	2.6	15.2

Valuation with P/E		Valuation with EV / Revenue		Valuation with EV / EBITDA	
		Revenue / bn \$	64	EBITDA / bn \$	11
Net Income / bn \$	4	Implied Enterprise / bn \$	186	Implied Enterprise / bn \$	170
Implied Market Value / bn \$	82	Net Debt / bn \$	35	Net Debt / bn \$	35
Shares Outstanding	1.47E+09	Implied Market Value / bn \$	151	Implied Market Value / bn \$	135
Implied Share Price	£56.12	Implied Share Price	£102.90	Implied Share Price	£92