Raytheon Technologies (RTX)

**Industrials – Aerospace & Defense**

### Investment Thesis

We recommend a hold rating for Raytheon Technologies with a potential downside of 18% and an upside of 11%. Raytheon’s merger is still very new, and we expect the company to realize significant cost synergies over the forecast period. Furthermore, Raytheon is one of the most diversified Aerospace & Defense companies, and its performance is insulated from swings in defense or commercial aerospace markets. Overall, Raytheon is undervalued relative to its peers due to its potential to improve operating metrics over the forecast period. However, we believe the Aerospace & Defense industry is overvalued in light of the heightened threat environment in Europe and Asia.

**Drivers of Thesis**

- Raytheon’s merger with United Technologies was completed in early 2020, and we believe significant cost synergies are yet to be realized. We expect gross margin to increase by 0.50% each quarter from Q1 2023 to FYE 2024. We then forecast gross margin to increase by 0.50% each year for the remainder of the forecast period.

- Raytheon manufactures the only geared propulsion engine on the market, and its GTF engine is currently the most sustainable engine in service. The GTF engine will be installed on Airbus’ new A321XLR coming in 2024, and we forecast that segment revenues will grow by 9.25% in 2025.

**Risks to Thesis**

- The synergies expected from the company’s merger with United Technologies could have been overvalued and result in significant impairments to goodwill. If our expected incremental cost synergies were halved, the DCF price would decline by 17%.

- Delta airline pilots are undergoing contract negotiations and have voted for the authorization to strike. If an agreement is not met, many delta and other airline pilots could strike, reducing demand for aircraft maintenance and other services.

### Earnings Estimates

<table>
<thead>
<tr>
<th>Year</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022E</th>
<th>2023E</th>
<th>2024E</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPS</td>
<td>$4.08</td>
<td>$(2.29)</td>
<td>$2.60</td>
<td>$4.02</td>
<td>$4.47</td>
<td>$5.55</td>
</tr>
<tr>
<td>HF est. growth</td>
<td>-1.6%</td>
<td>-156.17%</td>
<td>-213.34%</td>
<td>-11.27%</td>
<td>58.48%</td>
<td>18.13%</td>
</tr>
</tbody>
</table>

### 12 Month Performance

Raytheon Technologies is an aerospace and defense company that provides advanced products and services for global commercial, military, and government customers. The company operates through Collins Aerospace Systems, Pratt & Whitney, and Raytheon Intelligence & Space, Raytheon Missile & Defense.

**Company Description**

Important disclosures appear on the last page of this report.
COMPANY DESCRIPTION

Raytheon Technologies is an aerospace and defense company that provides advanced products and services for global commercial, military, and government customers. The company operates through Collins Aerospace Systems, Pratt & Whitney, and Raytheon Intelligence & Space, Raytheon Missile & Defense. The pie chart below represents the revenue decomposition of Raytheon’s segments.

**Revenue Decomposition**

The company’s largest customer is the US government, but it has significant exposure to foreign sales as 38% of its revenues were sourced from foreign customers.

Collins Aerospace Systems

Collins Aerospace is a global provider of advanced aerospace and defense products and aftermarket solutions, serving end markets in commercial aviation, business aviation, military and defense, helicopters, space, and airports. In 2021, approximately 65% of segment revenues were sourced through commercial aerospace customers. Additionally, 57% of sales were made to original equipment manufacturers, and the other 43% were from aftermarket solutions. The segment has high customer concentration as Airbus and Boeing accounted for 18%, 21%, and 27% of segment revenues in 2021, 2020, and 2019, respectively.

We believe the segment will experience strong YoY growth of 25% and 12% in Q4 2022 and Q1 2023, respectively. The airline industry is heating up and is close to returning to pre-pandemic levels. Passenger miles have reached roughly 70% of pre-pandemic levels, and travelers through TSA are up 30% YoY and approximately 90% of pre-pandemic levels. The graph below represents our revenue growth forecasts for the past three historical years and forecasted 2022E through 2024E.

As depicted above, we expect growth of 14.3% and 11.4% in 2022 and 2023, respectively. This is due to the swift return of travel volume to pre-pandemic levels. The increase in travel will result in a need for aircraft repairs and part replacement as well as entirely new aircraft.

**Customer Breakdown by Sales**


Source: FactSet
However, we expect more part replacement and maintenance revenue on the previously grounded fleets in 2022 and 2023. Additionally, the segment will benefit from its recent supplemental type certificate to install its CMU-4000 on all Hawker aircraft. The CMU-4000 helps decongest radio frequencies and reduce human error associated with vocal radio communication by enabling communication via text message. This will enhance the segment’s aftermarket solutions revenue as Hawker aircraft are no longer produced since its parent company, Beechcraft, was acquired by Textron Industries. Furthermore, Collins Aerospace recently signed a contract with Airbus to provide engine nacelles for its new A321XLR aircraft that is expected to release in 2024. Therefore, our revenue estimates are slightly below street estimates in the years leading up to 2025, where we are somewhat more bullish than the street. The street expects revenues to reach $26,098 million in 2025, and we see revenues reaching $26,230 million.

**Pratt & Whitney**

Pratt & Whitney is a global leader in designing, manufacturing, and servicing aircraft engines and auxiliary power units. The segment serves the military, commercial, business, and general aviation end markets. The segment has installed over 13,000 large commercial and 7,000 military engines to date. The segment has a concentrated customer base, as Airbus accounted for 31%, 30%, and 31% of segment sales in 2021, 2020, and 2019, respectively.

We expect the segment to experience strong growth due to similar travel trends stated in the Collins Aerospace section above. Additionally, the segment will benefit from an increased military budget of 9% and ongoing re-engine and maintenance contracts for the B-52 bomber. Pratt & Whitney has also developed the most sustainable engine on the market, the Geared Turbo Fan (GTF) engine. The GTF is the only geared propulsion engine in service right now and boasts a potential 75% reduction in noise footprint, 50% reduction in NOx emissions, and 20% reduction in CO2 emissions. The engine is currently installed on the Airbus A320neo family and will be installed on the A321XLR in 2024. The following chart represents historical and projected revenue growth rates for Pratt & Whitney.

We forecast 13.5% and 11.5% growth in 2022E and 2023E, respectively. We expect a large portion of the currently grounded fleet to return to service, and the segment stands to benefit from engine maintenance and replacement. Additionally, our estimates include the sales generated from GTF engines that will be installed on Airbus’ A321 product line. Our forecasts are slightly above street estimates in 2022 and 2023 as we forecast a quicker return to travel, leading to increased demand for engines and power units. We forecast revenues to be below street estimates by $51 million before experiencing over 9% growth in 2025. We anticipate Raytheon will start realizing revenues from Airbus’ A321XLR, in 2025; therefore, we forecast revenues to be $225 million above street estimates in 2025.

**Raytheon Intelligence & Space**

Raytheon Intelligence & Space (RIS) provides integrated space, communication, sensor systems, and cyber and software solutions. The segment generated over 85% of its revenue from the US government in 2021 and 6% from foreign military customers. A few of the segment’s major customers include the US Intelligence Community, the US Department of Defense, the Department of Homeland Security, the Federal Aviation Administration, and NASA. The segment has performed poorly year to date due to lower volume in its Command, Control, and Communications product lines. The segment’s book-to-bill ratio is 0.97 YTD indicating weaker demand. However, as geopolitical tensions increase, we expect the segment to experience significant growth. The US will likely require enhanced intelligence capabilities to assess a nuclear...
threat. Ukraine and its neighboring countries will probably benefit from similar capabilities, unmanned reconnaissance aircraft, and advanced cyber defense systems. Furthermore, demand for training and combat simulation technology is expected to increase as the threat of conflict rises in other parts of Europe and Asia. The following chart contains historical and forecasted revenue growth rates, excluding 2020 growth rates, as data is not available prior to the merger.

Raytheon Intelligence & Space

We forecast a decline in segment revenues in 2022 followed by growth of 6.4% in 2023. We anticipate that demand for surveillance and training products will be low in Q1 and Q2 2023. Therefore, we are forecasting the segment to grow by 3.0% and 3.5% in Q1 2023 and Q2 2023, respectively. We then expect demand to increase due to a slowdown in engagements between Russia and Ukraine and an increasing nuclear threat. A de-escalation in military movements will likely result in heightened expenditure on surveillance capabilities to gather intelligence about potential threats. Therefore, we forecast revenues to proliferate, reaching 11.8% YoY growth in 2024. Our estimates differ from street estimates due to our expectations for surveillance equipment and cyber security solutions. The table below represents our forecasted revenues for the segment and the percentage difference from street estimates.

<table>
<thead>
<tr>
<th></th>
<th>2022E</th>
<th>2023E</th>
<th>2024E</th>
<th>2025E</th>
</tr>
</thead>
<tbody>
<tr>
<td>HF</td>
<td>13,895</td>
<td>14,780</td>
<td>16,526</td>
<td>17,648</td>
</tr>
<tr>
<td>Street</td>
<td>14,443</td>
<td>14,835</td>
<td>15,694</td>
<td>16,440</td>
</tr>
<tr>
<td>% Difference</td>
<td>-3.8%</td>
<td>-0.4%</td>
<td>5.3%</td>
<td>7.3%</td>
</tr>
</tbody>
</table>

Raytheon Missile & Defense

Raytheon Missile & Defense (RMD) is a leading designer and producer of integrated air and missile defense systems, combat solutions, communications, radar, and sensors. The US government accounted for 68% of revenues in 2021, and 28% was attributable to foreign military sales. The segment was recently awarded a $985 million contract with the US Air Force to develop a hypersonic cruise missile. The company has partnered with Northrup Grumman to develop the missile, but we do not expect Raytheon to start realizing revenues for the missile until late 2025. Therefore, we forecasted Q3 and Q4 2024 revenues to grow by 7.0% and 6.5% YoY, respectively. Additionally, the segment installed its first AN/SPY-6 radar on the USS Jack H. Lucas. The radar enables ships to see further and quickly detect and react to threats. We expect demand for missile defense systems to remain elevated in 2023 due to geopolitical tensions in Europe and Asia. Therefore, we expect to see large growth of 11.8% in 2023 and 7.3% in 2024.

Cost Structure Analysis

The following depicts Raytheon’s historical and forecasted gross margin percentage over the 2019 to 2025 period. Raytheon merged with United Technologies in early 2020, and we believe the company will continue to realize cost synergies over the forecast period. The company has realized over $1 billion in synergies since the merger and reached its $600 million target gross cost synergy one year ahead of schedule. We expect it will be able to increase gross margin by 0.5% per quarter until 2025. After that, we
expect synergy realization to slow, and the company will then experience gross margin increases at 0.5% per year over the rest of the forecast period.

Due to the reduction in COGS, EBTIDA margin and net margin will experience growth over the forecast period. The chart below contains EBITDA and net margin data from 2019 to 2025E. As depicted, EBITDA margin increases from 13.2% in 2021 to 15% in 2025E, and the net margin rises by 2.2% from 2021 to 2025E.

**Debt Maturity Analysis**

The following table represents Raytheon’s debt maturity schedule. The most significant principal payment will come due in 2025 of $1,590M. We are confident that Raytheon will be able to meet its obligations and service its debt without the need to refinance. The company is still integrating the merged companies and will continue to generate more cash as cost synergies are realized.

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Payment ($mil)</th>
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</thead>
<tbody>
<tr>
<td>2022</td>
<td>$13</td>
</tr>
<tr>
<td>2023</td>
<td>588</td>
</tr>
<tr>
<td>2024</td>
<td>1,270</td>
</tr>
<tr>
<td>2025</td>
<td>1,590</td>
</tr>
<tr>
<td>2026</td>
<td>751</td>
</tr>
<tr>
<td>Thereafter</td>
<td>27,088</td>
</tr>
<tr>
<td>Total</td>
<td>$31,300</td>
</tr>
</tbody>
</table>

**ESG Analysis**

Raytheon also received one of the best credit ratings among its peers, with an A- rating. The table below contains the S&P credit ratings of Raytheon’s peer group. Raytheon manages its working capital well and has a high interest coverage ratio of 3.51 as of FYE 2021. Therefore, we believe Raytheon will be able to meet its debt obligations over the forecast period.

<table>
<thead>
<tr>
<th>Ticker</th>
<th>S&amp;P Credit Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTX</td>
<td>A-</td>
</tr>
<tr>
<td>LMT</td>
<td>A-</td>
</tr>
<tr>
<td>BA</td>
<td>BBB-</td>
</tr>
<tr>
<td>NOC</td>
<td>BBB+</td>
</tr>
<tr>
<td>GD</td>
<td>A-</td>
</tr>
<tr>
<td>LHX</td>
<td>BBB</td>
</tr>
<tr>
<td>TXT</td>
<td>BBB</td>
</tr>
<tr>
<td>HII</td>
<td>BBB-</td>
</tr>
</tbody>
</table>

**Ticker ESG Risk Score E S G**

<table>
<thead>
<tr>
<th>Ticker</th>
<th>ESG Risk Score</th>
<th>E</th>
<th>S</th>
<th>G</th>
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</thead>
<tbody>
<tr>
<td>RTX</td>
<td>36.0</td>
<td>2.1</td>
<td>2.6</td>
<td>7.5</td>
</tr>
<tr>
<td>LMT</td>
<td>30.3</td>
<td>4.2</td>
<td>4.5</td>
<td>7.7</td>
</tr>
<tr>
<td>BA</td>
<td>34.6</td>
<td>4.6</td>
<td>2.2</td>
<td>7.7</td>
</tr>
<tr>
<td>NOC</td>
<td>26.9</td>
<td>3.1</td>
<td>2.3</td>
<td>8.4</td>
</tr>
<tr>
<td>GD</td>
<td>34.9</td>
<td>0.9</td>
<td>8.6</td>
<td>7.5</td>
</tr>
<tr>
<td>LHX</td>
<td>23.5</td>
<td>1.9</td>
<td>5.3</td>
<td>7.3</td>
</tr>
<tr>
<td>TXT</td>
<td>33.8</td>
<td>3.5</td>
<td>2.2</td>
<td>6.7</td>
</tr>
<tr>
<td>HII</td>
<td>35.5</td>
<td>2.1</td>
<td>3.6</td>
<td>8.3</td>
</tr>
<tr>
<td>Median</td>
<td>34.2</td>
<td>2.6</td>
<td>3.1</td>
<td>7.6</td>
</tr>
<tr>
<td>Average</td>
<td>31.9</td>
<td>2.8</td>
<td>3.9</td>
<td>7.6</td>
</tr>
</tbody>
</table>

**Source:** Sustainalytics, Bloomberg
The previous chart contains ESG Risk scores and environmental, social, and governance scores for Raytheon and its comparable set. The ESG Risk Score is calculated to measure the manageable risk that is not being managed. As seen in the chart, Raytheon has the highest ESG risk score. Therefore, the company’s share price is more likely to react negatively to a material ESG event. The individual ESG scores are out of 10 (10 is better). Raytheon has an environmental score of 2.11, and its score has not changed over the past two years. It performs well in energy management and waste management but lags behind its peers in creating sustainable products and having a negative ecological impact. We expect Raytheon’s environmental score to increase with its strides in sustainable aviation. Raytheon also falls below its peer group’s median social and governance scores. The company has increased its social score by .63 over the past two years. The company scored 1.8 in data security and customer privacy and 3.0 in product quality. Raytheon leads its peer group in both of these areas. Finally, Raytheon falls slightly below the median governance score. The company performs well in most governance categories but lags behind its peer group in its audit score. We expect this to be related to the recent merger and the score will likely increase moving forward.

### Recent Developments

#### Q3 Earnings Results

Raytheon released Q3 results on October 25th. The company’s non-GAAP EPS of $1.21 beat consensus expectations by $0.07. However, GAAP EPS was $0.94 and missed by $0.06. Revenues missed by $250 million. The company lowered revenue guidance from a range of $67.75 to $68.75 billion to $67.0 to $67.3 billion. Raytheon’s underperformance over the quarter resulted from lower volumes in its defense and space segments. However, those segments were offset by its commercial aerospace segments. Collins Aerospace boosted operating profit by 31% QoQ and sales by 11% QoQ. Additionally, Raytheon’s Pratt & Whitney segment grew operating by 68% QoQ, and revenues by 14% QoQ.

The company is experiencing increased demand in its Commercial and Defense businesses. However, the labor market and supply chain has stunted the company’s ability to fulfill its defense backlog in the short term. Raytheon is working very closely with its suppliers to try and mitigate this issue but has revised expectations lower for its defense segments. The company’s defense backlog was up nearly $2 billion for the quarter, and it had a book-to-bill ratio of 1.22 for the quarter. This indicates that demand for defense products and aftermarket support is strong; however, the company does not currently have the means to fulfill its contracts. The company has a positive outlook for its commercial businesses and has revised expectations upwards for its Collins Aerospace and Pratt & Whitney segments. This is due primarily to increased commercial air travel. Travelers through TSA checkpoints reached 91% of pre-pandemic levels, and revenue passenger miles were 75% of 2019 levels over quarter.

#### Overture Aircraft

On July 19, 2022, Raytheon signed an agreement with Boom Supersonic to provide ice protection and air data systems for Boom’s Overture program. The Overture is a sustainable supersonic aircraft that can fly at a speed of Mach 1.7 over water and has a range of 4,250 nautical miles. Raytheon had previously worked with Boom Supersonic to develop Overture’s inlet, nozzle, and exhaust system technologies to enhance its net-zero carbon emissions capabilities. Boom Supersonic stated that they are thrilled to be working with Collins Aerospace for its expertise and scalability as they ramp up production of its supersonic airliner. The Overture will be released in 2025 and will carry its first passengers by 2029. Raytheon will benefit significantly from its partnership with Boom. However, Boom is working with Northrop Grumman to release a particular mission variant of the Overture to government and military customers. Therefore, we expect Raytheon to work mainly on the commercial overtime variant.

#### Hypersonic Cruise Missile Contract

On September 22, 2022, Raytheon Technologies and Northrop Grumman were awarded a $985 million contract to develop a Hypersonic Attack Cruise Missile (HACM) for the U.S. Airforce. The missile pairs Raytheon’s air-breathing technology with Northrop Grumman’s Scramjet engines to create a missile capable of reaching and sustaining Mach 5 speeds. Scramjet engines use high vehicle speed to compress incoming air before combustion, allowing the projectile to sustain supersonic speeds. Raytheon’s air-breathing technology propels the rocket into supersonic speeds, allowing Northrop Grumman’s Scramjet technology to compress and use the surrounding air. Raytheon and Northrop Grumman have
been working together since 2019 to build similar hypersonic weapons. Both companies did not indicate when the missile will be operational; however, we expect the missile to be complete within the next four years, considering they have been working on similar technology since 2019. Therefore, the Missile & Defense segment will likely start to realize the related revenues in 2026.

**INDUSTRY TRENDS**

### Sustainable Aviation

Sustainable aviation focuses on making air travel more efficient and environmentally friendly. Aviation currently accounts for 11% of all US transportation-related emissions. Aerospace companies can reduce emissions by using Sustainable Aviation Fuel. Sustainable Aviation Fuel (SAF) is a biofuel with similar properties to conventional jet fuel; however, the fuel is created using biomass feedstock, which leaves a much smaller carbon footprint. The degree of carbon impact depends on the feedstock used. Feedstock can include corn grain, oil seeds, algae, agricultural residues, wood mill waste, and others. Aerospace companies can also reduce emissions by designing more fuel-efficient aircraft, which Raytheon does well. The company currently manufactures the only geared propulsion engine on the market. Raytheon’s GTF engine uses sustainable aviation fuel and can reduce CO2 emissions by up to 20%. Additionally, the company signed an agreement to provide ice protection and air data systems for Overture, Boom’s supersonic sustainable aircraft. Furthermore, President Biden’s build back better Agenda includes a sustainable aviation tax credit. The credit aims to cut costs and scale domestic production of sustainable aviation fuel. Through this action, President Biden stated that he expects the US to reduce emissions by 20% by 2030 and increase union labor positions. Overall, the industry is moving toward a more sustainable future by investing in innovative technologies that reduce emissions.

### Geopolitical Tension & Supply Chain

The Russia-Ukraine conflict has had a massive impact on the global supply chain. Russia is one of the world’s largest exporters of oil, wheat, palladium, and nickel. The war and the sanctions imposed on Russian exports have caused commodity prices to increase. The increased oil and rare earth metals have caused input prices to increase for Raytheon’s Collins Aerospace and Pratt & Whitney segments as they are direct inputs. However, some of the cost was mitigated by Collins Aerospace as its commercial contracts cover 80% of the associated costs. The war in Ukraine also limits airfreight over Russia, significantly increasing shipping costs and causing delays. Raytheon’s RIS and RMD segments have also experienced difficulties realizing their backlog due to supply chain disruptions caused by the Russia-Ukraine conflict, but COVID-related supply chain issues are fading.

The war between Russia and Ukraine has also caused higher demand for various defense vehicles and weapons. The company expects to sell more of its short-range air defense missiles. The CEO of Raytheon also stated that the heightened threat environment is driving demand for Raytheon’s defense products. The company’s book-to-bill ratio for its defense products was 1.22. Additionally, it increased its defense backlog by around 2 billion over Q3 2022.

### Pilot Shortage

During the pandemic, most airlines assumed that travel would take up to five years to recover. Therefore, airlines placed many pilots on inactive status, pushing them to retire. It is estimated that nearly 6,000 pilots retired in 2020 compared to less than 2,000 in 2019. Travel recovered faster than expected due to vaccine accessibility, excess spending capacity, and the desire for leisure travel. This left the airlines understaffed and forced them to reduce the number of flights they offered. The airline industry continues to face issues, and hiring was down 2.55% in 2021 compared to 2019. The table below contains new pilot hiring data by airline.

<table>
<thead>
<tr>
<th></th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>% Change from 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>United</td>
<td>12,251</td>
<td>11,840</td>
<td>12,231</td>
<td>-0.16%</td>
</tr>
<tr>
<td>Delta</td>
<td>13,082</td>
<td>12,940</td>
<td>13,180</td>
<td>0.75%</td>
</tr>
<tr>
<td>American</td>
<td>13,800</td>
<td>13,400</td>
<td>12,700</td>
<td>-7.97%</td>
</tr>
<tr>
<td>Southwest</td>
<td>9,300</td>
<td>8,500</td>
<td>8,300</td>
<td>-10.75%</td>
</tr>
<tr>
<td>Jetblue</td>
<td>3,661</td>
<td>3,715</td>
<td>3,850</td>
<td>5.16%</td>
</tr>
<tr>
<td>Alaska</td>
<td>3,048</td>
<td>2,974</td>
<td>3,062</td>
<td>0.46%</td>
</tr>
<tr>
<td>Spirit</td>
<td>2,390</td>
<td>2,497</td>
<td>2,744</td>
<td>14.81%</td>
</tr>
<tr>
<td>Total</td>
<td>57,532</td>
<td>55,866</td>
<td>56,067</td>
<td>-2.55%</td>
</tr>
</tbody>
</table>

Hiring fell significantly in 2020 and slightly recovered in 2021. Southwest and American Airlines continue to struggle with their hiring initiatives. Similar airlines will
likely have a more significant number of grounded aircraft than those that have been able to hire more pilots.

Pilots are currently required to retire at the age of 65, and congress is attempting to increase the age to 67 due to the labor shortage for pilots. Additionally, congress proposed to reduce the amount of flight time needed to receive an airline pilot certification. Both proposals would benefit Raytheon as more planes would be needed to accommodate the influx of pilots.

**AEROSPACE & DEFENSE INDUSTRY**

Raytheon Technologies operates within the Aerospace & Defense industry. Industry operators compete for prime contractor roles on major defense programs. Government contracts account for roughly 65% of industry revenues, and the top firms usually source over 70% of revenues from government contracts. The table below contains revenues and the percentage of defensive revenues for Raytheon and its comparable companies. Lockheed Martin is the largest A&D company with respect to revenues and generated roughly 72% of its revenue from defense contracts in 2021. Raytheon is the second largest company but only generated 57% of its revenues from defense contracts. This indicates that Raytheon is well-diversified across commercial and defense markets.

<table>
<thead>
<tr>
<th>Ticker</th>
<th>Revenue (M)</th>
<th>Defense Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMT</td>
<td>67,044</td>
<td>72%</td>
</tr>
<tr>
<td>RTX</td>
<td>64,388</td>
<td>57%</td>
</tr>
<tr>
<td>BA</td>
<td>62,286</td>
<td>49%</td>
</tr>
<tr>
<td>GD</td>
<td>38,469</td>
<td>80%</td>
</tr>
<tr>
<td>NOC</td>
<td>35,667</td>
<td>85%</td>
</tr>
<tr>
<td>LHX</td>
<td>17,814</td>
<td>75%</td>
</tr>
<tr>
<td>TXT</td>
<td>12,382</td>
<td>26%</td>
</tr>
<tr>
<td>HII</td>
<td>9,524</td>
<td>99%</td>
</tr>
</tbody>
</table>

The degree of rivalry within the industry is in between low and medium. Competition is low for most defense contractors as they each specialize in niche areas and invest heavily in R&D to drive product differentiation. However, commercial aerospace is high in both OEM aircraft manufacturers such as Boeing and Airbus as well as component manufacturers. Boeing and Airbus operate in a duopoly for commercial narrow and wide-body jets. Therefore, competition is high as they compete on price and geographic reach. The aerospace component manufacturing market is more fragmented, and operators compete for OEM contracts. For example, Rolls Royce usually supplies engines to Boeing, while Raytheon’s Pratt & Whitney provides engines to Airbus. The bargaining power of customers is high for component and engine manufacturers, as Boeing and Airbus manufacture planes that can accommodate either type of engine. Additionally, the bargaining power of customers is very high for defense contractors, as most of their revenue comes from government contracts. Therefore, revenues are sensitive to defense budgeting. The industry has very high capital requirements, thus making it very difficult to enter. Overall, it seems that companies that diversify across commercial aerospace and defense markets are best positioned for future growth.

**PEER COMPARISONS**

**Lockheed Martin**

Lockheed Martin is a leading aerospace and defense contractor. The company specializes in manufacturing combat aircraft, helicopters, satellites, spacecraft, and ship and submarine technology. Lockheed operates through four segments: Aeronautics (40%), Rotary and Mission Systems (25%), Space Systems (20%), and Missiles and Fire Control (15%). The company’s main customer is the Department of Defense, which typically accounts for around 65% of revenues.

The company is known for its advanced military aircraft, especially its F-35 fighter jet. The F-35 program accounted for 27% of net sales and 68% of Aeronautics sales in 2021. Lockheed differentiates itself from its comparable set through its expertise in designing and manufacturing fighter jets. Lockheed’s jets are far superior to any that are on the market and command a lot of business from international military forces. Lockheed’s Aeronautics segment generated 65% of revenues from the US, and the other 35% was sourced internationally. However, Lockheed partners with Raytheon’s Pratt & Whitney to manufacture the engines for its F-35 program.

**Boeing**

Boeing is one of the world’s largest aerospace companies. The company designs and manufactures commercial jetliners, military aircraft, satellites, missile defense systems, and space flight and launch systems. Boeing operates through four segments: Defense, Space &
Security (45%); Commercial Airplanes (30%); Boeing Global Services (25%); and Boeing Capital (>1%)\(^4\). Since COVID, the company has generated most of its revenue domestically, and 63% of revenues in 2021 were gained within the US. Before COVID, the company generally generated around 50 to 55% of revenues within the US\(^4\).

Boeing is one of two companies that manufactures airplanes that hold over 100 passengers. It is known for its commercial aircraft, but its Defense, Space & Security segment generates the most revenue compared to the other segments. The segment designs and manufactures manned and unmanned military aircraft and weapons systems. Additionally, the segment produces various intelligence systems, including strategic missile and defense systems, surveillance, and reconnaissance, among others\(^18\). The company is currently known for the issues it’s been having with its 737 MAX, which has resulted in the company performing poorly over the past few years. Boeing’s commercial airplane revenues were down 65% from Q1 2018 to Q1 2022\(^20\).

**Northrop Grumman**

Northrop Grumman is a leading global aerospace and defense company. The company has a diverse product portfolio, providing space systems, advanced aircraft, missile defense weapons and long-range firing capabilities, mission systems, and other offerings\(^4\). The company operates globally but typically earns 85% of its revenues within the US. The company operates through four segments: Aeronautics (31%), Space Systems (29%), Mission Systems (26%), and Defense Systems (14%)\(^4\).

Northrop Grumman differentiates itself from its peer set through its expertise in unmanned autonomous vehicles. The company offers HALE and VTOL tactical strike and ISR systems. Additionally, Northrop Grumman is designing an unmanned undersea vehicle named the Manta Ray. The vehicle can operate on long-duration long-range missions by anchoring itself to the sea floor and harvesting energy from surrounding resources\(^16\). The company also competes with Raytheon on manned attack, tactical, and air dominance aircraft.

**General Dynamics**

General Dynamics is a global aerospace and defense company specializing in designing, engineering, and manufacturing various marine, aerospace, and combat products and services. The company operates through four segments: Technologies (35%), Marine Systems (30%), Aerospace (20%), and Combat Systems (20%)\(^4\). The company operates in over 65 countries; however, approximately 85% of its revenue is typically sourced within the United States. The company generated 70%, 12%, 10%, and 8% of its revenue in 2021 from the US government, US commercial customers, non-US government, and foreign commercial customers, respectively\(^15\).

General Dynamics differentiates itself through its expertise in shipbuilding and marine systems. The Marine Systems segment is the largest producer of nuclear submarines for the US Nav and has a nearly $50 billion backlog for its submarines\(^15\). Its expertise in marine warfare allows General Dynamics to benefit from coastal warfare and defense. General Dynamics mainly competes with Raytheon’s Intelligence & Space segment. General Dynamic’s Technologies segment provides information technology and mission systems. The segment provides intelligence, surveillance, reconnaissance, and cyber security solutions, directly competing with Raytheon’s products in these areas.

**L3Harris Technologies**

L3Harris Technologies is a leading aerospace and defense contractor. The company was created by merging L3 Technologies and Harris in 2019\(^21\). The company designs, develops, and manufactures radio communications products and systems, including single-channel ground and airborne radio systems. L3Harris provides advanced defense and commercial technologies across air, land, sea, space, and cyber domains. The company operated through four segments but reorganized its segments in early 2022. The previous segments included: Integrated Missions (30%), Space & Airborne Systems (30%), Communications Systems (25%), and Aviation Systems (15%)\(^4\). The Aviation Systems segment was eliminated in 2022 and reorganized into the three other segments. Product sales typically account for 75% of revenues. Additionally, the company’s main customer is the US government and typically accounts for 75% of sales\(^4\).

The company is smaller than many of its competitors and cannot sustain higher R&D and capital expenditures\(^22\). It allocates a large percentage of its resources to enhancing its current product portfolio rather than diversifying across many different areas. This allows them to be a strong
subcontractor on larger projects. Additionally, the company focuses on allocating resources to improve its operating metrics and has its peer group's highest gross and EBIT margins. We do not expect the company to gain significant market share in the industry and is an attractive acquisition candidate.

**Textron Industries**

Textron Industries is a global aerospace and defense company. It specializes in manufacturing business and commercial planes and helicopters. However, it is also one of the leading manufacturers of helicopters for the US military. It operates through five segments: Textron Aviation (37%), Bell Helicopter (27%), Industrial Segment (25%), Textron Systems (10%), and Textron Financial Corporation (1%)4. The company differentiates itself through its expertise in helicopters and business jets. The company’s industrial segment also produces plastic gas tanks, golf carts, snowmobiles, and all-terrain vehicles21.

**Huntington Ingalls**

Huntington Ingalls designs, builds, and maintains nuclear and non-nuclear ships for the US Navy and Coast Guard. The company also provides after-market services for military ships globally. The company operates through three segments: Newport News (60%), Ingalls (30%), and Technical Solutions (10%)4. The company differentiates itself as it is the sole designer, builder, and refueler of the US Navy’s nuclear aircraft carriers. Additionally, it is the largest military shipbuilding company, and almost all of its revenues are sourced from the US government.

**Margin Analysis**

The following chart contains the 5-year average gross, EBIT, and Net margin for Raytheon and its comparable set. As depicted within the chart, Raytheon manages its costs of goods sold well and has the second-highest 5-year historical gross margin in its peer group. However, its operating margin resides within the middle of the pack and has the second-lowest net margin over the historical period. L3Harris has the highest average gross and EBIT margin, while Boeing has the lowest margins within the peer group. We believe Raytheon will be able to increase its gross and EBIT margin as it continues to realize revenue and cost synergies from its recent merger.
Research & Development

R&D expense is critical to aerospace and defense companies as they are constantly attempting to innovate and create unique products that are difficult to replicate. The chart above contains 2021 R&D expense as a percentage of revenue for Raytheon and its peer group. In 2021 Raytheon ranked second in R&D contributions within its peer group. Raytheon has been making strides within the sustainable aviation market and developing new hypersonic missile technologies with Northrop Grumman since 2016. We expect Raytheon to remain one of the top R&D contributors within its peer group.

Return on Research Capital

The chart above shows the QoQ percentage change in real GDP in the US. As depicted, GDP fell sharply in Q2 2020 when the pandemic struck and made a swift recovery. However, GDP growth has slowed over the past few quarters and reached negative QoQ numbers in Q1 and Q2 2022. This typically refers to a technical recession; however, we believe that we are currently at the peak of a business cycle and can expect a decline in GDP over the next couple of quarters. However, if we enter into a recession, we expect that we will reach a trough in 6 months. On average, troughs are typically noticed six months after markets have bottomed out. We believe that equity markets have hit their trough.
Interest Rate Environment

The chart above consists of US treasury yields as of 11/17/2022. The yield curve is currently inverted, starting at the one-year yield. This is a leading indicator of a recession and a flight to quality. Additionally, the short end of the yield curve continues to steepen as the federal reserve increases the fed funds rate to combat inflation. This further inverts the yield curve as the fed has less influence over the long end of the yield curve. We expect the federal reserve to increase rates by 50 bps at the next FOMC meeting. Rising rates significantly impact Raytheon as it increases its cost of debt.

Unemployment

The chart below shows the monthly unemployment rate in the US in 2022. Unemployment recently ticked up to 3.7% from 3.5%. This is likely a result of rising interest rates and low profitability putting pressure on firms. We believe that increased rate hikes will increase the cost of borrowing for firms, and slower demand might force firms to lay off employees. Therefore, we expect the unemployment rate to increase in November to 3.8% and reach 4% by January 2023. Increased labor pressures could negatively affect Raytheon’s ability to fulfill backlog obligations. However, we believe that Raytheon is overstaffed as a result of the merger, and a reduction in its employee count will boost margins and result in a leaner and more efficient company.

Revenue and Costs

The chart above shows our forecasted net revenue growth rates over the forecast period. Segment forecasts are described in the company description section above. We are expecting slight growth in 2022 as the company continues to struggle with tight labor markets and supply chain. We expect the company to start realizing significant portions of its backlog from 2023 to 2025 before returning to somewhat moderate growth for the rest of the forecast period. Additionally, we expect the company to achieve major cost synergies from its recent merger. We forecast gross margin to increase by 50 basis points each quarter until 2025. We then expect gross margin to increase each year until the end of the forecast period. The DCF price we calculated is highly sensitive to changes in our synergy and CAPEX assumptions. The sensitivity table below depicts how small changes in either input can have large effects on the purchase price. Further description of margin expectations can be found in the cost analysis section.
Management did not provide guidance on capital expenditures, but we expect them to grow in line with the overall inflation rate. Industry operators usually increase capital expenditures to perform new contract obligations. Therefore, it is likely that revenue and capital expenditures would be recognized in the same period. We forecasted CAPEX by growing it by our expected inflation rate.

Discount Rate Assumptions

Five main assumptions flow into the weighted average cost of capital. These include:

- Risk-Free Rate
- Beta
- Equity Risk Premium
- Default Premium
- Marginal Tax Rate

The risk-free rate gathered for Raytheon is the yield on the 10-year US treasury as of 11/14/2022. The 10-year was chosen as it is closest to our forecast period. The Beta of 0.82 was gathered from Bloomberg and was calculated as the two-year weekly raw beta against the S&P 500. The market risk premium is the henry fund’s expected equity risk premium. These three assumptions make up the CAPM model and provide us with Raytheon’s cost of equity of 8.06%. The assumptions were chosen based on the current economic and geopolitical climate. As we are currently in a rising interest rate environment, it would not be realistic to forecast a risk-free rate equal to the 3-month T-bill. This is a consequence of investors moving to longer-duration treasury securities as a flight to safety in uncertain economic and political climates. This significantly increases short-term yields. Therefore, using the T-bond is more appropriate as it presents a more realistic risk-free cost of borrowing over our investment horizon.

The cost of debt is calculated by adding the company’s default premium to the risk-free rate to get the pre-tax cost of debt. This is then multiplied by one minus the tax rate to get a cost of debt of 4.47%. The default premium was found by regressing the company’s peer group yields on outstanding debt and subtracting the risk-free rate. The marginal tax rate was carried forward at the same rate in the most recent FYE, as we do not forecast any significant corporate tax changes over the 8-year period. Multiplying the after-tax cost of debt and cost of equity by their respective weights resulted in a WACC of 7.37%.

Discounted Cash Flow Analysis (DCF)

Our DCF model resulted in an estimated share price of $105.53. We are most comfortable with this model as we were modest in crafting our growth rates and are confident in the the other inputs in the model. The DCF/EP models are calculated by discounting expected free cash flows by the company’s weighted average cost of capital to present value. This gives you the present value of the company’s operating assets. Non-operating assets and cash are added back, and debt and NCI are subtracted to arrive at the equity value. The model is susceptible to its inputs. The table below represents the model’s sensitivity to the risk-free rate and CV growth rate changes. Changes in the risk-free rate significantly impact the WACC, and a slight increase could drastically reduce the valuation.

Implied Price to Earnings/DDM

Historically, Raytheon has increased its dividend every year. However, in 2020 the company reduced its dividend from $2.94 per share to $2.16 per share. The company reduced its dividend again in 2021 to $2.01 per share. We
expect the company to have lower dividends in 2022 before growing over the rest of the forecast period. To forecast dividends, we multiplied the average payout ratio by net income. Over the forecast period, dividends per share will reach pre-pandemic levels in 2028. Using the dividend discount approach to valuation, we calculated a price per share of $77.72. The model is sensitive to its discount rate, which is the cost of equity and the CV growth rate of EPS. Additionally, it is exposed to the shares outstanding as decreases in percentage out will increase earnings per share.

**Relative Valuation**

We calculated the relative value of Raytheon based on the implied relative EV/2023E EBITDA multiple. Using the median multiple of Raytheon’s peer group, it was determined that Raytheon should be trading at $70.15 per share or 11.97-times 2023E EBITDA. The valuation is market-based and consists of many peers that are not true pure-play comps. Therefore, we do not believe that Raytheon’s implied relative valuation is near fair value for the company.

**Target Range**

Our target range for Raytheon is $78 – $105. To generate our target range, we used the DDM as the lower bound of our range and the DCF as the upper bound. We are comfortable with this range as we believe that our DDM produced a price that is the minimum of what someone should pay for the shares based on its expected dividend income. Our DCF price considers various inputs, future growth expectations, and the free cash flows generated by the company; therefore, we see the DCF price as the upper bound of what someone should pay for a share of Raytheon.

**KEYS TO MONITOR**

**Cost Synergies:** Cost synergies are a major driver of our thesis and can quickly change our expected purchase price. If the company overvalued its potential synergies from the merger, then Raytheon will continue to operate less efficiently than its peers.

**Research & Development:** Research and development is critical for attaining new business within the A&D industry. It will be important to see if Raytheons investments in R&D are generating return. The return on research capital metric is important to monitor in this regard.

**Book-to-bill Ratio:** The book-to-bill ratio is a good indicator of demand. It is the ratio of orders received to units shipped. If Raytheons book-to-bill ratio consistently falls below one, it could indicate that its products are no longer superior to its peers.

**Commercial & Defense Diversification:** Firms that are heavily weighted in defense contracts are more sensitive to changes in the defense budget. Additionally, those companies that do not have much exposure to defense contracts will be more susceptible to swings in the commercial aerospace market. Therefore, companies that are well diversified across markets are best positioned for growth.

**Interest Rates:** As interest rates rise, companies’ cost of debt increases. Therefore, it will be more expensive to raise capital. This is crucial for capital intensive industries such as A&D. If interest rates continue to rise, companies may slow down capital expenditures and R&D spending.

**Defense Budgeting:** Many of the top firms in the industry source over 70% of their revenue from government contracts. Therefore, changes in defense budgeting is critical to the success of the industry and those firms. Firms that are diversified across commercial and military segments are better positioned to withstand changes in revolving political agendas.

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