

A Work Project, presented as part of the requirements for the Award of a Master Degree in Management from the NOVA – School of Business and Economics.

Rolls-Royce Holding plc
Equity Research

High debt impact on valuation.

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Abstract

The following equity research has the purpose to estimate the value of Rolls Royce Holding plc. After analyzing the company current situation to understand how the future forecast will look like, the increased level of debt of the last years was analyzed to understand who it affected the valuation. The high level of debt, with the decreased profitability, led to a cost of debt of 5.91%. This value was reflected in the WACC estimate, and used to compute the enterprise value with the discounted cash flows method. The computed share price of 237.15p is higher compared to the current market price of 117.14p as it reflects the positive industry trends of the incoming years.

Keywords – Valuation, Finance, Rolls-Royce Holding plc, Aerospace and Defence

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This report is part of the Rolls-Royce Holding plc report (annexed) and should be read as an integral part of it.

Table of Contents

Rolls-Royce Holding plc Overview	5
Rolls-Royce Trends	6
Civil Aerospace	7
Unit sold, Engine Flying Hours and LTSA.....	7
Power Systems	8
Value Driver	8
Defence	8
Government Contracts.....	9
ITP Aero	9
Selling the branch to rais cash.....	9
Forecast.....	10
Debt & Disposal Program	10
WACC.....	10
MSCI vs FTSE100.....	12
Growth and Continuing Value.....	12
Report Reccomendation	13

Rolls-Royce Holding plc Overview

Rolls-Royce Holding plc was founded by Charles Rolls and Henry Royce during the year 1906. The company had many ups and downs during the many years of operations. In 1971 the company was forced to enter in a voluntary liquidation as it was unable to meet its financial obligations. In 1987, under the government of Margaret Thatcher, the company was privatized and then returned to the stock market. Since then, the company has been trading on the stock market as Rolls-Royce plc.

In the company's words "Rolls-Royce pioneers cutting-edge technologies that deliver clean, safe and competitive solutions to meet our planet's vital power needs. Our purpose is to pioneer the power that matters to connect, power and protect society".

Exhibit 1: Rolls-Royce plc historic stock price (GBP)

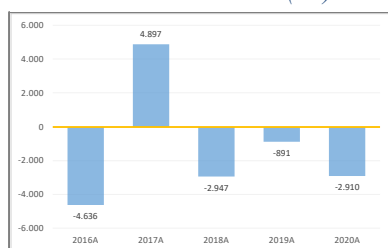


Source: Bloomberg

In 2016, the company registered the biggest loss before taxes of the last years (Exhibit 4) and hence the management team was forced to undertake drastic measures. The stock price suffered on of its biggest drops, second only to the 2020 one. In 2018, a restructuring program was announced with the goal of cutting costs and increasing efficiency. Rolls-Royce was reorganised in three independent business units, Civil Aerospace, Power Systems, and Defence.

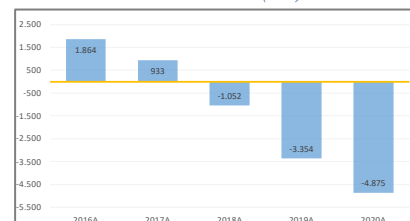
The recovery process was made even harder by the enormous investment in the development of the Trent 1000 engine for commercial aircrafts. The programme suffered significant delays due to reliability issues. This led to excessive capital expenditure in R&D, with the hope of increasing reliability, and to sustain more frequent inspections.

Exhibit 2: EBT 2016 – 2020 (£m)



Source: Company Data, Analyst

Exhibit 3: Net Liabilities (£m)



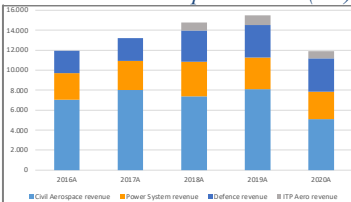
Source: Company Data, Analyst

Rolls-Royce, already damaged by the 2016 drop and the problems of Trend 1000 engine, was heavily hit by the Covid-19 in 2020. The pandemic forced airlines to leave most of planes on ground which means fewer flying hours and less engine checks. The reduction in the company main sources of revenue lead to a second significant loss of the year of £3bn. The stock market reacted drastically causing a fall of the stock price which dropped from 327p to 44p (-86,5%) in one year. The urgent situation forced the management to raise capital to survive. £4bn was raised in debt and £2bn was financed by issuing 6.4bn shares.

The current financial situation of Rolls-Royce looks precarious. In the past three years, the company continuously registered negative net liabilities and cash flows (Exhibit 5). In 2020, the Rolls-Royce recorded a cash outflow of £4,185m making the need of a better balance sheet a priority for the company's long-term survival.

Although the overall picture suggests that a rapid recovery will be hard to achieve, updated market trends and the latest successes of Rolls-Royce's restructuring program provides some optimism for the future forecast. The company aims to raise further £2bn, through its disposal program, by selling all the business classified as not strategic aiming to fix its balance sheet and return to a positive cash flow. These decisions are expected to slowly bring the value of net liabilities to a positive figure in the next years, reducing interest expenses and boosting cash inflows on the long run.

Exhibit 4: Revenue per Branch (£m)



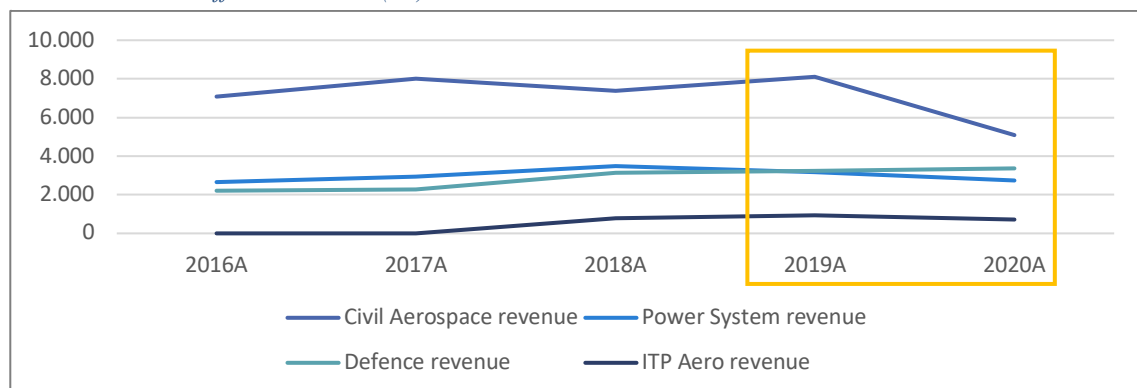
Source: Company Data, Analyst

Rolls-Royce Trends

As stated previously, Rolls-Royce plc operates in three main sectors: Aerospace, Power Systems and Defence. Although the main source of revenues come from the Aerospace industry (nearly 50%), the other two sector represent a significant source of sales. In 2020 revenues from Power Systems accounted for 23% of total sales and Defence for more than 28% (Exhibit 6).

The current pandemic impacted each sector differently, with affecting mainly the Aerospace branch, causing a 28% drop in the company's total revenue compered to 2019 (Exhibit 7). By analysing each sector individually it's possible to highlight the specific value drivers and how Covid-19 affected them. A good understanding of the reasons of the poor performance of Rolls-Royces in 2020, will allow the analysts to comprehend the strengths and weaknesses and, hence making a reasonable forecast.

Exhibit 5: Covid-19 effect on Revenue (£m)



Source: Company Data, Analyst

Civil Aerospace

The Civil Aerospace branch represents the main source of revenue for Rolls-Royce, and it accounted for 43% of total revenues in 2020. The branch is a major manufacturer of aero engines for large commercial aircrafts, business aviation and commercial jets. Among these, large engines account for 65% of the revenue mix, explaining why the branch was heavily affected by the COVID-19 pandemic which saw a 37% drop in revenues in 2020.

The Civil Aerospace sources of revenue are the number of new engines sold, Engine Flying Hours (EFH) and the Long-Term Service Agreement (LTSA). Although all three are linked, an individual analysis of the value drivers will improve the forecast of the branch revenues.

- Unit sold, Engine Flying Hours and LTSA

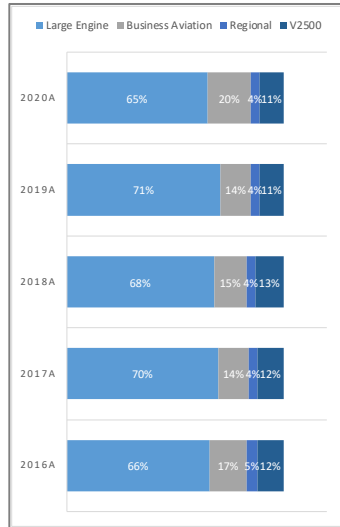
The large aircraft engine sector is mature and is not expected to grow exponentially in the incoming years. A growth of 0.9% YoY is expected for global market size for the next 10 years. According to an IATA report “Economic Performance of the Airline Industry”, commercial aircraft are expected to overtake the 2019 sales as soon as 2022. Moreover, according to Rolls-Royce’s annual report, an increase in the number of large engines sales is to be expected as most of their old engines are reaching the end of their useful life. This information suggests an incoming increase in units sold is to be expected. The market growth and the incoming growth in engine sales will have a positive impact on Rolls-Royce’s revenues boosting its short-term recovery.

One potential risk is that the whole Airline industry was heavily impacted by the pandemic. Therefore, the airline companies will probably try to avoid unnecessary expenditure in the incoming years.

Multiple reports, one of which the “20 Year Passenger Forecast” from IATA, expect the number of passengers to recover to 2019 levels no sooner than 2023. Although this data does not provide a precise estimate of the Engine Flying hours, it is reasonable to assume the two to be closely linked meaning that EFH will return to pre-Covid levels in 2023. Moreover, EFH and LTSA will most likely follow a similar recovery trend as aircraft engines require periodical maintenance based on the engine flying hours. Flight numbers are forecasted to grow by 1.9% YoY, after recovering from the current crisis. A similar yearly growth is expected for revenues from EFH and LTSA.

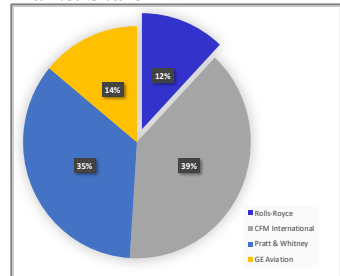
The global fleet size is expected to grow from 2021 to 2031 with CAGR 2.5% while the MRO is forecasted to have CAGR 3% in the same period¹. These will impact revenues from the Civil Aerospace branch which is expected to have the same CAGR in each segment. The analysts don’t believe Rolls-Royce will be able to increase its market share in the close future as all the company resources are used to solve its financial issues. The company market share will stay constant at 12% as in 2019 and 2020².

Exhibit 6: Civil Aerospace Revenue Breakdown



Source: Company Data, Analyst

Exhibit 7: Rolls-Royce 2020 Market Share

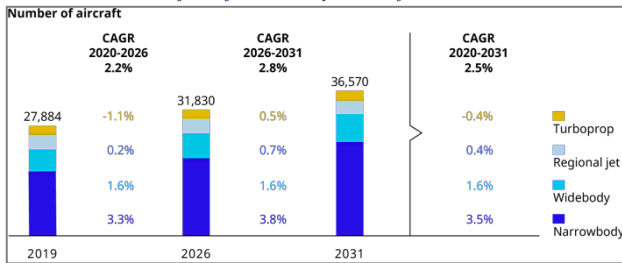


Source: Statista, Flight Global

¹ Oliver Wyman analysis, Global Fleet and MRO Market Forecast 2021-2031.

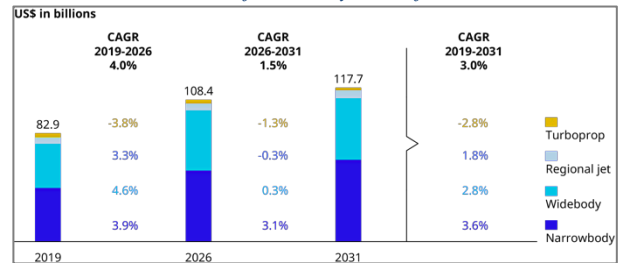
² Flight Global, Commercial Engines 2021.

Exhibit 9: Global fleet forecast by aircraft class, 2020-2031.



Source: Oliver Wyman analysis

Exhibit 8: MRO market forecast by aircraft class, 2019-2031.



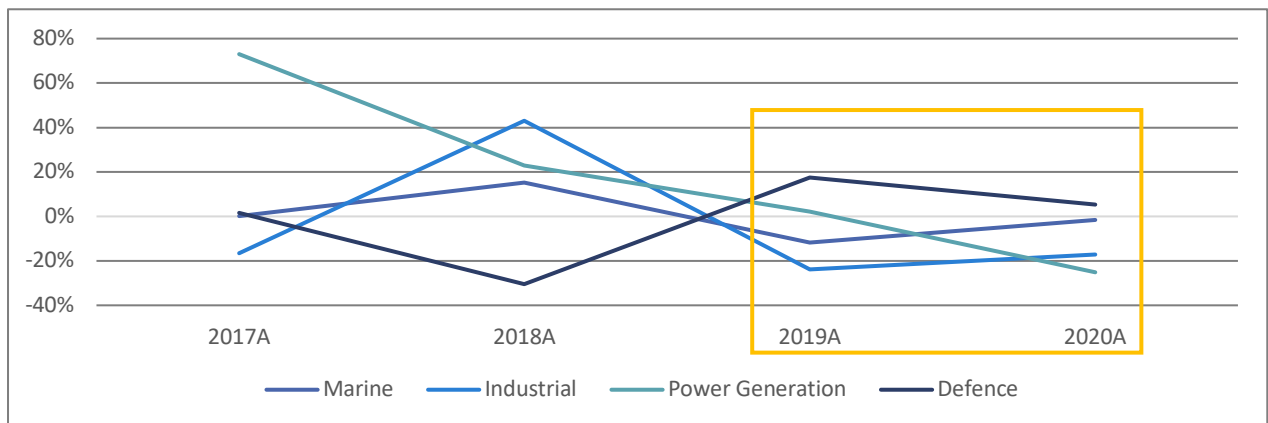
Source: Oliver Wyman analysis

The precise forecast of the industry growth is impossible to compute, and it mainly depends on how quick governments will recover from the pandemic and ease the traveling restrictions. There are three possible scenarios depending on how fast the market go back to pre-Covid levels. In the worst-case scenario, “weak scenario”, the Airline industry will take up to 6 years to recover. The more optimistic analysis expects the market to recover in just a few years, this would be the “best scenario”. A “base scenario” expects the market to recover in 3-4 years.

Power Systems

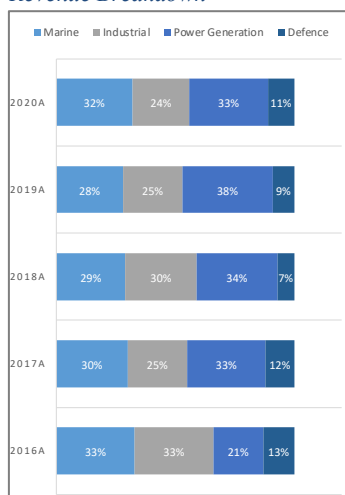
The Power Systems business accounts for significant part of Rolls-Royce revenue, generating in 2020 more than £2.7bn in revenue (23% of total revenue) and £178m in profit. Although this represents a shrink compared to 2019 the industry suggests a fast recovery and growth potential.

Exhibit 10: Covid effect on Power Systems Revenue



Source: Company Data, Analyst

Exhibit 11: Power Systems Revenue Breakdown



Source: Company Data, Analyst

Power Systems is a leading provider of high-speed reciprocating engines and complete propulsion and power generation systems. The branch serves the marine, defence, power generation and industrial markets. Although the pandemic generally had a negative impact on revenues it affected them differently. The power generation and industrial markets were the two that suffered the most, with a respective loss of -17% and -29% in 2020. The two markets will have a higher growth rate in the next years as they go back to pre-Covid levels.

- Marine and power generations engines

The main sales driver of the market the engines sold for the marine market and the power generation systems. Both have a significant weight in the branch sales accounting for 65% of total revenues (Exhibit 13). Their growth is key for the business future success.

The marine market is expected to grow at a 4% rate for the next 10 years³. This accounts for both the private industry and the commercial one, as Rolls Royce produces engines for both private yachts and the commercial maritime market. It is expected for the company's sales to at least follow the global market trend.

Market research show that there is a growing attention and demand for sustainable engines in the marine market. Although this is long term investment and not estimable with precision. Rolls Royce Power Systems is investing part of its resources into it, if this trend is as expected by the company could have a significant impact on its future revenues.

Defence

The defence branch is a market leader in aero engines for military transport and patrol aircraft with strong positions in combat and helicopter applications. It has significant scale in naval and is the technical authority for through-life support of the nuclear power plant for the Royal Navy's submarine fleet. Despite the Covid-19 pandemic the branch to grow its revenues by 4% and operating profits by 8%.

Overall, the forecast looks positive with a confident growth for the incoming years. The branch has signed contract with multiple military forces across the globe as the German Air Force, the Republic of Korea Navy and more. Moreover, the group is the official supplier of the Royal Army and is working on strengthening its position in the United States.

Being international governments and military forces the main clients on the Defence branch the market is expected to follow the governments military expenditure trend.

ITP Aero

ITP Aero is a global leader in aero-engine subsystem design. Alongside the development, manufacturing, assembly and testing of engine components, it provides MRO services for regional airlines, business aviation, industrial and defence applications. Since its acquisition in the end of 2017 the branch has generated positive income but now it plays an important role in the disposal program of Rolls Royce.

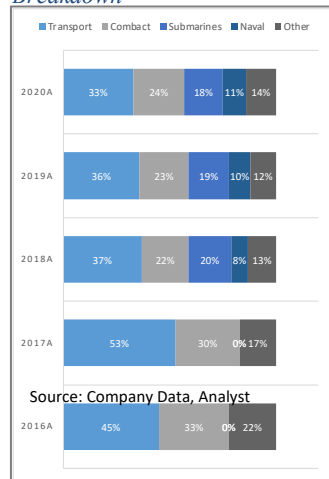
To fix its balance sheet issues Rolls Royce is aiming raise £2 billion in cash. For this reason, the company has agreed to sell the Spanish branch to Bain Capital Private Equity for approximately £1.7 billion. The buyout should occur in mid 2022 and the agreement marks a milestone in Rolls Royce recovery process.

Moreover, Rolls-Royce and ITP Aero announced that a partnership between the two companies will continue to exist in the future⁴. A healthy cooperation between the two companies is key to boost Rolls-Royce growth even more as ITP Aero will become a key supplier.

▪ Selling ITP Aero

Although the exact conditions of the deal are confidential is expected that, for the transaction to take place, some requirements need to be fulfilled. The expected day for this to happen is around mid 2022, but there is a range of uncertainties that need to be assessed.

Exhibit 12: Defence Revenue Breakdown



³ Global Industry Analysts & Statista

⁴ Rolls-Royce Holding plc press release

There is a risk for the needed condition never to be met, cancelling the deal. This is the worst-case scenario and is not expected to happen. Other two relevant factors are the price and the day the transaction will occur.

The price of £1.7 billion on which the two parties agreed on has probably a variable component into it. If the aerospace market does not recover as expected the price could drop, putting in danger the recovery plan of Rolls Royce. At last, a delay in the fulfilment of deal condition will probably put in danger or delay the recovery of the company. Later these two aspects will be analysed with the goal to measure their effect on the valuation.

Overall, the ITP Aero buyout means that Rolls-Royce will lose the branch revenues from 2022 on, less than £1 billion, with a little impact on sales growth rate.

Debt & Disposal Program

Since 2016 Rolls-Royce has been increasing its debt touching a total £7.3bn of debt in 2020 (Exhibit 34). This debt was raised with only goal of allow the company to survive the pandemic crisis and not to finance its growth. Such high levels of debt raised financial costs which will affect the profitability.

Exhibit 13: Debt level 2016-2020

	2016A	2017A	2018A	2019A	2020A
Rolls-Royce plc					
Debt	3.357	3.488	4.662	5.685	7.330
Cash	5	7	750	18	288
Net Debt	3.352	3.481	3.912	5.667	7.042

Source: Company Data

Rolls-Royce was downgraded to a Ba3 grade which increased interest expense and damaged the company's cashflows. If the situation does not recover the company could lose future deal due to its high probability of insolvency. The overall situation makes the reduction of the company's debt a priority and the management team are working on raising enough cash to decrease the total debt.

A higher debt level affected the debt-to-equity ratio which rose to 0.73. Looking at the comparable the figure results above average (Exhibit 35). Suggesting that Rolls- Royce should target at least a D/E ratio of 0.43. The announced deal to sell ITP Aero for 1.7bn suggests that the company will be able to raise enough cash to avoid further raise of debt and work on de reduction of its D/E ratio.

Exhibit 14: Comparable D/E

Company	Debt	Market Cap	D/E
Raytheon Technologies	24.775	79.595	0,31
General Electric	57.167	69.348	0,82
Honeywell	17.004	108.570	0,16
Average			0,43

Source: Bloomberg

WACC

The WACC was computed using the Modigliani Miller approach including the tax shield effect. This led to a WACC of 6.12% (Exhibit 36). To compute the different inputs for the WACC formula the analysts tried different approaches in order to find values that better reflected their beliefs.

- Cost of Equity

The Cost of Equity (Re) of 6,31% was computed using the Capital Asset Pricing Model (CAPM) through the risk-free rate (rf), MRP and Beta. rf was computed based on a 10-year UK Government

Exhibit 15: WACC

Market Capitalisation (million £)	11,032
Market Value of Debt	8,065
Debt/Equity	0,73
Target D/E	0,43
rf	1,00%
Market Risk Premium	5,31%
Beta	1,23
Corporate Tax rate	3,40%
Unlevered Cost of Capital (Ru)	7,53%
Cost of Equity (Re)	6,30%
Cost of Debt (Rd)	5,91%
WACC	6,12%

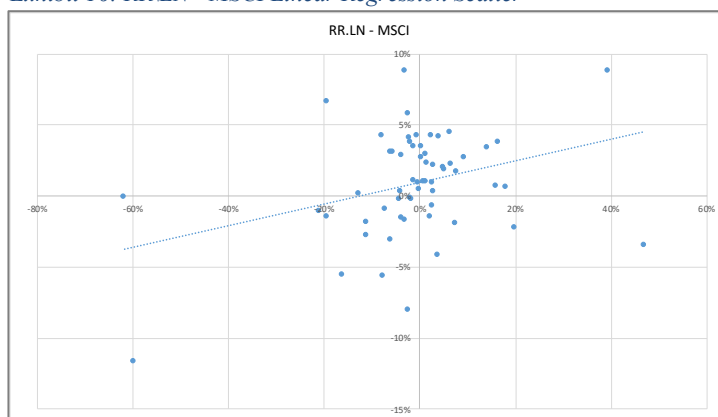
Source: Analyst estimates

bond yield. The bond was chosen as it reflected the 10 years forecast period and was issued in the same currency of Rolls-Royce cashflows.

For the Market Risk Premium estimate the analysts used the one suggested by the professor Aswath Damodaran of 5,31%⁵. Different papers prove that Damodaran value is good estimate of the expected market return⁶.

The Beta was computed with different approaches. First the company stock was compared with the MSCI index using excess return. This gave a very low value for R2 of 0.09, therefore the choice of using monthly returns was made as it improved the model with a higher R2. The Beta of 1.49 was then unlevered and levered again with the target D/E ratio. The final value for Beta of 1.23 was compared with the industry average of 1.03. The higher level of Beta for Rolls-Royce is justified as the targeted D/E ratio is still bigger than the Aerospace market of 0.33.

Exhibit 16: RR\LN - MSCI Linear Regression Scatter



Source: Bloomberg, Analyst estimates

■ Cost of Debt

The Cost of Debt estimate (Rd) is significantly affected by the current high level of debt carried by Rolls-Royce and the below investment grade of its bond (Ba3). Due to these factors the company's Rd is equal to 5.91%.

Due to the poor risk grade to compute YTM the following formula was adopted:⁷

$$Price = \frac{E(CF)}{1 - Rd} \quad YTM = \frac{Price}{Issue Price}$$

To compute YTM it was decided to use the most liquid bonds with the longest years to maturity. The only one meeting these requirements was a bond issued in 2020 at price of \$100,00 with a coupon of 5.75.

The recovery rate of 60% was given from the company's annual report and the probability of default was given by Moody's annual default study at 9.35%.

Finally, the Rd was computed by using the binomial tree formula by subtracting from the YTM the PD times LGD, obtaining a before-tax Rd of 6.12% (Exhibit 36). From here the after-tax Rd of 5.91 was computed.

Exhibit 17: Cost of Debt

Kd	5,75%
Probability of Default	9,35%
Recovery Rate	60,00%
Price	91,03
YTM	9,86%
Before Tax cost of debt	6,12%
Cost of debt	5,91%

Source: Analyst estimates

⁵ Aswath Damodaran, Country Default Spreads and Risk Premiums.

⁶ Pablo Fernandez, Sofia Bañuls, Pablo Fernandez Acin. IESE Business School Working Paper. Market Risk Premium and Risk-Free Rate used for 88 countries in 2021.

⁷ McKinsey & Company, Valuation

Once again, the effects of the high level of debt carried by Rolls-Royce are noticeable. Due to the low credit score the company has to carry a high Rd which leads to higher WACC. With a lower D/E ratio it can be achieved a better credit score which in turns allows for a lower WACC (Exhibit 39).

Exhibit 18: WACC sensitivity on Rd and Beta

		Beta				
		0,93	1,08	1,23	1,38	1,53
Rd	3,34%	4,48%	4,93%	5,38%	5,84%	6,29%
	4,84%	4,92%	5,37%	5,82%	6,27%	6,72%
	6,34%	5,35%	5,80%	6,26%	6,71%	7,16%
	7,84%	5,79%	6,24%	6,69%	7,14%	7,60%
	9,34%	6,22%	6,68%	7,13%	7,58%	8,03%

Source: Analyst estimates

The capital structure of the company has an impact also on the Beta estimate. A lower target D/E allows for lower Betas (Exhibit 40). This will allow for a lower Re and lower WACC.

Exhibit 19: Beta sensitivity on D/E

		D/E				
		0,13	0,28	0,43	0,58	0,73
Unlevered Beta	0,67	0,76	0,85	0,95	1,05	1,14
	0,77	0,87	0,98	1,09	1,20	1,31
	0,87	0,98	1,11	1,23	1,36	1,48
	0,97	1,09	1,23	1,37	1,51	1,66
	1,07	1,21	1,36	1,52	1,67	1,83

Source: Analyst estimates

Achieving lower WACC estimates will allow Rolls-Royce to benefit from a better valuation.

MSCI vs FTSE100

To compute Rolls-Royce beta the analysts preferred to use the MSCI world index instead of the FTSE100.

The FTSE100 only considers the highest 100 companies by market capitalisation in the London Stock Exchange. Although the index could be a good choice for the beta estimate as Rolls-Royce headquarters are in the UK and the index shares the same currency, this was not the preferred option as the company generates profits mainly from developed countries across the world. For this reason, the MSCI world index was preferred.

Growth and Continuing Value

Due to the size of Rolls-Royce Holding and the market maturity from 2030 on the growth rate is assumed to be constant at 0.5%, below the forecasted 2.9% average GDP growth rate⁸.

The continuing value growth rate is assumed from 2030 on as the rates seem to stabilise during the last years of the forecasted model (Exhibit 41). To compute the growth rate $ROIC_{t-2}$ seemed a better forecast indicator. The reason for it is that Rolls-Royce takes more than one year to record the returns on their investments as their products and services are very complex.

The forecasted growth rate of 3.5% for 2030 was used to compute the terminal value after the reality check. To compute the growth rate in real terms the computed 3.5% was adjusted by the expected 3% inflation rate⁹ for the GBP. The forecasted UK inflation rate was used as the cash flows are expressed in GBP. The difference between the growth rate and the inflation rate led to

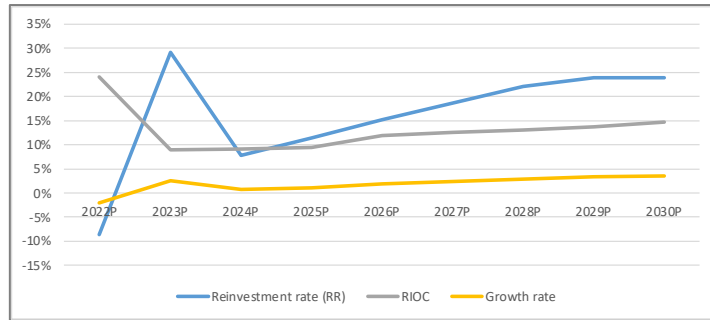
⁸ PwC Analysis

⁹ Office for Budget Responsibility

a real growth value of 0.5%, which is lower than the 2.9% average GDP growth rate.

The 0.5% value was used to compute the continuing value through the perpetuity formula.

Exhibit 20: Growth Rate



Source: Analyst estimates

Recommendation

Comparing the two methods, multiples and DCF, the results are similar. Both resulted in a target price higher than the current Market price of 117.14p suggesting a buy option.

Exhibit 21: Recommendation

Valuation method	Price per share
DCF	237,15
Multiple - EV/EBITDA	283,66
Market Price p	117,14
Target Price p	237,15

Source: Analyst estimates

The DCF method is preferred as it predicts the future share price on a 10-year horizon allowing for some flexibility to account for varying margin, and growth assumptions during the different phases. The industry is facing some significant changes both from an economic and technologic point of view. New technologies are crucial for the success of the company and future failures are hard to predict. The industry has high entry barriers, mainly due to the fact of high R&D costs, therefore new players are not expected to enter the market.

The target price of 237.15p is 102% higher than the current market value of 117.14p. Meanwhile, it is also noteworthy for investors that the valuation of Rolls-Royce is established on the world economy can recover from the pandemic. The vulnerability of the company is that it is closely related to the aviation industry and hence it is inevitable that it will be affected by any fluctuation of the macro economy.