Rating
Hold

Company
Rolls-Royce Plc

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Industrial
Large Engines & Turbines

Date
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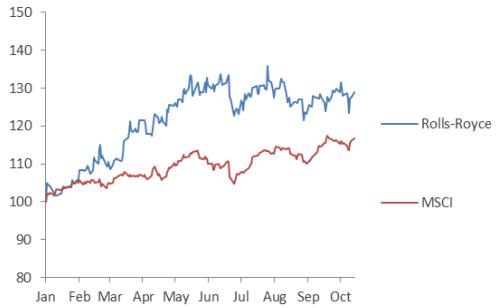
History of solid performance and well positioned for growth, hold

- Issue a **HOLD** for Rolls-Royce with a **target price of £10,** positive long term potential balances out short term risks. Forecast **7% revenue CAGR** until 2017 with an average **EBITDA margin of 13%**
- Some downside risks, but opportunities in the strong **wide-body platform** and exciting entry into **distributed power** through the acquisition of Tognum. Both markets are expected to see strong growth in the coming years, **driven by large macro trends**
- **Civil Aerospace** expected to grow at a **7% CAGR** over the period with 15% EBITDA margin
- Key issue for the next 12-18 months is the launch of the **Airbus A350** which engine orders make up the **majority of the Civil Aerospace order book**
- As government budgets keep being under pressure we see **Defense** growing modestly, with **3% revenue CAGR** from 2013 to 2017, but EBITDA margins will continue to be strong
- The newly formed **Power Systems** is having some issues, but we see potential and expect the business to grow revenues by **9% CAGR** from 2013 to 2017 with improving EBITDA margins reaching 15% in the second half of the forecast period
- Unfunded **Pension Obligations** of £1.2 billion are **possibly underestimated** due to generous discount rates, true unfunded status might be **closer to £2.7 billion**. Poses a risk if either stakeholders or the market readjust their stance on the appropriate discount rate

Forecasts and Ratios

Year End	2013E	2014E	2015E	2016E	2017E
Full Year EBITDA (GBPm)	1,870	2,073	2,196	2,484	2,776
Revenue (GBPm)	14,895	15,760	17,106	18,694	19,341

YTD Relative Performance



Stock Information

Price at 18th of Oct	10.92
Price target	10.00
52-week range	8.40-12.40
Earnings Yield	1.8%

Contents

Company Overview

Rolls-Royce provides integrated power solutions for customers in civil and defense aerospace, marine and energy markets worldwide. The company is an iconic British brand that has repositioned itself during the last 20 years to become a truly global company with over half its order book positioned in faster growing markets in the Middle East and Asia. This has enabled Rolls-Royce to double in size over the last 10 years while improving profitability. Both developments have been rewarded in the stock market, where the company's LTM Enterprise to EBTIDA multiple has risen from around 5.5-6x in the early 2000s to around 11-12x EBITDA. Before we look into whether the current market value is justified by the company's outlook let's look at the current business model and management's strategy.

Business Model

The core part of Rolls-Royce's business revolves around the company's gas turbine technology, which is an integral part of the company's aero, marine and power system businesses. The company's biggest business is manufacturing of aircraft engines. However, as we can see in Figure 1 the company has been making an effort to diversify its business, in 2003 roughly 73% of its revenue came from aerospace while in the first half of 2013 that number had dropped down to 60%. Management is committed to continue growing the power systems part of the business further in the coming years through its joint venture with Daimler, where it hopes to capture a share of the fast growing distributed power market.

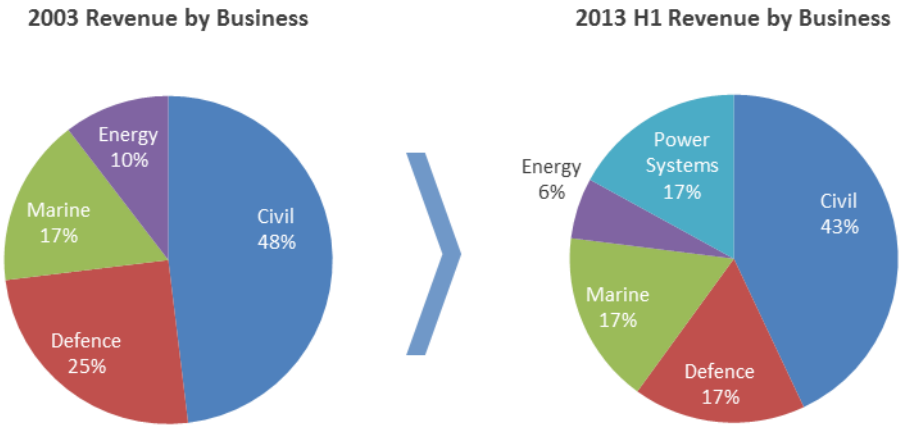


Figure 1: Some diversification from aerospace and defense, source company reports

The biggest part of the companies costs originate in the manufacturing of its products, as Figure 2 shows roughly 86% of its costs relate to cost of goods sold, 9% from SG&A and 5% from R&D.

In terms of revenue the company relies on two sources of revenue, selling of equipment and servicing equipment it has already sold. We can see in Figure 3 that for the last 5 years the % of revenue that is attributable to services has remained close to 50%.

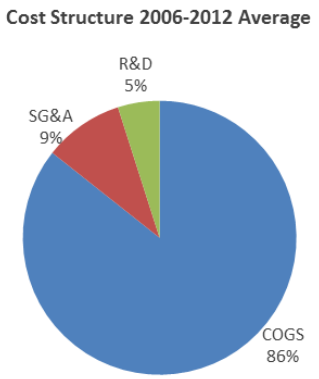


Figure 2: Rolls-Royce average cost structure from 2006-2012 as reported by company

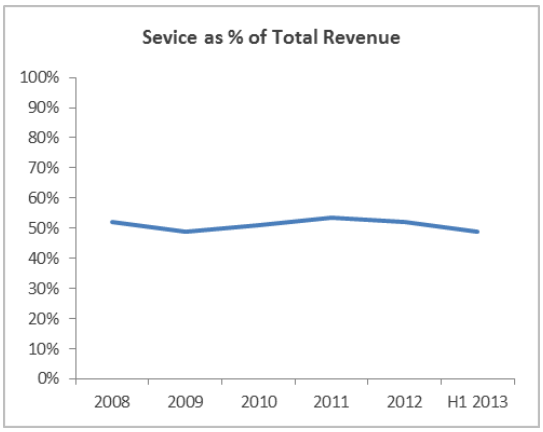


Figure 3: Service as a % of Total Revenue over the last 5 years, Rolls-Royce reporting and authors calculation

The service revenue is more stable, as it depends on the total number of engines in service rather than just this year's deliveries. Due to the highly complex nature of the company's products and the crucial part they play in its customers businesses, the service business is very stable once an engine is sold. The engines have a life span of over 20 years, which means that as long as Rolls-Royce adds more new engines to its servicing plan than old engines that are retired its service revenues grow. This can be seen in the data as the company's service revenue has grown at a much more stable rate during the last 5 years than the original equipment sales,

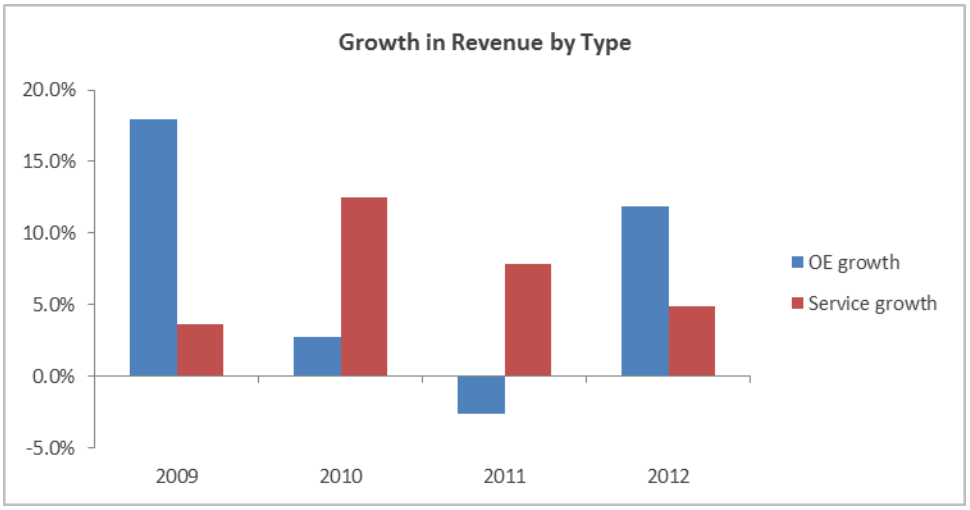


Figure 4: Service revenue growth has been much more stable than equipment sales

Although around 50% of the current order book and most of its growth comes from the Middle East and Asia, we can see in Figure 5 that the changes of revenue by geography over the last ten years are not as drastic. This can be explained by the fact that the majority of the service revenue comes from legacy customers and because most orders have 18 to 24 month lead times.

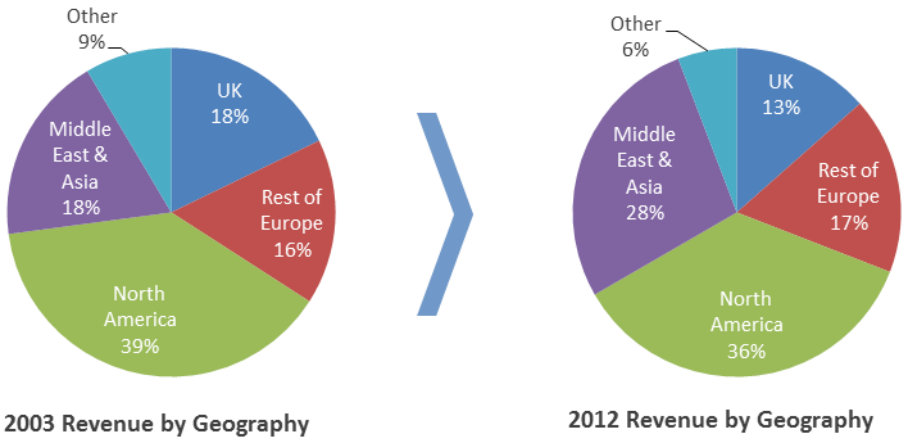


Figure 5: Revenue by Geography 10 year development

The company's strategy is to keep growing its business in Asia and during 2012 it opened its first manufacturing facility in Asia. The plant, which is located in Singapore, will produce part of the company's wide-body aircraft engines and shows the company's commitment to growing its presence in the region.

Profitability and Competition

The overall profitability of Rolls-Royce has been cyclical during the last decade, but has seen some stabilization in the past couple of years as we can see in Figure 6. Management contributes the more stable margins to increased focus on quality and service to customer, with 100% of deliveries in the Civil Aerospace segment being on time for the first half of 2013.

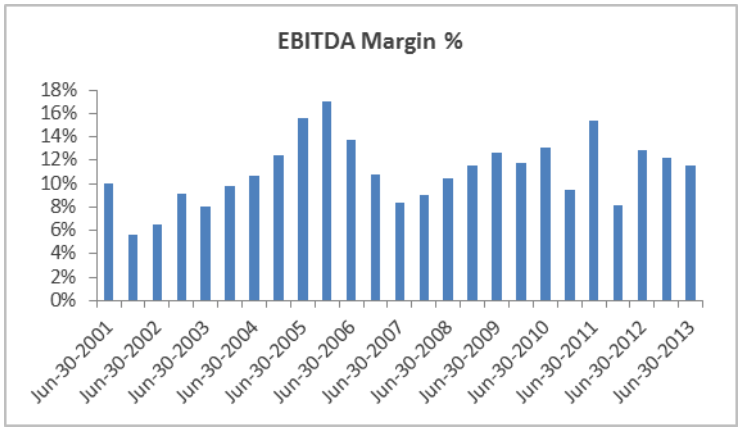


Figure 6: Semi-annual Total EBITDA margin, source Capital IQ

One consequence of the increased focus on timely delivery of orders has been higher inventory balances, which we can see in a drop in inventory turnover. Figure 7 shows how the company's inventory turnover has changed from hovering around 4.5x to roughly 3x in the latest reporting period. As the initiative to deliver on time has proved successful, management has stated that the next step is to

improve efficiency in the supply chain to push inventory levels down. We expect their efforts to be successful and are forecasting inventory turnover to be around 4.3x over our forecast horizon.

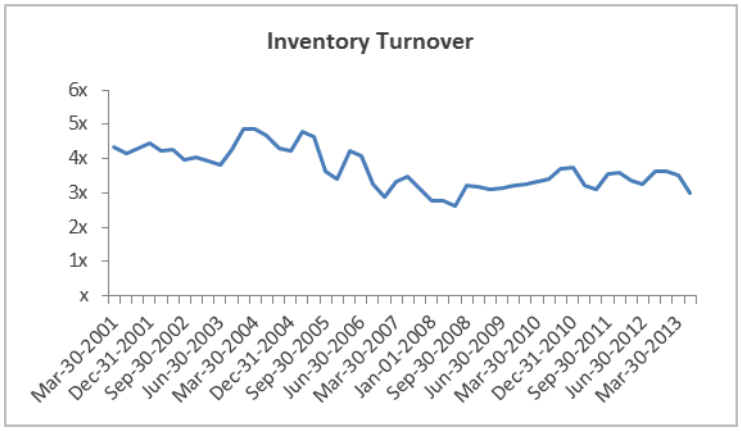


Figure 7: Changes in Inventory turnover, source Capital IQ

Management has stated that the biggest challenge in terms of improving capital efficiencies is in the Civil Aerospace part of the business. Partly because this business is experiencing the strongest growth and robust performance compared to the other businesses. Figure 8 shows the operating margins of Rolls-Royce Civil & Defense Aerospace business compared to its biggest competitors. We can see that it lags considerably behind the industry's top performers GE Aviation and Honeywell.

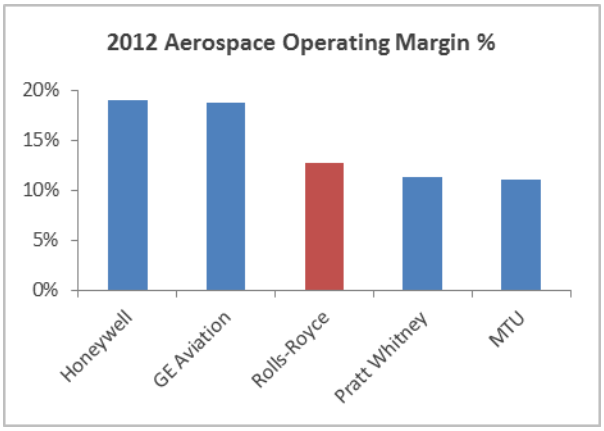


Figure 8: Operating margins of the Aerospace business compared to peers, source company financials

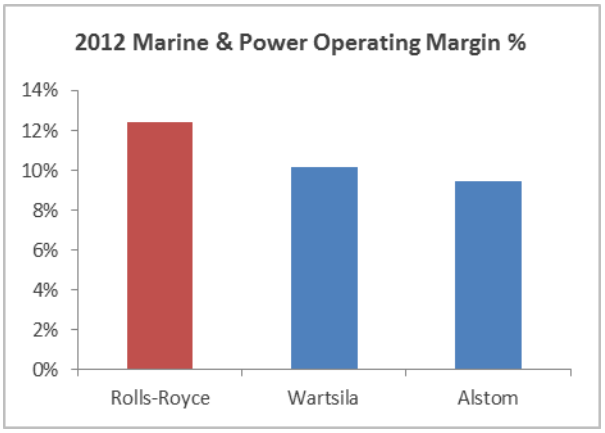


Figure 9: Operating margins of the Marine & Power business compared to peers, source company financials

Figure 9 shows that in terms of its Marine and Power System business the operating margins are quite competitive compared to its peers.

Segments and Drivers

Total Company Forecast Summary

Figure 10 shows our sales forecast for Rolls-Royce from 2013 to 2017. We expect modest growth this year, but faster growth in 2015 and 2016. The main drivers of the uptick in growth are the Civil Aerospace segment which will benefit from the ramp up of the new Airbus A350, the Marine segment which will see a turn in its business cycle. Power Systems will also see strong growth, following some issues of integration following last year's merger of Tognum and Bergen. The Defense segment will remain weak throughout the period due to tight defense budgets and we don't see an improvement in the Energy segment, as it will keep lagging its much bigger rivals. Overall there is little shift in the revenue share by segments over the period, but Civil Aerospace and Power Systems share of total revenue increases from 43% and 17% to 46% and 20% respectively.

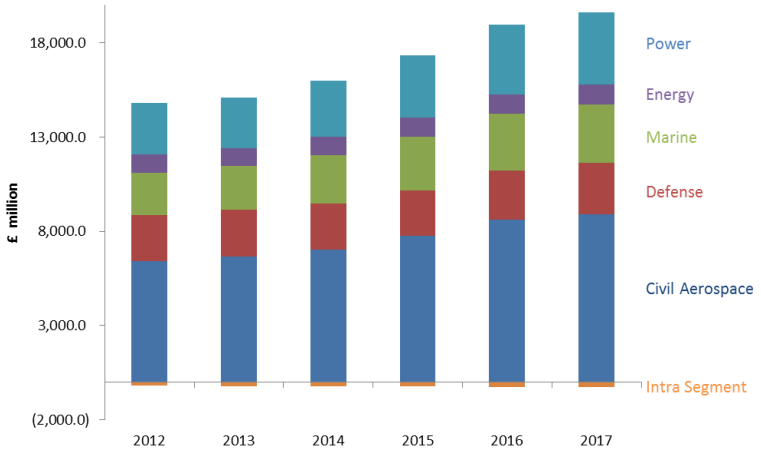


Figure 10: Rolls-Royce Sales forecast

In terms of EBITDA margins, we expect mixed performance. The bright spots are improvements in Civil Aerospace and Power systems, while we expect continuing lackluster performance in Energy.

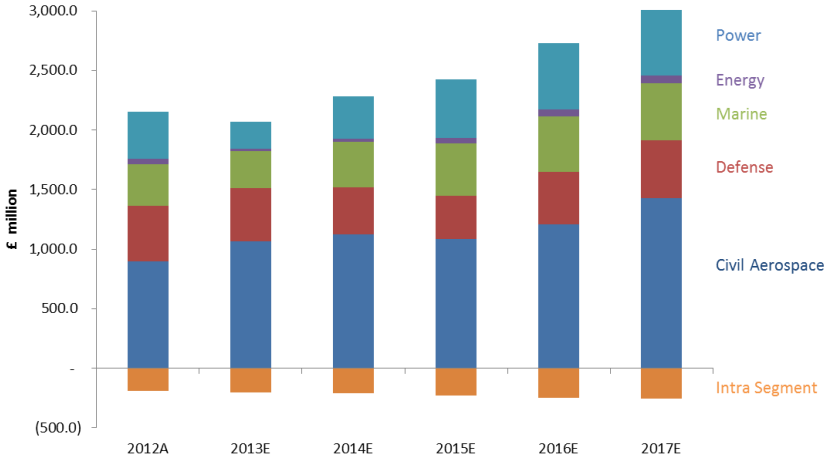


Figure 11: Rolls-Royce EBITDA forecast

We can see in Figure 12 that our revenue Forecast falls in the lower half of analyst estimates, except in 2014. We expect the second half of 2013 and 2014 to disappoint as there is a limited impact from new product launches, marine has not fully taken off from the through of its business cycle and the new Power System segment is still going through integration problems.

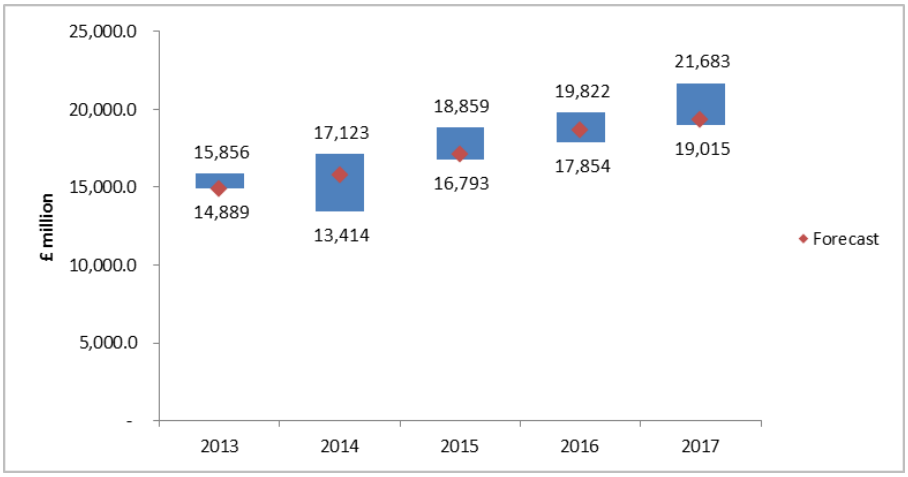


Figure 12: Analyst Revenue Estimates and our Forecast

Figure 13 shows us how our EBITA margin estimates are disproportionally lower than our revenue forecasts. This is mainly driven in our disbelief that management will be able to further increase margins in the slow growth businesses, as they have already grabbed considerable value from suppliers. Further, it has proved difficult to increase margins in the Civil Aerospace segment and although we expect a modest improvement, we believe it will prove hard to keep as production volumes grow again and focus shifts to making deliveries.

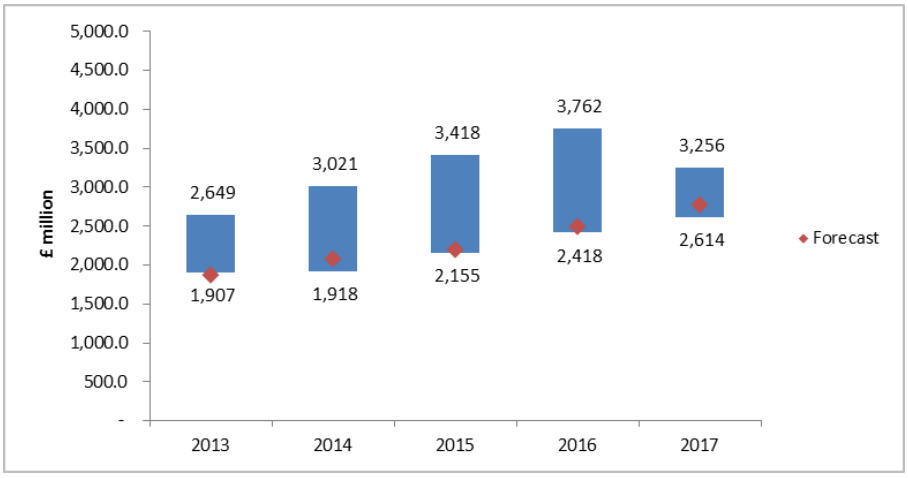


Figure 13: Analyst EBITDA estimates and our forecast

Civil Aerospace

Rolls-Royce's big strategic focus in Civil Aerospace is the wide-body market, with 58% of the company's 2012 revenue coming from the wide-body market. The rest of the business is split into narrow-body 6%, where Roll-Royce has been shrinking its exposure, and corporate and regional at 36%. The company's current strategic focus is thus on the medium size wide-body aircraft, where Rolls-Royce has a very strong competitive position and many industry pundits think will be the biggest beneficiary of emerging markets growth. For example, Boeing estimates that over the next 20 years the medium body fleet will grow at a roughly 5% CAGR while the total fleet is estimated to grow at 3.5% CAGR.

As we can see in Figure 14 the company's current order book is heavily reliant on the Airbus A350, which represents 55% engines on order, Figure 15 shows us the growth in the order book in the last 6 months, or from £49.6 billion to £56.7 billion. If we assume that the wide-body order book represents roughly 60% of the total order book or £34 billion that means 25% of the current Civil Aerospace order book relies on this one program. When we consider the issues Airbus had with the launch of its latest airframe, the Airbus A380, and that there have already been announcements of delays due to technical issues and supplier problems, it is clear that this concentration is a substantial risk for revenue growth over the next 18-24 months.

Engine	Airframe	Market share	Engines in service	Engines on order
Trent XWB	Airbus A350	100%	-	1,460
Trent 1000	Boeing 787	44%	68	642
Trent 900	Airbus A380	44%	232	147
Trent 800	Boeing 777	40%	448	-
Trent 700	Airbus A330	58%	1,060	406
Trent 500	Airbus A340	100%	524	-
			2,332	2,655

Figure 14: Wide-body market share and H1 2013 order book, source company presentation

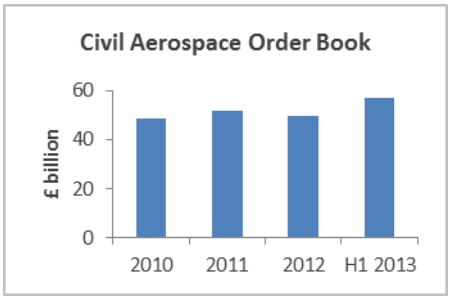


Figure 15: Civil Aerospace total order book, source company presentation

If we look at Figure 16, we can see that the revenue performance over the last couple of years has been growing at a steady pace in the service side of the business, while the Original Equipment side of the business received a boost in both 2011 and 2012. There are three big reasons for the sharp increase in revenue during those two years. On the wide-body side of the business the Boeing 787 Dreamliner came online in 2011 and production ramp-up of the Airbus A380, where deliveries grew by 45% in 2011. On the corporate side of the business Gulfstream introduced its new flagship in 2011 that led to increases in sales particularly in 2012. We can see part of these developments in the wide-body ordering book in Figure 14Figure 15.

If we assume that the average growth rate of the civil aircraft market is 3.5%, as predicted by Boeing and Airbus and that the rest of the revenue increase in 2011 and 2012 is mainly due to new aircraft bodies being introduced, we can try to quantify the effect. Further, assuming that 75% of the abnormal increase comes from the wide-body engines, we get £675 million of additional Original Equipment

revenue in 2011 and 2012. Now because Rolls-Royce has exclusivity in selling engines to the Airbus A350 its total order book is roughly 35% bigger than the combined order books for the A380 and Dreamliner. That means that the total additional revenue to be expected over a 2-3 year period is roughly £1 billion.

During the first half of 2013 the Civil Aerospace revenue of £3.2 billion was roughly flat compared to the year before and management's guidance for the full year is modest revenue growth. This is in line with our forecast. Where the biggest growth impact of the Boeing 787 and Airbus A380 have already materialized and the Airbus A350 is still going through test flights. The biggest question for original equipment sales in 2014 and 2015 is how quickly Airbus will be able to ramp up production of the new A350, as the first deliveries are currently scheduled for the second half of 2014. Judging by Airbus's recent track record and the resemblance of their current communications to when the problems were appearing in the development of the A380 we expect the ramp up to be slower than expected. Therefore, we see modest Original Equipment sales growth as well in 2014 with roughly £100 million of abnormal revenue providing roughly 3% of added revenue growth. We then expect acceleration in 2015 where the A350 should provide roughly 11% of abnormal revenue growth and finally 15% of abnormal growth in 2016 when production of the Airbus A350 will reach full capacity. Following that there will be a drop to more modest growth as the production of the A350 has reached full capacity.

Sales Forecast (£ million)	2010A	2011A	2012A	2013E	2014E	2015E	2016E	2017E
Original Equipment.....	1,892.0	2,232.0	2,934.0	3,036.7	3,234.1	3,703.0	4,388.1	4,541.7
% annual growth	2.0%	18.0%	31.5%	3.5%	6.5%	14.5%	18.5%	3.5%
Service.....	3,027.0	3,340.0	3,503.0	3,643.1	3,799.8	4,046.8	4,220.8	4,402.3
% annual growth	15.3%	10.3%	4.9%	4.0%	4.3%	6.5%	4.3%	4.3%
Civil.....	4,919.0	5,572.0	6,437.0	6,679.8	7,033.8	7,749.8	8,608.8	8,943.9
% annual growth	9.8%	13.3%	15.5%	3.8%	5.3%	10.2%	11.1%	3.9%

Figure 16: Revenue history and forecast for Civil Aerospace

We expect the service side of the business to see a boost as well, although a more modest one. The strong growth in 2010 of the service arm can be traced to the recovery from the financial crisis, rather than new product development. We therefore foresee an increase around the same pace as growth in total installed thrust, which has increased at an average rate of 4.3% for the last 10 years with very low volatility, with a small uptick in 2015 due to the large number of TRENT XWB engines starting service.

If we turn our attention to profitability, the main focus of management currently is improving operations to close the gap between Rolls-Royce and the top performers in the industry. The first half of 2013 showed promising results with a 17.2% EBITDA margin for the first half of the year[1]. Although this is still short of its best in class competitors it is certainly a step in the right direction. Management's guidance for strong profit growth in Civil Aerospace in 2013 indicates that they are confident that they will be able to deliver strong margins for the whole year. We expect EBITDA margins to end the year

[1] Calculated as Operating profit plus a 2.5% adjustment for Depreciation and Amortization, which is the historical average for the whole group.

around 17% and remain strong in 2014. However, as production volumes grow in 2015 and 2016 we expect a drop in EBITDA margins as pressure from customers to make deliveries on time will take over focus. It is hard to keep top margins in such an environment and we therefore expect a dip during those two years.

EBITDA Margin Forecast	2010A	2011A	2012A	2013E	2014E	2015E	2016E	2017E
EBITDA Margin.....	10.6%	11.6%	13.9%	17.0%	17.0%	13.5%	13.5%	16.0%
Civil	801.6	844.1	930.0	1,135.6	1,195.8	1,046.2	1,162.2	1,431.0

Figure 17: EBITDA Margin Forecast

Defense

The Defense business has been under pressure from shrinking military budgets. As we can see in Figure 18 the order book for Defense has been shrinking every year since 2010 and deliveries have been flat as Figure 19 shows. It is a testament of the quality of the operations that the segment has managed to keep growing its revenues and improving.

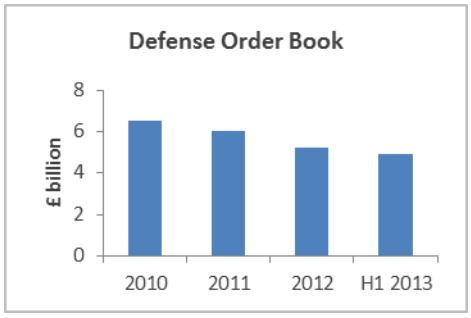


Figure 18: Defense business order book, source company presentation

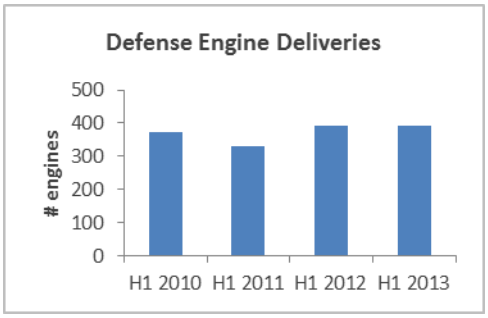


Figure 19: Defense engine deliveries during H1, source company presentations

The first half of 2013 saw total Defense revenues of £1,261 million, with £593 million coming from Original Equipment sales and £643 million from services. Management's guidance for the full year is that revenues will be flat relative to 2012. Based on the long lead time in this business we believe management has a pretty good picture of this year's revenue by now and forecast it to be almost flat as can be seen in Figure 20. For 2014 and 2015 we expect the declining order books will start to bite and expect revenues to contract somewhat. Then in 2016, as government budgets in Europe and the US are past the biggest cuts, we expect some growth in Original Equipment sales and services.[2]

[2] IMF's newest world economic outlook expects GDP growth in advanced economies to reach 2.5% in 2015, from a current level of 1.2%. Further, structural budget deficits are expected to half.

Sales Forecast (£ million)	2010A	2011A	2012A	2013E	2014E	2015E	2016E	2017E
Original Equipment.....	1,020.0	1,102.0	1,231.0	1,243.3	1,218.4	1,181.9	1,323.7	1,429.6
% annual growth	5.8%	8.0%	11.7%	1.0%	-2.0%	-3.0%	12.0%	8.0%
Service.....	1,103.0	1,133.0	1,186.0	1,209.7	1,233.9	1,246.3	1,299.8	1,355.7
% annual growth	5.4%	2.7%	4.7%	2.0%	2.0%	1.0%	4.3%	4.3%
Defense Sales.....	2,123.0	2,235.0	2,417.0	2,453.0	2,452.4	2,428.1	2,623.6	2,785.4
% annual growth	5.6%	5.3%	8.1%	1.5%	0.0%	-1.0%	8.0%	6.2%

Figure 20: Defense segment sales forecast

In terms of margins, they have remained strong for the last three years and the first half of 2013 was a strong EBITDA margin of 19.6%. We expect margins to come under some pressure as revenues start to contract and customer gain more power, however as the market picks up in 2016 we expect margins to gain their prior strength.

EBITDA Margin Forecast	2010A	2011A	2012A	2013E	2014E	2015E	2016E	2017E
EBITDA Margin.....	17.2%	19.4%	19.3%	18.0%	16.0%	15.0%	17.0%	18.0%
Defense EBITDA	364.2	434.1	466.8	441.5	392.4	364.2	446.0	501.4

Figure 21: Defense EBITDA Forecast

Marine

The Marine business is very cyclical, with the offshore part of the business driving the majority of revenues as we can see in Figure 23. The order book has been increasing, as we can see in Figure 22,Figure 22 and it has historically taken around 2 years for a strong uptick in the order book to translate into revenue[3]. We therefore, forecast an uptick in revenue in 2014 and 2015. This growth will be driven by the offshore market where we capital expenditures to grow 8% annually until 2016.

[3] According to the trends we observe in graphs in the company's presentation

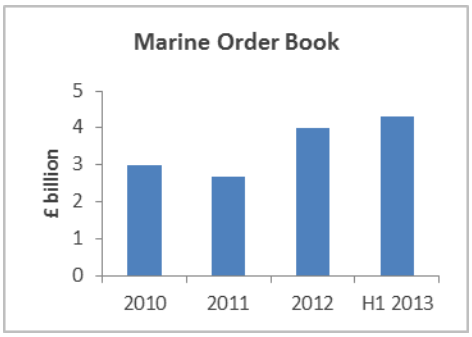


Figure 22: Marine Order Book, source company presentation

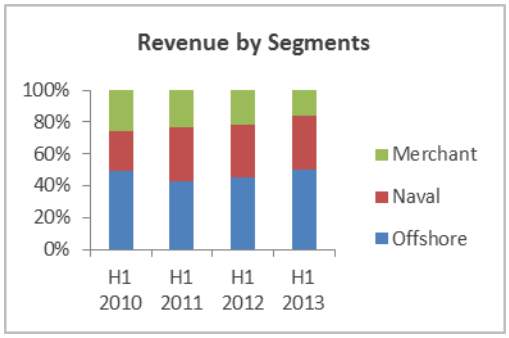


Figure 23: Revenue by Segments, source company presentations

Total revenues in the Marine segment for the first half of 2013 were £1,241 million, with Original Equipment sales being £546 million and Service revenue £695 million. We expect the revenue for 2013 to fall in line with management's guidance, with modest growth. Regarding the uptick in 2014 and 2015, we observe from company data that the Marine order book inflow peaked in the second half of 2007, while the order book reached a height of roughly £5 billion in the second half or 2008. Subsequently Original Equipment revenues peaked at £1.8 billion in 2009. As we can see in Figure 22 the order book saw strong growth in 2012 and the total order book stood at £4.3 billion mid-year 2013. Therefore, we expect the revenues to start rising in 2014 and reaching roughly £1.7 billion in 2016 when growth slows down. We don't expect negative growth in the subsequent years as the collapse in order inflows that the Marine segment saw in 2009 following the financial crisis and collapse of oil prices is unlikely to repeat itself. We expect service revenue to see a considerable uptick in the next couple of years following the increased order inflow, but then to level off as growth slows down.

Sales Forecast (£ million)	2010A	2011A	2012A	2013E	2014E	2015E	2016E	2017E
Original Equipment.....	1,719.0	1,322.0	1,288.0	1,236.5	1,384.9	1,592.6	1,672.2	1,730.7
% annual growth	-4.7%	-23.1%	-2.6%	-4.0%	12.0%	15.0%	5.0%	3.5%
Service.....	872.0	949.0	961.0	1,076.3	1,162.4	1,255.4	1,309.4	1,355.2
% annual growth	11.1%	8.8%	1.3%	12.0%	8.0%	8.0%	4.3%	3.5%
Marine Sales.....	2,591.0	2,271.0	2,249.0	2,312.8	2,547.3	2,848.0	2,981.6	3,086.0
% annual growth	0.1%	-12.4%	-1.0%	2.8%	10.1%	11.8%	4.7%	3.5%

Figure 24: Marine Segment revenue forecast

The EBITDA margins in the Marine business have been stable in the past couple of years at around 15.5%, but for the first half of 2013 the margin dropped to 13.4%. We expect the EBITDA margin for the full year 2013 to come in at 13.5% and then recover as revenue increases to the 15.5% average.

EBITDA Margin Forecast	2010A	2011A	2012A	2013E	2014E	2015E	2016E	2017E
EBITDA Margin.....	15.8%	15.2%	15.7%	14.0%	15.0%	15.5%	15.5%	15.5%
Marine EBITDA	408.9	346.0	352.5	323.8	407.6	473.1	504.6	522.3

Figure 25: Marine segment EBITDA forecast

Power Systems

The Power System business is Rolls-Royce's newest business segment. The business is set up in a consolidated subsidiary Engine Holding, which holds ownership of Tognum and Bergen. Rolls-Royce bought Tognum in a 50/50 joint venture with Daimler in November of 2011 for €3.4 billion and it is the company's biggest push into the broader engine market. Tognum offers distributed power solutions for many different industries, which is a fast growing market.

In 2012 and the first half of 2013 there has been a slight contraction in revenue and contraction of EBITDA margin. We expect the full year of 2013 to see slightly lower revenue than 2012 and a drop in EBITDA margin. Then in 2014 we forecast that the revenue synergies between the Bergen and Tognum businesses will start to deliver growth in line with the broader distributed power market. In terms of profitability we see sharing of best practices and economies of scale contributing to EBITDA margins reaching similar levels as Rolls-Royce marine business.

Power Segment Forecast (£ million)	2010A	2011A	2012A	H1 2013A	2013E	2014E	2015E	2016E	2017E
Power Sales.....	2,201.6	2,811.6	2,732.3	1,239.0	2,677.7	2,945.4	3,298.9	3,694.7	3,824.0
% annual growth		27.7%	-2.8%		-2.0%	10.0%	12.0%	12.0%	3.5%
Power EBITDA	216.6	389.6	394.8	102.8	227.6	353.5	494.8	554.2	573.6
EBITDA Margin.....	9.8%	13.9%	14.5%	8.3%	8.5%	12.0%	15.0%	15.0%	15.0%

Figure 26: Power Systems revenue and EBITDA forecast

Energy

The Energy segment of the Rolls-Royce business also competes in the distributed power segment, with 65% of its revenue coming from the Oil & Gas sector and the rest coming from traditional Power Generation and Civil Nuclear. The business has been lagging the other Rolls-Royce businesses for quite some time, both in terms of revenue growth and operating margins. This can be explained by very weak demand for Power Generation and Civil Nuclear in developed markets and a weak position relative to its competitors in the Oil & Gas turbine market, where the market leaders are Caterpillar and GE. We see opportunities to merge the Energy and Power Systems segments, once the operations of Bergen and Tognum have been successfully merged. That should bring some cost synergies, as the Energy segment and Tognum have overlapping products, but limited cannibalization as they do not focus on the same markets. We don't see a lot of growth in revenue, as the segments main business the Oil & Gas segment still struggles to find its niche while competing with businesses 10 times its size. We forecast relatively flat revenue, but improving margins as benefits from co-operation with Power Systems materialize.

Energy Segment Forecast (£ million)	2010A	2011A	2012A	H1 2013A	2013E	2014E	2015E	2016E	2017E
Energy Sales	1,233.0	1,083.0	962.0	488.0	971.6	991.1	1,010.9	1,031.1	1,051.7
% annual growth	19.9%	-12.2%	-11.2%		1.0%	2.0%	2.0%	2.0%	2.0%
Energy EBITDA	59.1	44.2	46.0	9.2	19.4	29.7	30.3	30.9	31.6
EBITDA Margin	4.8%	4.1%	4.8%	1.9%	2.0%	3.0%	3.0%	3.0%	3.0%

Figure 27: Energy Segment Revenue and EBITDA forecast

Risks

The risks we choose to highlight in investing in Rolls-Royce come from general business risks and also risks to shareholders stemming from the company's pension obligations.

General Risks

The biggest single business risk the firm faces is the delay in the introduction of the Airbus A350. The company did very well to gain a 100% supply agreement for the A350 engines, but we are afraid it might have taken on all the exposure from delays in order to secure exclusivity. Therefore, if Airbus needs to delay production, similar to what happened with the A380, revenue growth in the Civil Aerospace segment will suffer and the share price will see a drop.

The Power System business increases Rolls-Royce exposure to sector that have different dynamics than the Aerospace sector. These are the Oil & Gas sector and other industrial sectors, where the companies have shorter business cycles and are not as rigid in their decision making as the large Aerospace manufacturers. Managing risks in this new business will take different skills and it introduces new risks to the company.

Pension Obligations

Rolls-Royce's pension obligations stood at year end 2012 at £10.2 billion, the unfunded part of those obligations stood at £1.2 billion mid-year 2013. The discount rate used for the obligations is listed out in Figure 31 next to the respective 10 and 30 year government yields. As the pension and healthcare liabilities are contractual obligations that Rolls-Royce has to meet, it can be argued that the correct discount rate should be close to the risk free rate. In the footnotes of the 2012 annual report the company discloses that a 0.25% reduction in the discount rate for the UK assets results in a roughly 3.7% increase in the present value of the obligation. We want to use this information to get some estimate of how much the pension obligation might change is stakeholders change their opinion about the discount rate.

Simple Average Yield of 10 year and 30 year Government Bonds			
	Rate Difference	Linear approx.	Non-Linear approx.
UK	1.25%	1,600	1,724
US	0.75%	132	137
German	1.60%	101	112
		1,833	1,972

Figure 28: Simple Average Yield of 10 year and 30 year government bonds

Yield on 30 year Government Bonds			
	Rate Difference	Linear approx.	Non-Linear approx.
UK	0.80%	1,024	1,067
US	0.20%	35	35
German	1.20%	76	81
		1,135	1,183

Figure 29: Yield of 30 year government bonds

Now we start by assuming that the average duration of the pension obligations lies between the duration of 20 and 30 years government bonds. As a proxy for 20 year government bond yields we use the simple average between the 10 and 30 year yield. We then calculate the difference between the current discount rate being used and the current government bond yield, for both 30 year government bonds and our estimated 20 year government bonds, in the respective jurisdictions. Figure 28 and Figure 29 show the differences we come up with, but they range from 20 bps to 1.6%. We then use both linear and non-linear estimations to estimate how much higher the obligation would be if the discount rates were brought down to the risk free rates.

We begin by making the conservative assumption that the relationship between the obligation and lower discount rates is linear[4], we find that the risk free obligation is anywhere from £1.1 billion to £1.8 billion higher than the current one, depending on which risk free rates we use. Now if on the other hand we apply a non-linear approximation[5], that captures a little better the curvature of the discount factor, we arrive at a number between £1.2 billion and £2.0 billion. Figure 28 and Figure 29 list the result from these calculations. We see that the estimation risk inherent in the current discount rate is therefore likely to lie somewhere between £1 billion and £2 billion in the current rate environment. To quantify the risk further, it represents between 5-10% of the current market capitalization of the company. In the valuation section that follows, we provide a scenario that takes into account a re-estimation of the obligation of £1.5 billion.

[4] The linear estimation: Original Amount * (Sensitivity to 0.25%*(Rate Diff./0.25%))
[5] The non-linear estimation: Original Amount * (1+Sensitivity to 0.25%)^(Rate Diff./0.25%) - Original Amount

Estimated Pension Obligation Oct 2012		
United Kingdom	£	8,588
United States		1,177
Germany		424
		10,189
Discount rate adj.		1,500
Total Obligation		11,689
Funded		(8,978)
Unfunded	£	2,711

Figure 30: Estimated Pension Obligations

	10 Year Gov.	30 Year Gov.	Obligation
United Kingdom	2.7%	3.6%	4.4%
United States	2.6%	3.7%	3.9%
Germany	1.9%	2.7%	3.9%

Figure 31: Pension Obligation Discount Rates

It is important to remember that the company will have to pay the same future obligation to beneficiaries, no matter what discount rate is used today, but the timing of the cash flows might change due to how trustees and regulators estimate a funding shortfall. The risk from a possible re-estimation by stakeholders is very real, and if they would adjust their opinion about the size of the pension obligation it can result in a request for a cash inflow to reduce the funding gap. The last time the company was forced to take such measures was in May of 2007, when it reached a settlement with stakeholders to pay an extra £500 million into the pension fund. The share price fell 3.5% following the announcement, relative to a drop of 0.8% for the FTSE 100.

Another risk that could result in a drop in the share price is if the market changes its estimates of the obligations even without stakeholder pressure. As the rules that determine the discount rate have changed in the past and the current ones are not widely agreed upon, a scenario where discussions about what rate to use make investors reconsider their estimates is not unconceivable. It is therefore clear in our mind that this is an important factor to consider when evaluating the stock price.

Valuation

We did an Adjusted Present Value (APV) valuation of the business using our forecasts for the business described in the prior chapter.

Forecasts

Figure 32 shows the forecast of the business. The forecast for the years 2013 to 2017 is based on the business segment forecasts presented above, while the forecast for 2018 and 2019 is based on the 2017 forecast and a growth rate equal to the terminal growth rate. This is to ensure that the business has reached the terminal growth rate of Free Cash Flow before we apply the Gordon growth formula.

	2013	2014	2015	2016	2017	2018	2019
Sales	14,894.9	15,760.0	17,105.7	18,693.8	19,340.8	20,017.8	20,718.4
Cost of Goods Sold	11,357.37	12,001.21	13,078.99	14,211.06	14,708.71	15,223.51	15,756.33
SG&A (incl. depr)	1,415.02	1,418.40	1,539.51	1,682.45	1,585.95	1,641.46	1,698.91
R&D expense	670.27	709.20	769.76	841.22	773.63	800.71	828.74
Other operating expense / (income)	(29.79)	(31.52)	(34.21)	(37.39)	(38.68)	(40.04)	(41.44)
EBIT	1,482.0	1,662.7	1,751.6	1,996.5	2,311.2	2,392.1	2,475.8
Taxes	340.87	349.16	367.84	419.27	485.36	502.35	519.93
Profit after taxes	1,141.17	1,313.5	1,383.8	1,577.2	1,825.9	1,889.8	1,955.9
Depreciation and Amortization	387.27	409.76	444.75	486.04	464.18	480.43	497.24
Capex	497.7	695.2	888.8	1,010.1	677.7	703.8	728.4
Change in Accounts Receivable	68.7	207.6	323.0	381.2	155.3	162.5	168.1
Change in Inventory	34.5	199.0	309.5	365.3	148.8	155.7	161.1
Change in Accounts Payable	38.9	99.5	154.8	182.6	74.4	77.8	80.6
Change in Accrued Expenses	(31.2)	125.4	195.1	230.3	93.8	98.2	101.6
Change in Prepaid Expenses	18.4	13.0	20.2	23.8	9.7	10.2	10.5
FREE CASH FLOW	916.8	833.4	636.9	695.8	1,466.8	1,514.1	1,567.1
Growth in FCF		-9.1%	-23.6%	9.2%	110.8%	3.2%	3.5%

Figure 32: Total Company Operating Forecast

For the terminal growth rate we chose 3.5% as our base case as the nominal increase of Rolls-Royce's biggest market segment is expected to grow at a 3.6% CAGR until 2032. We performed sensitivity analysis to this important measure, which can be observed in Figure 37 and Figure 38[6].

For balance sheet items we use historical averages of percentage of sales as guidance, but also take into account management's guidance.

Cost of Capital

To calculate the company's all equity cost of capital we used Rolls-Royce's own equity beta rather an average asset beta of comparable firms. The reason for this choice is that the company's main competitors have a very different business model than Rolls-Royce. On one end there are very large diversified industrial companies that have big exposures to businesses totally unrelated to turbines and large engines, for example GE and Honeywell. On the other end we have smaller companies which rely on one product line and therefore are not nearly as diversified as Rolls-Royce.

[6] As a comparison the IMF forecasts the real gdp growth in the World Economy to be around 4% from 2014 to 2018, which translates into at least 5.5% of nominal growth. This is in line with the fact that Rolls-Royce is not part of the fastest growing sectors in the world economy.

Therefore, in estimating the all equity financed cost of capital for Rolls-Royce we calculated the firm's equity beta with 5 years of historical data and tracked it over a 5 year period. We used the MSCI World Index as a benchmark and the short term Treasury bill for the risk free rate, as we are viewing the investment for an US based investor. Finally we chose an equity beta of 1.1 that is just below the 5 year average.

All Equity Discount Rate	
Value of Debt	2,627.0
Common Stock (million)	1,880.3
Closing share price	10.9
Value of Equity	20,532.9
Equity Beta (msci index)	1.10
Cost of debt	0.030
Beta on debt	-
Tax rate	0.23
Asset Beta	1.00
Risk free rate - 10 yr gov bonds	0.026
Equity market premium	0.070
Cost of equity for all equity financed firm	9.60%

Figure 33: Calculation of the Cost of Capital for the All Equity Financed Firm

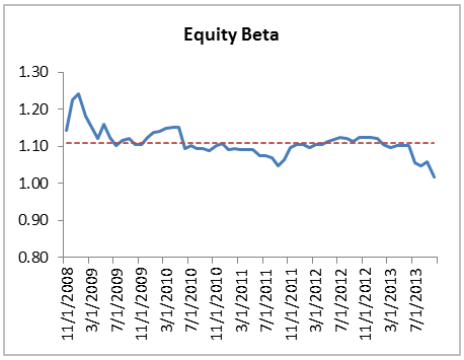


Figure 34: Rolls-Royce Equity Beta over time, correlation to the MSCI World Index

We then calculated the company's asset beta using the formula for a constant amount of debt. Assuming that Rolls-Royce will carry £2.5 billion of debt going forward, historically the company has kept a very stable debt balance and it has mostly fluctuated when the firm has bought or sold businesses. We therefore felt that as long as the business is not transformed in a steady debt balance of £2.5 billion is a reasonable assumption. The rest of the inputs were the company's tax rate of 23% and the company's current cost of debt 3%.

These assumptions gave us a cost of equity for the firm of 9.6%.

Target Price & Sensitivity Analysis

We calculated a target share price for two key scenarios, Valuation Scenario I using the Pension Obligations as presented by the company and Valuation Scenario II for the alternate Obligations. We performed a separate valuation of Tognum and came at a value of £1 billion for Daimler's stake. This compares to a price of £1.4 billion that the companies paid for it when they acquired the company and £1.1 billion, which is the stock price before the acquisition. This decline in value is due to the drop in revenues and profit margins at Tognum since the deal was announced[7]. Daimler has a put option for its share in Tognum, which might justify assigning a premium to its stake but as we don't have any information on that agreement we decided to stick with the £1 billion.

[7] Appendix I has more information on the Tognum valuation.

		2013	2014	2015	2016	2017	2018	2019
Percentage of year left		0.25	1	1	1	1	1	1
Free Cash Flow		229.2	833.4	636.9	695.8	1,466.8	1,514.1	1,567.1
Long term FCF growth rate								3.50%
Terminal Value in 2017								26,588.9
Present Value using Asset Cost of Capital	9.60%	224.0	743.2	518.2	516.5	993.5	935.7	15,876.5
Present Value with Mid Period Adjustment		226.6	778.0	542.5	540.8	1,040.1	979.6	16,621.1
Present Value of All Equity Cash Flows	20,728.7							
Tax Shields		4.31	15.8	15.8	15.8	15.8	15.8	15.8
Terminal Value of Tax Shield in 2017								605.77
Present Value of Tax Shield of Constant Debt		4.28	15.25	14.87	14.49	14.12	13.76	529.40
With Mid Period Adjustment		4.30	15.45	15.06	14.68	14.30	13.94	536.24
Present Value of Tax Shield of Constant Debt	614.0							
Total Enterprise Value	21,342.7							
Value of Cash	3,443.0							
Value of Debt	(2,627.0)							
Unfunded Pension Liability	(1,211.0)							
Daimler's Stake in Engine Holding	(1,000.0)							
Value of equity at end of 2012	19,947.7							
Stock Price	10.61							
Difference from Current Stock Price	-2.85%							

Figure 35: Valuation Scenario I – Original Pension Obligation

We can see in Figure 37Figure 35 and Figure 36 that the target share price for Scenario I is £10.61, which is roughly on par with the current stock price, but the target price for Scenario II is £9.81. As discussed above Scenario II represents a possible risk scenario, where the market might readjust its expectations regarding the pension obligations and push the share price down accordingly. We do not believe this risk is large, and certainly not large enough to justify issuing a sell rating on the stock. We therefore have a HOLD rating for the stock with a target share price of £10.

		2013	2014	2015	2016	2017	2018	2019
Percentage of year left		0.25	1	1	1	1	1	1
Free Cash Flow		229.2	833.4	636.9	695.8	1,466.8	1,514.1	1,567.1
Long term FCF growth rate								3.50%
Terminal Value in 2017								26,588.9
Present Value using Asset Cost of Capital	9.60%	224.0	743.2	518.2	516.5	993.5	935.7	15,876.5
Present Value with Mid Period Adjustment		226.6	778.0	542.5	540.8	1,040.1	979.6	16,621.1
Present Value of All Equity Cash Flows	20,728.7							
Tax Shields		4.31	15.8	15.8	15.8	15.8	15.8	15.8
Terminal Value of Tax Shield in 2017								605.77
Present Value of Tax Shield of Constant Debt		4.28	15.25	14.87	14.49	14.12	13.76	529.40
With Mid Period Adjustment		4.30	15.45	15.06	14.68	14.30	13.94	536.24
Present Value of Tax Shield of Constant Debt	614.0							
Total Enterprise Value	21,342.7							
Value of Cash	3,443.0							
Value of Debt	(2,627.0)							
Unfunded Pension Liability	(2,711.0)							
Daimler's Stake in Engine Holding	(1,000.0)							
Value of equity at end of 2012	18,447.7							
Stock Price	9.81							
Difference from Current Stock Price	-10.16%							

Figure 36: Valuation Scenario II - Full Pension Obligation

Finally we perform a sensitivity analysis for how our target share price

Discount Rate \ Terminal Growth	2.50%	3.00%	3.50%	4.00%	4.50%
8.60%	-9.5%	-4.0%	2.5%	10.1%	19.2%
9.10%	-11.7%	-6.3%	0.0%	7.4%	16.3%
9.60%	-13.8%	-8.5%	-2.4%	4.8%	13.5%
10.10%	-15.9%	-10.7%	-4.8%	2.3%	10.7%
10.60%	-17.9%	-12.9%	-7.0%	-0.2%	8.0%

Figure 37: Sensitivity of Valuation I - % difference from Stock Price

Discount Rate \ Terminal Growth	2.50%	3.00%	3.50%	4.00%	4.50%
8.60%	-16.8%	-11.3%	-4.8%	2.8%	11.9%
9.10%	-19.0%	-13.6%	-7.3%	0.1%	9.0%
9.60%	-21.1%	-15.8%	-9.7%	-2.5%	6.2%
10.10%	-23.2%	-18.0%	-12.1%	-5.0%	3.4%
10.60%	-25.2%	-20.2%	-14.3%	-7.5%	0.7%

Figure 38: Sensitivity of Valuation II - % difference from Stock Price

We can see that our valuation is most sensitive to the terminal growth rate. If we think about Rolls-Royce's current strategy it might be able to sell investors on the idea that it can raise its terminal growth rate if it proves it can shift its portfolio from the legacy defense and marine businesses and towards the distributed power business. Then it will have an overall business with a very strong growth profile in the wide-body niche of civil aerospace and distributed power. It is still too early however to judge whether it will be successful to build its Power Systems business.

Discount Rate \ Terminal Growth	2.50%	3.00%	3.50%	4.00%	4.50%
8.60%	9.88	10.49	11.19	12.02	13.02
9.10%	9.64	10.23	10.92	11.73	12.70
9.60%	9.41	9.99	10.66	11.45	12.39
10.10%	9.19	9.75	10.40	11.17	12.09
10.60%	8.97	9.52	10.15	10.90	11.80

Figure 39: Sensitivity of Valuation I - Stock Price

Discount Rate \ Terminal Growth	2.50%	3.00%	3.50%	4.00%	4.50%
8.60%	9.08	9.69	10.39	11.23	12.22
9.10%	8.84	9.44	10.12	10.93	11.90
9.60%	8.61	9.19	9.86	10.65	11.59
10.10%	8.39	8.95	9.60	10.37	11.29
10.60%	8.17	8.72	9.35	10.10	11.00

Figure 40: Sensitivity of Valuation II - Stock Price

Appendix I – Tognum Valuation

Tognum	2013	2014	2015	2016	2017
Sales	2,572.5	2,683.1	2,782.3	2,879.7	2,980.5
Growth	5.2%	5.2%	5.2%	5.2%	5.2%
Cost of Goods Sold	1,826.44	1,905.0	1,975.5	2,044.6	2,116.2
SG&A (incl. depr)	308.69	322.0	333.9	345.6	357.7
R&D expense	180.07	187.8	194.8	201.6	208.6
Other operating expense / (income)	(2.57)	(2.7)	(2.8)	(2.9)	(3.0)
EBIT	259.8	271.0	281.0	290.9	301.0
Taxes	59.76	56.91	59.01	61.08	63.22
Profit after taxes	200.06	214.1	222.0	229.8	237.8
Depreciation and Amortization	90.04	93.9	97.4	100.8	104.3
Capex	98.3	113.3	114.8	117.8	122.0
Change in Accounts Receivable	28.1	19.4	17.4	17.0	17.6
Change in Inventory	29.3	29.9	26.8	26.3	27.2
Change in Accounts Payable	22.7	13.3	11.9	11.7	12.1
Change in Accrued Expenses	1.4	2.2	2.0	1.9	2.0
Change in Prepaid Expenses	-	-	-	-	-
FREE CASH FLOW	158.6	161.0	174.4	183.0	189.4
Growth		1.5%	8.3%	5.0%	3.5%

All Equity Discount Rate	
Value of Debt	200.0
Common Stock (million)	300.0
Closing share price	10.0
Value of Equity	3,000.0
Equity Beta (msci index)	1.30
Cost of debt	0.050
Beta on debt	-
Tax rate	0.23
Asset Beta	1.24
Risk free rate - 10 yr gov bonds	0.027
Equity market premium	0.070
Cost of equity for all equity financed firm	0.114

		2013	2014	2015	2016	2017
Percentage of year left		0.25	1	1	1	1
Free Cash Flow		39.6	161.0	174.4	183.0	189.4
Long term FCF growth rate						3.50%
Terminal Value in 2017						2,478.7
Present Value using Asset Cost of Capital		38.6	140.6	136.7	128.8	1,685.7
Present Value with Mid Period Adjustment		39.1	148.5	144.3	136.0	1,779.3
Present Value of All Equity Cash Flows	2,247.1					
Tax Shields		0.58	2.1	2.1	2.1	2.1
Terminal Value of Tax Shield in 2017						76.92
Present Value of Tax Shield of Constant Debt		0.57	2.03	1.98	1.92	70.48
With Mid Period Adjustment		0.57	2.06	2.00	1.95	71.43
Present Value of Tax Shield of Constant Debt	78.0					
Total Enterprise Value	2,325.2					
Cash	250.0					
Value of Debt	(200.0)					
Value of Unfuded Pension Obligation	(420.0)					
Value of equity at end of 2012	1,955.2					
Daimler's Stake	977.58					

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