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Equity Valuation: Aston Martin Lagonda Global Holdings PLC

International Master of Science in Finance

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Abstract

The purpose of this dissertation is to determine a target price for the shares of Aston Martin, a UK luxury auto manufacturer, and provide an investment recommendation. The stock is down 96% since its IPO, therefore, it is of interest to understand if the stock is now trading at a fair price.

Three valuation methods are presented, the discounted cash-flow method, comparable company analysis, and precedent transaction analysis. Within the DCF, three different scenarios were developed, an optimistic one that follows AM's disclosed targets for the coming years, a pessimistic one that subjects the company to impacts felt by its peers during the 2008 financial crisis, and a base case where Aston Martin is expected to follow the same growth as the estimates for the SUV, Luxury, and Sports cars sales through 2027. For each of the scenarios, the analyst has made assumptions that best fit the current economic and geopolitical landscape, considering, for example, increases in raw material prices, and worsening of payment periods. The discount rate used was the weighted average cost of capital using the 5FF method to forecast the cost of equity, however, for comparison purposes, the Capital Asset Pricing Model and the 3FF were also considered. Within the comparable company analysis, multiples utilized were computed on a forward-looking and backward-looking basis.

The research results in a **Strong Sell** investment recommendation, with a **target price set of £0.73**, representing a 126% overvaluation relative to the price the stock was trading at on August 31st, 2022 (£1.65).

Abstrato

Esta dissertação pretende determinar um preço-alvo das ações da Aston Martin, um fabricante Inglês de automóveis de luxo, e fornecer uma recomendação de investimento. As ações desvalorizaram 96% desde a IPO, portanto, é importante compreender se as ações estão agora a ser negociadas a um preço justo.

São apresentados três métodos de avaliação, o método dos fluxos de caixa descontados, análise de empresas comparáveis, e análise de transações precedentes. Na DCF, foram desenvolvidos três cenários diferentes, um otimista que segue os objetivos divulgados pela AM para os próximos anos, um pessimista que sujeita a empresa ao impacto da crise financeira de 2008, e um cenário base em que se espera que a Aston Martin siga o mesmo crescimento que as estimativas para as vendas dos segmentos SUV, Luxo, e Desportivos até 2027. Para cada um dos cenários, o analista fez suposições que melhor se adaptam ao atual panorama económico e geopolítico, considerando, por exemplo, aumentos nos preços das matérias-primas. A taxa de desconto utilizada foi o custo médio ponderado do capital utilizando o método 5FF para prever o custo do capital; no entanto, para efeitos de comparação, foram também considerados o modelo CAPM e o 3FF. Na análise de empresas comparáveis, os múltiplos utilizados foram calculados numa base prospetiva e retrospetiva.

A pesquisa resultou numa recomendação de investimento **Venda Forte**, com um **preço-alvo fixado em £0.73**, representando uma sobrevalorização de 126% em relação ao preço a que as ações estavam a ser negociadas a 31 de Agosto de 2022 (£1.65).

Acknowledgements

This chapter of my life comes to an end with this thesis. It was a time of sacrifice, but more importantly of growth—both intellectually and personally. I want to express my gratitude to Professor José Faias for supporting me during the entire development process and motivating me to strive for greater and better results. Above all, I want to express my gratitude to my family for their unwavering support over the years, which has helped me mature as a person.

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1. Executive Summary

The purpose of this dissertation is to determine a target price for the shares of Aston Martin, and subsequently give an investment recommendation. The company is a luxury auto manufacturer founded in 1913 in the UK. Some of the cars produced are well known for their appearance in James Bond movies, portrayed as an icon of success, power, and glamour. Despite the brand's desire to be associated with these traits, it appears to be the contrary when analyzing its financial performance. The company has been accumulating losses, and this is being felt in the share price. Its stock price has dropped -96% since the company's market debut in 2018 and -67% YTD. Given this drop, it is of interest to understand if Aston Martin's stock is already trading at a fair price. The first step was to undertake a review of the literature to determine which methodologies were appropriate for valuing Aston Martin stock and some of the assumptions that should be used in each. As a result three methodologies were selected, the discounted cashflow method, the comparable company analysis, and the precedent transaction analysis.

The automotive sector was then studied to determine how production and consumption are distributed across the globe. In the same section, a comment is made about the growth prospects of the industry for the next 5 years, and about the biggest challenges it is currently facing, such as the impact of regulation forcing the energy transition and the disruptions caused by the Russia-Ukraine and China-Taiwan conflicts.

The next section focuses on the history of Aston Martin and the different business areas of the company. It also explains the company's strategy, the circumstances under which the company was listed on the London Stock Exchange, and the reasons behind the stock's underperformance since then.

An examination of Aston Martin's SUV, Sports, and Luxury car segments follows. The market share of peer companies within each segment is analyzed to spot trends and underlying causes. Projections for the growth of each segment are also provided through 2027.

The financial analysis section aims at understanding the company's financial position in terms of liquidity, efficiency, profitability, and solvency. Several ratios are computed and compared to peers. The analyst identifies trends, turning points, and tries to understand the reasoning.

The valuation chapter is where the methods introduced in the literature review were applied and the assumptions explained. Within the DCF three different scenarios were developed, an optimistic one that follows AM's disclosed targets through 2027, a pessimistic one that subjected the company to impacts felt by its peers during the 2008 financial crisis, and a base case where Aston Martin is expected to follow the same growth as the estimates for the SUV, Luxury, and Sports cars sales through 2027. For each of the scenarios, the analyst has made assumptions that best fit the current economic and geopolitical landscape, considering for example increases in raw material prices, adjustments in demand for the different segments, and worsening of payment periods. The discount rate used was the weighted average cost of capital using the 5FF method to forecast the cost of equity, however, for comparison purposes, the Capital Asset Pricing Model and the 3FF were also utilized.

Within the comparable company analysis (CCA), peers were selected using a bottom-up approach given the specificity of the cars developed by Aston Martin and the services it offers. Only publicly traded companies whose largest share of revenues originated from the sale of compact, mid-size, executive, or luxury cars were considered. Each of the peers had to have at least one model within the hypercar segment. This screening resulted in 5 companies. For each, three multiples were computed, EV/Sales, EV/EBITDA, and Price/Sales both on a last twelve months and next twelve months' bases. For the target prices computation, only the median values were considered to diminish the impact of out-of-range values.

For the precedent transaction analysis (PTA), a list of transactions that took place within the last decade was collected. The criteria for the transaction selection was the same applied in the CCA regarding the target company. Again, only the median values were used for the EV/Sales and EV/EBITDA multiples to reduce the impact of out-of-range values.

The last section contains the final target price for Aston Martin's shares. The three methods utilized originated nine different target prices which were combined into one through a weighted average. The final investment recommendation is identified as a **Strong Sell**, with a **target price set of £0.73**, representing a 126% overvaluation relative to the price the stock was trading at on August 31st, 2022 (£1.65). A weight of 70% was put on the DCF valuation using the 5FF computed WACC. The reason for this is that the DCF has a much higher level of detail and allows making firm-specific assumptions about its future. Regarding the CCA, a weight of 6.7% was put on the forward-looking multiples (NTM) since they have historically performed better at estimating stock prices. A weight of only 2% was given to the backward-looking multiples (LTM) since they are likely to give a misleading representation following the ongoing

disruptions caused by the Russia-Ukraine conflict and the inflation surge. Lastly, a 2% weight was assigned to the precedent transaction method. Similar to CCA's backward-looking multiples, PTM multiples are likely to be an inaccurate representation of how AM's performance will be in the future. That happens because they refer to transactions that happened under different market circumstances (more than two years ago), and because are also likely to produce overstated valuations given the adjustments made by acquiring firms to account for the control premium.

2. Literature Review

The following literature review aims to provide insight into the methods used in the financial industry to determine the value of each share of a company, whether it is publicly traded or about to be. Finding the correct value of each stock is of utmost importance. For example, fundamental analysis can help an analyst at a hedge fund identify mispriced stocks and assist in an investment decision such as to go long, short, or to take no action. The same is true for an investment bank analyst working on an IPO, who has an interest in pricing each of his client's shares in a way that leaves no more money on the table than is strictly necessary[1].

2.1 Market Value vs. Intrinsic Value

In a letter to *Berkshire Hathaway*'s shareholders, Warren Buffet in wrote, "Benjamin Graham taught me that - Price is what you pay, value is what you get." Both price and value are important. The fundamental idea behind value investing is the distinction between price and value, in other words, Market Value and Intrinsic Value. Undervaluation and overvaluation are the two main ideas in value investing. When a stock is trading for less than its true worth, value investors deem it to be undervalued. On the other side, a stock is overvalued if it is trading for more than it is actually worth. The reason for the disparity between Market and Intrinsic values can have varying causes. On this, Graham said that "in the short run, the market is a voting machine but in the long run, it is a weighting machine".

This statement implies that what matters, in the long run, is a company's fundamental business performance rather than the investors' volatile opinion of its prospects in the short run, thus the true value (intrinsic) of an asset will be reached in the long run.

2.2 Introduction to Valuation

On a daily basis, financial analysts use several models with different degrees of complexity. These same models often use assumptions that are also quite different, but share several identical characteristics, which allows us to group them into larger groups. (Damodaran, Investment Valuation, 2002) identifies 3 groups of models. First, he identifies the Discounted Cash Flow methods (DCF), which essentially resumes the value of an asset/company as the Present Value of the Future Cash Flows expected to be generated by that company over the coming years. Secondly, he mentions the Relative Valuation methods, which determines the

[1] "Leaving money on the table is measured by the difference between the closing price on the first day of trading and the issue price, multiplied by the number of shares issued. The main cause for leaving money on the table is short-run underpricing which rewards positive financial returns for initial investors at the very first day of trading. The shortrun underpricing is a universally accepted phenomenon." (Perera and Kulendran, 2015)

value of an asset by looking at the price of comparable company, that are filtered bearing in mind variables such as "earnings, cash flows, book value, sales". Lastly, he mentions the Contingent Claim Valuation which essentially uses option pricing models to measure the value of assets that share option characteristics, however, this methodology will not be covered in this dissertation.

2.3 Valuation Models

2.3.1 Discounted Cash-Flow Method

In a 1997 *Harvard Business Review*, Luehrman mentioned the DCF's emersion in the 70s as the best practice when it comes to valuing corporate assets. Further on in the paper, when talking about the possible emergence of new valuation practices, he adds that "Discounted Cash-Flow will remain the foundation of most formal valuation analysis". Also, in a 2005 *McKinsey on Finance* Article, Goedhart, Koller, and Wessels refer to it as "the most accurate and flexible method for valuing projects, divisions, and companies".

The Discounted Cash-Flow Analysis relies on forward-looking data. It assumes one can calculate the value of a company using the present value of expected free cash-flows, discounted at a risk-adjusted rate. The formula is as follows:

$$\text{Discounted Cash Flow} = \frac{FCF_1}{(1+r)^1} + \frac{FCF_2}{(1+r)^2} + \ (\dots) \ + \frac{FCF_n}{(1+r)^n} = \sum_{t=1}^{t=n} \frac{\text{FCF}_t}{(1+\text{r})^t}$$

Where:

- n = number of periods generating free cash-flows over the project's life. For a 5-year project with quarterly cash flows, n=20. A project assuming lifelong FCFs generation, n = ∞.
- FCF_t = Expected Free Cash-flow generated in period t
- t = Period number
- r = risk-adjusted discount rate (%). Should be adjusted according to the seasonality of the cash-flows (monthly, quarterly, semi-annual, annual).

The expected free cash flows of a company are determined using a wide range of "assumptions and judgments about its expected financial performance, including sales growth rates, profit margins, capital expenditures, and net working capital requirements" (Rosenbaum & Pearl, 2009). Regarding the number of periods whose free cash-flows should be estimated, Rosenbaum & Pearl wrote that depending on the industry the company operates in, where it is in its development, and how predictable its financial performance is, the Free Cash-Flows are

typically projected for a period of five years, which is the period the firm is assumed to reach its steady state. Regarding this steady-state concept, Damodaran wrote in his 2012 "Investment Valuation" publication, that a company will eventually grow at a pace that is either lower than or equal to the growth rate of the economy in which it operates as it grows because it becomes more challenging for it to maintain high growth as it expands. He then added that it is possible to estimate the value of all future free cash-flows once the firm is assumed to have reached the steady state by using a growing perpetuity formula. The formula thus becomes the following:

$$\text{Discounted Cash Flow} = \frac{FCF_1}{(1+r)^1} + (\dots) + \frac{FCF_s}{(1+r)^s} + \frac{FCF_s * (1+g)}{(r-g) * (1+r)^s}$$

$$= \frac{FCF_1}{(1+r)^1} + (\dots) + \frac{FCF_s}{(1+r)^s} + \sum_{t=s+1}^{t=\infty} \frac{\mathrm{FCF_t}}{(1+\mathrm{r})^{\mathrm{t}}}$$

$$= \frac{FCF_1}{(1+r)^1} + (\dots) + \frac{FCF_s}{(1+r)^s} + \frac{Terminal\ Value_s}{(1+r)^s}$$

$$= \sum_{t=1}^{t=s} \frac{\mathrm{FCF_t}}{(1+\mathrm{r})^{\mathrm{t}}} + Terminal\ Value_0$$

Where:

- s = number of periods generating free cash-flows until the firm reaches its steady-state.
- FCF_s = Expected Free Cash-flow when firm reaches its steady-state
- g = growth rate of the Expected Free Cash-flow after the firm reaches its steady state. Must not be greater than the expected growth rate of the economy over the long run.
- r = risk-adjusted discount rate (%). Should be adjusted according to the seasonality of the cash-flows (monthly, quarterly, semi-annual, annual).

Using this formula, we are able to obtain either the value for the whole enterprise (EV) or the equity value. The Enterprise Value can be obtained by using the Free Cash-flows to the Firm (FCFF) discounted at the firm's weighted average cost of capital (WACC). On the other hand, the Equity Value of the firm can be found using the Free Cash-flows to Equity discounted at the firm's cost of equity (Cegłowski & Blażej, 2012).

2.3.1.1 Free Cash-Flows to the Firm (FCFF)

The FCFF are the cash-flows available to common shareholders, debtholders, and preferred shareholders (Damodaran, Investment Valuation, 2012). They are obtained using the following formula:

$$FCFF = EBIT * (1 - t) + D\&A - Capex - Change\ in\ NWC$$
$$= NOPAT + D\&A - Capex - Change\ in\ NWC$$

Where:

- EBIT = Earnings Before Interest and Taxes
- t= marginal tax rate for the given period being estimated
- D&A = Depreciation and Amortization Expenses
- Capex = Capital Expenditures
- Change in NWC = Change in Net Working Capital

As the formula illustrates, to compute the FCFF, the taxes must be subtracted from the firm's Earnings Before Interest and Taxes (EBIT), resulting in the Net Operating Profit After Tax (NOPAT). Then, Depreciation and Amortization is added back and the Capex is subtracted. This happens because when there is a capital expense (e.g.: acquisition made to extend the overall life of an asset or increase its capacity/use) the amount is capitalized on the balance sheet, and only a portion of the investment, corresponding to the total amount invested divided by the useful life of the asset, is expensed on the income statement in the form of depreciation and amortization. Thus, capital expenditures, unlike depreciation, represent actual cash outflows, and as a result, to calculate FCFF in the year in which the purchase is made, it needs to be deducted (Rosenbaum & Pearl, 2009). Lastly, the absolute change in Net Working Capital (NWC) must be subtracted as it illustrates the firm's annual use or retention of cash. The NWC is given by the difference between non-cash current assets and non-interest-bearing current liabilities.

2.3.1.2 Free Cash-Flows to Equity (FCFE)

As mentioned before, the Equity Value of a Firm can be estimated using the FCFE as an input on a DCF model, provided that they are discounted at the required return to equity, commonly referred as cost of equity (Fernández, 2013). The FCFE are the cash flows available to the company's common equity holders after all operating expenses, interest, and principal payments have been paid and necessary investments in working and fixed capital have been made. FCFE is the cash flow from operations minus capital expenditures minus payments to

(and plus receipts from) debtholders. According to (Damodaran, Investment Valuation, 2012) the FCFE can be computed as follows:

$$\begin{aligned} FCFE = {} & Net\ Income - Capex + D\&A - Change\ in\ NWC + Net\ Borrowing \\ & = (EBIT - Interest) * (1 - t) - Capex + D\&A - Change\ in\ NWC \\ & + Net\ Borrowing \end{aligned}$$

Where:

- Net Borrowing = New debt issued – Debt repayments

Alternatively, the FCFE can be computed from the FCFF. The formula is as follows:

$$FCFE = FCFF + Net\ Borrowing - Interest * (1 - t)$$

2.3.1.3 FCFF vs. FCFE

Depending on the company being analyzed, an analyst may have reasons to prefer using FCFF or FCFE. If the company's capital structure is relatively stable, FCFE is more direct and simpler to use than FCFF. In the case of a levered company with negative FCFE, however, working with FCFF to value equity may be easier (Stowe, Robinson, Pinto, & McLeavey, 2007). The authors also mention that for companies with volatile leverage, a growth rate in FCFF is likely to lead to more accurate results when compared to those using FCFE.

2.3.2 Inputs for DCF Model

2.3.2.1 Weighted Average Cost of Capital (WACC)

As previously mentioned, when using the FCFF to determine the value of an enterprise, the WACC is used as discount rate. It is given by the weighted average of the returns required by both shareholders and debtholders to invest capital into the company. Because debt and equity have different riskiness and tax policies, WACC is computed bearing in mind the firm's long-run target capital structure. However, in the absence of a clear direction for the firm's target capital structure in the long run as is the case for Aston Martin, the average of the capital structure of peer firms can be used (Rosenbaum & Pearl, 2009). Regardless of the scenarios, the WACC is computed as follows:

$$WACC = Cost\ of\ Debt * (1 - t) * \frac{D}{D + E} + Cost\ of\ Equity * \frac{E}{D + E}$$

Where:

- t = marginal tax rate
- D = market value of debt

- E = market value of equity

2.3.2.2 Terminal Value

Because predicting a company's free cash-flows over the long term can be difficult, the terminal value is used to determine how much value derives from a company after the projection period. In a DCF valuation, the Terminal Value makes up a sizeable amount of the firm's value. There are two ways to determine a company's terminal value (Rosenbaum & Pearl, 2009). The perpetuity growth method determines the terminal value by treating the firm's terminal year FCF as a perpetuity growing at an assumed rate (g), whereas the exit multiple method determines the firm's remaining value after the projection period based on a multiple of the target's terminal year EBITDA (or EBIT). For this analysis, only the perpetuity growth method was utilized. The formula is as follows:

$$Terminal\ Value = \frac{FCF_s * (1 + g)}{(r - g)}$$

Where:

- FCF = FCFF or FCFE, depending on whether determining the Enterprise Value or Equity Value, respectively
- s = terminal year of the projection period
- g = perpetuity growth rate, chosen typically based on the anticipated long-term industry growth rate, which typically tends to be within a range of 2% to 4% (nominal GDP growth).
- r = Weighted average cost of capital, or cost of equity, depending on whether determining the Enterprise Value or Equity Value, respectively

2.3.3 Comparable Company Analysis (CCA)

The comparable company analysis is designed to reflect current valuation based on prevailing market conditions and sentiment (Rosenbaum & Pearl, 2009). The core of this analysis involves selecting a universe of comparable companies, under the assumption that similar companies provide a highly relevant reference point for valuing a given company as they share the same industry segments, performance drivers, financing structure, geographic focus, and riskiness.

2.3.3.1 Multiples

Trading multiples, which utilize a measure of value in the numerator and an operating metric in the denominator, are then calculated for all the comparable companies.

The most used are the following:

$$\frac{EV}{Sales}; \frac{EV}{EBITDA}; \frac{EV}{EBIT}; \frac{equity\ value}{net\ income}; \frac{stock\ price}{sales\ per\ share}$$

These can be computed using both historical data (last twelve months) or forward-looking data (consensus next twelve months). In (Moonchul & Ritter, 199) valuation accuracy using forecasted earnings led to more reliable results than those using historical values.

2.3.4 Precedent Transaction Analysis (PTA)

Similar to the comparable company analysis, the precedent transaction analysis uses multiples to derive the value of a firm. Those multiples are determined bearing in mind values paid in previous mergers and/or acquisitions involving peer companies. The basis for carrying out precedent transactions is the selection of acquisitions that occurred within the same universe as our company, however this is an extremely difficult procedure. The most recent transactions (those that took place within the preceding two to three years) are the most pertinent since they probably happened in an environment with similar market conditions to the one being considered. However, in some circumstances, it may be relevant to examine older transactions if they took place in a similar period to that of the company under valuation (Rosenbaum & Pearl, 2009).

The most used multiples are the following:

$$\frac{EV}{Sales}; \frac{EV}{EBITDA}; \frac{EV}{EBIT}$$

According to (Rosenbaum & Pearl, 2009), PTA yields higher enterprise values than the CCA. The reason for that is that the acquirer is willing to pay a premium for taking control over other firms' assets and the decisions for its future. They also add that acquirers pay a premium in expectation to benefit as a whole from synergies such as economies of scale or entering new markets.

3. Industry Overview

The automotive industry directly represented ~3% of the world GDP in 2021, worth $96 trillion, making it one of the largest industries by revenue. It is also one of the industries that invests the most in research and development every year. Over the last decades it has faced major disruptions such as the global energy transition plan, trade war, Covid-19, Brexit, countries emergence, consumer preferences shift, and supply chain issues. Before diving into AM's valuation, it is appropriate to examine and understand the environment in which the auto industry operates at the moment and what is expected for its future.

3.1 Geographic Split

3.1.1 Leading car manufacturing countries

China became the world's largest manufacturer of automobiles in 2008, overtaking the USA, and since then maintained its position. According to a report from the Organisation Internationale des Constructeurs d'Automobiles, in 2021 China accounted for 37,5% of all passenger cars manufactured. It is forecasted to remain the largest producer, even though the industry in the country is facing slower growth given the maturing domestic demand, supply chain changes and growing costs pressure in the industry. Japan, Germany, India, and South Korea are other major automotive manufacturers. In 2021, together accounted for more than 70% of the global production of automobiles.

Table 1: Top passenger vehicles producers by number of cars produced, *OICA*

	2019	2020	2021
China	31,84%	38,26%	37,49%
Japan	12,40%	14,90%	14,60%
Germany	6,94%	8,34%	8,17%
India	5,40%	6,49%	6,36%
South Korea	5,38%	6,46%	6,33%
USA	3,74%	4,49%	4,40%
Brazil	3,64%	4,38%	4,29%
Spain	3,35%	4,02%	3,94%
France	2,48%	2,98%	2,92%
Russia	2,27%	2,73%	2,67%

3.1.2 Exporting Countries

In 2021, the automotive sector exported goods worth $710.4 billion. Germany exports more than any other country in the world in the automobile sector (20% of all exports in 2021). The rise of exports has been aided by the key regions' recovering demand for luxury cars as well as the global reach of German automakers. Mexico has been emerging as an auto exporting country experiencing increased demand from the north American market following the increased

Table 2: Passenger Vehicles exports by country, billion USD, *World's Top Exports*

	2021	2020	YoY
Germany	$ 139	$ 123	13%
Japan	$ 86	$ 81	6%
USA	$ 55	$ 46	19%
South Korea	$ 44	$ 36	24%
Mexico	$ 40	$ 40	-1%
Spain	$ 34	$ 31	8%
Belgium	$ 32	$ 33	-4%
United Kingdom	$ 30	$ 27	14%
Canada	$ 29	$ 32	-9%
Slovakia	$ 27	$ 24	10%

investment in new production facilities as a result US' trade war with China. Japan, the USA and South Korea are also among the major exporters.

3.1.3 Importing Countries

In 2021, the automobile sector imported $716.2 billion worth of goods. The USA, Germany, China, France, and the UK were the top 5 importers. Together, they made up 47.4% of all imports. With a weight of 46.7%, the European region imported the most goods in 2021. Nearly 26% of all imports came from the North American region, while 20% came from Asia.

Table 3: Passenger Vehicles imports by country, billion USD, *World's Top Exports*

	2021	2020	YoY
USA	$ 148	$ 146	2%
Germany	$ 67	$ 81	1%
China	$ 49	$ 46	9%
France	$ 40	$ 36	10%
United Kingdom	$ 36	$ 40	3%
Belgium	$ 32	$ 31	-2%
Canada	$ 28	$ 33	27%
Italy	$ 25	$ 27	9%
Australia	$ 18	$ 32	37%
Spain	$ 15	$ 24	11%

3.2 Key players in the Industry

Toyota, Volkswagen, Stellantis, Ford and Mercedes were in 2021 the 5 largest car manufacturers in the globe, with a combined revenue of $896 billion. Toyota had the highest revenue of $239 billion. Volkswagen ranked second, selling under its own brand but also as Audi, Seat, Skoda, Bentley, Bugatti, Lamborghini, Porsche[2], Ducati, Scania and MAN. Resulting from a merger in 2021 between the Italian Fiat Chrysler Automobiles and the French PSA Group, Stellantis ranked third. It sells vehicles under known brands such as Maserati, Abarth, Alfa Romeo, Chrysler, Dodge, Fiat, Jeep, Lancia, Ram, Peugeot, Citroen, DS Automobiles, Opel, and Vauxhall. In fourth place, Ford commercializes vehicles under the names of Ford, and Lincoln. The fifth largest group, Mercedes sells through its brands, Mercedes-Benz, Mercedes-AMG, and Mercedes-Maybach, Smart, and Freightliner.

Table 4: Largest Car Manufacturers by 2021 Revenue, billion USD, *Refinitiv Eikon & F&I Tools USA*

	Country	Revenue 2021
1. Toyota	Japan	$ 239
2. Volkswagen	Germany	$ 234
3. Stellantis	Holand	$ 173
4. Ford	USA	$ 126
5. Mercedes	Germany	$ 124

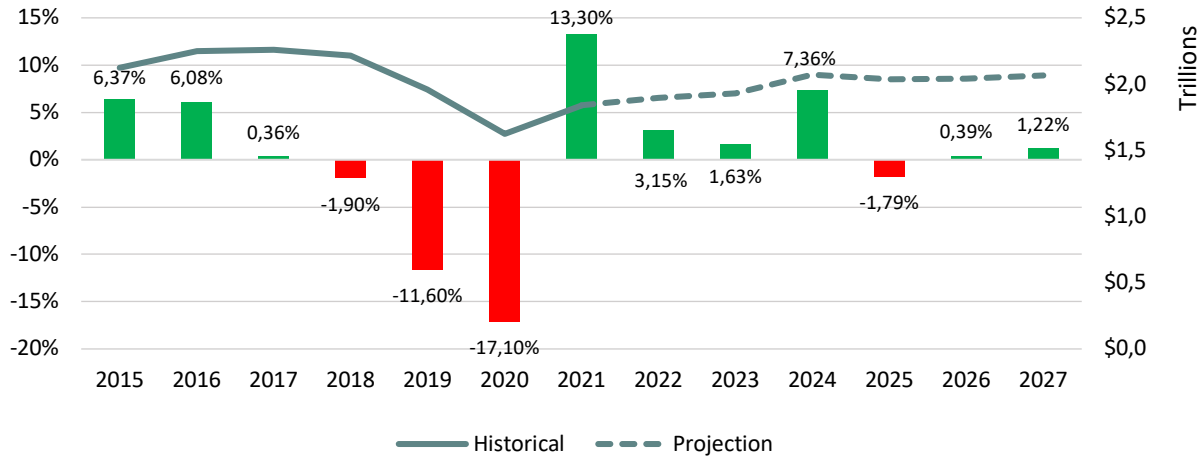
[2] Revenues from Porsche included into the revenue for the year 2021, however the company (Porsche) has been spined-off from the Volkswagen Group following its IPO in 29th September 2022.

3.3 Industry Outlook

The automotive industry, although severely impacted by the pandemic, proved resilient and returned to pre-pandemic values. Strong demand for vehicles in Asia-Pacific, North America and Europe helped to drive the recovery.

Despite regulatory pressure for an energy transition, instability brought on by disputes between China and Taiwan and Russia, as well as shifting customer preferences, the industry is predicted to grow in the years to come, albeit more slowly. Despite the industry's growth, it is crucial to assess the effects of each of these factors to comprehend how they will impact future company profitability and solvency:

Figure 1 – YoY total revenue change from automotive industry (left-hand side) and total revenue from the automotive industry in USD (right-hand side), June 2022, retrieved from *Statista.*



3.3.1 Energy transition implications

Automakers are being forced to invest in the electrification of their vehicles as a result of new regulations aimed at reducing the pollution produced by internal combustion engines.

3.3.1.1 Focus on high margin models: Component shortages

A demand shock occurred as a result of governments all over the world providing subsidies for the purchase of electric vehicles, an increase in the number of nations banning the registration of new gasoline and diesel vehicles, a growing infrastructure of charging stations, and the increased autonomy and reliability of electric vehicles. The rivalry between China and Taiwan, which accounts for 20% of global production, along with underinvestment in the semiconductor industry, on the other hand, led to a negative supply shock. This shortage is expected to last at least until 2024 because the industry is capital and knowledge intensive, making it difficult to make up for this imbalance in the short term. Therefore, producers will have to reevaluate their production schedules and concentrate on more profitable models.

3.3.2 Ukraine-Russia conflict disruptions

3.3.2.1 Rise in nickel prices expected to impact the producers of electric and hybrid cars

Nickel prices have dramatically surged as a result of Russia's invasion of Ukraine and the rise in market volatility. Between March 2021 and March 2022, the price of nickel on a global scale more than doubled. Nickel is a crucial component of batteries utilized in hybrid and electric vehicles, and supply issues pose a threat to the industry. Increases in nickel prices are predicted to drive up the cost of electric vehicles by $1000. Additionally, a lack of nickel might create production delays and financial losses for the auto manufacturers.

3.3.2.2 Energy price increase to affect the entire supply chain

Despite the automobile industry's low energy expense (0.2% of total costs on average), the sector is nonetheless susceptible to rising energy prices because of its reliance on logistics firms. Fuel expenditures made up more than 7% of overall costs in the global road transport sector in 2021. The entire automobile supply chain is thus affected by rises in energy and fuel prices, which run the risk of driving up logistics costs.

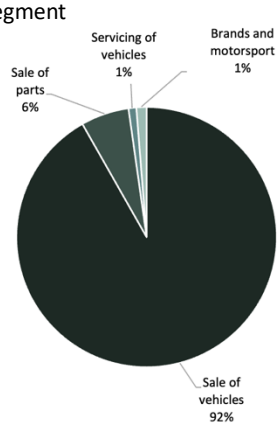
4. Company Overview

Aston Martin Lagonda Limited, is a British car manufacturer founded in 1913, based in Gaydon, England. For much of its history, it was a niche producer of luxury, high-performance sports cars, mainly for U.K. customers. The company's name is derived from the name of one of the company's founders, Lionel Martin, and a reference to his victory in the first edition of Aston Clinton Hill Climb Race. The Aston Martin and Lagonda brands have a combined history of more than a century presenting their clients with sophisticated, elegant, and exclusive products.

4.1 Revenue Streams

Aston Martin sells in more than 55 countries and has increased its offering, selling not only sports cars but also mid-engine grand tourers and SUVs. In 2021, car sales accounted for 92% of its revenue. Alongside car sales, AM has other revenue streams such as parts sales, servicing, and Brands & Motorsport. Within the servicing business, which only accounted for 1% of the business revenue in 2021, Aston Martin provides maintenance and accident repair services, as well as the restoration of older Aston Martin models. It also offers services such as classic car inspection/certification, and track day works and upgrades. Within the parts business, Aston Martin sells replacement components for both classic and modern cars. It is largely correlated with the previously mentioned servicing business, being the supplier of the network of authorized dealers and approved third-party maintenance centers. The weight of this segment is much more significant, representing 6% of the firm's 2021 revenue. Within the Brands & Motorsports business, Aston Martin leverages its solid reputation for exclusivity and prestige, earned from both its remarkably long and rich history in Hollywood and its victories in motorized sports competitions such as the Le Mans or the European Grand Prix. This positioning allowed it to close partnerships in areas such as real estate, clothing, jewelry, and more recently Formula One. After 60 years absent from the F1 grid, Aston Martin got back to the competition as

Figure 2 - 2021 AM's Revenue per Segment



the company became the title sponsor and technical partner of Red Bull Racing. This segment represented only 1% of the firm's 2021 revenue, however, has been steadily growing over the last years. Figure 3 illustrates the evolution of Aston Martin's revenue for each of its segments over the past 4 years. Over this period the proportions of each of the segments have remained relatively stable, apart from the year 2020, when the revenue coming from the sale of vehicles dropped.

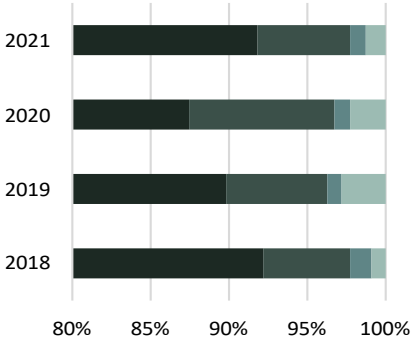
4.2 Listed in London Stock Exchange in 2018

In 2017, Aston Martin managed to generate, for the first time, a full year of pre-tax profits after decades yielding large losses and facing 7 bankruptcies. Leveraging the favorable results Aston Martin announced, in September 2018, it planned to become publicly traded on the London Stock Exchange. Therefore, on October 3rd, 2018, Aston Martin placed 25% of its capital in the market, at £19 a share, for a total of 57 million shares, valuing the company at £4.3 billion.

4.3 Ownership Structure

As of August 31st, 2022, the ownership structure of Aston Martin can be seen in figure 4. AM has 699 million shares outstanding. Its largest shareholder is Lawrence Stroll, currently holding 22% of the voting power. Invesco Holding Company, an asset management firm integrating the SP500, holds 12.6% of the company. Mercedes-Benz group holds a similar share, with a 11.7% position. Three other investment management companies hold positions between 2.9% and 1%. The remaining capital (48.6%) is divided among numerous stockholders. Regarding the investor type, the majority of the shares is detained by retail investors (38%), followed by corporations (27%). Individual investors are the third largest type of investors in Aston Martin, holding 24% of the capital. With smaller stakes, investors such as hedge funds, holding companies, pension funds, banks, trusts, and others, together account for 10% of the shares.

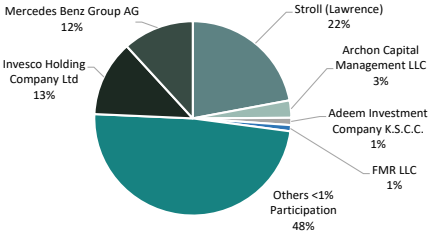
Figure 3 – 2018-2021 AM's Revenue per Segment (Relative and Absolute Values)

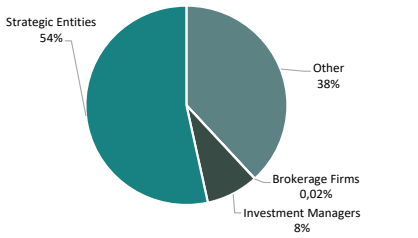


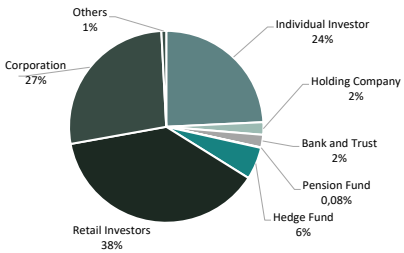
(%)	2018	2019	2020	2021
Sale of vehicles	92,2%	89,8%	87,5%	91,8%
Sale of parts	5,6%	6,4%	9,3%	6,0%
Servicing of vehicles	1,3%	0,9%	1,1%	1,0%
Brands & Motorsport	0,9%	2,8%	2,2%	1,3%

Million (£)	2018	2019	2020	2021
Sale of vehicles	£1 010,70	£ 880,80	£ 535,10	£ 1 005,40
Sale of parts	£ 61,10	£ 63,00	£ 56,60	£ 65,50
Servicing of vehicles	£ 14,60	£ 9,30	£ 6,60	£ 10,60
Brands & Motorsport	£ 10,10	£ 27,40	£ 13,50	£ 13,80

Figure 4 – Aston Martin's ownership structure, data as of August 31st, 2022, retrieved from *Refinitiv Eikon.*







4.3.1 Partnership with Mercedes-Benz Group

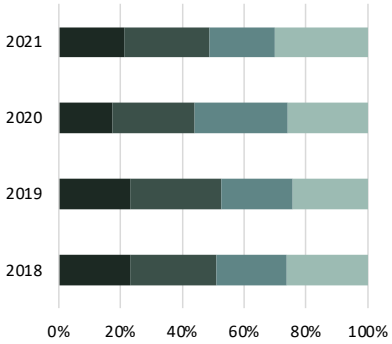
In 2013, Aston Martin signed a contract with MB Group (former Daimler AG) to be supplied with both Mercedes-AMG engines for the firm's new models and also with hardware and software to be used on its infotainment systems. This strategic cooperation agreement allowed Aston Martin to secure, until 2027, access to powertrains to be used in the next generation of hybrid, electric and conventional vehicles. With this agreement, Aston Martin eliminated the risks and the costs associated with developing these technologies, enabling it to focus its investment in other areas and expand its product portfolio. In exchange for the right to use this technology and these engines, Aston Martin issued Mercedes new shares. The issuance of these additional shares to Mercedes is to take place in stages, allowing MB Group to increase its ownership up to 20% of the common equity.

4.4 Regional Breakdown

Aston Martin has sales points all over the world. It divides them into 4 regions: United Kingdom, EMEA, Americas, and Asia Pacific. Looking at **Figure 5**, in 2021 the Asia Pacific region was responsible for the largest sales, with a contribution of 29.9%. Very close behind was the Americas region, whose contribution to AML's revenue was 27.6%. Sales from the United Kingdom and EMEA were on par, with values of 21.1% and 21.3%, respectively. Over the past 4 years the proportions of company revenue by region have been somewhat volatile apart from EMEA which proved to be a bit more resilient. Part of this volatility is due to the effect of the pandemic in the year 2020, whose impact, depending on the region, varied between -20% and -54% in the same year (table 8). Throughout these 4 years, Aston Martin saw its revenue drop in the Americas (-0.33% CAGR), EMEA (-1.83% CAGR), and most pronouncedly in the UK (-3.25% CAGR).

On the bright side, there was a considerable increase in revenue coming from the Asia Pacific region whose CAGR was 4.34% in the 2018-2021 period.

Figure 5 - 2018-2021 AM's Revenue per Region (Relative and Absolute Values)



(%)	2018	2019	2020	2021
United Kingdom	23,3%	23,0%	17,3%	21,1%
The Americas	27,9%	29,6%	26,6%	27,6%
EMEA	22,5%	23,2%	30,2%	21,3%
Asia Pacific	26,3%	24,2%	25,9%	29,9%

Million (£)	2018	2019	2020	2021
United Kingdom	£ 255	£ 230	£ 106	£ 231
The Americas	£ 306	£ 295	£ 163	£ 303
EMEA	£ 247	£ 231	£ 185	£ 234
Asia Pacific	£ 288	£ 241	£ 158	£ 328

Figure 6 - 2021 AM's Revenue per Region

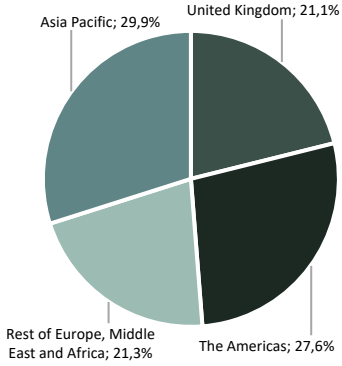


Table 5 – 2018-2021 Aston Martin's Revenue YoY % change per Region

YoY (%) change	2019	2020	2021
United Kingdom	-10%	-54%	118%
The Americas	-3%	-45%	86%
EMEA	-6%	-20%	26%
Asia Pacific	-16%	-34%	107%

This gain in the Asia Pacific region can be explained by Aston Martin's growth strategy. Over the past 21 years, the sales points network has undergone significant expansion, growing from 61 dealerships in 19 countries in 2000, to 168 dealerships in 56 countries in 2021. In particular, over the last few years Aston Martin Lagonda has developed its Asia Pacific dealer network, in particular its Chinese dealer network, to build on recent success and on further growth opportunities associated with the increasing number of HNWIs in these regions.

4.4.1 Impact of the Brexit

Since the majority of sales are made outside of the UK, the company's management claimed that the effects of Brexit would be minimal and that a potential devaluation of the pound might even increase its competitiveness with other manufacturers.

4.4.2 Impact of the Russia-Ukraine conflict

Aston Martin suspended its sales and deliveries to Russia. According to the automaker, together those countries account for less than 1% of its global sales. The current scenario does not allow doing business with both countries at all. Some Russian banks have been banned from the Swift banking system, and also shipping operators, have suspended deliveries to and from Russia. In Ukraine, Aston Martin is closely monitoring developments and maintaining close contact with its local dealers, focusing on the safety and well-being of its employees.

4.5 Strategy

Aston Martin has undergone some management changes in recent months, with CEO Tobias Moers stepping down from his position and being replaced by Amadeo Felisa in July 2022. Despite this change it is important to look at all the work done under Moers' supervision and also to know Felisa's plans for Aston Martin.

4.5.1 Tobias Moers (May 2020 - July 2022)

Tobias Moers (former Mercedes-AMG CEO) in an interview with a British magazine, Autocar, announced his plans for the future of Aston Martin with a strategy called Project Horizon:

4.5.1.1 Project Horizon

Project Horizon is the path set for Aston Martin defining the company's short to mid-term future. Those were the areas of focus:

4.5.1.1.1 From wholesale to retail-driven business model

Under the previous CEO's mandate, Andy Palmer, the brand was manufacturing vehicles without accounting for fluctuations in the demand side. This caused frequent oversupplies at

dealerships and led to high discounts, rapidly depreciating the vehicles. To make the cars better hold their value, Moers changed the company's distribution model and reduced production. To boost the retail-type orders, a new online configurator was launched, allowing for high customization, and thus higher average selling prices when compared to dealership orders[3].

4.5.1.1.2 Powertrain diversification

To address different markets and different types of consumers, the CEO announced two more powertrains to be added to the traditional V8 of the model *DBX*. To minimize the impact of the high tariffs on imports of large-engine cars to China, the CEO released an inline six-cylinder engine coupled with an electric motor, allowing the brand to considerably reduce the cubic centimeters of the engine, without compromising performance. Moers also released the DBX707, a high-performance configuration of the DBX to compete with the Urus, Lamborghini's best-selling car for the last 3 years.

4.5.1.1.3 Entry to low volume, high margin segment: Hypercars

Moers' strategy also involved the introduction of three new mid-engine models which introduced Aston Martin to the hypercars segment, the Valkyrie, Valhalla, and the revamped Vanquish, with prices starting at £2 million, £580 thousand, and £250 thousand, respectively. The company prioritized the development of the higher margin model, the Valkeryie, whose deliveries started in 2021. Of the rest of the models, the launch of the most expensive is expected to be prioritized and take place in 2024. There are no release dates for the Vanquish.

4.5.1.1.4 Facelift of older models and creation of limited-edition versions

Moers also set out to create special editions of the cars in production and facelifts for the models that were still being marketed in order to increase the average selling price of the cars and reduce investment in R&D. For the special editions, the fact that Aston Martin had returned to Formula 1 was taken advantage of, and a commemorative edition was created for the Vantage and DBX models.

4.5.1.1.5 Improved customer journey

Another focus of Project Horizon was to improve the customer experience when buying an Aston Martin. An educational program was created to teach salespeople how to give the best possible experience to the clients of the brand.

[3] Tobias Moers mentioned on an interview that "retail-type orders are always a higher ASP, always", (Gibbs, 2021).

4.5.2 Amadeo Felisa (July 2022 - Future)

Ferrari technical director and later CEO for the period 2008 to 2016, Amadeo Felisa took over the role at Aston Martin after Moers stepped down. With a long experience in the ultra-high-luxury car segment, Felisa was behind the creation of Ferrari's first electrified vehicle, the Ferrari La Ferrari. This signals a strategic move from Aston Martin, as it prepares for a transition to a fully electric lineup in 2027. Under Felisa's supervision, a new strategy was announced:

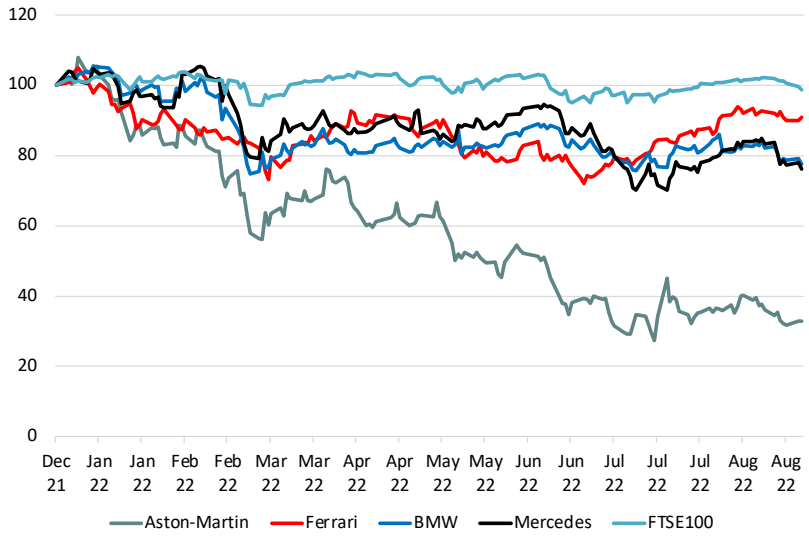
4.5.2.1 Racing Green

Racing Green defines the company's path toward electrification by 2027, with increased in-house development of software integration and greater engagement with the F1 team, the new management team, as well as the new organizational structure, will focus on constructing the mid-engine electric future, with the launch of the first fully electric vehicle in 2025. By 2026, all new Aston Martin model lines will have an electrified alternative, allowing the brand to fully electrify its core portfolio of GT sports cars and SUVs by 2030.

4.6 Share Price Performance

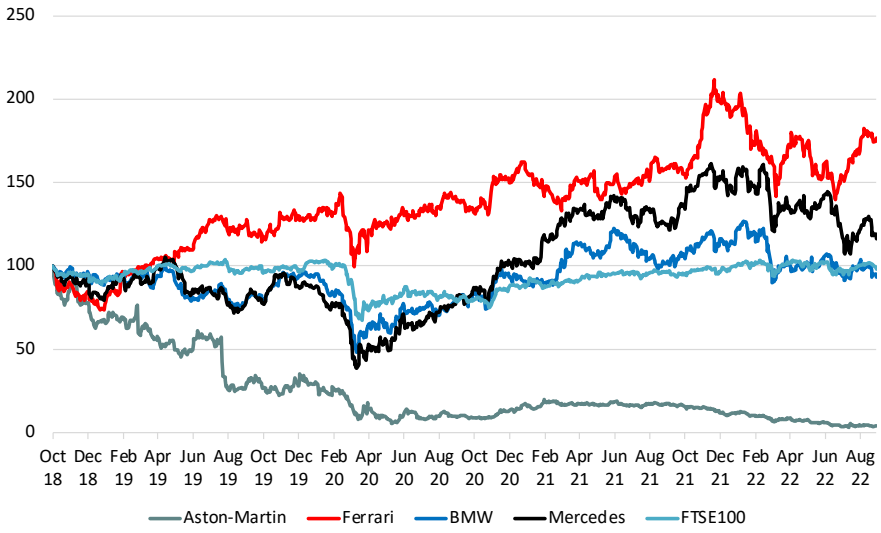
Aston Martin's stock price is down -67% YTD[4], and -96% since its market inception in 2018, trading at around £1.65. Compared to other peers, the company fared much worse. A comparison of Aston Martin's cumulative performance both YTD and since market inception can be seen in the following figures:

Figure 7 – YTD cumulative performance of Aston Martin, Ferrari, BMW, Mercedes and the FTSE 100. Data retrieved from Refinitiv Eikon as of August 31st, 2022.



[4] As of August 31st, 2022. Data retrieved from Refinitiv Eikon in GBP.

Figure 8 – Since AM's market inception cumulative performance for Ferrari, BMW, Mercedes and the FTSE 100. Data retrieved from Refinitiv Eikon as of August 31st, 2022.



YTD, Ferrari delivered -15%. For the same period, BMW and Mercedes, returned -17%. Since AM's inception, Ferrari, Mercedes, and BMW delivered 62%, 19%, and -6%, respectively. Referring to the FTSE 100[5], Aston Martin lagged severely both YTD and since its inception, with the index returning -1.4%, and 3% respectively. AM's maximum drawdown period is still ongoing, as the stock hasn't rebounded to its peak value, reached on the first day being traded at the London Stock Exchange.

AM's poor performance can be explained by several factors:

4.6.1 Hype around the IPO

When the company announced plans to become publicly traded, it had been reporting positive earnings for 7 quarters straight. At the same time, Ferrari, the only publicly traded luxury cars manufacturer, was delivering returns of around 150% after its IPO, just 3 years before. Being within the same industry segment, Aston Martin was valued at Ferrari's multiples around the assumption it would follow the same path.

4.6.2 Ambitious targets for a short period

The valuation close to Ferrari's multiples was also built upon extremely ambitious targets for the company. Behind the valuation, Aston Martin was targeting a 15% increase in output just one year after the IPO, and a 55% increase after two years, coming from a total production of 6441 vehicles in 2018 to 10000 in 2020. For 2021, Aston Martin expected the production of

[5] Index tracking the 100 largest British firms measured by market capitalization.

one of its factories to double with the introduction of a new model in the line, targeting a whopping 12050 production volume, which meant an 87% increase compared to 2018 output.

4.6.3 Excessive R&D capitalization rate

From 2015 to 2017, Aston Martin reported £484 million channeled into R&D, from which it capitalized £451 million (93%). AM's capitalization rate for the period was more than three times that of Ferrari (25%), and more than twice that of the average automaker (40%). This asymmetry in capitalization rates of R&D reveals some weakness in Aston Martin. Adjusting the 2017 EBITDA (£206.5 million), considering Ferrari's capitalization rate of 25%, the EBITDA would become £49 million. Using the average capitalization rate of the automotive industry, EBITDA would be £83 million. The high capitalization of R&D allowed then the company to inflate profits and reduce losses for the periods preceding the IPO.

4.6.4 High IPO cost

Aston martin ended 2018 with its highest revenue ever, £1.1 billion. Profit before taxes was £68 million, however, adjusting for the IPO costs, worth £136 million, resulted in a reported loss before tax of -£68 million. Once the information came to the public in February 2019, the shares of the company went down -21.4%.

4.6.5 Management outlook revised down

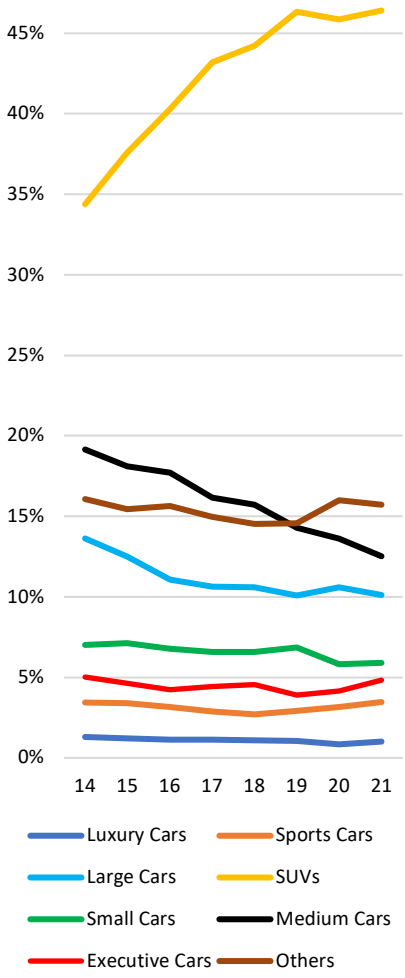
In July 2019, Aston Martin stock plunged -26% after lowering its projections for the rest of the year and disclosing severe difficulties in the United Kingdom and Europe. The reduction in its outlook was attributed to macroeconomic uncertainties as well as difficulties in the UK and European markets. Sales to dealerships in the UK had fallen 17% in the first half of the year compared to the same period in 2018, and 19% for the rest of Europe. As a result, Aston Martin drastically reduced expectations, reporting 6300 units (vs. 7100 expected), an operating margin of 8% (vs. 13% expected), and an EBITDA margin of 20% (vs. 24%).

5. Segments Analysis

5.1 Trends

A 2022 report from *Statista* splits the vehicle manufacturing industry into 8 different segments. The weights over the period 2014 to 2021, measured by revenue terms, can be observed in figure 9. The SUVs segment saw their share of the market increase, going from 34.4% of the industry revenue to 46.4% in just 6 years. This consistent increase in the SUV market share proves a shift in the consumer preferences, following the loss of market share from the Medium, Small, and Large cars segments. The Medium and Large cars segments faced the biggest hit, falling from 19% of the market share to 12%, and 14% to 10%, respectively. Lastly, the Executive, Luxury and Sports cars segments have kept their market share fairly stable over the last 8 years.

Figure 9: 2013-2021 % revenue by automotive segment, *Statista, 2022*



5.2 Aston Martin's Car Segments Analysis

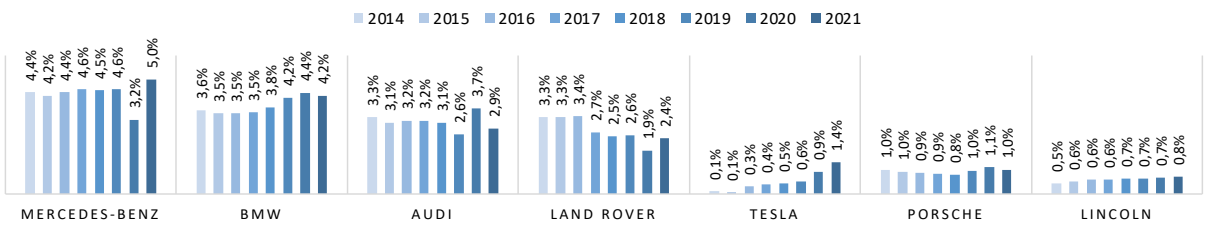
Aston Martin's current lineup offers vehicles within the SUV, Luxury, and Sports cars segments. Those were analyzed in greater detail below:

5.2.1 SUV Segment

5.2.1.1 Key Players

In the luxury SUV segment, where AM competes with the DBX model, premium brands such as Mercedes, BMW, Audi, Land-Rover, Porsche, and Lincoln represented 17,7% of sales generated in 2021.

Figure 10: 2014-2021, Players within the SUV segment market share evolution, measured as % of revenue coming from the sale of SUVs, Data retrieved from *Statista* as of June 2022.

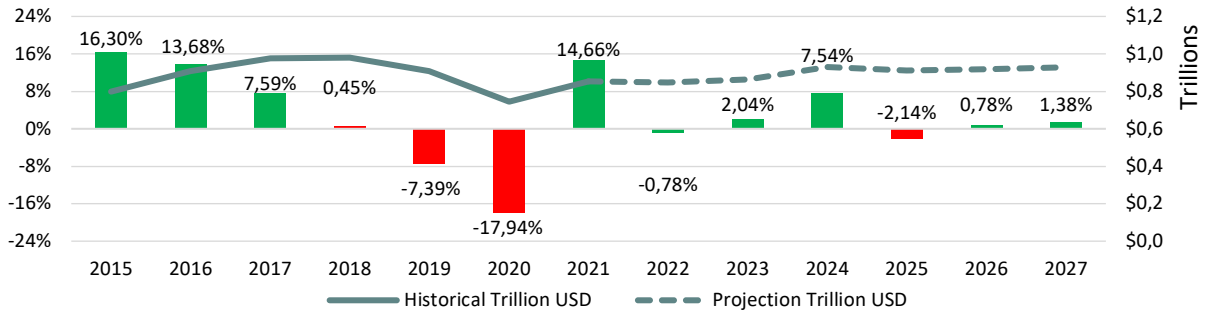


Tesla, BMW, and Lincoln have been gaining ground in part due to their pioneering electrification, consumer confidence, and standard equipment proposals. Porsche, Audi, and Mercedes, although with different levels of volatility, have been commanding the same market share. Land Rover, on the other hand, has been losing market share due to factors such as high prices, reliability issues, and delays in the development of new electric/hybrid engines.

5.2.1.2 SUV Outlook

The SUV market is projected to reach $930 billion by 2027 from $854 billion in 2021, at a CAGR of 1.43%. The consumer finds in this segment an optimal value proposition. This segment is well positioned strategically, having pioneered the adoption of plug-in and mild hybrid engines but also of electric motors. At the same time, the consumer not only benefits from lower fuel consumption and a smaller ecological footprint but also finds some benefits compared to the medium and large car segments, such as more cabin and boot space, more comfort for long journeys, greater versatility since the greater ground clearance gives the vehicle all-terrain capabilities and the possibility of towing a trailer.

Figure 11: estimated SUV segment YoY revenue growth (left-hand side) and estimated SUV segment total revenue in Trillion USD (right-hand side), June 2022, retrieved from *Statista.*

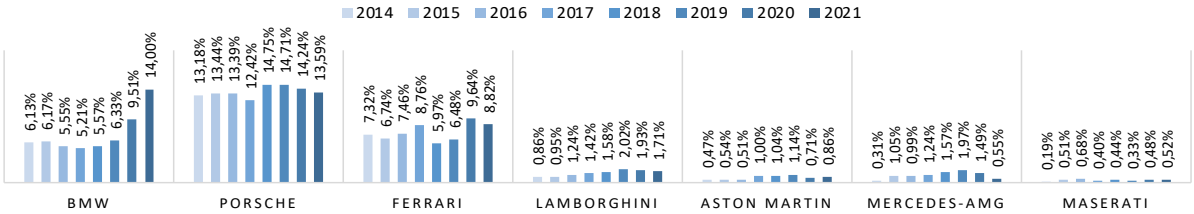


5.2.2 Sports Car Segment

5.2.2.1 Key Players

Taking a closer look at the sports car segment in which Aston Martin competes with the *Vantage*, *Valhalla*, and *Valkyrie* models, there is significant competition from brands such as

Figure 12: 2014-2021, Players within the Sports cars segment market share evolution, measured as % of revenue coming from the sale of sports cars, Data retrieved from *Statista* as of June 2022.



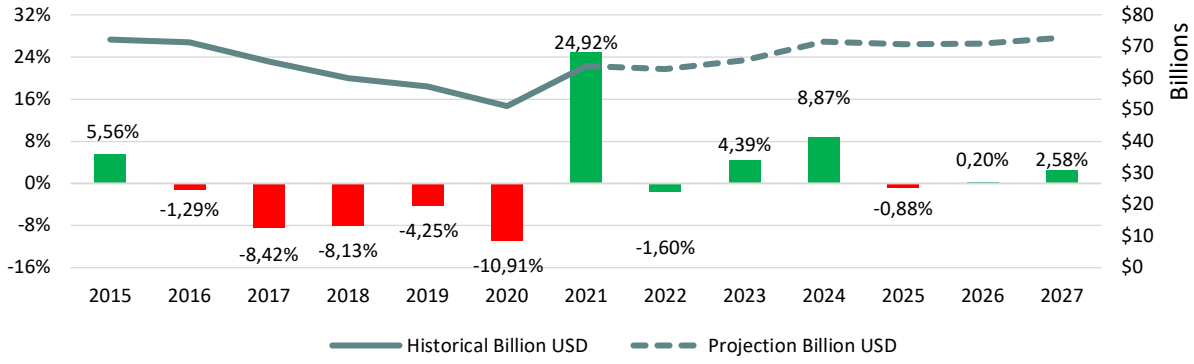
Ferrari, Porsche, Lamborghini, Mercedes-AMG, Maserati, and BMW. These together

accounted for 40% of the sports car market in 2021. BMW, for its sports cars division, has seen its share of the market increase exponentially over the last 8 years, with the world success of vehicles such as the BMW M2 and its subsequent facelifts. It managed to pass Porsche which has held the highest portion of the market over the last years. Lamborghini, Aston Martin, Mercedes-AMG, and Maserati also faced improvements in terms of market share, having doubled their share in the same period. With some volatility, Ferrari, on the other hand, has maintained its market share.

5.2.2.2 Sports Cars Outlook

The Sports Cars segment is projected to reach $72 billion by 2027 from $63 billion in 2021, at a CAGR of 2.2%. Its customer base is expected to increase over the coming years as HNWI and UHNWI are not only expected to increase but also to become younger over time, something that has been happening over the last decade, especially in Asia Pacific and Latin America. The preference of younger people for luxury sports cars with high performance and great handling is expected to boost the segment's sales.

Figure 13: estimated Sports cars segment YoY revenue growth (left-hand side) and estimated Sports Cars segment total revenue in Billion USD (right-hand side), June 2022, retrieved from Statista.



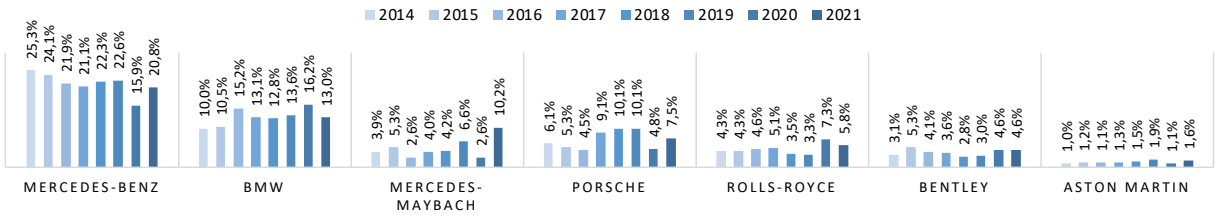
5.2.3 Luxury Segment

5.2.3.1 Key Players

Looking at the Luxury car sector, in which Aston Martin competes with its grand tour models, the DB11 and DBS, we find renowned brands such as Rolls-Royce, Maybach, Bentley, and also the more generalist BMW and Mercedes. These together accounted for 63% of the segment revenue in 2021.

Mercedes-Benz's loss in market share over the last years has been partially compensated by Mayback's (its subsidiary) growth in the Luxury Sector. BMW, Porsche, Rolls-Royce, Bentley, and Aston Martin took advantage of consumers' preference shifts.

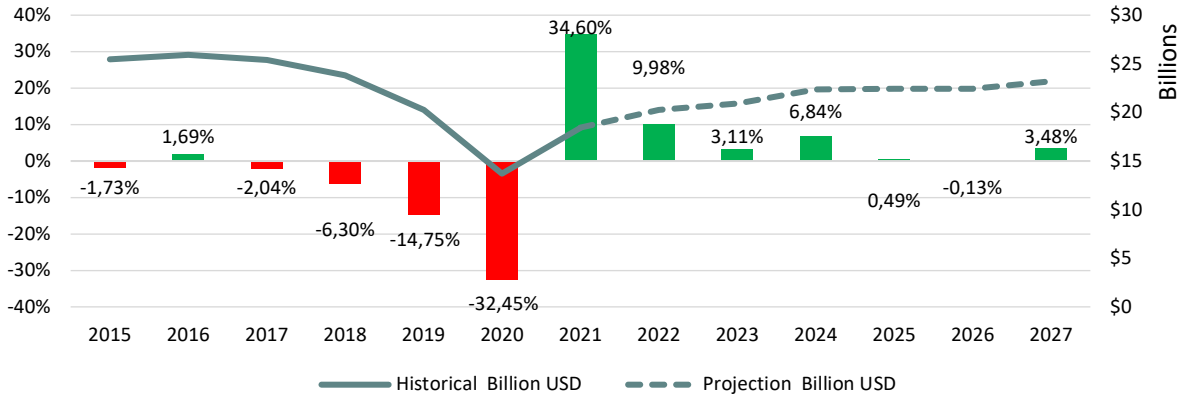
Figure 14: 2014-2021, Players within the Luxury segment market share evolution, measured as % of revenue coming from the sale of luxury vehicles, Data retrieved from Statista as of June 2022.



5.2.3.2 Luxury Outlook

The Luxury cars segment market is projected to reach $23 billion by 2027 from $18 billion in 2021, at a CAGR of 3.9%. Similar to the sports cars segment, the luxury segment is expected to leverage the growing number of HNWI and UHNWI.

Figure 15: estimated Luxury cars segment YoY revenue growth (left-hand side) and estimated Luxury Cars segment total revenue in Billion USD (right-hand side), June 2022, retrieved from Statista.



6. Financial Analysis

To evaluate Aston Martin's financial positioning, it is important to analyze ratios, identify trends, turning points, linkages, and ultimately, understand the reasoning. Therefore, ratios for liquidity, efficiency, profitability, and solvency were assessed.

6.1 Liquidity

The current ratio for AM in 2021 was 0.96x and has generally been less than 1 during the past five years. As a result, the business cannot use its current assets to pay off its short-term obligations. The company's current assets fell by 2.4% while its current liabilities rose by 12% year over year in comparison to 2020, when the ratio was 1.10x. AM's competitors are in a better position in maintaining a current ratio above 1, as is the case of Ferrari (1.62x) and Porsche (1.42x). AM's quick ratio of 0.65x in 2021 implies that AM could only cover 65% of its current liabilities by using all its cash, cash equivalents, and assuming it fully collects its outstanding receivables. It also illustrates AM's dependence on inventory liquidation, as inventories represented 22% of its current liabilities. Ferrari and Porsche's 2021 quick ratios were 1.33x and 1.06x. AM's cash ratio in 2021 was 0.43. This ratio highlights that AM could cover 43% of its current liabilities, only using cash. As a reference, the cash ratio of the peers is higher. Ferrari and Porsche's 2021 cash ratio was 0.65x and 0.83x.

6.2 Efficiency

The company's capacity to collect money was negatively impacted by Covid-19, as evidenced by the rise in days sales outstanding in 2019 and 2020, however, in 2021 the company managed to recover significantly to values lower than 2018. Between 2018 and 2020, the days inventory held rapidly grew, reaching a peak of 151 days, showing that AM was less able to liquidate its stock. This pattern also reversed in 2021.

Figure 16: AM Current Ratio 2017-2021

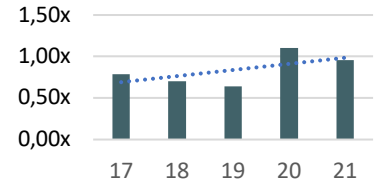


Figure 17: AM Quick Ratio 2017-2021

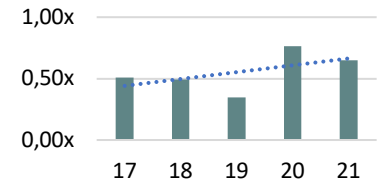


Figure 18: AM Cash Ratio 2017-2021

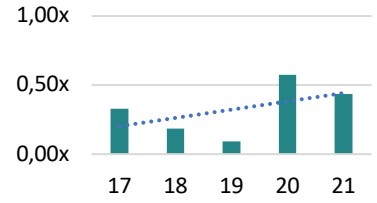


Figure 19: Days inventory held peers

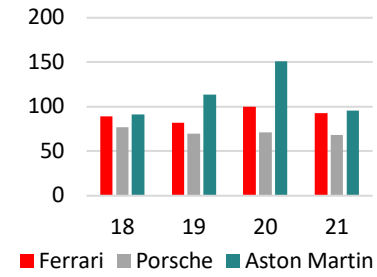


Figure 20: Days sales outstanding peers

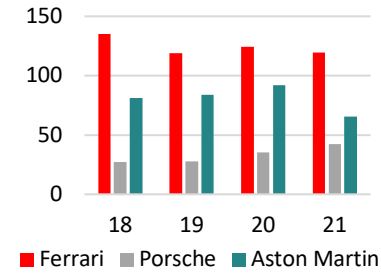
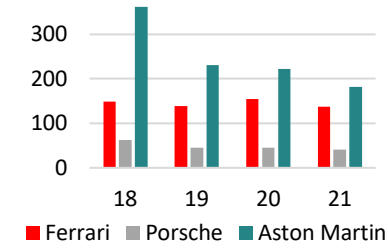
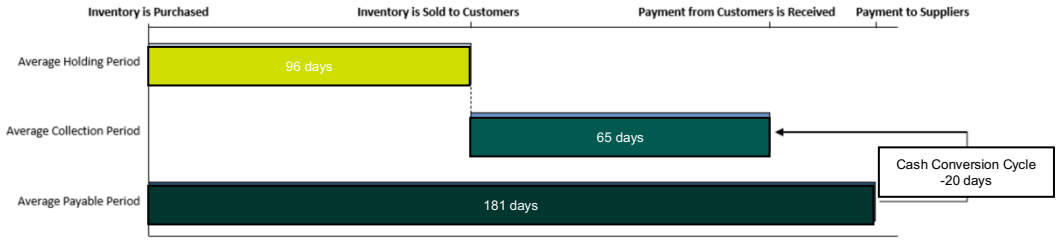


Figure 21: Days payable outstanding peers



AM's cash conversion cycle is represented in figure 23. In 2021, the company took roughly 181 days to pay to its suppliers, while it was only taking the company 65 days to collect the money from its clients. Before making the sale, however, the company would take 96 days to convert its inventory into an actual sale. As a result, its suppliers funded its operations for about 20 days in 2021.

Figure 23: AM's cash conversion cyle, Analyst own computations



Conversely, Ferrari and Porsche have consistent positive CCC, 75 days and 50 days for the year 2021, respectively. AM's negative CCC is explained by the larger time span used by the company to pay for its inventory (DPO). In 2021, it took 45 days longer than Ferrari, and 141 days more than Porsche, to pay its suppliers. Nevertheless, the firm has been reducing considerably its cash conversion cycle, coming closer to its more mature peers.

6.3 Profitability

Aston Martin displays a high gross profit margin (31.4% in 2021) when compared to generalist auto manufacturers such as Volkswagen (19.2%). Within the luxury segment, however, Aston Martin is lagging behind Ferrari (51.3%), which operates under the same low volume high margin strategy. On the other hand, the firm has similar margins to those of Porsche (30.4%), however, the average selling price and volume of cars sold, are much different, making the comparison not reasonable.

The heavy amount of Operating Costs largely decreases margins, making EBITDA considerably lower (12.5%). We then observe a further decrease in EBIT (-6.8%), explained by the level of Depreciation. As mentioned earlier, only in 2017 did Aston Martin post a positive net profit margin (9%). Since then, the company has only

Figure 22: Cash Conversion Cycle (CCC)

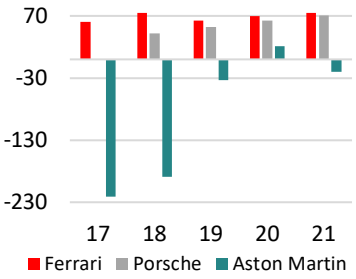


Figure 24: Gross Profit industry players

	2020	2021
Ferrari	51,3%	51,3%
Porsche	30,1%	30,3%
Aston Martin	**18,2%**	**31,4%**
Mercedes	17,0%	23,4%
BMW	19,5%	25,4%
Volkswagen	18,0%	19,2%

Figure 25: EBITDA Margin industry players

	2020	2021
Ferrari	32,9%	35,7%
Porsche	26,9%	26,4%
Aston Martin	**-11,1%**	**12,5%**
Mercedes	20,4%	14,6%
BMW	11,0%	17,9%
Volkswagen	16,9%	18,4%

Figure 26: EBIT Margin industry players

	2020	2021
Ferrari	21,1%	25,5%
Porsche	17,6%	18,4%
Aston Martin	**-36,8%**	**-6,8%**
Mercedes	6,2%	3,4%
BMW	4,8%	12,1%
Volkswagen	5,5%	7,6%

Figure 27: EBT Margin industry players

	2020	2021
Ferrari	19,7%	24,7%
Porsche	17,4%	18,2%
Aston Martin	**-53,5%**	**-21,0%**
Mercedes	6,0%	3,2%
BMW	4,5%	11,9%
Volkswagen	4,4%	6,8%

Figure 28: Net Profit Margin industry players

	2020	2021
Ferrari	18,0%	19,9%
Porsche	11,9%	13,1%
Aston Martin	**-66,9%**	**-18,9%**
Mercedes	3,3%	17,5%
BMW	3,9%	11,2%
Volkswagen	4,0%	6,2%

delivered negative results, reaching its historic low net margin in 2020 of -66.9%. It is important to mention again that the company only expenses a little portion of its R&D investments, which alleviates considerably the company's financial results.

As a percentage of sales, AM spends more than its peers on selling, general, and administrative expenses, as well as on the depreciation and amortization of its assets. In 2021 most of the profits were erased by SG&A (38% of 2021 sales), and by Depreciation and Amortization (19% of 2021 sales). Other industry players, depreciated close to 10% of sales on average and spent 15% of sales on SG&A.

Figure 29: Peers D&A and SG&A % Sales

	SG&A % Sales	D&A % Sales
Ferrari	26,6%	10,9%
Porsche	11,5%	10,2%
Aston Martin	**38,0%**	**19,0%**
Mercedes	12,8%	11,3%
BMW	14,0%	5,8%
Volkswagen	11,9%	10,9%

6.4 Solvency

For the previous five years, Aston Martin has financed its operations with a significant level of leverage[6]. The firm's gearing ratio peaked in 2016 at 91% following a 31% YoY increase in long-term debt. Since then, the firm's reliance on debt has been decreasing. Total debt increased (68%), but total equity growth outpaced, increasing by 848%. Additionally, the debt/equity ratio has followed the same path, and it is currently 2.01, meaning that for each dollar invested in the company, 67 cents come from debt, while 33 cents come from the company's equity. On the other hand, net debt/EBITDA showcases that it would take the company 5.3 years to pay back its debt if net debt and EBITDA are held constant. This, however, is not a reasonable assumption given the company's history of volatile profitability. The solvency ratio showcases AM's weak condition, which has been deteriorating over the past 5 years. In 2020 the company reached negative territory, but it managed to recover in 2021. Nevertheless, the rebound to positive territory is still not sufficient, as it is still close to 0, not ruling out the possibility that the company defaults on its obligations. Adding to AM's low solvency, its ability to cover its interest obligations has also deteriorated over the last 5 years. For the past 3 years, AM could not pay its interest obligations using its earnings. This highlights the need

Table 6 - Solvency Ratios

	2017	2018	2019	2020	2021
D/(D+E)	87%	66%	77%	60%	67%
D/E	6,69x	1,94x	3,35x	1,51x	2,01x
Net Debt /EBITDA	2,96x	5,36x	11,06x	-3,82x	5,30x
Solvency Ratio	0,11x	0,03x	0,01x	-0,13x	0,00x
EBIT/ Interest	2,47x	0,36x	-0,90x	-2,95x	-0,26x

[6] Measured by the gearing ratio = Total Debt/(Total Debt + Total Equity)

for the company to raise additional capital to continue its operations. One could argue the interest coverage ratio does not account for noncash expenses, however, the firm has had also consistent negative FCFF over the last 4 years.

7. Valuation

The valuation of Aston Martin is performed on January 1st, 2023, utilizing all the available data as of August 31st, 2022. The fiscal year is assumed to start on January 1st and end on December 31st. To value Aston Martin, a DCF valuation was utilized as the primary valuation model. To support and test the assumptions made, a comparable company analysis and precedent transaction analysis were also included.

Within the DCF, the forecast period goes from 2022 until 2026. For that period, three different scenarios were estimated: upside, downside, and base. After 2026, Aston Martin is assumed to have reached its steady state. Within the upside scenario, the variables were estimated using targets disclosed by the firm in its 2022 H2 report. The scenario also took into consideration the analyst's own assumptions under a more optimistic scenario for the impact of the Russia-Ukraine conflict on input prices, such as salaries, parts, and customers/suppliers' payment terms. The base scenario assumes Aston Martin maintains its market share and grows at the same pace as the estimations shown before for the car segments it commercializes. Again, the analyst's assumptions were taken into consideration, however under a more conservative approach regarding the disruptions caused by the current geopolitical environment. Finally, the downside scenario, subjects AM's different elements, such as revenues, days payable outstanding, inventories and others, to the effect of a crisis such as the one in 2008. The analyst's assumptions were also utilized for this approach. The following paragraphs present in detail how each one of the variables was forecasted for the scenarios utilized, and target prices obtained.

7.1 Discounted Cash Flow Valuation

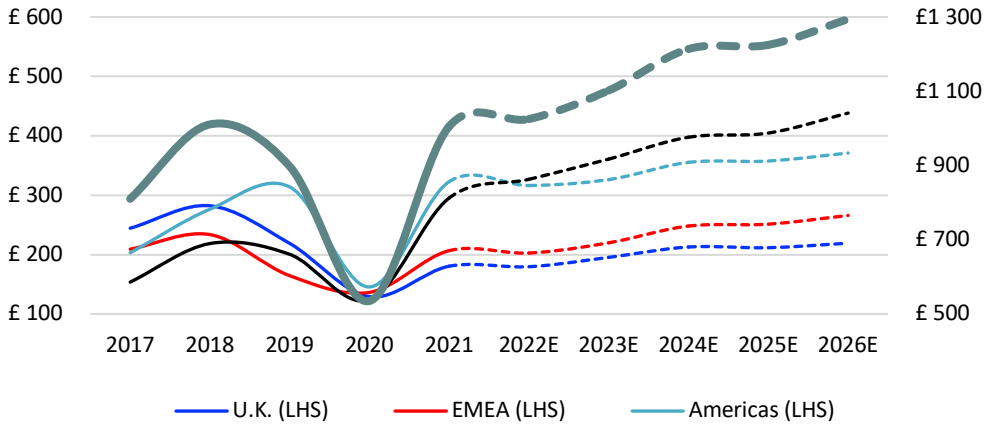
7.1.1 Revenue

7.1.1.1 Base Scenario

Sale of Vehicles

As mentioned earlier, AM's vehicle sales are split into 4 regions: UK, EMEA, Americas, and Asia-Pacific. Revenue per region was projected using a multiplier that considers both the estimated change in prices and quantity. YoY change in quantity derived from *Statista*'s sales volume outlook for Sports, Luxury, and SUV segments that included analysts' expectations on demand disruption caused by the Russia-Ukraine conflict. YoY change in prices derived from IMF's inflation outlook report. The estimated vehicle sales are as follows:

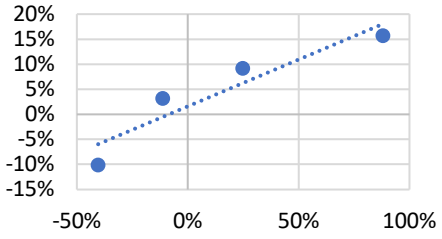
Figure 30: Forecasted revenue from sale of cars per region (LHS) & Forecasted revenue from sale of cars worldwide (RHS)



Sale of Parts

A multiplier was also used to forecast the sale of parts. The growth of the item was forecasted as a function of vehicle sales growth. Figure 31 illustrates the high (R^2=0.88) and positive (β=0.1868) relationship between both variables. It can be said that a 1% growth in vehicle sales, will lead to a 0.186% increase in the sale of parts.

Figure 31: Parts sales growth (PSG) as a function of vehicles sales growth (VSG)

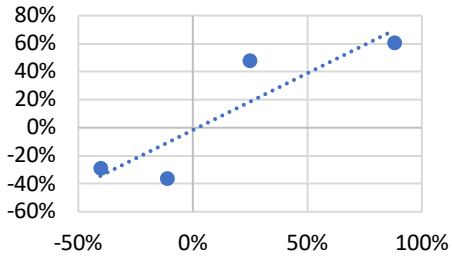


PSG = 0,1868 x VSG + 0,0159
R^2 = 88%

Servicing of Vehicles

To forecast the revenue from servicing vehicles, a multiplier was also determined. The growth of the variable was estimated as a function of the vehicle sales growth, and a high R^2 of 79% and a positive relationship between the variables was found, slope of 0.81. It can be said that a 1% increase in vehicle sales revenue will lead to a 0.81% increase in servicing revenue (see figure 32).

Figure 32: Servicing revenue growth (SRG) as a function of vehicles sales growth (VSG)



SRG = 0,81 x VSG - 0,02
R^2 = 79%

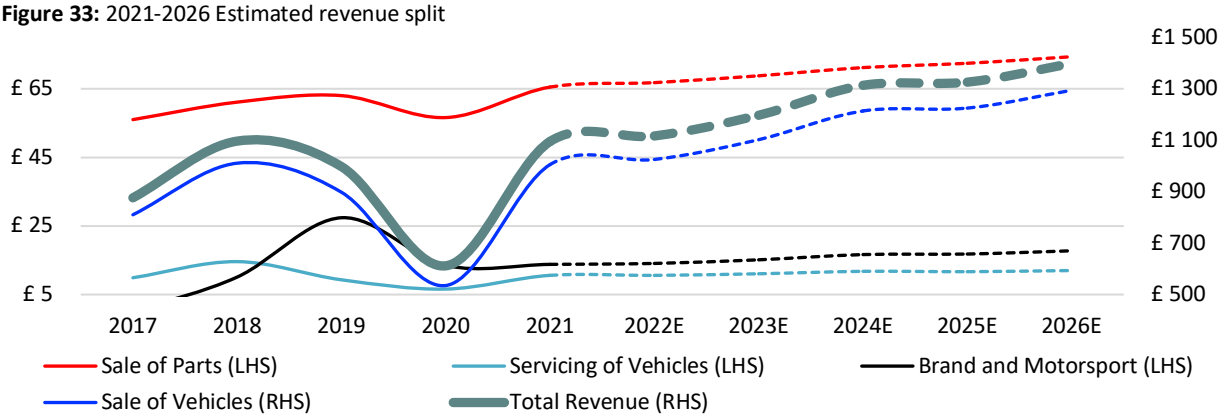
Brand and Motorsports

The Brand and Motorsports division of the company was assumed to grow at the same pace as the vehicle sales. The underlying assumption is that the interest in the company's vehicles directly influences the interest of other companies to close partnerships.

Total Revenue

Within the base scenario, assuming Aston Martin maintains its market share, and grows at the same rate as the SUV, Luxury, and Sports cars segments, and also considering the changes in prices estimated for the next 6 years, its revenue is expected to reach £1398 million in 2026, at a CAGR of 5% from 2021.

Figure 33: 2021-2026 Estimated revenue split



7.1.1.2 Downside Scenario

To assess how the company would fare under circumstances such as the 2008 financial crisis, a multiple was applied to AM's revenues, reflecting the contraction/growth of peers from 2008 to 2012. Mercedes and BMW were selected given the high correlation of sales growth with AMs in 2012-2021, ρ=0.77 and 0.86, respectively. The contraction/growth of both peers were combined into the multiplier and adjusted for correlation. Revenue is expected to reach £1628 million in 2026, at a CAGR of 8.25% from 2021. The figures exceed the base scenario. Revenues from this segment of the automotive industry do not seem to suffer as much from downturns, as demand continues to be robust. Proof of that is the recent record sales volume from both Rolls-Royce and Porsche during the pandemic crisis.

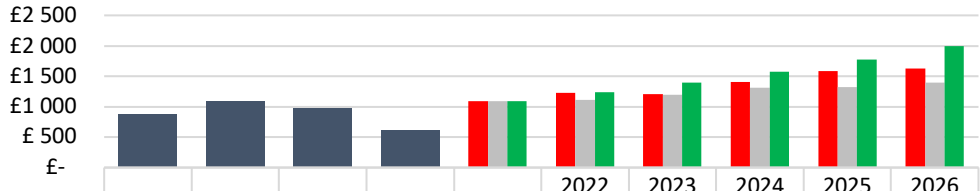
7.1.1.3 Management Scenario (Optimistic)

For this scenario, management expectations were taken into consideration, as described in the company's 2022 H2 report. Outlining the move into the hypercar segment, AM expects to reach £2000 million in revenue by 2026, implying a CAGR of 12.80% from 2021. Those figures are extremely ambitious, meaning the company would double its sales in just 5 years.

7.1.1.4 Summary

The fact that the revenues for the downside scenario exceed those for the base scenario through 2026 is puzzling when one looks at figure 34. However, it is important to stress that the revenue growth used under the downside scenario, which assumes a financial crisis scenario, refers to the real impact felt by Aston Martin's peers between 2008 and 2012. The base case could be argued to be overly cautious in terms of revenue growth, but this scenario was made based on projections from experts in the field on changes in quantity (SUV, Sports, and Luxury cars segments YoY growth) and price (IMF inflation outlook through 2026).

Figure 34: 2022-206 Estimated Revenue within for scenario.

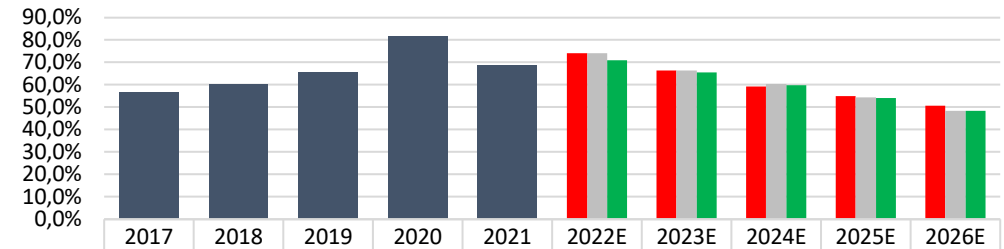


	2017	2018	2019	2020	2021	2022 E	2023 E	2024 E	2025 E	2026 E
Downside Scenario	£ 876	£1 097	£ 981	£ 612	£1 095	£1 222	£1 204	£1 410	£1 589	£1 628
Base Scenario	£ 876	£1 097	£ 981	£ 612	£1 095	£1 117	£1 197	£1 313	£1 326	£1 398
Management Scenario	£ 876	£1 097	£ 981	£ 612	£1 095	£1 235	£1 394	£1 572	£1 773	£2 000

7.1.2 COGS

AM's cost of sales includes the raw materials and components (including engines) used to manufacture cars, the salary of employees, logistics costs, warranty costs, and parts and service variable costs. The COGS were forecasted as a percentage of sales. For each scenario, different assumptions were made regarding the effects of the Russia-Ukraine conflict and the pandemic-related inflation surge, being the cost of fuel, nickel, aluminum, and labor force.

Figure 35: 2022-206 Estimated COGS as % of revenue for each scenario.



	2017	2018	2019	2020	2021	2022E	2023E	2024E	2025E	2026E
Downside Scenario	56,6%	60,3%	65,5%	81,8%	68,6%	74,2%	66,6%	59,3%	55,0%	50,8%
Base Scenario	56,6%	60,3%	65,5%	81,8%	68,6%	74,2%	66,6%	60,5%	54,4%	48,3%
Management Scenario	56,6%	60,3%	65,5%	81,8%	68,6%	71,0%	65,5%	59,8%	54,1%	48,3%

With AM's increased focus on the high-margin hypercar segment, and with the strategic cooperation agreement with AMG, which allows the company to benefit from economies of scale, the firm's COGS as % of revenue is expected to converge towards that of Ferrari at around 48%. To point out that the company reached a similar milestone (56.6%) in 2017.

7.1.2.1 Base Scenario

The convergence is not linear, however. The aggregate effect of the increase in fuel, labor, aluminum, and nickel prices translated into a 15% penalty on the COGS/Revenues ratio for the year 2022, and 10% in 2023. In the remaining years, a decrease in raw material prices is expected, caused by a deflationary environment and the end of the energy crisis. As such, between 2024 and 2026, the decrease will be linear until it reaches 48%.

7.1.2.2 Downside Scenario

Again, the convergence towards Ferrari's 48% is not linear. A 15% penalty was applied to the ratio in 2022, 10% in 2023, and 5% from 2024 to 2026. This signals a scenario under which the impact of the Russia-Ukraine and the inflationary surge have a more impactful and lasting effect on the supply chain, regulators, and syndicates (wages increase).

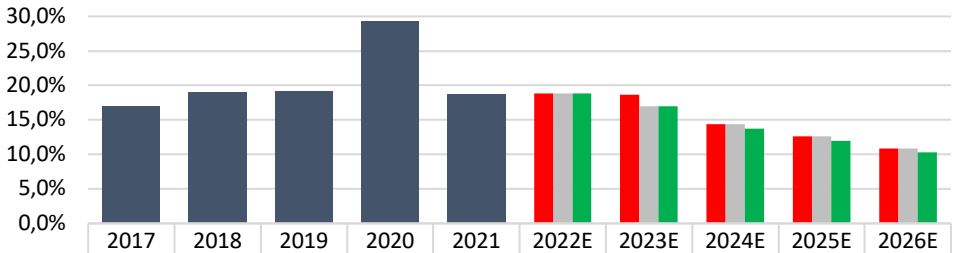
7.1.2.3 Management Scenario

This scenario assumes a minor impact from input costs. Only a 10% penalty was applied to the ratio in 2022, and 5% in 2023. In the remaining years, a decline in raw material prices is again expected, allowing for a convergence towards 48%.

7.1.3 SG&A

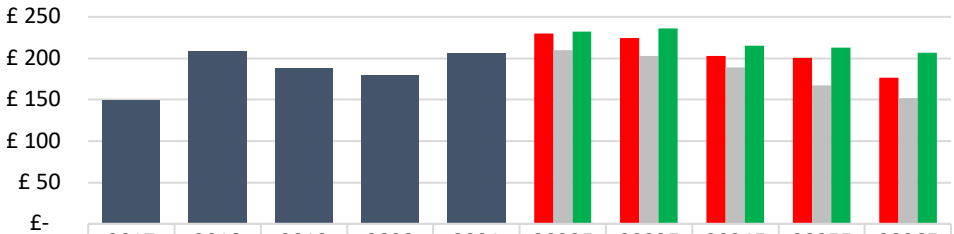
Selling and distribution expense consists of marketing costs and selling costs, such as the salary of marketing personnel, costs of advertising, marketing events, and sales personnel costs. Administrative expense consists of salaries for management, finance, HR, IT, and others. It also includes research and development costs (salary of engineers, fees paid to consultants, prototype development expenses).

Figure 36: 2022-206 Estimated SG&A as % of revenue for each scenario.



	2017	2018	2019	2020	2021	2022E	2023E	2024E	2025E	2026E
Downside Scenario	17,0%	19,1%	19,1%	29,3%	18,8%	18,8%	18,6%	14,4%	12,6%	10,8%
Base Scenario	17,0%	19,1%	19,1%	29,3%	18,8%	18,8%	16,9%	14,4%	12,6%	10,8%
Management Scenario	17,0%	19,1%	19,1%	29,3%	18,8%	18,8%	16,9%	13,7%	12,0%	10,3%

Figure 37: Estimated SG&A in absolute terms for each scenario.



	2017	2018	2019	2020	2021	2022E	2023E	2024E	2025E	2026E
Downside Scenario	£ 149	£ 209	£ 188	£ 179	£ 206	£ 230	£ 224	£ 203	£ 201	£ 176
Base Scenario	£ 149	£ 209	£ 188	£ 179	£ 206	£ 210	£ 203	£ 189	£ 167	£ 152
Management Scenario	£ 149	£ 209	£ 188	£ 179	£ 206	£ 232	£ 236	£ 216	£ 213	£ 206

AM's global marketing director, following the negative earnings of the company has committed to a comprehensive cost-saving program going forward. He commented on the future of the company's campaigns, pointing to a distancing from the costly promotions made in the 007 movies. "We have relied too much on 007 in the past. (…) Once people stop talking about the movie, things become very quiet and that's bad. We have to avoid that". Dan Balmer also revealed that upcoming advertising would mostly be distributed through social networks, suggesting more efficient and affordable marketing strategies. "TV ads are (…) expensive (…) and social allows us to really target the right luxury audience."

AM is expected to lower its SG&A costs as a percentage of revenue, achieving a value close to Ferrari at about 10%, as a result of a shift towards less expensive marketing tools and the decreased dependence on salespeople with the launch of an immersive online configurator. However, the net change in SG&A costs in absolute terms, is expected to be positive, given the lower rate of R&D capitalization assumed in the model, which drives costs up. This comes as an adjustment made to the issue reported on 8.6.3.

Similar to the COGS estimation, the conversion towards Ferrari's value is not linear across the different scenarios.

7.1.3.1 Base Scenario

From 2022 to 2023, a penalty of 10% was applied as result of expected increases in wages and marketing campaign costs to mitigate the inflationary surge. From 2024 to 2026, only a 5% penalty was applied as a result of slowing inflationary environment.

7.1.3.2 Downside Scenario

Assuming an intensification of inflation, a 10% penalty was applied to the ratio in 2022, and 10% in 2023. In the following years the penalty was of 5% in anticipation of a longer period of inflation.

7.1.3.3 Management Scenario

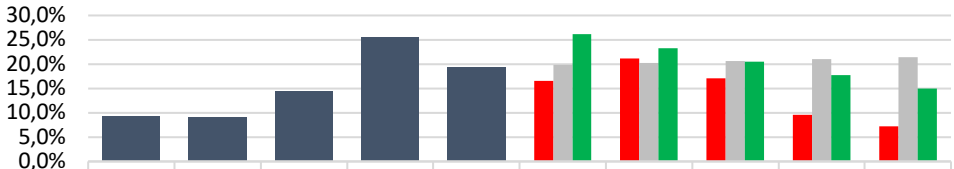
Similar to the base case, a 10% penalty was applied to account for expected increases in prices in 2022-2023. No penalties were applied in the following years in anticipation of a return to normality.

7.1.4 Unusual Expense/Income

Unusual expenses/income refer to restructuring, litigation, and impairment charges. It was forecasted as a percentage of revenue, and it was assumed to remain constant over the forecasting period at 3.2% (2012-2019 average).

7.1.5 Depreciation and Amortization

Figure 38: Estimated D&A as % of revenue for each scenario.



	2017	2018	2019	2020	2021	2022E	2023E	2024E	2025E	2026E
Downside Scenario	9,4%	9,1%	14,4%	25,6%	19,4%	16,5%	21,2%	17,1%	9,5%	7,2%
Base Scenario	9,4%	9,1%	14,4%	25,6%	19,4%	19,8%	20,2%	20,6%	21,0%	21,5%
Management Scenario	9,4%	9,1%	14,4%	25,6%	19,4%	26,1%	23,3%	20,6%	17,8%	15,0%

7.1.5.1 Base Scenario

From 2022-2026, it is assumed D&A expense will linearly converge towards £300 million (21% of forecasted sales), the same amount AM plans to spend in Capex from 2022-2026 according to its latest 2022 H2 report.

7.1.5.2 Downside Scenario

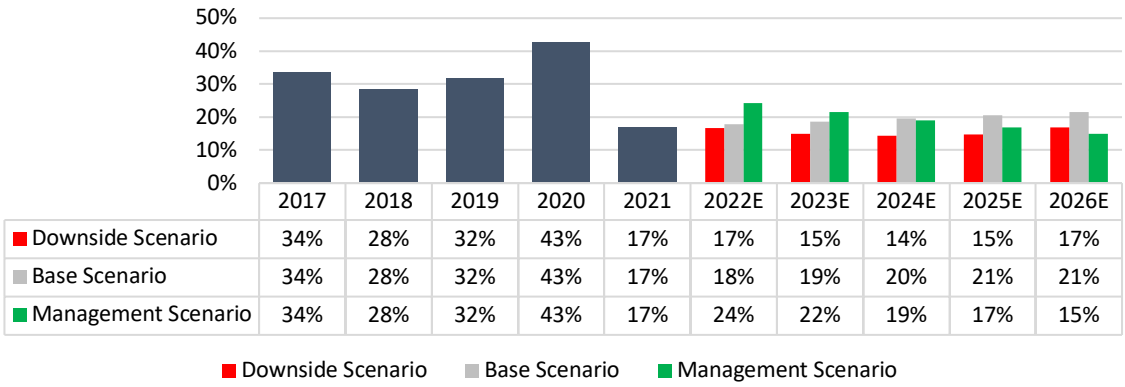
Similar to the method used to forecast sales evolution under the downside scenario, a multiplier was determined to evaluate how the firm's depreciation as % of revenue would evolve if AM behaved like its peers during the 2008 financial crisis. Mercedes was used given the high correlation (ρ=0.63) with AM's depreciation values for the period 2012-2021. Thus, Mercedes' D&A YoY growth for the period 2008-2012, was used as a multiplier to forecast AMs D&A as % of sales for the period 2022-2026.

7.1.5.3 Management Scenario

In its 2022 H2 report, the firm estimated £315-330 million spent in D&A for 2022 (26% of forecasted sales). From 2023-2026, it is assumed D&A expense will linearly converge towards £300 million (15% of forecasted sales) under the same assumption of the base scenario.

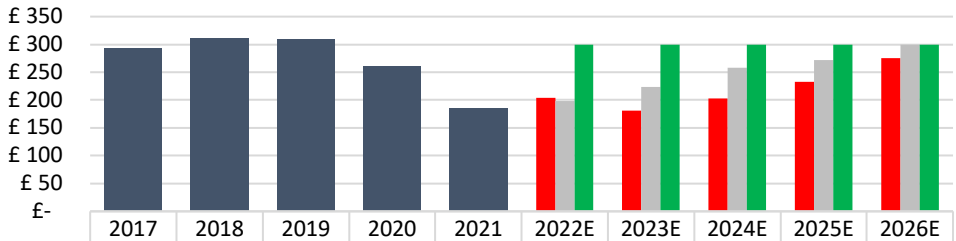
7.1.6 Capex

Figure 39: Estimated CAPEX as % of revenue for each scenario.



	2017	2018	2019	2020	2021	2022E	2023E	2024E	2025E	2026E
Downside Scenario	34%	28%	32%	43%	17%	17%	15%	14%	15%	17%
Base Scenario	34%	28%	32%	43%	17%	18%	19%	20%	21%	21%
Management Scenario	34%	28%	32%	43%	17%	24%	22%	19%	17%	15%

Figure 40: Estimated CAPEX in absolute terms for each scenario.



	2017	2018	2019	2020	2021	2022E	2023E	2024E	2025E	2026E
Downside Scenario	£ 294	£ 311	£ 310	£ 261	£ 185	£ 204	£ 181	£ 203	£ 233	£ 275
Base Scenario	£ 294	£ 311	£ 310	£ 261	£ 185	£ 199	£ 224	£ 258	£ 272	£ 300
Management Scenario	£ 294	£ 311	£ 310	£ 261	£ 185	£ 300	£ 300	£ 300	£ 300	£ 300

7.1.6.1 Base Scenario

From 2022-2026, it is assumed capital expenditure will linearly converge towards £300 million (21% of forecasted sales) targeting the same Capex expense as AM on its 2022 H2 report.

7.1.6.2 Downside Scenario

Again, a multiplier was determined to evaluate how the firm's Capex as % of revenue would evolve if AM was subject to a financial crisis such as the one from 2008. Thus, Mercedes' and BMW's Capex YoY growth for the period 2008-2012 were used as a multiplier to forecast AMs Capex as % of sales for the period 2022-2026. Both firms were utilized given the high correlation with AM's Capex values for the period 2012-2021, 95% and 74%, respectively.

7.1.6.3 Management Scenario

As mentioned earlier, according to AM's latest 2022 H2 report, the firm plans to spend £300 million yearly on capital expenditures from 2022 to 2026.

7.1.7 Taxes

On April 1st, 2023, the UK corporate tax rate will increase from 19% to 25%. Thus, from 2023 to 2026 a 25% tax rate was applied.

7.1.8 Changes in Net Working Capital

As mentioned on the literature review, the NWC is given by the total non-cash current assets minus the total non-interest-bearing current liabilities. To forecast the yearly changes in net working capital, its cash conversion cycle was estimated, as well as prepaid expenses, other current assets, and other current liabilities.

Figure 41: Estimated changes in NWC in absolute terms for each scenario.

	2019	2020	2021	2022E	2023E	2024E	2025E	2026E
Downside Scenario	£ 5	-£ 11	£ 46	£ 26	£ 100	-£ 62	£ 30	£ 31
Base Scenario	£ 5	-£ 11	£ 46	-£ 18	-£ 23	-£ 15	-£ 37	-£ 28
Management Scenario	£ 5	-£ 11	£ 46	-£ 15	-£ 24	-£ 30	-£ 35	-£ 40

Downside Scenario Base Scenario Management Scenario

7.1.8.1 Base Scenario

As a result of switching from a wholesale to a retail-driven business strategy, a reduction in the days sales outstanding is expected coming from 65 days to 26. The target DSO was previously achieved in 2012. Regarding inventories, from 2022 to 2026, the company is expected to become more efficient, converting its products into sales in the same amount of time as it did in 2013 (73 days). When it comes to payments, within the 5-year time window, the company is expected to decrease its DPO, as a way to decrease its reliance on suppliers financing and

increase its bargaining power. In summary, this is in line with the recent improvement of the firm's cash conversion cycle, which has been pointing towards positive territory.

Accrued liabilities and prepaid expenses are expected to reach Ferrari's values as % of revenue, at around 1% and 17%, respectively. Other current assets were assumed to remain at 1% of revenue (average for the period 2020-2021).

Table 7 – Base scenario - Forecasted non-cash current assets and non-interest-bearing current liabilities

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022E	2023E	2024E	2025E	2026E
Accounts Receivable	£ 33	£ 40	£ 52	£ 69	£108	£ 95	£ 244	£ 226	£ 155	£ 196	£ 176	£ 163	£ 150	£ 123	£ 99
Days Sales Outstanding	*26*	*28*	*40*	*49*	*67*	*39*	*81*	*84*	*92*	*65*	*57*	*50*	*42*	*34*	*26*
Inventories	£ 73	£ 70	£ 98	£ 80	£117	£128	£ 165	£ 201	£ 207	£ 197	£ 207	£ 189	£ 178	£ 153	£ 134
Days Inventories Held	*86*	*73*	*115*	*85*	*115*	*94*	*91*	*114*	*151*	*96*	*91*	*86*	*82*	*77*	*73*
Prepaid Expenses	£ -	£ -	£ -	£ -	£ 5	£ 21	£ -	£ 24	£ 24	£ 49	£ 42	£ 36	£ 30	£ 21	£ 12
Prep. Exp. % Sales	*0%*	*0%*	*0%*	*0%*	*1%*	*2%*	*0%*	*2%*	*4%*	*4%*	*4%*	*3%*	*2%*	*2%*	*1%*
Other Current Assets	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ 37	£ 40	£ 33	£ 49	£ 53	£ 58	£ 59	£ 62
O. Curr. Asset. % Sales	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*4%*	*7%*	*3%*	*4%*	*4%*	*4%*	*4%*	*4%*
Accounts Payable	£177	£131	£160	£180	£339	£483	£ 655	£ 408	£ 305	£ 373	£ 391	£ 356	£ 335	£ 286	£ 251
Days Payable Outstanding	*206*	*135*	*186*	*191*	*333*	*355*	*362*	*231*	*222*	*181*	*172*	*163*	*154*	*145*	*135*
Other Current Liabilities	£ 7	£ 9	£ 10	£ 7	£ 10	£ 15	£ 20	£ 351	£ 381	£ 408	£ 371	£ 350	£ 332	£ 282	£ 242
O. Curr. Liab. % Sales	*2%*	*2%*	*2%*	*1%*	*2%*	*2%*	*2%*	*36%*	*62%*	*37%*	*33%*	*29%*	*25%*	*21%*	*17%*

7.1.8.2 Downside Scenario

Again, a multiplier was determined to evaluate how the firm's DSO, DIH, and DPO would evolve if AM was subject to a financial crisis such as the one from 2008. Mercedes' and BMW's 2008 to 2012 YoY change for DSO, DIH, and DPO were used as multipliers to estimate AMs for the 2022-2026 period. For the estimation, the weight of each brand's multiplier was again adjusted for the correlation they had with Aston Martin's measured in the 2012-2022. Due to the uncertain economic environment felt during the financial crisis, both days sales outstanding and days of inventory held increase in 2022, however, the situation improves in the years following given the luxury segment robustness mentioned earlier.

Table 8 - Downside scenario - Forecasted non-cash current assets and non-interest-bearing current liabilities

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022E	2023E	2024E	2025E	2026E
Accounts Receivable	£ 33	£ 40	£ 52	£ 69	£108	£ 95	£ 244	£ 226	£ 155	£ 196	£ 288	£ 260	£ 284	£ 311	£ 298
Days Sales Outstanding	*26*	*28*	*40*	*49*	*67*	*39*	*81*	*84*	*92*	*65*	*86*	*79*	*73*	*71*	*67*
Inventories	£ 73	£ 70	£ 98	£ 80	£117	£128	£ 165	£ 201	£ 207	£ 197	£ 280	£ 188	£ 205	£ 229	£ 207
Days Inventories Held	*86*	*73*	*115*	*85*	*115*	*94*	*91*	*114*	*151*	*96*	*113*	*86*	*89*	*96*	*91*
Prepaid Expenses	£ -	£ -	£ -	£ -	£ 5	£ 21	£ -	£ 24	£ 24	£ 49	£ 46	£ 36	£ 32	£ 25	£ 14
Prep. Exp. % Sales	*0%*	*0%*	*0%*	*0%*	*1%*	*2%*	*0%*	*2%*	*4%*	*4%*	*4%*	*3%*	*2%*	*2%*	*1%*
Other Current Assets	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ 37	£ 40	£ 33	£ 26	£ 44	£ 51	£ 56	£ 59
O. Curr. Asset. % Sales	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*4%*	*7%*	*3%*	*2%*	*4%*	*4%*	*4%*	*4%*
Accounts Payable	£177	£131	£160	£180	£339	£483	£ 655	£ 408	£ 305	£ 373	£ 498	£ 467	£ 365	£ 350	£ 330
Days Payable Outstanding	*206*	*135*	*186*	*191*	*333*	*355*	*362*	*231*	*222*	*181*	*200*	*213*	*159*	*146*	*146*
Other Current Liabilities	£ 7	£ 9	£ 10	£ 7	£ 10	£ 15	£ 20	£ 351	£ 381	£ 408	£ 464	£ 493	£ 577	£ 670	£ 679
O. Curr. Liab. % Sales	*2%*	*2%*	*2%*	*1%*	*2%*	*2%*	*2%*	*36%*	*62%*	*37%*	*38%*	*41%*	*41%*	*42%*	*42%*

7.1.8.3 Management Scenario

From 2022 to 2026 the days payable outstanding are expected to value close to its peers, Ferrari and Porsche, at around 96 days. The other variables are expected to follow the same path previously explained in the base case.

Table 9 – Upside scenario - Forecasted non-cash current assets and non-interest-bearing current liabilities

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022E	2023E	2024E	2025E	2026E
Accounts Receivable	£ 33	£ 40	£ 52	£ 69	£108	£ 95	£ 244	£ 226	£ 155	£ 196	£ 195	£ 189	£ 180	£ 164	£ 142
Days Sales Outstanding	*26*	*28*	*40*	*49*	*67*	*39*	*81*	*84*	*92*	*65*	*57*	*50*	*42*	*34*	*26*
Inventories	£ 73	£ 70	£ 98	£ 80	£117	£128	£ 165	£ 201	£ 207	£ 197	£ 219	£ 216	£ 211	£ 203	£ 192
Days Inventories Held	*86*	*73*	*115*	*85*	*115*	*94*	*91*	*114*	*151*	*96*	*91*	*86*	*82*	*77*	*73*
Prepaid Expenses	£ -	£ -	£ -	£ -	£ 5	£ 21	£ -	£ 24	£ 24	£ 49	£ 46	£ 42	£ 36	£ 28	£ 17
Prep. Exp. % Sales	*0%*	*0%*	*0%*	*0%*	*1%*	*2%*	*0%*	*2%*	*4%*	*4%*	*4%*	*3%*	*2%*	*2%*	*1%*
Other Current Assets	£ -	£ -	£ -	£ -	£ -	£ -	£ -	£ 37	£ 40	£ 33	£ 55	£ 62	£ 69	£ 78	£ 88
O. Curr. Asset. % Sales	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*4%*	*7%*	*3%*	*4%*	*4%*	*4%*	*4%*	*4%*
Accounts Payable	£177	£131	£160	£180	£339	£483	£ 655	£ 408	£ 305	£ 373	£ 395	£ 369	£ 336	£ 298	£ 256
Days Payable Outstanding	*206*	*135*	*186*	*191*	*333*	*355*	*362*	*231*	*222*	*181*	*164*	*147*	*130*	*113*	*96*
Other Current Liabilities	£ 7	£ 9	£ 10	£ 7	£ 10	£ 15	£ 20	£ 351	£ 381	£ 408	£ 411	£ 408	£ 397	£ 378	£ 346
O. Curr. Liab. % Sales	*2%*	*2%*	*2%*	*1%*	*2%*	*2%*	*2%*	*36%*	*62%*	*37%*	*33%*	*29%*	*25%*	*21%*	*17%*

7.1.9 WACC Inputs

7.1.9.1 Cost of Debt

The cost of debt was determined as the average between AM's interest expense divided by it total debt the year before. The period under consideration was 2013-2021.

Table 10 – Interest Expense divided by Total Debt in t-1, 2013-2021

	2013	2014	2015	2016	2017	2018	2019	2020	2021	
Interest Expense at *T*	£ 32	£ 54	£ 69	£ 131	£ 60	£ 72	£ 58	£ 117	£ 165	AVERAGE
Total Debt at *T-1*	£ 311	£ 436	£ 557	£ 720	£ 859	£ 821	£ 1 065	£ 1 188	£ 1 293	
Cost of Debt		**17,3%**	**15,9%**	**23,4%**	**8,4%**	**8,4%**	**7,0%**	**11,0%**	**13,9%**	**13,2%**

7.1.9.2 Cost of Equity

The Capital Asset Pricing model, as well as the Fama-French 3 and 5-factor models, were used to calculate AM's cost of equity. However, the first two methods were used for comparison purposes only. This is due to empirical findings indicating that the 5FF model outperforms both the 3FF and the CAPM in estimating excess returns. Those studies indicate that when the number of explanatory variables in the regression increases, the explanatory power of the models improves and the R^2 rises.

Depending on the model, different inputs were used to estimate the AM's cost of equity. AM's monthly stock returns were retrieved from Refinitiv Eikon for the period October 31st, 2018, until August 31st, 2022. The different factors utilized in the different model's regressions were retrieved from Kenneth French's data library.

The factors retrieved were:

Table 11 – Inputs used in CAPM, 3FF, 5FF models. Results obtained for each model, *Kenneth French's data library*

Factor\Model	CAPM	3FF	5FF	Description
Rm-Rf	✔	✔	✔	"Market Returns minus risk-free rate. Market is the return on a region's value-weight market portfolio minus the U.S. one month T-bill rate."
SMB		✔	✔	"Small Minus Big is the average return on the nine small stock portfolios minus the average return on the nine big stock portfolios "
HML		✔	✔	"High Minus Low is the average return on the two value portfolios minus the average return on the two growth portfolios"
RMW			✔	"Robust Minus Weak is the average return on the two robust operating profitability portfolios minus the average return on the two weak operating profitability portfolios"
CMA			✔	"Conservative Minus Aggressive) is the average return on the two conservative investment portfolios minus the average return on the two aggressive investment portfolios"
R^2	39%	44%	46%	
Rf	1.54%			Germany[7] 10 Years Government Bond, on August 31st, 2022.
Cost of Equity	12.25%	11.91%	17.77%	

7.1.9.3 Capital Structure

AM does not have a target capital structure for the long run. As mentioned in the literature review, the average capital structure of peer firms can be used. Thus, the market value of debt and market capitalization of AM's peers were determined for August 31st, 2022. As result, the assumed target debt-to-equity ratio was 1.06, coming down 38% from AMs current 1.71.

Table 12 – Inputs used to determine AM's target capital structure, Refinitiv Eikon, August 31st, 2022

Comparable Companies	Levered Beta	Book Val. Debt	Mkt. Val. Debt	Market Cap.	Debt to Equity	Tax Rate	Unlevered Beta
Aston Martin	2,26	£ 1 293	£ 1 280	£ 747	1,71	25,0%	0,99
Ferrari	0,52	£ 2 210	£ 2 216	£ 33 338	0,07	24,0%	0,49
Porsche	1,49	£ 8 169	£ 8 588	£ 40 954	0,21	15,8%	1,27
BMW	1,20	£ 85 361	£ 90 229	£ 45 440	1,99	15,8%	0,45
Mercedes-Benz	1,34	£ 105 742	£ 107 176	£ 54 461	1,97	15,8%	0,50
AVERAGE Peers	1,14	£ 50 370	£ 52 052	£ 43 548	1,06	17,9%	0,68

7.1.9.4 Summary

Different methods were used to calculate the cost of capital, which resulted in the development of three separate WACCs. For the final recommendation, only the option based on the 5FF model was chosen because it is assumed to be the most realistic. Again, the findings from other models were solely used for comparison.

Table 13 – WACC utilizing cost of equity derived from different methodologies.

	CAPM	3FF	5FF
Rf Rate	1.54%		
Cost of Debt	13.2%		
D/E Ratio	1.06		
Tax Rate	25%		
Cost of Equity	12.25%	11.91%	17.77%
WACC	**11.00%**	**10.84%**	**13.60%**

[7] UK 10-Year government bond yield would be the ideal risk-free rate, however, the volatility brought by the 2022 United Kingdom Government crisis, the resignation of Boris Johnson, and Moody's changed outlook from stable to negative for the UK, led the analyst to utilize the 10-YR Bund on its computations.

7.1.10 Discounted FCFF

Considering all the assumptions explained above, AMs discounted FCF within each scenario can be found below. The discount rate used was 13.60%, calculated using the 5FF model:

7.1.10.1 Base Scenario

Table 14 – Discounted FCFF within the base scenario

	2018	2019	2020	2021	2022	2023	2024	2025	2026
Sales	**£ 1 097**	**£ 981**	**£ 612**	**£ 1 095**	**£ 1 117**	**£ 1 197**	**£ 1 313**	**£ 1 326**	**£ 1 398**
COGS	£ 661	£ 643	£ 501	£ 752	£ 829	£ 797	£ 794	£ 721	£ 676
Gross Profit	**£ 436**	**£ 338**	**£ 111**	**£ 344**	**£ 288**	**£ 400**	**£ 519**	**£ 604**	**£ 722**
SG&A	£ 209	£ 188	£ 179	£ 206	£ 210	£ 203	£ 189	£ 167	£ 152
Unusual (Expense) / Income	£ 121	£ 42	£ 121	-£ 32	£ 36	£ 39	£ 42	£ 43	£ 45
EBITDA	**£ 126**	**£ 89**	**-£ 189**	**£ 170**	**£ 42**	**£ 159**	**£ 288**	**£ 394**	**£ 526**
Depreciation & Amortization	£ 100	£ 141	£ 157	£ 212	£ 221	£ 242	£ 271	£ 279	£ 300
EBIT	**£ 26**	**-£ 52**	**-£ 346**	**-£ 42**	**-£ 179**	**-£ 83**	**£ 17**	**£ 115**	**£ 226**
Taxes	£ 5	-£ 10	-£ 66	-£ 8	-£ 34	-£ 21	£ 4	£ 29	£ 56
NOPAT	**£ 21**	**-£ 42**	**-£ 280**	**-£ 34**	**-£ 145**	**-£ 62**	**£ 13**	**£ 87**	**£ 169**
Plus: Depreciation & Amortizatior	£ 100	£ 141	£ 157	£ 212	£ 221	£ 242	£ 271	£ 279	£ 300
Less: Capital Expenditures	-£ 311	-£ 310	-£ 261	-£ 185	£ 199	£ 224	£ 258	£ 272	£ 300
Less: Change in Net Working Capital					-£ 18	-£ 23	-£ 15	-£ 37	-£ 28
FCFF					**-£ 105**	**-£ 21**	**£ 41**	**£ 130**	**£ 197**
Discount Factor					1,00	1,14	1,29	1,47	1,67
Discounted FCFF					**-£ 105**	**-£ 19**	**£ 32**	**£ 89**	**£ 118**

7.1.10.2 Downside Scenario

Table 15 - Discounted FCFF within the downside scenario

	2018	2019	2020	2021	2022	2023	2024	2025	2026
Sales	**£ 1 097**	**£ 981**	**£ 612**	**£ 1 095**	**£ 1 222**	**£ 1 204**	**£ 1 410**	**£ 1 589**	**£ 1 628**
COGS	£ 661	£ 643	£ 501	£ 752	£ 947	£ 801	£ 835	£ 874	£ 826
Gross Profit	**£ 436**	**£ 338**	**£ 111**	**£ 344**	**£ 275**	**£ 403**	**£ 574**	**£ 715**	**£ 802**
SG&A	£ 209	£ 188	£ 179	£ 206	£ 251	£ 224	£ 203	£ 201	£ 176
Unusual (Expense) / Income	£ 121	£ 42	£ 121	-£ 32	£ 39	£ 39	£ 45	£ 51	£ 52
EBITDA	**£ 126**	**£ 89**	**-£ 189**	**£ 170**	**-£ 15**	**£ 139**	**£ 326**	**£ 463**	**£ 573**
Depreciation & Amortization	£ 100	£ 141	£ 157	£ 212	£ 202	£ 255	£ 241	£ 151	£ 117
EBIT	**£ 26**	**-£ 52**	**-£ 346**	**-£ 42**	**-£ 217**	**-£ 115**	**£ 85**	**£ 312**	**£ 456**
Taxes	£ 5	-£ 10	-£ 66	-£ 8	-£ 41	-£ 29	£ 21	£ 78	£ 114
NOPAT	**£ 21**	**-£ 42**	**-£ 280**	**-£ 34**	**-£ 176**	**-£ 87**	**£ 64**	**£ 234**	**£ 342**
Plus: Depreciation & Amortizatior	£ 100	£ 141	£ 157	£ 212	£ 202	£ 255	£ 241	£ 151	£ 117
Less: Capital Expenditures	-£ 311	-£ 310	-£ 261	-£ 185	£ 204	£ 181	£ 203	£ 233	£ 275
Less: Change in Net Working Capital					£ 26	£ 100	-£ 62	£ 30	£ 31
FCFF					**-£ 204**	**-£ 112**	**£ 163**	**£ 123**	**£ 153**
Discount Factor					1,00	1,14	1,29	1,47	1,67
Discounted FCFF					**-£ 204**	**-£ 99**	**£ 126**	**£ 84**	**£ 92**

7.1.10.3 Management Scenario

Table 16 - Discounted FCFF within the upside scenario

	2018	2019	2020	2021	2022	2023	2024	2025	2026
Sales	**£ 1 097**	**£ 981**	**£ 612**	**£ 1 095**	**£ 1 235**	**£ 1 394**	**£ 1 572**	**£ 1 773**	**£ 2 000**
COGS	£ 661	£ 643	£ 501	£ 752	£ 877	£ 913	£ 940	£ 959	£ 967
Gross Profit	**£ 436**	**£ 338**	**£ 111**	**£ 344**	**£ 358**	**£ 481**	**£ 632**	**£ 815**	**£ 1 033**
SG&A	£ 209	£ 188	£ 179	£ 206	£ 232	£ 236	£ 216	£ 213	£ 206
Unusual (Expense) / Income	£ 121	£ 42	£ 121	-£ 32	£ 40	£ 45	£ 51	£ 57	£ 64
EBITDA	**£ 126**	**£ 89**	**-£ 189**	**£ 170**	**£ 86**	**£ 200**	**£ 366**	**£ 544**	**£ 762**
Depreciation & Amortization	£ 100	£ 141	£ 157	£ 212	£ 323	£ 325	£ 323	£ 315	£ 300
EBIT	**£ 26**	**-£ 52**	**-£ 346**	**-£ 42**	**-£ 237**	**-£ 125**	**£ 43**	**£ 229**	**£ 462**
Taxes	£ 5	-£ 10	-£ 66	-£ 8	-£ 45	-£ 31	£ 11	£ 57	£ 116
NOPAT	**£ 21**	**-£ 42**	**-£ 280**	**-£ 34**	**-£ 192**	**-£ 94**	**£ 32**	**£ 172**	**£ 347**
Plus: Depreciation & Amortizatior	£ 100	£ 141	£ 157	£ 212	£ 323	£ 325	£ 323	£ 315	£ 300
Less: Capital Expenditures	-£ 311	-£ 310	-£ 261	-£ 185	£ 300	£ 300	£ 300	£ 300	£ 300
Less: Change in Net Working Capital					-£ 15	-£ 24	-£ 30	-£ 35	-£ 40
FCFF					**-£ 155**	**-£ 45**	**£ 85**	**£ 222**	**£ 387**
Discount Factor					1,00	1,14	1,29	1,47	1,67
Discounted FCFF					**-£ 155**	**-£ 39**	**£ 66**	**£ 152**	**£ 232**

7.1.11 Terminal Value

The TV was determined using the perpetuity growth method, assuming the growth rate for the FCFF of 3% (expected nominal GDP growth). The value chosen is within the range of 2% to 4%, as per Rosenbaum & Pearl (2009).

7.1.12 Target Share Price

The EV was obtained by adding the discounted FCFF and the TV. To obtain the equity value, the market value of debt was subtracted, and both cash and cash equivalents were added. The equity value was then divided by the number of shares outstanding, resulting in a target price of £0.57 within the base scenario. Targe share price under the upside and downside scenarios was £2.36 and £0.10, respectively:

Table 17 – Target share price per forecasting scenario, Base, Downside, Upside.

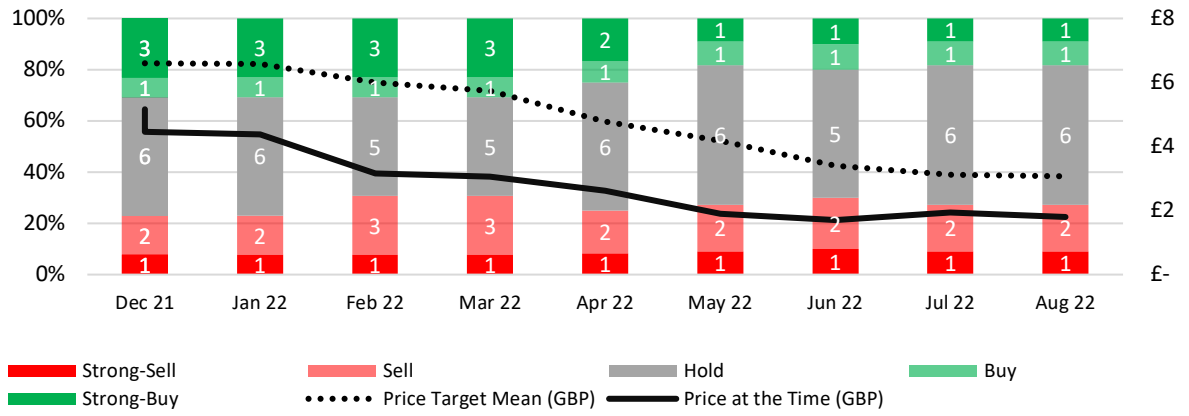
	BASE	DOWNSIDE	UPSIDE
SUM Discounted FCFF's 22-26	£ 115	£ 49	£ 256
Discounted TV	£ 1 149,91	£ 890,23	£ 2 256,71
Enterprise Value	**£ 1 265**	**£ 939**	**£ 2 513**
Less Mkt Value Debt	£ 1 259,92	£ 1 259,92	£ 1 259,92
Plus Cash and Cash Equivalents	£ 393,20	£ 393,20	£ 393,20
Equity Value	£ 398,42	£ 72,12	£ 1 646,00
Shares Outsanding, 31/08/2022	698 757 075	698 757 075	698 757 075
Target Share Price	**£ 0,57**	**£ 0,10**	**£ 2,36**

7.1.13 Comparison with other analysts

As of the August 31st, 2022, the AM's median target share price considering analysts' predictions available on Refinitiv Eikon was £1.88, and the average was £3.07. Out of the 10

analysts disclosing their target, 3 recommended to sell (1 strong-sell, 2 sell), 6 to hold, and 2 to buy (1 strong buy, 1 buy). On the same day the stock was trading at £1.65.

Figure 42: Analysts recommendation, price target mean and price at the time of forecast, retrieved from Refinitiv Eikon as of August 31st, 2022.



In comparison to both the median and average estimated prices disclosed on Refinitiv, the target price obtained with the base scenario was considerably lower. Although the values obtained are substantially lower, it is crucial to keep in mind that they were calculated using a more sophisticated and accurate method for the cost of equity estimation (5FF) than the CAPM, which is frequently employed by equity analysts. Using the CAPM derived WACC under the base case assumption, drives up the target share price from £0.57 to £1.35, reducing the distance to the market price (-18%) and to the median target price (-28%). The following table illustrates how the base scenario target price change assuming different discount rates:

Table 18 – Sensitivity analysis of AMs target share price within the base scenario. Variables: weighted average cost of capital and growth rate of the terminal value.

		WACC												
		(3FF)	(CAPM)									(5FF)		
		10,84%	11%	11,30%	11,60%	11,90%	12,20%	12,50%	12,80%	13,10%	13,40%	13,60%	14,00%	14,20%
TV growth rate	4,0%	£ 1,80	£ 1,71	£ 1,57	£ 1,44	£ 1,31	£ 1,20	£ 1,09	£ 0,99	£ 0,90	£ 0,82	£ 0,76	£ 0,66	£ 0,61
	3,5%	£ 1,59	£ 1,52	£ 1,39	£ 1,27	£ 1,16	£ 1,06	£ 0,96	£ 0,87	£ 0,79	£ 0,71	£ 0,66	£ 0,57	£ 0,52
	3,0%	£ 1,41	£ 1,35	£ 1,23	£ 1,12	£ 1,03	£ 0,93	£ 0,85	£ 0,77	£ 0,69	£ 0,62	**£ 0,57**	£ 0,49	£ 0,44
	2,5%	£ 1,25	£ 1,19	£ 1,09	£ 1,00	£ 0,91	£ 0,82	£ 0,74	£ 0,67	£ 0,60	£ 0,53	£ 0,49	£ 0,41	£ 0,37
	2,0%	£ 1,11	£ 1,06	£ 0,97	£ 0,88	£ 0,80	£ 0,72	£ 0,65	£ 0,58	£ 0,51	£ 0,45	£ 0,41	£ 0,34	£ 0,31

7.2 Comparable Company Analysis (CCA)

The universe of companies comparable to Aston Martin is small since it operates in a niche segment. What makes the universe of comparables even smaller is the fact that some of the comparable companies, in terms of product range, are integrated into other larger automotive groups (e.g. Rolls-Royce integrated into BMW), or are not publicly traded such as Koenigsegg, Lotus, or McLaren. Therefore, finding companies with similar characteristics is a challenging

process. Given the specificity of the cars developed by Aston Martin and the services it offers, the selection of peers was made using a bottom-up approach. The criteria were as follows:

1. Industry: Production of Cars and Parts
2. Revenues mostly derived from the sale of cars from the compact, mid-size, executive, and luxury segments. (Volkswagen, Toyota, Renault, Stellantis, Ford, Mazda, General Motors, Honda, Hyundai, Kia, Nissan, Subaru, Mitsubishi excluded)
3. Production of Hyper Cars in at least one of the company's portfolio (Volvo excluded)

This screening resulted in the following selection of companies[8]:

Table 19 – LTM and NTM based multiples for AM peers, Retrieved from *Refinitiv Eikon* as of August 31st, 2022

			EV/Sales		EV/EBITDA		P/S	
Company	Industry	Country	LTM	NTM	LTM	NTM	LTM	NTM
Ferrari NV	Automobiles and Parts	Italy	8,56x	7,67x	24,74x	21,00x	8,24x	7,39x
Bayerische Motoren Werke	Automobiles and Parts	Germany	1,04x	0,98x	7,08x	6,38x	0,43x	0,40x
Mercedes Group AG	Automobiles and Parts	Germany	1,11x	1,07x	12,56x	6,43x	0,48x	0,46x
Dr Ing hc Porsche AG	Automobiles and Parts	Germany	1,21x	1,11x	4,45x	4,32x	1,30x	1,19x
Pininfarina SpA	Automobiles and Parts	Italy	1,02x	n.a	11,76x	n.a	1,07x	n.a
		Median	**1,11x**	**1,09x**	**11,76x**	**6,41x**	**1,07x**	**0,83x**

To value AM with the comparable company method, three multiples were considered: EV/Sales, EV/EBITDA, and Price/Sales. Secondly, the analysis was performed on a last twelve months (LTM) and next twelve months (NTM) bases.

Ferrari usually yields higher multiples, while BMW, Porsche, Mercedes, and Pininfarina SpA showcase more consistency, therefore the median values were preferred in this analysis to diminish the impact of out-of-range values.

The median EV/Sales LTM multiple was 1.11x, which yields a target share price of £0.50. The median EV/Sales NTM was 1.09x, resulting in a target price of £0.87. These values are in line with the base scenario DCF valuation using the 5FF-WACC.

Table 20 – EV/SALES, inter-quartile price target on LTM and NTM bases

	LTM			NTM		
	1st Quartile	**Median**	**3rd Quartile**	**1st Quartile**	**Median**	**3rd Quartile**
EV / Sales Multiple	1,04x	1,11x	1,21x	1,04x	1,09x	2,75x
Sales 2021 (Consensus Sales 2022)	£ 1 095	£ 1 095	£ 1 095	£ 1 355	£ 1 355	£ 1 355
Enterprise Value	**£ 1 144**	**£ 1 218**	**£ 1 326**	**£ 1 416**	**£ 1 475**	**£ 3 726**
(-) Market Value of Debt	£ 1 260	£ 1 260	£ 1 260	£ 1 260	£ 1 260	£ 1 260
(+) Cash and cash equivalents	£ 393	£ 393	£ 393	£ 393	£ 393	£ 393
Equity Value	£ 278	£ 351	£ 460	£ 549	£ 608	£ 2 860
Shares Outsanding, 31/08/2022	699 Mil.	699 Mil.	699 Mil.	699 Mil.	699 Mil.	699 Mil.
Target Share Price	**£ 0,40**	**£ 0,50**	**£ 0,66**	**£ 0,79**	**£ 0,87**	**£ 4,09**

[8] More information on how each of the companies was selected can be found on the appendix.

The median EV/EBITDA LTM multiple was 11.76x, yielding a target price of £1.62. For the next twelve months, the projected multiple is of 6.41x, resulting in a forecasted share price of £0.62, a 62% reduction. This suggests analysts are expecting a correction within the coming months following a loss in investors' confidence on the automobile industry.

Table 21 – EV/EBITDA, inter-quartile price target on LTM and NTM bases

	LTM			NTM		
	1st Quartile	Median	3rd Quartile	1st Quartile	Median	3rd Quartile
EV / EBITDA Multiple	7,08x	11,76x	12,56x	5,87x	6,41x	10,07x
EBITDA 2021 (Consensus EBITDA 2022	£ 170	£ 170	£ 170	£ 202	£ 202	£ 202
Enterprise Value	**£ 1 203**	**£ 1 997**	**£ 2 132**	**£ 1 188**	**£ 1 297**	**£ 2 040**
(-) Market Value of Debt	£ 1 260	£ 1 260	£ 1 260	£ 1 260	£ 1 260	£ 1 260
(+) Cash and cash equivalents	£ 393	£ 393	£ 393	£ 393	£ 393	£ 393
Equity Value	£ 336	£ 1 130	£ 1 265	£ 321	£ 431	£ 1 173
Shares Outsanding, 31/08/2022	699 Mil.	699 Mil.	699 Mil.	699 Mil.	699 Mil.	699 Mil.
Target Share Price	**£ 0,48**	**£ 1,62**	**£ 1,81**	**£ 0,46**	**£ 0,62**	**£ 1,68**

The median P/Sales LTM is of 1.07x, which yields £1.68, whereas the P/Sales NTM is 0.83x, yielding a price of £1.61. This multiple results in an inflated target share price as it is considering the Equity Value, and not the Enterprise value. As such, it is not considering the impact of the Market Value of Debt of AM, which would ultimately drive down the multiple to the values of EV/Sales.

Table 22 – Price/Sales, inter-quartile price target on LTM and NTM bases

	LTM			NTM		
	1st Quartile	Median	3rd Quartile	1st Quartile	Median	3rd Quartile
P / Sales Multiple	0,48x	1,07x	1,30x	0,45x	0,83x	2,74x
Sales 2021 (Consensus Sales 2022)	£ 1 095	£ 1 095	£ 1 095	£ 1 355	£ 1 355	£ 1 355
Equity Value	**£ 530**	**£ 1 177**	**£ 1 425**	**£ 607**	**£ 1 122**	**£ 3 715**
Shares Outsanding, 31/08/2022	699 Mil.	699 Mil.	699 Mil.	699 Mil.	699 Mil.	699 Mil.
Target Share Price	**£ 0,76**	**£ 1,68**	**£ 2,04**	**£ 0,87**	**£ 1,61**	**£ 5,32**

7.3 Precedent Transaction Method (PTA)

Lastly, to support and test the assumptions made on the DCF, a valuation based on the precedent transaction analysis was also made. Using the *Merger Market* database, it was possible to obtain a list of transactions that have taken place in recent years. The criteria for the transaction selection were the same the same as the one used in the comparable company analysis regarding the target company. Please consider the list bellow with the transactions screened:

Table 23 – 2009-2022 list of transactions involving peers, *Merger Market* portal as of August 21st, 2022

Target Name	Transaction Date	Country	EV/Sales	EV/EBITDA
Williams Grand Prix Engineering Limited (100% Stake)	21/08/2020	USA	1,27x	5,71x
Porsche Automobil Holding SE (14.71% Stake)	03/04/2017	USA	n.a	
Pininfarina S.p.A. (100% Stake)	14/12/2015	Ireland	1,16x	13,02x
Porsche Automobil Holding SE (5.71% Stake)	17/06/2013	USA	1,67x	0,74x
Dr. Ing. h.c. F. Porsche AG (50.1% Stake)	04/07/2012	Canada	1,45x	5,42x
Dr. Ing. h.c. F. Porsche AG (49.9% Stake)	20/11/2009	USA	2,15x	11,13x
Porsche Automobil Holding SE (5% Stake)	14/08/2009	Canada	1,29x	29,22x
MEDIAN			**1,37x**	**8,42x**

To value AM with the previous transaction analysis, two multiples were considered: EV/Sales and EV/EBITDA. Similar to CCA, only the median values were considered to diminish the impact of out-of-range values.

The median EV/Sales multiple was 1.37x, which yields a target share price of £1.03, and the median EV/EBITDA multiple was 8.42x, yielding a target price of £1.46.

Table 24 – Target price using the EV/Sales ratio from precedent transactions in the auto industry for the period 2009-2022.

	EV/Sales		
	1st Quartile	Median	3rd Quartile
EV / Sales Multiple	1,28x	1,45x	1,91x
Sales 2021	£ 1 095	£ 1 095	£ 1 095
Enterprise Value	**£ 1 400**	**£ 1 583**	**£ 2 089**
(-) Market Value of Debt	£ 1 260	£ 1 260	£ 1 260
(+) Cash and cash equivalents	£ 393	£ 393	£ 393
Equity Value	£ 533	£ 716	£ 1 222
Shares Outsanding, 31/08/2022	699 Mil.	699 Mil.	699 Mil.
Target Share Price	**£ 0,76**	**£ 1,03**	**£ 1,75**

Table 25 – Target price using the EV/EBITDA ratio from precedent transactions in the auto industry for the period 2009-2022

	EV/EBITDA		
	1st Quartile	Median	3rd Quartile
EV / EBITDA Multiple	5,56x	11,13x	12,47x
EBITDA 2021	£ 170	£ 170	£ 170
Enterprise Value	**£ 945**	**£ 1 890**	**£ 2 118**
(-) Market Value of Debt	£ 1 260	£ 1 260	£ 1 260
(+) Cash and cash equivalents	£ 393	£ 393	£ 393
Equity Value	£ 78	£ 1 023	£ 1 251
Shares Outsanding, 31/08/2022	699 Mil.	699 Mil.	699 Mil.
Target Share Price	**£ 0,11**	**£ 1,46**	**£ 1,79**

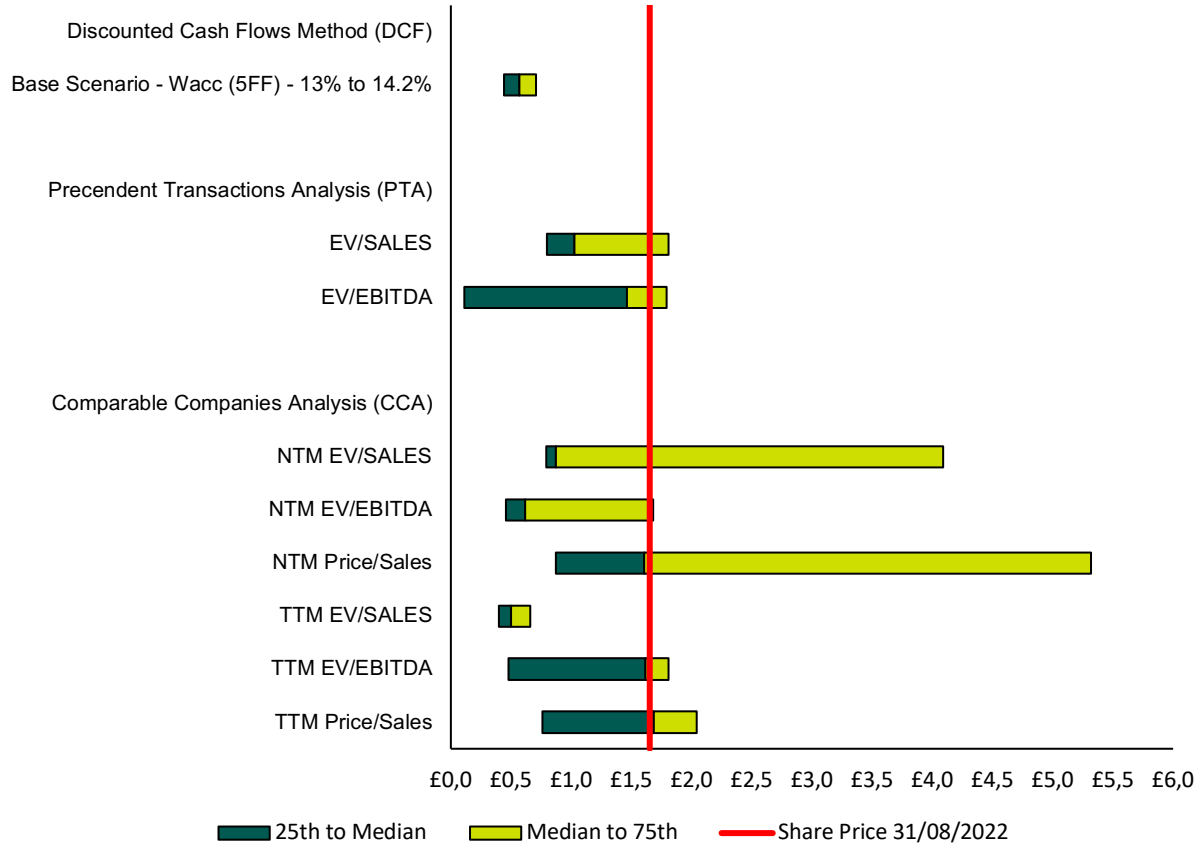
Both the values obtained using median multiples on PTA are higher than the target price obtained using the base DCF (5FF-wacc), however as mentioned in the literature review, the PTA typically yields higher multiples. That happens for two reasons. First, when purchasing another company, buyers typically pay a "control premium". The authority to make decisions

affecting the target's business and its underlying cash flows is given to the acquirer in exchange for this premium. Second, buyers frequently have the chance to realize synergies, supporting the capacity to pay greater purchase prices. Removing the control premium would drive the target prices down, coming close to that obtained using the base scenario DCF valuation discounted with the 5FF-wacc.

7.4 Valuation Summary

The figure bellow illustrates the target price range reached with each method utilized for the valuation:

Figure 42 – Aston Martin target price range for each valuation method utilized.



8. Final Recommendation

The investment recommendation is identified by a **Strong Sell**, with a target price set of **£0.73**, representing a 126% overvaluation relative to the price the stock was trading at on August 31st, 2022 (£1.65). 3 different methods were used to determine Aston Martin's target price for January 1st, 2023, taking into consideration information available as of August 31st, 2022. The discounted cash flow, comparable company analysis and the precedent transaction analysis resulted in 9 different target prices. Please consider the table to the right.

Table 26 – Summary of target prices obtained using base DCF, CCA, and PTA

Method	Weight	Share Price
DCF	70,0%	£ 0,57
CCA - EV/SALES LTM	2,0%	£ 0,50
CCA - EV/EBITDA LTM	2,0%	£ 1,62
CCA - P/S LTM	2,0%	£ 1,68
CCA - EV/SALES NTM	6,7%	£ 0,87
CCA - EV/EBITDA NTM	6,7%	£ 0,62
CCA - P/S NTM	6,7%	£ 1,61
PTA - EV/Sales	2,0%	£ 1,03
PTA - EV/EBITDA	2,0%	£ 1,46
Final Target Price	100%	£ 0,73

The final target price is a weighted average of all nine methodologies. To arrive at the final target price, a weight of 70% was put on the DCF valuation using the 5FF computed WACC. The reason for this is that the DCF has a much higher level of detail and allows making firm-specific assumptions about valuation. It is important to mention that the assumptions employed in this model and for this scenario were all supported by estimates made by the analyst with a high degree of confidence. The analyst has made assumptions that best fit the current economic and geopolitical landscape, considering for example increases in raw material values, adjustments in demand for segment vehicles, worsening of payment periods, among others. Regarding the comparable company analysis, a weight of 6.7% was put on the forward-looking multiples (NTM) since they have historically performed better when estimating stock prices. A weight of only 2% was given to the backwards looking multiples (LTM) since they are likely to give a misleading representation following the ongoing disruptions generated by the Russia-Ukraine conflict and the inflation surge. Lastly, a 2% weight was assigned to the precedent transaction method. Similar to CCA's backwards looking multiples, PTM multiples are likely to be an inaccurate representation of how AM's performance will be in the future. Firstly, that happens because they refer to transactions that happened at least 2 years ago and secondly, they are also likely to produce overstated valuations given the EV adjusted for the previously mentioned control premium.

9. Limitations

The accuracy of the results could have been improved with further access to information and by using more valuation methods. Firstly, inconsistencies in reported data from Aston Martin led to some approximations and common-sense assumptions. Little data was available on topics such as what is included in COGS and the impact of currency fluctuations on revenues and costs. From these points, more conclusions could be drawn on AM's income statement and cash flow generation. For an even more extensive analysis, slight adjustments on the DCF valuation could have been performed. The perpetuity growth model for the terminal value was preferred, but the exit multiple could have been explored.

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11. Appendix

Comparable Company Analysis (CCA)

Selection of Peer companies

Within the CCA, the list of companies that resulted from the screening is as follows:

1. **Ferrari NV** – Italian sports automobile designer, manufacturer, and retailer. Ferrari is a competitor whose product and service offering overlaps the most. Like Aston Martin, Ferrari markets high-performance cars in the SUV (Purosangue with DBX), grand-tourer (Roma with AM DB11), and hypercar (LaFerrari with Valkyrie, Valhalla) segments. The company's regional markets are also similar to AM'S, being divided into EMEA Americas, Greater China, and the Rest of APAC (Asia-Pacific area, excluding Greater China). Ferrari operates in 60 markets globally against the 56 of Aston Martin. Making Ferrari distinct from Aston Martin is the fact that it not only has higher revenue but also that it offers financing solutions through Ferrari Financial Services.

2. **Dr Ing hc F Porsche AG (Porsche AG)** – German luxury car maker. Porsche AG was recently listed on the Frankfurt Stock Exchange. The line-up of the company is similar to that of AM, with their offering in the SUV (Cayenne with DBX), grand tourer (911 with V8 Vantage), and hypercar (918 Spyder with Valkyrie) segments. In contrast, Porsche AG sells automobiles through a network of about 900 dealerships, car leasing, and finance.

3. **Pininfarina SpA** – Italian company operating in the automotive sector. It designs, plans, and manufactures automobiles, with the core business being still the design and engineering services. The company started commercializing in 2022 the Pininfarina Battista and Battista Aniversario, an all-electric grand tourer and hypercar. With Aston Martin planning to release all its models with fully electric powertrains by 2025, these two models which are now competing with other currently commercialized high-performance hybrid and petrol AM cars (Valhalla and Valkyrie), will be competing against AM's full electric hypercars the company intends to release. Contrasting to Aston Martin, Pininfarina SpA works in the fields of architecture, interior design, industrial design, electronics, furniture, and lifestyle.

4. **Mercedes-Benz Group AG** – German company manufacturing and distributing vehicles. The company has exposure to the High Luxury Segment through its subsidiaries Mercedes-AMG and Mercedes-Maybach. Those produce vehicles directly competing with AM's models (Mercedes-AMG Project One with Valkyrie, and Mercedes-Maybach GLS with DBX). Similar to Aston Martin, Mercedes-Benz Group AG has exposure to F1TM, however to a much greater extent since it owns one-third of the team Mercedes-AMG Petronas Formula One, whereas Aston Martin only holds an F1 sponsorship agreement with Aston Martin Aramco Cognizant F1 Team. In contrast to AM, Mercedes-Benz Group commercializes vans (light-duty vehicles only since Daimler Trucks' spin-off) and offers services such as fleet management, financing, leasing, automobile subscription and rental, and mobility services.

5. **Bayerische Motoren Werke AG (BMW AG)** – German company manufacturing and distributing vehicles. The company has exposure to the High Luxury Segment through its subsidiaries BMW-M and Rolls-Royce, with products such as the BMW M8 and BMW X7 or Rolls-Royce Cullinan competing directly with Aston Martin's V8 Vantage and DBX, respectively. Unlike AM, BMW manufactures motorcycles and offers financing solutions to its customers such as leasing, multi-brand financing, fleet financing, dealer and retail financing, and insurance.