

**Czech University of Life Sciences in Prague**

**Faculty of Economics and Management**

**Department of Economic Theories**



**Diploma Thesis**

**Comparison of Business Valuation Methods Outcomes**

**Karel Prückner**

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## Declaration

I hereby declare that I have worked on my diploma thesis titled “Comparison of Business Valuation Methods Outcomes” by myself, under guidance of my supervisor. I have used only academic literature and information resources mentioned in overview in the end of the diploma thesis. As author of the diploma thesis, I further declare that I have not breached copyrights of third parties when working on the diploma thesis.

In Prague on November 29, 2013

Pavla Kral

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# **Comparison of Business Valuation Methods Outcomes**

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## **Srovnání výsledků daných různými metodami oceňování podniku**

### **Summary**

The objective of the thesis is to value a selected company via several valuation methods, and to compare the results obtained. The methodological part of the thesis presents a valuation framework and describes various valuation methods. Literature review provides reader with information on appropriateness of use of valuation methods. It also explores advantages and disadvantages of methods. Besides, it summarizes conclusions reached by other authors on comparison of valuation methods outcomes. The first part of analysis informs about Aston Martin as a company of case study. This is followed by application of asset-based and relative valuation methods which determine the value of the company in 2007. Valuation outcomes are compared among each other, as well as related to real value of Aston Martin in 2007. Significant differences among outcomes stem from different logic of the methods, value of goodwill of Aston Martin, synergies of investors and other factors. In the last part of the analysis, Aston Martin is valued using ex-post discounted cash flow approach. The result strongly reflects financial distress of the company within 2007-2012.

### **Souhrn**

Tato diplomová práce si bere za cíl zjistit hodnotu podniku několika metodami ocenění a porovnat získané výsledky. Metodologická část diplomové práce představuje rámec oceňování podniků a popisuje metody ocenění. Přehled literatury se nejprve věnuje

vhodnému použití jednotlivých metod ocenění, dále jsou zde rozebrány výhody a nevýhody metod. Kapitola také shrnuje předešlá akademická zjištění týkající se porovnávání výsledků metod ocenění. První část praktické části předkládá informace o společnosti Aston Martin, jakožto o cíli následné případové studie. Druhá část se již věnuje aplikaci oceňovacích metod, které zjišťují hodnotu Aston Martinu k roku 2007. Výsledky metod jsou vzájemně srovnány, přičemž jsou také dány do kontextu reálné hodnoty zkoumané společnosti z téhož roku. Významné rozdíly mezi jednotlivými hodnotami je možné vysvětlit rozdílnými předpoklady metod, cenou goodwillu Aston Martinu, synergii pro investory a dalšími faktory. V poslední části analýzy oceníme Aston Martin ex-post metodou diskontovaných peněžních toků. Výsledek je do značné míry ovlivněn špatnou finanční situací společnosti v letech 2007-2012.

**Keywords:** business valuation, discounted free cash flow, multiples, P/E ratio, enterprise value/EBITDA, asset-based valuation

**Klíčová slova:** oceňování podniku, diskontované volné peněžní toky, násobitelé, P/E ukazatel, hodnota podniku/EBITDA, oceňování na základě aktiv

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# 1. Introduction

Although value creation and growth are among the foremost requirements of shareholders, companies achieve them with difficulties in the competitive markets of nowadays. Mature companies must seek new ways to create value and they face many hurdles of organic growth, such as market saturation, lack of innovation, rigidity, etc. That is why more and more companies acquire other firms. According to Institute of Mergers, Acquisitions and Alliances, the number of transactions has increased from 4,000 in 1985 to over 41,000 in 2012<sup>1</sup>.

Mergers and acquisitions (M&A) provide companies with growth and sustainability in the long term. Moreover, in pursuit of benefiting from synergies, companies generate additional value through mergers and acquisitions. In ideal case, this leads to satisfaction of shareholders. Yet M&A seems like the right direction for companies striving to grow and create value. However, countless questions arise when the decision to involve in transaction has been made. Where to seek the acquisition target? How to choose the right one? What synergies can we expect? How to determine value of transaction? ... Although there are many questions to be answered, this thesis deals solely with the valuation issue.

Valuation of businesses can be considered as one of the main issues in finance because it is used in numerous situations. Companies use valuation techniques to find out which investment opportunity brings about higher returns. Portfolio managers value companies when searching for undervalued firms to invest in. In case of analysing market efficiency, researchers determine intrinsic value of companies in order to compare it with the current stock price (Damodaran, 2005).

Based on the data from Institute of Mergers, Acquisitions and Alliances, we suppose that valuation of companies for purposes of M&A has gained an increasing importance in past decades. Since there are numerous methods how to determine value of a company, it is crucial to choose methods accordingly and be able to handle methods

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<sup>1</sup> Source: Statistics. Institute of Mergers, Acquisitions and Alliances. [Accessed on November 27, 2013.] Available at: [http://www.ima-institute.org/statistics-mergers-acquisitions.html#MergersAcquisitions\\_Worldwide](http://www.ima-institute.org/statistics-mergers-acquisitions.html#MergersAcquisitions_Worldwide)

properly to obtain the most accurate and reliable result. This is why we deal with theoretical background of the valuation topic in the methodological part of the diploma thesis. Underlying theories are introduced, selected valuation methods are described and valuation procedure is outlined. Further, the literature review provides reader with information on correct application of valuation methods, their advantages and disadvantages, and findings on comparison of valuation methods outcomes reached by other authors.

In the practical part of the thesis, we apply selected valuation methods on a case study. A luxury sports car producer Aston Martin is the company of choice for the case study. Aston Martin was acquired by Kuwaiti investors in 2007 and circumstances of the deal are introduced at first. Further, the company is valued via various valuation methods and the outcomes are compared to each other, as well as to the transaction price paid in 2007. Following discussion attempts to question the appropriateness of the purchase price in relation to the results obtained.

## **2. Objectives of the diploma thesis**

This part defines the hypothesis and objectives of the thesis. Since the field of valuation is very broad and related to many other topics of corporate finance, there are many issues that might be discussed in the thesis. However, we focus on outcomes of valuation methods.

### **2.1 Hypothesis formulation**

The methods of valuation has been developing and improving. In these days, we can use manifold valuation approaches to find out value of company. New valuation methods are discussed (e.g. real option pricing), combination of methods as new valuation solutions arise (Monte Carlo simulation of real option pricing) and importance of old valuation techniques (valuation based on decision tree analysis) is reminded (Laughton, a další, 2008).

Despite more or less sophisticated valuation procedures, methods seldom end up calculations of value of a company at similar result. In other words, when we compare valuation outcomes, values can differ even though they should be the same if financial theories hold. The hypothesis of the diploma thesis is that the valuation outcomes disparity applies.

The preliminary rationale of the hypothesis is that there are many factors influencing the value but only some of them are reflected in valuation outcomes delivered by methods. Moreover, the intrinsic value of company does not necessarily need to be equal to transaction price.

### **2.2 Objectives formulation**

The first aim of the thesis is to apply several business valuation methods on case study and to compare the outcomes. After comparing the results, we discuss the reasons of similarity/disparity of values obtained.

The second objective is to compare the valuation outcomes with price of real transaction. This allows us to determine whether other factors, inherently included in the price of transaction, can be captured by valuation methods or not.

Thirdly, the thesis attempts to disclose if the transaction price of case study was appropriate via ex-post approach to valuation.

### **3. Methodology**

This chapter deals with methodology of the thesis. The aim of this chapter is to make reader of the thesis familiar with theoretical background of business valuation and financial concepts related to valuation.

In the first part of the chapter, sources of information are introduced. After, framework of business valuation is described. This part includes overview of four main approaches to business valuation that are later described in a detail.

The next part of methodology deals with discounted cash flow valuation as one of the valuation approaches. It explains the rationale behind discounting cash flows, it provides examples of selected methods and describes the procedure of valuation.

Asset-based valuation is a name of next chapter. It includes definitions of the approach and net asset value method is a highlighted representative which is further applied in the practical part of the thesis.

Topic of asset-based valuation is followed by chapter devoted to relative valuation. Within the concept of relative valuation, we distinguish four main approaches which differ in terms of data source for consequent comparison. Moreover, we use different valuation procedure in case of relative valuation compared to discounted cash flow valuation procedure. This is also described in the part aimed at relative valuation.

#### **3.1 Sources of information**

The sources of information can be divided into three groups. Firstly, sources of theoretical knowledge are based on literature dealing with corporate finance, academic articles, scientific resources and relevant books.

Secondly, data concerning selected company for the purpose of practical application of valuation methods is collected from accounting statements of selected firm. These are retrieved from DueDil.com database tool upon subscription. Further, publicly available information about the object of the valuation is gathered mainly from news articles, reports, business performance summaries, etc.

Thirdly, corporate finance related data, serving as input of valuation methods, is retrieved mainly from database of Professor Aswath Damodaran<sup>2</sup>. Damodaran maintains a broad database of updated corporate finance information that is used by analysts around the world.

## **3.2 Valuation framework**

In finance, value of company, or asset in general, is not the perceived biased price of an owner. Instead, we use various valuation methods to deliver a robust and reliable value. Nevertheless, figures obtained by more or less sophisticated valuation methods are further suspect to negotiations of parties involved in the transaction process. This means that the value serves as judgement but, based on any deal circumstances, seller may always require premium price and buyer can ask for discount.

In general, we distinguish between four major groups of valuation methods. The first and most common group is based on discounted cash flows. Methods included in this group relate value of an asset to the estimated cash flows connected to the asset. Second group of methods, asset-based valuation, determines the value of company using existing assets and further adjustments. Thirdly, comparative methods (relative valuation) estimate value on the basis of similarities between the valued company and historical valuations. Fourth group treats company as a portfolio of future decisions and uses option pricing methodology, which is in case of business valuation termed as real options valuation. The groups mentioned differ in assumptions used, appropriateness of use as well as in methodology. If market efficiency theories hold, all methods should deliver the same results.

The thesis deals with three out of the four groups. In each group, one method is selected, described in the methodological part and applied in the practical part on a case study.

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<sup>2</sup> Damodaran's database is available at <http://pages.stern.nyu.edu/~adamodar/>

### **3.3 Discounted cash flow valuation**

Discounted cash flow methods see the value of an asset as the present value of expected future cash flows on the asset (Damodaran, 2005). Therefore, future expected cash flows are the driver of company value (Koller, 2005). Inherently, this is possible only under the assumption of going-concern, i.e. we are positive about future existence of the company valued.

To deliver the present value of expected cash flows, we discount cash flows at a rate which reflects opportunity cost and riskiness of the asset. The fundamental theory says that assets having high and predictable cash flows have higher value, whereas assets with low and volatile cash flows are less valued (Damodaran, 2005).

There are four approaches that discounted cash flow valuation can be handled (Damodaran, 2005).

1. Discount rate adjustment models
2. Certainty equivalent models
3. Adjusted present value approach
4. Excess return models

For the purposes of the thesis, we deal with discount rate adjustment models. Adjusted present value should deliver similar results as discount rate adjustment models (Koller, 2005). Also excess return models, where discounted economic value added is the main representative, provide analysts with similar valuation outcomes (Damodaran, 2005). Therefore, we do not concentrate on them in the thesis. Certainty equivalent models are less common in valuation practice so we do not deal with them in the thesis.

Before proceeding to description of discount rate adjustment methods, it is appropriate to briefly remind reader of the diploma theses about the underlying basics of discounting and determining the discount factor, both with regard to business valuation.



### 3.3.1 Determining present value and discount rate

Business valuation based on discounting uses the well-known and widely-used present value methodology. This is also used in case of investment project valuation, bond and stock valuation, etc.

As mentioned at in the beginning of the chapter, value is a function of future expected cash flows. Once the future cash flows are known / estimated, we are interested in their present value. This is done via dividing with the discount rate. The formula is as following (Kislingerová, 2010):

$$Present\ value = \sum_{t=1}^n \frac{future\ cash\ flow_t}{(1 + discount\ rate)^t}$$

The present value cannot be computed without knowing the discount rate. The discount rate is used to reflect the time value of money as well as riskiness of the subject. There are numerous ways how one can determine the discount rate. The list below provides some examples.

1. Weighted average cost of capital (WACC)
2. Build-up model
3. Discount rate of comparable entity
4. Return on assets, return on equity
5. Interest rate, risk-free rate
6. Management-determined discount rate

In this thesis, WACC and CAPM model will be utilized. Although the underlying assumptions of WACC and CAPM models are not flawless, the models are commonly used by corporate finance practitioners and academics. The reason mainly comes from its understandable structure and easy application.

### 3.3.1.1 *Weighted average cost of capital*

The WACC-based discount rate represents the cost of equity capital (= opportunity cost of capital of investors) as well as cost of debt capital. Also, WACC counts in the tax shield and the ratio of equity and debt capital. Hence, the formula of WACC can be drawn (Kislíngerová, 2010):

$$WACC = \frac{E}{C} * r_e + \frac{D}{C} * r_d * (1 - t)$$

Meaning of characters used in the equation is explained below.

WACC..... weighted average cost of capital

E ..... equity capital

D ..... debt capital

C ..... total capital invested (C = E + D)

r<sub>e</sub> ..... cost of equity capital

r<sub>d</sub> ..... cost of debt capital

t..... corporate tax

We can easily derive amounts of equity and debt from balance sheet. Corporate tax is a matter of up-to-date law in country of company seat.

Cost of debt consists of two principal components, risk-free rate and risk premium, which reflects riskiness of the debtor. According to Mařík, a market data and financial statements can be used to determine cost of debt (Mařík, 2007). Firstly, credit rating should be found out for those companies which are rated by a rating agency (Moody's, Standard & Poor's, ...). Credit rating can be also estimated using procedure outlined by Damodaran and described by Mařík, i.e. interest coverage ratio serves as proxy to assign

credit rating to company. Secondly, risk premium derived from credit rating is added to risk-free rate of given period. Hence, we obtain cost of debt.

In case of cost of equity, such estimation cannot be performed and deeper analysis of components is required. We use capital asset pricing model to do so.

### ***3.3.1.2 Capital asset pricing model***

Capital asset pricing model (CAPM) is the most used approach to determine the expected rate of return on equity. Although the model incorporates many unrealistic assumptions such as perfect market competition, it is widely accepted and preferred to other models, for instance Arbitrage pricing theory (APT) and Fama-French three-factor model (Koller, 2005) (Mařík, 2007).

The CAPM defines the expected rate of return on equity as a function of risk-free rate, market risk premium and a lever of company's inclination to follow market fluctuations. The formula is as following:

$$E(r_e) = r_f + \beta * (E(r_m) - r_f)$$

Meaning of characters used in the equation is explained below.

$E(r_e)$  ..... expected rate of return on equity

$r_f$  ..... risk-free rate

$\beta$  ..... beta coefficient

$E(r_m)$  ..... expected rate of return on market portfolio

The logic inherent in the model bases the expected rate of return on equity on risk-free rate and extends it in accordance with the tendency of a company to follow market fluctuations. In order to do so, we will explain terms like risk-free rate, market premium and beta coefficient.

### **Risk-free rate**

Risk-free rate is the rate of return on risk-free assets which have no probability of default. In general, we can state that no such assets exist. Nevertheless, we use proxy to determine the risk-free rate. When valuing a company, treasury bills of USA are considered as one of the safest assets and rate of return on treasury bills with 10 year maturity can be used as a risk-free rate (Mařík, 2007).

### **Market premium**

Market premium indicates the excess of expected return on market portfolio over risk-free assets. Thus, market premium can be derived as  $(E(r_m) - r_f)$  from the upper equation.

### **Beta coefficient**

Lastly, details of beta coefficient are provided. In the CAPM model, beta is the only factor which is related directly to the asset being valued. Beta coefficient captures the tendency of company's stocks to move along the market move (Koller, 2005). When  $\beta = 1$ , the riskiness of company's stock is on the same level as the risk connected to the market and company's stock moves exact same as market.

Interpretation of all possible beta values is explained in following table.

<b>Beta coefficient values</b>	<b>Relation of company and market move</b>
$\beta > 1$	Company stock increase (decrease) is more significant than market increase (decrease)
$\beta = 1$	Company stock increase (decrease) is similar to market increase (decrease)
$1 > \beta > 0$	Company stock increase (decrease) is less significant than market increase (decrease)
$0 > \beta > -1$	Company stock increase (decrease) is less significant than market decrease (increase)

$\beta = -1$	Company stock increase (decrease) is similar to market decrease (increase)
$\beta < -1$	Company stock increase (decrease) is more significant than market decrease (increase)

**Table 1: Beta coefficient value, source: own creation**

According to Mařík, there are three ways how to determine beta coefficient (Mařík, 2007).

1. Estimation based on relevant factors
2. Regression analysis
3. Analogy method

Since estimation of beta based on relevant factors is not commonly applied approach, description of regression analysis and analogy method is provided.

To determine beta by regression analysis, we scrutinize the relation of historical values of company shock returns and market returns. The formula used in the regression analysis is:

$$\beta = \frac{COV (R_m; R_i)}{VAR (R_m)}$$

Symbols in the equation mean:

$\beta$ .....beta coefficient

$COV (R_m; R_i)$  .....covariance of market and stock returns

$VAR (R_m)$ .....variance of market returns

Obviously, this method can be used only for companies quoted on stock market. If we want to calculate beta of non-listed company, we use method of analogy. This method uses betas of comparable quoted companies as a proxy for beta of company being valued.

When employing the analogy method, two obstacles might appear. Firstly, the risk of industry slump might appear. To overcome this, we compare only companies from the same industry. Second obstacle is represented by different default probabilities of companies in analogy. In balance sheets, this is easily observable in debt/equity ratio. Thus, levered and unlevered betas reflect the ratio.

$$\beta_L = \beta_U * \left( 1 + (1 - t) * \frac{D}{E} \right)$$

$\beta_L$ .....beta of levered firm

$\beta_U$ .....beta of unlevered firm

D.....debt capital

E.....equity capital

t.....corporate tax

### 3.3.2 Discount rate adjustment models

The basic economic principle behind the discount rate adjustment models is the fact that we increase the discount factor when valuing riskier assets and, conversely, lower discount rate when it comes to safer and predictable companies.

We distinguish between two approaches within discount rate adjustment models which use different discount rates. The first method, enterprise discounted cash flow, attempts to value the entire business. Therefore, present value of entire company is reflected, putting value of equity and debt claims together. The second approach, discounted cash flow to equity, values only the claims of shareholders.

### ***3.3.2.1 Enterprise discounted cash flow***

As mentioned, enterprise discounted cash flow valuation takes into account value of equity as well as value of debt. Thus, cash flows used in this approach are further divided among investors and creditor. Such cash flows are called free cash flow to firm. The basis of determining free cash flow to firm is operating profit (earnings before interest and taxes; or earnings before interest, taxes and amortization when available). In order to find out amount of free cash flow accurately, we adjust operating profit for several items. The emphasis is put on using just numbers that are directly related to the core business of analysed company and are necessary for further continuity of operations. The calculation of free cash flow is available below (Mařík, 2007).

#### **Operating profit**

- Taxes on operating profit
- + Depreciation
- Increase of working capital
- Capital expenditures
- = **Free cash flow**

After calculating free cash flows, we aim to determine the present value of future free cash flows. For doing so, we use discount rate that reflects claims of investors and stakeholders, most commonly discount rate obtain by WACC method.

#### **Forecast horizon phasing**

In discounted cash flow valuation, we usually estimate free cash flows in 5 years horizon, although analyst might choose more suitable horizon if necessary. This is called the first phase of prognosis.

The second phase of the prognosis starts after the end of the first phase and stretches to infinite future. We use a term terminal value (TV) for the second phase.<sup>3</sup>

To identify the terminal value, analyst can choose among several approaches (Mařík, 2007):

1. Continuing cash flows method
2. Liquidation method
3. Exit value
4. Accounting value

Continuing cash flows method operates with cash flows sustainable for a very long term and adjusts them for expected growth. To estimate the growth, Gordon growth model or parametrical build-up models can be used. Liquidation method is appropriate only when we expect the company will cease to exist after the first phase. Exit value applies relative valuation approach, which is explained in further parts of the methodology. Accounting value approach employs balance sheet facts to identify terminal value.

### **Enterprise value**

After obtaining discounted free cash flows and terminal value, we can calculate the enterprise value according to the formula below (Koller, a další, 2005).

$$Enterprise\ Value = \sum_{t=1}^n \frac{future\ free\ cash\ flow_t}{(1 + WACC)^t} + \frac{terminal\ value_n}{(1 + WACC)^n}$$

Nevertheless, the enterprise value given by the formula is gross value of company. When net value is desirable, several adjustments need to be done.

1. Prepare gross enterprise value

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<sup>3</sup> In some cases, we can also come across three-phase valuation horizon but it is not as used as two-phase horizon.



2. Subtract the amount on interest-bearing debt
3. Add redundant assets

After fulfilling the second point, we obtain the value of operating value of equity. When adding the redundant assets, we calculate the final outcome – total net value of equity.

### ***3.3.2.2 Discounted cash flow to equity***

Another variation of discount rate adjustment models is discounted cash flow to equity (DCFTE). These two models differ in (Mařík, 2007):

- Calculation of free cash flows
- Discount rate
- Result interpretation

The reason of the differences stems from the fact that this method discounts only cash flows available for equity holders. Therefore, the method calculation does not result into value of entire business. The outcome of the method is value of equity, i.e. value available to investors.

As mentioned, the DCFTE method reconciles free cash flow differently compared to enterprise discounted cash flow method. The process is following:

- Sales**
- Costs (excluding depreciation)
- Change in working capital
- Interest
- Provision for net income taxes (from income statement)
- = **Cash flow from operations**
- Capital expenditures

- + Proceeds from new debt and preferred equity issues
- Preferred dividends
- Debt repayments
- = **Free cash flow to equity**

When having future free cash flows to equity calculated, we discount them at cost of equity to deliver present value. Capital asset pricing model (CAPM) can be used to determine the cost of equity.

The question of forecast horizon phasing in equity valuation is analogical to enterprise valuation procedure. The terminal value must be treated in accordance with the main idea of equity valuation – it reflects only claims of shareholders.

### **Dividend discount model**

Dividend discount business valuation model employs fundamental principle of dividend valuation and applies it on equity valuation. According to Damodaran, this simple approach may be useful although many analysts have turned away from it (Damodaran, 2005).

Discounted dividend model and DCFE model should lead to the same outcome but it is not always the case. Mařík provides explanations of the disparity (Mařík, 2007).

Since equity discount models are not applied in the thesis on case study, more theoretical information may be found in valuation literature by Damodaran who covers equity valuation in great detail (Damodaran, 2005).

### **3.3.3 Procedure of business valuation**

So far, valuation principles are explained and discounted cash flow methods of valuation described. This part provides reader with overall information on discounted cash flow valuation process.

Generally, following procedure is recommended (Mařík, 2007):

1. Data collection
2. Data analysis
  - a. Strategic analysis
  - b. Financial analysis
  - c. Assets analysis
  - d. Value drivers analysis
  - e. Preliminary valuation based on value-drivers
3. Financial planning
4. Valuation
  - a. Method selection
  - b. Methods application

We provide information on the steps in next paragraphs.

### ***3.3.3.1 Data collection***

Data collection is a fundamental step in the entire valuation process. When the subsequent steps of valuation are to be done in proper detail and validity, data collection covers many topics connected with the valuation target.

#### **Basic company information**

Basic company information stretches from the legal entity establishment to equity ownership, it covers history of the company as well as current management and board members.

#### **Economic data**

Economic data are based on balance sheet, income statement and cash flow statement. Additionally, annual reports, auditing reports and corporate plans can be used.

### **Market and competition data**

Market and competition data need to be also collected in order to provide information on relevant competitive forces, product substitutes, market entry barriers, market drivers, segmentation, market share and many others.

### **Suppliers, customers and supply chain**

Information concerning suppliers, customers and supply chain are required especially for strategy analysis.

#### ***3.3.3.2 Strategic analysis***

Strategic analysis is a necessary part of the valuation process. The aim of the strategy analysis is to find out whether the valued company is able to generate profits and added value in the future.

The strategy analysis links results of external and internal environment analysis together and tries to come up this answers to following questions (Mařík, 2007):

1. Is the existence of company sustainable in the long-term? What are the possible scenarios?
2. How will the market situation evolve? How will it influence future of company?
3. What threads and risk can influence the future of company?

The strategic analysis is divided into three main steps:

1. Analysis and prognosis of target market
2. Analysis of competition and company's influence
3. Revenues prediction based on previous steps

Although many well-known strategy tools (SWOT, PEST, PESTEL, Porter's Five Competitive forces, SPACE, Balanced scorecard, ...) might help to analyse internal and external aspects of the company, a holistic approach accounting for all available information is recommended.

### **3.3.3.3 *Financial analysis***

Financial analysis is a tool which serves to evaluate company from financial point of view. Although the strategy analysis predicts long-term profitability, financial analysis might reveal a financial distress forcing the company cease to exist.

Financial analysis may have many components. While some of them are necessary, other provide additional information of more detailed or more holistic character.

A basic approach to analyse company is to investigate financial statements. These include much information and can serve as a great source of details. Some of the techniques to analyse balance and income statement are vertical and horizontal analysis. Horizontal analysis studies the yearly change within the same item of statement. Vertical analysis examines the proportions of subordinated items within aggregate ones.

However, it is hard to arrive to a single conclusion after scrutinizing so much information, therefore we use more sophisticated techniques to analyse company. Further paragraphs are devoted to financial ratios and other tools of analysis.

#### **Ratio analysis**

We generally distinguish between five main ratio groups:

1. Liquidity ratios
2. Profitability ratios
3. Efficiency ratios
4. Leverage ratios
5. Market ratios

Market ratios are available only for companies listed in stock markets. We calculate indicators such as Price/Earnings ratio, Retention ratio, Market-to-book ratio and Pay-out ratio. Since the case study in practical part of the thesis does not include a listed company, we do not deal with market ratios in greater detail.

As opposed to market ratios, liquidity ratios are applied in the practical part so we describe them properly. Liquidity indicators measure in what extent company is able to transform its liquid assets into cash for the purpose of paying its short-term liabilities. We distinguish between 3 liquidity indicators (Brealey, 2011).

$$\text{Current ratio} = \frac{\text{current assets}}{\text{current liabilities}}$$

$$\text{Quick ratio} = \frac{\text{cash} + \text{marketable securities} + \text{receivables}}{\text{current liabilities}}$$

$$\text{Cash ratio} = \frac{\text{cash} + \text{marketable securities}}{\text{current liabilities}}$$

The three ratios differ in the “austerity” which determines what is considered as a liquid asset and what not. Consequently, current ratio provides much looser definition of liquidity compared to cash ratio. Current ratio provides information on what part of current liabilities company is able to settle if converting all items of current assets into cash. Some parts of current assets, especially inventories, are less transformable into cash though. Thus, cash ratio indicates what part of current liabilities the company is able to settle within extremely short period of time using just easily transformable current assets. Naturally, we expect lower ratio outcome for cash ratio than for current ratio. The scores of liquidity ratios are influenced by industry of company analysed. Thus, it is appropriate to compare values obtained from company analysis with industry peers or industry averages if possible.

Another important group of ratios deals with profitability. They analyse the ultimate goal of all companies – ability to create profits. We can define many return ratios but it is sufficient if we deal with ROA, ROE and ROS:

$$ROA = \text{Return on assets} = \frac{EBIT}{\text{total assets}}$$

$$ROE = \text{Return on equity} = \frac{\text{net income}}{\text{equity}}$$

$$ROS = \text{Return on sales} = \frac{\text{net income}}{\text{sales}}$$

While ROA analyses returns on claims of shareholders as well as of lenders, ROE concentrates only on returns for owners. ROE is considered as foremost profitability indicator that companies should monitor. ROS is also called net profit margin. Obviously, companies strive for increasing profitability ratios. Correspondingly to liquidity ratios, it is recommended to compare outcomes of return ratios with industry average or benchmark companies.

Leverage ratios provide information on debt used by analysed company. It reflects solvency and trustworthiness of the company. Debt ratio is the most straightforward indicator but it delivers important facts on indebtedness. Times-interest-earned ratio (TIE ratio) illustrates whether the company is able to cover its interest expenses from EBIT. In the same vein, cash flow coverage ratio uses the similar logic but delivers more informative outcome (Brealey, 2011). That is why we use it in practical analysis.

$$\text{Debt ratio} = \frac{\text{total liabilities}}{\text{total assets}}$$

$$\text{TIE ratio} = \frac{EBIT}{\text{interest expenses}}$$

$$\text{Cash flow coverage ratio} = \frac{\text{EBIT} + \text{depreciation}}{\text{interest expenses}}$$

Efficiency ratios seek factors that contribute to current profitability/losses and evaluate company's performance. It can inform management about possible efficiency improvements.

$$\text{Asset turnover} = \frac{\text{sales}}{\text{total assets}}$$

Assets turnover illustrates to what extent company uses its assets in order to generate revenues. Also, the ratio says how many dollars company generates from one dollar in assets.

$$\text{Inventory turnover} = \frac{\text{cost of goods sold}}{\text{inventory at start of year}}$$

$$\text{Average days in inventory} = \frac{\text{inventory at start of year}}{\text{daily cost of goods sold}}$$

Inventory turnover informs whether company does not tie up too much capital in inventories. Average days in inventory ratio expresses how many days of production output is tied up in inventory.

$$\text{Receivables turnover} = \frac{\text{sales}}{\text{receivables at start of year}}$$



$$\text{Average collection period} = \frac{\text{receivable at start of year}}{\text{average daily sales}}$$

Companies want to have their receivables turnover high because it means that sales turn into cash quickly. This is also explained by average collection period ratio which indicates how long the average time interval between purchase and payment is.

There are much more indicators within 5 covered ratio groups but it is not necessary to mention them. Moreover, skilful analysts can create their own ratios if they find proper interpretation of results obtained.

### **Other tools of financial analysis**

There are many other methods which analyse the performance of the company from various points of view.

First group of them is called aggregate indicators. These indicators strive for delivering verdict on overall financial performance within one result. We sort Altman model, Zmijewski model, Taffler model, Fulmer model, Springgate model and many others among aggregate indicators. Another aggregate indicator is Economic Value Added (EVA) which explicitly highlights whether a company creates value for its shareholders or not.

Last group is constituted by inter-related sets indicators. For example, Du Pont breakdown analysis is one of the representatives.

#### **3.3.3.4 Asset analysis**

In this step we strive to divide assets into two groups – operating assets and redundant assets. Operating assets are those that company needs for its core operations. Redundant assets are those remaining ones. They consist mainly of:

1. Short-term financial assets
2. Long-term financial assets

### 3. Miscellaneous assets

Obviously, company keeps certain level of cash in order to cover expenses on operations, e.g. debt instalments and investment funding (Mařík, 2007). However, keeping unnecessary cash and marketable securities means inefficient capital allocation. As every industry poses a different cash reserve requirements, we can use industry standards or benchmarking to compare reserves of cash among companies. To do so, we relate cash to another relevant characteristic such as sales, short-term debt or other (Mařík, 2007) (Koller, 2005). Due to the comparison, we find out what the ideal amount of cash held is.

In terms of long-term financial assets, we need to distinguish whether their function is related to the core business or not. We consider long-term financial assets which are not related to the core business as redundant assets.

After dividing the assets into groups of operating and redundant, we should also adjust the income statement. For the purposes of valuation, we should cope solely with incomes and expenses directly related to the operating assets.

#### ***3.3.3.5 Value drivers analysis***

Value drivers are basic corporate characteristics which determine value of company if put into relation (Mařík, 2007). Among value drivers we sort:

- Revenue
- Revenue growth
- Operating margin
- Investment into operating working capital
- Investment into operating property, plant and equipment
- Discount rate
- Capital structure
- Expected life-cycle of company

All these value drivers combined determine the value of company. This is the reason why we predict them based on analysis of the past. We can use outcomes of financial analysis but deeper investigation is necessary. We try to underpin the influences and determinants of each of the drivers, predict the determinants and, consequently, estimate the value drivers. Afterwards, value drivers serve as a basis for financial planning.

### ***3.3.3.6 Financial planning***

Financial planning is a crucial part of discounted cash flow valuation. The financial plan consists of:

- Income statement
- Balance sheet
- Cash flow statement

Financial planning is supposed to be a common activity of financial management of company. It is interrelated with planning of sales, production, capital expenditures, etc.

The main steps of financial planning are (Mařík, 2007):

- Revenue prognosis
- Operating margin prognosis
- Working capital prognosis
- Capital expenditure prognosis

The steps mentioned stem from the analysis of drivers of value. To complete the financial plan, we need to:

- Plan capital structure of the company
- Plan missing items of financial plans based on the relation to value drivers
- Plan dividend policy
- Plan operations related to redundant assets and non-operating incomes and expenses

A complete financial plan is basis for free cash flow estimation. Then, the valuation itself can follow.

### **3.4 Asset-based valuation**

Asset-based valuation does not consider value of a company as function of future cash flows on the company, as discounted cash flow valuation approach does. Instead, value of company is regarded as collection of assets which have certain value at the time of valuation. In other words, asset-based valuation concentrates on current assets of company and strives to estimate value of each of them separately. Then, after adding values of individual assets, we obtain value of company (Damodaran, 2005).

We divide the asset-based valuation methods into two groups which use different assumptions:

1. Methods in which going-concern assumption holds
2. Methods in which going-concern assumption does not hold

Liquidation valuation is representative of the second group of methods. This valuation model determines the value of company upon presumption that its assets are being sold now (Damodaran, 2005). For this reason, liquidation valuation is appropriate principally when valuing a company which is about to cease to exist very soon.

There are numerous asset-based valuation approaches where going-concern assumption holds. Some of them are listed below (Mařík, 2007).

- Valuation based on historical prices
- Valuation based on current purchase prices
- Valuation based on cost savings
- Valuation based on market prices

While some of the approaches are more common than others, we will focus on a method which represents historical prices approach as well as market prices approach.

### **3.4.1 Net assets value**

According to some analysts, the net assets method is a reasonable proxy for true value of a company (Damodaran, 2005). However, majority of analysts use the method as addition to DCF or relative valuation in order to deliver a rigorous valuation outcome.

Net assets value determines the business value using accounting statements, namely balance sheet. The calculation is following:

$$\text{Net assets value} = \text{Total assets} - \text{Total liabilities (excluding equity)}$$

Besides using accounting statements as source of valuation data, the calculation may rely on current value of total assets and total liabilities at market value. Hence, we obtain market value of net assets value (Kumah, 2009).

## **3.5 Relative valuation**

This thesis deals with three big groups of valuation techniques. Two of them are described in previous chapters of methodology, the last valuation technique is relative business valuation.

In relative valuation, value of asset is derived from price of similar assets in the market. Literally, we estimate value of an asset by observing how much the market is willing to pay for similar assets. While DCF valuation seeks for intrinsic value of an asset, relative valuation does not attempt to do so. It relies on market efficiency (Damodaran, 2005).

If market is effective and we apply methodology accordingly, DCF valuation and relative valuation deliver the same valuation outcome.

### 3.5.1 Steps of relative valuation

Mařík proposes detailed procedure of relative valuation (Mařík, 2007):

1. National economy analysis with focus on growth rate, inflation, interest rate, ...
2. Industry sector analysis – current issues, industry growth, prospects, ...
3. Strategic analysis of company valued
4. Financial analysis of company valued
5. Search for comparable companies
6. Detailed analysis of comparable companies
7. Selection of suitable multipliers
8. Valuation using multiple methods
9. Determination of price from relative valuation outcomes

Unlike Mařík, Damodaran identifies just a three-step procedure that is essential to correct relative valuation (Damodaran, 2005).

1. Find comparable assets which are priced by the market.
2. Relate the market prices to a variable that is common in order to create standardized and comparable prices (this step is necessary primarily when comparing assets different in size or units).
3. Adjust for differences between assets after comparing their standardized values.

The challenge is always to find comparable companies. We must accept the fact that companies should, but never will be, identical in terms of expected cash flow, risk and growth. Therefore, we should focus mainly on following characteristics:

- Industry
- Products produced
- Firms size
- Legal establishment
- Financing of company
- Technologies used and know-how

- Suppliers and customers relations
- Performance and future prospects

Owing to many characteristics that need be taken into consideration, we might want to opt for controlling of differences in characteristics via adjusting. Generally, there are three approaches for adjusting for differences (Damodaran, 2005):

- Subjective adjustments
- Modified multiples
- Statistical techniques

Subjective adjustments stem from analyst's judgements and might be very handful but biased though. Modified multiples serve to capture the analysed situation from additional point of view and provide more holistic multiple. For instance, PEG multiple reflects 3 characteristics (price of share, earnings per share, growth rate) upon which the comparison is made and value determined. The third point in the list, statistical techniques, uses mainly regressions of industry sector or whole market in order to find out whether characteristics included in selected multiples have sufficiently strong relationship.

### **3.5.2 Multiples**

As mentioned above, we use multiples in relative valuation to assign value to a company. A multiple is a ratio putting in context value of company with a chosen characteristic.

$$\text{Multiple} = \frac{\text{value of company}}{\text{chosen characteristic}}$$

The chosen characteristics may have either relation to cash flow (net income, EBIT, EBITDA, revenues, P/E ratio, ...) or to assets (equity, total assets, capital invested, ...).

Besides, we can use some industry-specific characteristics such as number of rooms for motels, number of faithful readers for newsletter publishing, and many more (Mařík, 2007).

For instance, when trying to determine value of company A using EBITDA multiple, and company B as a quoted comparable entity, the multiple equation looks as following.

$$\frac{\text{Value of equity of A (unknown)}}{\text{EBITDA of A (known)}} = \frac{\text{Value of equity of B (known)}}{\text{EBITDA of B (known)}}$$

Some multiples deal with enterprise value in the numerator of the equation while some use value of equity.

### **3.5.3 Approaches to relative valuation**

There are 4 approaches to value companies using relative comparison. Unfortunately, not all of them can be applied in all markets of the world with sufficient credibility. Relative valuation is widely used in United States of America. US stock markets comprise of thousands of listed companies and US database of transactions is most sophisticated in the world (Mařík, 2007).

The four main approaches to relative valuation are to be found below.

- 1) Similar public company method
- 2) Similar IPO method
- 3) Recent acquisition method
- 4) Industry multiples

Details about all of them are also provided.



### ***3.5.3.1 Similar public company method***

This method compares company being valued to comparable companies that are quoted in stock markets.

### ***3.5.3.2 Similar IPO method***

Since IPO is a very specific phase of company life cycle, we can use IPO of comparable situation to find out value of a company that is currently/soon-to-be undertaking IPO.

### ***3.5.3.3 Recent acquisition method***

The logic behind recent acquisition method is similar to IPO method besides the fact that we use a multiple with numerator containing value in real terms, i.e. price that was really paid at the transaction.

### ***3.5.3.4 Industry multiples***

The main difference between previous approaches and industry multiples is that averages calculated from many companies are used in this case. Industry multiples can efficiently work only under condition of large database. Industry-specific multiples are often used in this approach.

## **4. Literature review**

The aim of literature review chapter is to inform reader about previous findings on topics related to diploma thesis title.

The chapter consists of three main parts. Firstly, valuation methods appropriateness is discussed. No method performs perfectly for all valuation cases and it is advisable to be aware of right application before use.

Second part of literature review reveals pros and cons of valuation methods. The last part mentions conclusions of several studies focused on comparison of outcomes of various valuation methods.

### **4.1 Valuation methods appropriateness**

There are many valuation approaches and methods we can use to determine value of a company. However, we cannot apply all methods to all valuation cases. We need to distinguish what valuation method “fits” to a company valued in given situation in order to deliver precise and rigorous valuation outcome with sufficient level of credibility.

This chapter titled “Valuation methods appropriateness” covers all valuation approaches mentioned in methodology and proposes the right use of methods based on academic literature.

#### **4.1.1 Discounted cash flow methods**

When using DCF methods, we assume the company will operate in the future. This is the underlying premise of using the approach. If we do not expect company to operate, we should turn to asset-based methods.

We mentioned couple of methods within the discounted cash flow approach. Koller provides overview of methods and assesses them according to situation where they perform best (Koller, 2005).

First of all, the enterprise discounted cash flow method works best for valuation of business units, projects and companies targeting their capital structure. Moreover, this method is especially useful for valuing multi-business corporations.

The second described method, equity cash flow, is suitable primarily for financial institutions.

Adjusted present value approach performs excellent for companies with changing capital structure. This should be also the method of choice when company plans to gain capital in the future.

Lastly, excess return models are generally applicable in situations where enterprise discounted cash flow methods works.

#### **4.1.2 Asset-based methods**

Obviously, such approach is not suitable for all companies. High-growth companies with few assets are undervalued when using asset-based valuation (Damodaran, 2005). The reason is that their assets will grow in the future, which is not the characteristic that asset-based methods can capture. Conversely, this valuation performs well when valuing companies with mostly fixed assets, no potential for excess returns and no growth. In such case, Damodaran admits asset-based methods deliver true value of company.

Also, asset-based methods are widely used for companies at the edge of company's life cycle. These companies do not expect future cash flows so the value is reflected mostly in the current value of its assets. Particularly, this is the case when determining value of bankrupted companies for the purposes of debt arrangements.

#### **4.1.3 Relative valuation methods**

The main characteristic of relative valuation is that it tightly connects the object of valuation to market. Owing to this, this method should be applied when valuing companies present in corporate markets with high level of development. Such markets are for example in USA and UK (Mařík, 2007).

There are no limitations in use of relative valuation when it comes to industry or capital structure. The analyst can always adjust for differences. Moreover, when comprehensive data is available, analyst can employ industry-specific multiples to get a broader perspective for valuation.

When applying multiples, Mařík advises to bear in mind information asymmetry and certain peculiarities of markets with companies (Mařík, 2007):

- Not all cases of comparable acquisitions can be known to analyst so conclusions are distorted.
- Lack of information concerning what the actual deal consisted of. For instance, analyst knows the price but is not aware of undisclosed deal details which might have had largely influence the price paid.

## **4.2 Pros and cons of valuation methods**

So far, we review the appropriateness of application of different valuation methods. Nevertheless, analyst should be always aware of positives and negatives of methods he uses. This part mentions the main pros and cons of methods used in the thesis.

### **4.2.1 Discounted cash flow methods**

Discounted cash flow valuation is used for 75% of all investment decisions (Brealey, 2011). According to such a high share, it is obvious that the method has many positives. Nevertheless, there are also negatives connected to the use of DCF valuation.

The greatest advantage of discounted cash flow valuation is that it reflects time value of money, risks and expected future of the company (Brealey, 2011). When applying DCF valuation, it requires thinking in long term and projecting the future development. Besides determining cash flows for the purposes of valuation, such insight into future may change directions that management undertakes.

DCF allows for incorporation of case-specific characteristics. For instance, forecasted cash flows can be flexibly adjusted if performance is expected to impair within certain period of time.

Nevertheless, discounted cash flow methods are often criticized for unreliable predictions of expected revenue growth, improved cost savings (both indicators influence the cash flow) and discount rate (Damodaran, 2005).

Laughton finds the main weakness of DCF methods in the rigidity of cash flow predictions. The “given state” of future cash flows based on currently available information does not allow managers to capture future flexibility which can create value. Secondly, he criticizes the use of single discount rate as it does not properly reflect the riskiness of various situations that may arise in the future. Therefore, Laughton proposes decision tree analysis to overcome the limitations of static, single rate discounted cash flow valuation (Laughton, 2008).

#### **4.2.2 Asset-based methods**

Some academics argue that business valuation outcomes of asset-based valuation deliver more reliable outcomes than dynamic methods based on disputable assumptions about the future such as DCF valuation (Damodaran, 2005).

Asset-based methods utilize first-hand data of the company valued so the procedure is intuitive and fairly easy. We can reflect specific characteristics of company in the valuation, which can be also considered as advantage (Kumah, 2009).

Besides positives of asset-based method mentioned, we can find negatives of the approach. The first is related to those methods within asset-based approach which rely solely on accounting information. Even though accounting regulations are more and more harmonized among countries (e.g. International financial reporting standards), accounting data can be easily manipulated and does not necessarily reflect the actual performance of the company. Hence, asset-based valuation delivers faulty image of the company in case of manipulating accounting statements. Fortunately, not all the methods within asset-based approach use values purely from the statements (Kumah, 2009).

### **4.2.3 Relative valuation methods**

Relative valuation offers many positives for practical use. These methods overcome many weaknesses of discounted cash flow methods. In particular, the strong bond to actual market prices truly rationalizes the determined value of company. Thus, the value can be seen as more objective.

Moreover, the application is somewhat easier and requires rather experience than expertise and deep knowledge of the topic compared to discounted cash flow valuation (Mařík, 2007).

A serious disadvantage of relative valuation is that it does not consider individual company characteristics. For example, if a company is expected to grow more than comparable companies, most multiples does not capture this fact in valuation and the company valued will consequently end up undervalued (Kumah, 2009).

Next, judgements of analyst are subjective when it comes to adjustments of data input as well as multiples selection (Mařík, 2007).

The fact that relative valuation relies on accounting data can be also considered as one of the drawbacks of multiples. Although this is case of all mentioned valuation techniques, relative valuation can overcome this via using several multiples combining several accounting characteristics.

Another disadvantage of relative valuation stems from limited applicability due to insufficiently developed stock markets, which is described in greater detail in chapter “Valuation methods appropriateness”.

## **4.3 Comparison of outcomes of valuation methods**

This part of literature review gives examples of academic findings on comparison of valuation methods outcomes. While some authors reach rather similar outcomes of various valuation methods, others find large discrepancies of outcomes.

Berkman investigates 45 after-IPO companies listed in stock exchange of New Zealand. He uses discounted cash flow valuation and P/E multiple and concludes that 70% of

variation in stock price can be explained by the valuation methods. Both methods reach similar accuracy (Berkman, 2000).

We can also sort Kaplan and Ruback among authors who conclude that discounted cash flow valuation and relative valuation yield similar results. They use adjusted present value approach as representative of DCF methods and EBIT and EBITDA multiples and apply selected methods on 51 transaction cases. Their sample proves the methods perform comparably (Kaplan, 1995).

Unlike Berkman, Kaplan and Ruback, other authors reach divergent valuation outcomes when using various methods. Kim and Ritter found that P/E multiple based on forecasted earnings (forward P/E) delivers more accurate outcomes than trailing P/E multiple (Kim, 1999).

No studies comparing results of DCF and asset-based valuations were found as well as no articles dealing with comparison of relative valuation outcomes and asset-based valuation outcomes were found. The reason is simple though. As mention in methodological part, DCF valuation is by used under assumption of going-concern, which is not always the condition of asset-based valuation.

## **5. Analysis**

The practical part of the thesis is strongly connected to the methodological part and literature review. The analysis attempts to prove or disprove the hypothesis defined at the beginning of the paper. The hypothesis states that the outcomes of valuation methods may differ although they should be the same if financial theories hold. In order to find it out, we apply various valuation methods on case study.

As the object of case study, we cope with a luxury sports car producer Aston Martin. The reason for choosing Aston Martin comes from the attractiveness of the brand to the author of the thesis. Moreover, the company is a suitable object of valuation analysis as the car brand has changed its owners several times within last two decades. The company was owned by Ford in years 1987-2007. In 2007, Aston Martin was acquired by Kuwaiti investors. In 2013, a part of Kuwaiti investors' stake was purchased by Italian group Investindustrial. The first part of the analysis deals with history of the car producer, the circumstances of the transaction in 2007 and the development after that year.

This is followed by the second part, in which we determine value of Aston Martin via two fundamentally different valuation approaches. Outcomes are compared afterwards. Also, we compare the obtained results to acquisition price and we discuss the possible factors that might have influenced the deal price in 2007.

The last part of the analysis focuses on ex-post DCF valuation. We strive to disclose whether the price of Aston Martin was a bargain for Kuwaiti investors, or Ford, as a seller, was better off. In this part, financial analysis supports the findings reached.

### **5.1 Company description**

The first section of practical part focuses on company of choice for the analysis. The description of Aston Martin begins with general information on company's history, former successful periods, and present operations.



Later, circumstances of Aston Martin's acquisition in 2007 are outlined. This is a crucial chapter for understanding the deal analysis in following practical sections of the thesis.

The subsequent part illustrates the time period after acquisition of Aston Martin by two Kuwaiti investor groups. The years after 2007 brought about important events for the car manufacturer. Especially, the financial situation significantly deteriorated since then. Eventually, current shareholders of Aston Martin are presented to clarify the ownership structure of the company to date.

### **5.1.1 General information<sup>4</sup>**

Aston Martin is British producer of cars, focused mainly on luxury sports cars. The company was founded on 1913 by Lionel Martin and Robert Bamford as "Bamford & Martin Ltd". Lately, the company gained its current name after Lionel Martin's successful run in Aston Hill.

In 1922, Aston Martin cars first competed in international race, namely in French Grand Prix. Two years later, the engineering excellence and increasing reputation of Aston Martin cars allowed the marque to take part in the well-known Le Mans 24-hr race. Since then, Aston Martin cars regularly have participated in the competition and place among the first ones. As years passed by, Aston Martin was gaining the image of prestige and noble car, which was undoubtedly highlighted in 1964 when Aston Martin model BD5 became the car of James Bond's choice in the film Goldfinger. The relationship between the movie character and car marque remains until today.

Nowadays, company is headquartered in Gaydon, Warwickshire, and serves markets all over the world, selling thousands of luxury cars every year. The legendary marque is a symbol of luxury and quality, as well as it is rated among top coolest brands in United Kingdom<sup>5</sup>.

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<sup>4</sup> Source: Aston Martin – Company history. [Accessed on November 5, 2013.] Available at: <http://www.astonmartin.com/heritage>

<sup>5</sup> According to brand consulting company Coolbrands. Source: Britain's coolest brands barometer. Coolbrands. 2013. [Accessed on November 11, 2013.] Available at: <http://www.coolbrands.uk.com>

The company is privately held and currently led by CEO Dr. Ulrich Bez. The full name of the entity analysed in the thesis is Aston Martin Holdings Limited. Within the history, Aston Martin has changed many owners. The thesis concentrates on transaction from 2007, when American car manufacturer Ford sold the company to consortium of two major Kuwaiti investors. A detailed description of the deal as well as the current shareholder structure is provided in following chapters.

### **5.1.2 Sale of Aston Martin in 2007**

Ford, an American car manufacturer, purchased 75% share in Aston Martin in 1987. Five years later, Ford became the only owner of the luxury car brand when it purchased to remaining 25% share. Since then, Ford transformed Aston Martin from solely hand-crafted sport vehicles to world-wide supplier of exclusive cars. This is strikingly underlined by yearly number of produced cars – in 1992, Aston Martin built only 46 cars, while after transformation Ford was selling thousands cars annually (e.g. 7,000 in 2007 (Guthri, 2007)). Also, the era of Ford ownership is considered as bloom of Aston Martin vehicle's beauty, producing famous models such as DB7, Vanquish or V8 Vantage (Martinez, 2006).

Despite the success of Ford ownership and profitability of Aston Martin, the legendary marque was announced to be for sale in 2006. Ford was struggling with losses and decided to drop Aston Martin from its Premier Automotive Group, which consisted of Jaguar, Land Rover, Volvo and Aston Martin. Ford CEO Bill Ford commented upon the announced sale saying “As part of our ongoing strategic review, we have determined that Aston Martin may be an attractive opportunity to raise capital and generate value” (Martinez, 2006). The deal was expected to generate around \$1 million available cash to Ford. Also, he expressed that Ford should concentrate on its core portfolio products (Rechtin, 2007).

In March 2007, the buyer of Aston Martin was announced. The brand was purchased by a consortium led by former British rally champion Dave Richards and American investment banker John Singers. The consortium consisted of two Kuwaiti co-investors Investment Dar and Adeem Investment, both having long-term plans in owning Aston Martin (Macalister, 2007). At the time of the transaction, Adnan Al-Musallam,

managing director of Investment Dar, said Aston Martin was profitable investment opportunity attractive to his wealthy Gulf-based clients (Guthrie, 2007). The fact that Investment Dar is truly proud of its Aston Martin stake is captured on the website of the fund. “...In 2007, the Investment Dar Company (TID) made one of the most sophisticated deals in the history of Kuwaiti investments, when it led a consortium of local and international investors to purchase the majority shares of Aston Martin from Ford Motor.” describes the website<sup>6</sup>.

The transaction was finished in mid-2007 at the height of the economic boom. The deal details were in accord with previous Ford’s expectations and Aston Martin was valued at £479 million, i.e. \$925 million (Guthrie, 2007). While Ford retained a £40 million preferred equity stake in the company, Investment Dar gained 51% share in the company, which was financed by several international banks upon agreement of sharia-compliant loan of £204 million (Inman, 2009).

The future outlooks of Aston Martin were more than positive. Around 200 jobs were created, new models were about to be launched and further sales increase was expected mainly in Russia and Asia (Macalister, 2007).

### **5.1.3 Aston Martin after acquisition**

The year after acquisition of Aston Martin, the business was growing according to expectations. As new investor planned, sales increased mainly in emerging market such as China, Russia and South America, where the proportion of wealthy social class gains its share year by year (Leggett, 2012).

Nevertheless, like other car producers, the worldwide economic recession in 2008 caused severe decrease of sales in United Kingdom and North America, meaning a 35.21% slump of revenues of 2009. Naturally, this affected the net income, losing even 39%. Moreover, the company struggled with temporary closures and had to cut 600 jobs at Graydon factory, which represented one third of its employees (Inman, 2009).

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<sup>6</sup> Source: Group companies – Automotive. Investment Dar. [Accessed on November 10, 2013.] Available at: [http://www.inv-dar.com/En\\_Automobile.cms?ActiveID=1211](http://www.inv-dar.com/En_Automobile.cms?ActiveID=1211)

In 2010, the situation turned positive again. Revenues of Aston Martin increased by 36.32%, totalled £474 million. The increase was accompanied by 46% jump in operating profit and nearly doubled net profit compared to previous period. The growth was again led mainly by emerging markets. The board was so positive about the future that certain sources speculated that Aston Martin might go public within 3 years (Wright, 2011). Although the IPO plan never came into reality and the net assets value was £333 million, former chairman David Richards valued Aston Martin at £1 billion (Wright, 2011).

The year 2011, revenues were slightly growing but the overall financial situation was deteriorating. The liquidity was decreasing and the solvency was threatened. Therefore, company started to seek ways of raising capital.

Despite launches of new Vanquish and Vanquish Volante, the 2012 annual report indicated alarming net income loss of £24.6 million. The reason comes from shrinking sales. Whereas in successful year 2007 Aston Martin managed to sell 110,000 units worldwide, the 2012 sales accounted only for 67,500 units (Knapman, 2013). According to the company's board, the market segment that Aston Martin operates in was severely hit by the economic crisis (Turkus, 2013) and European car markets indicated weakness especially in fourth quarter of 2012 (Knapman, 2013).

Weak performance was also reflected in the fact, that Aston Martin was reviewed by Moody's because of the possibility of downgrading debt rating in 2012. The liquidity was very poor and a financial infusion was more than necessary. Company's debt was already too high, rating it in a "junk" category (Reed, 2012)

Although the cash was needed and the future of the legendary car producer was uncertain, the owner of Aston Martin, Kuwait's companies Investment Dar and Adeem Investment Co., denied two offers for the firm. Reportedly, investor group Investindustrial offered £250 for the whole company and Indian Mahindra and Mahindra offered even higher price.

Although Investment Dar proclaimed long-term interest in holding Aston Martin marque (Leggett, 2012), in December 2012 it decided to sell a 37.5% share to

Investindustrial for £150 million (Kennedy, 2012). This stabilized to liquidity crisis of company.

The centenary year 2013 of Aston Martin brings about positive news and hope for following years. At the beginning of the year, Aston Martin signed a technological partnership with AMG, a Mercedes-Benz engine division. The contract is based on access of Aston Martin to AMG technological and know-how resources. The partnership promises dramatic cost cuts as well as improved car engine performance (Markovič, 2013).

In May 2013, Investindustrial completed the purchase of the share and few months after, a luxurious SUV car branded Lagonda was approved to be launched within 4 years. This should target other than sports car oriented audiences and reach new sources of revenue (Ebhardt, 2013). Another piece of good news for Aston Martin is that Investment Dar got creditor backing to restructure debt. This should free cash flows as well as improve solvency and debt rating (Hall, 2013).

Additionally, new CEO will be appointed until the end of 2013 in order to fulfil an ambitious plan of doubling sales by 2016. Hence, current CEO Ulrich Bez will be replaced after more than twelve year of mandate (Ebhardt, 2013).

#### **5.1.4 Shareholders of Aston Martin**

As previous chapter outlined, the shareholder structure got complicated since Ford sold Aston Martin in 2007. The pie chart below provides overview of current shareholders (as of November 2013).

### Shareholder structure of Aston Martin

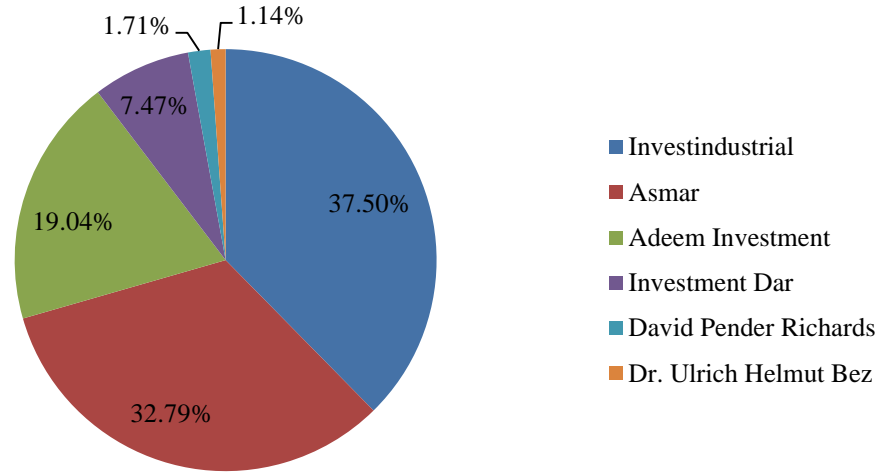


Figure 1: Shareholder structure, source: Duedil.com database tool

Although Investindustrial owns majority share in the company, the controlling majority is represented by mutual cooperation between Invesment Dar and Asmar, which is affiliate of Investment Dar (Hall, a další, 2013).

## 5.2 Evaluation of the deal from 2007 perspective

In this part, we compare business valuation outcomes of relative and asset-based methods. We choose Aston Martin as a target of valuation and the values of the company are calculated to year 2007.

Moreover, we scrutinize the sale of Aston Martin in 2007. To do so, we compare the real deal price that investors paid for Aston Martin with valuation outcomes using data available to external analyst in 2007. This will allow us to acquire additional information not revealed in the news announcements and to evaluate the adequacy of the deal price.

As already mentioned, the amount Ford received for Aston Martin in 2007 was £479 million and Ford retained a £40 million stake in the company. Based on this, we can imply that the real value of the company was £519 million. Two valuation methods

outcomes are compared to this value. Firstly, net asset value method is applied. Secondly, six representatives of relative valuation determine the value.

### 5.2.1 Net asset value

Based on the formula for calculating value of company via net asset value method, we are able to determine the value of Aston Martin as of 2007.

<b>Net asset value of Aston Martin in 2007</b>	
Total asset	738,098,000
Total liabilities	518,413,000
Net asset value	219,685,000

**Table 2: Net asset value in 2007, source: own computation**

As visible in the table, the net asset value method delivers significantly lower valuation outcome compared to the value of Aston Martin in 2007. While the method values Aston Martin at £219,685,000, the value of equity was £479 million in deal price + £40 million in preferred stock. Since market value of debt is not available, book value of debt is used for the calculation of net assets. Therefore, the net asset value is exact same as book value of equity.

Value based on the deal of 2007 is more than 2.3 times higher than the value determined by the asset-based method. Hence, we see that the disparity between these two values is truly striking. There might be several reasons for the disparity. Firstly and most importantly, it is the appropriateness of use of asset-based method for valuation of Aston Martin in 2007. Although some academics consider asset-based methods as most accurate and least disputable approach to valuation of businesses, it does not really reflect many factors which crucially influence the company's value. In case of Aston Martin, the asset-based method neglects factors such as expected future growth of sales, expected growth of cash flows, portfolio investment synergies, etc.

Another important point is that the net asset method does not consider the value of goodwill of Aston Martin brand. Since Aston Martin annually ranks among most valued brands, this might play a key role in valuation.

In further paragraphs, we deal with relative valuation. This might prove or decline the importance of goodwill and other factors in valuation of Aston Martin.

### 5.2.2 Relative valuation

Relative valuation uses multiples to determine value of company. There are four approaches of relative valuation, and in the analysis we use the industry multiples approach.

The industry averages data is obtained from database of Professor Aswath Damodaran. Database of current and historic industry multiples is provided on the website and six multiples are selected to illustrate what values of Aston Martin relative valuation determines for 2007. Industry multipliers are related to Auto & Truck industry and they are based on sample of 31 traded firms and transactions.

Following industry multiples are selected:

1. Enterprise value / EBITDA
2. Enterprise value / EBIT
3. Enterprise value / EBIT \* (1-t)
4. Enterprise value / Revenue
5. Price / Current EPS
6. Enterprise value / Book value

In the table below, we see very diverse enterprise values given by various industry multiples.

Multiples	Industry average 2007	Aston Martin variable	Enterprise value
EBITDA	10.05	29,936,000	300,856,800
EBIT	21.49	19,445,000	417,873,050
EBIT*(1-t)	29.97	13,611,500	407,936,655
revenue	1.1	332,766,000	366,042,600
P/E	22.34	4,747,000	106,047,980
book value	1.56	219,685,000	342,708,600

Table 3: Multiple valuation, source: own computation



The discussion upon multiples and valuation outcomes is to be found in following text.

#### ***5.2.2.1 EBITDA multiple***

EBITDA multiple is the one of the most common ones when it comes to use of relative valuation. According to Damodaran, the industry average for automotive industry in 2007 is 10.05. This means that in 2007 companies in automotive industry were valued on average at amount ten times greater than their EBITDA of the year. As to Aston Martin, the calculated EBITDA in 2007 is £29,936,000 and, according to the EBITDA multiple, the enterprise value is slightly over £300 million. Compared to the real value of Aston Martin, the valuation outcome stands only for 58% of the actual value of Aston Martin in 2007.

#### ***5.2.2.2 EBIT and tax-adjusted EBIT multiples***

Next, we used EBIT and tax-adjusted EBIT multiples to value Aston Martin. The difference between EBIT and EBITDA is that EBITDA does not reflect amortization and depreciation expenses (which are non-cash expenses). Therefore, EBITDA is better proxy for real cash flow, while EBIT might be largely influenced by depreciation and amortization strategy of firm.

Both EBIT and tax-adjusted EBIT deliver similar outcomes, valuing Aston Martin at £417 million and £407 million respectively. As well as EBITDA, the valuation outcome is lower than the value of the company determined by the real deal. Surprisingly, less common EBIT and tax-adjusted EBIT multiples deliver closer outcome to real value than widely-used EBITDA multiple which is said to capture value-creation of companies in better way. The reason might stem from depreciation and amortisation peculiarities in Aston Martin compared to automotive companies in 2007.

#### ***5.2.2.3 Revenue multiple***

Revenue multiple is often used in industries where extensive production processes can be relatively easily restructured via methods of lean management. Thus, the real value

lies in the ability to generate revenues and satisfy needs of customers. Internal processes in the company are not reflected in valuation because they can be ameliorated. Besides this, we employ revenue multiple when we want to avoid possible accounting tricks (Kumah, 2009).

The revenue multiple for automotive industry was 1.1 in 2007. After multiplying the multiple with revenues of Aston Martin, we obtain £366 million valuation of the car producer. The value takes into account selling ability of Aston Martin but neglects important aspects such as financial strength, profitability and value creation.

#### ***5.2.2.4 P/E multiple***

Price to Earnings multiple is another widely-used representative of relative valuation. It draws the attention of valuation practitioners because it reflects actual market values and does not rely too heavily on economic fundamentals (Kumah, 2009). P/E ratio is sometimes called “Price multiple” and exists in several versions:

- Price/Current EPS
- Price/Trailing EPS
- Price/Forward EPS
- Aggregate Market Capitalization / Aggregate Net Income
- PEG modification

Based on available data, we value Aston Martin using the first version with net income in the denominator. The industry average of Price/Current EPS multiple was 22.34 in 2007. Aston Martin generated only £4.7 million of net income in 2007 so the value determined is £106 million.

This confirms the statement that revenue multiple neglects important factors such as profitability. While revenue multiple values Aston Martin at £366 million, price multiple designates only 30% such value for Aston Martin. This is consequence of profit characteristics that are inherently included in the P/E multiple.

Despite the low net income, Aston Martin was traded at roughly 5 times higher price than P/E multiple determined. This reveals the indisputable value of Aston Martin brand which is highly valued although the car producer does not perform well from the financial point of view.

#### ***5.2.2.5 Book value multiple***

Book value industry multiple illustrates how much more investors paid for companies compared to the book value. In 2007, the multiple was 1.56 in automotive industry. Since the book value of Aston Martin was £219.6 million, the enterprise value is determined at £342.7 million.

Book value multiple is another form of relative valuation that delivers significantly lower valuation outcome than the value of Aston Martin was in 2007. This finding goes hand in hand with the outlined importance of brand value.

#### ***5.2.2.6 Summary of relative valuation results***

To conduct relative valuation of Aston Martin in 2007, we used six different multiples. The usage of several multiples improves the valuation outcome because it brings about broader overview of the object analysed. It touches upon number of performance characteristics of different context.

A summary and discussion upon delivered results is provided. The spread of relative valuation outcomes ranges from £106 million (P/E multiple) to £417 million (EBIT multiple). Seemingly, the disparity of results is truly large. The highest value estimate delivered by EBIT multiple is also the closest one to the actual Aston Martin value, which was £519 million in 2007. Nevertheless, the difference between the closest valuation outcome and real value in 2007 is still very high.

Such “inaccurateness” of relative valuation may have many reasons. One of them can be attributed to using a single-year multiple values. Prevalently, relative valuation outcomes of more time periods are taken into consideration in order to avoid extreme and exceptional fluctuations. This can happen especially in case of multiples associating enterprise value with any kind of cash flow. On the contrary, book value multiple is less

prone to yearly fluctuations. All in all, the analysed year might include certain performance fluctuation compared to previous years which distorts our analysis.

Further reasons of valuation mismatch are described in following chapter.

### **5.2.3 Summary of evaluation**

In this chapter, we strive for comparison of Aston Martin valuation outcomes. Firstly, net asset method is applied and the valuation outcome is £219 million. Secondly, six multiples valued Aston Martin at various amounts, stretching from £106 million to £417 million.

The differences in valuation outcomes are caused by different logic that methods employ to determine the value. This applies particularly for disparities among outcomes of asset-based method and multiples. Furthermore, the assumptions and inputs of used methods influence the designated valuation outcomes. For instance, revenue multiple neglects current financial situation, net asset value method ignores expected future growth and EBITDA, EBIT and tax-adjusted EBIT multiples do not account for indebtedness.

The next aim of the chapter is evaluation of the deal from 2007 perspective. All valuation methods applied delivered outcomes significantly lower than the value of Aston Martin was in 2007. We can draw number of conclusions.

First of all, Aston Martin was traded at premium price compared to industry average. This is obvious from relative valuation outcomes when comparing with industry averages. The causes lie mainly in the value of goodwill. In case of prestigious car producer Aston Martin, the brand value constitutes a major part of the whole value of the company. Therefore, the value of Aston Martin is perceived even though the firm performs financially unwell. This idea is supported by Wright who states that Aston Martin should be traded at premium price (Wright, 2011).

Secondly, the real price in 2007 reflects factors that are unknown to external analyst. For example, expected portfolio synergies from purchase of Aston Martin for Investment Dar and Adeem Investment could have been reflected in the price. Kuwaiti funds could have been willing to pay a premium price for Aston Martin because a

“traffic-builder effect” might have been expected, i.e. luxurious Aston Martin brand in their portfolio would have attracted more investments to the funds. Thus, the price is determined based on subjective circumstances while valuation outcomes provided attempt to be as much objective as possible.

Lastly, the value determined by any valuation method rarely becomes the actual deal price. In other words, parties involved in a deal always negotiate and the final price is, besides valuation outcome, determined by negotiation strategies and negotiation power.

### **5.3 Evaluation of purchase of Aston Martin in 2007**

This chapter is devoted to ex-post evaluation of the acquisition of Aston Martin in 2007. It aims at finding out whether the purchase of Aston Martin in 2007 was a good deal for Kuwaiti investors or it was wise decision of Ford to sell Aston Martin.

In order to come to conclusion, ex-post discounted cash flow valuation is performed and the obtained value is compared with Aston Martin’s value as of 2007.

Based on the chapter describing after-deal circumstances, we know that the financial performance of Aston Martin was deteriorating after 2007. To depict the financial situation, financial statements of the car producer are analysed in the first part of this chapter. Second part of the chapter deals with the DCF valuation. All details and inputs to the valuation are explained. Eventually, the chapter is concluded with discussion over the results.

#### **5.3.1 Financial analysis of Aston Martin**

Before we apply ex-post DCF valuation, we execute basic financial analysis to illustrate the worsening financial performance of Aston Martin through 2007-2012. It provides us with insights on financial situation which is priceless for that understanding and interpreting the outcomes of ex-post DCF valuation.

The financial analysis deals with four indicator groups and results overview is provided in the end.

### 5.3.1.1 Liquidity ratios

We observe three ratios within the group of liquidity ratios – current ratio, quick ratio and cash ratio. As mentioned in the methodological part of the thesis, the ratios differ in numerator. Values of all liquidity ratios are to be found in following graph.

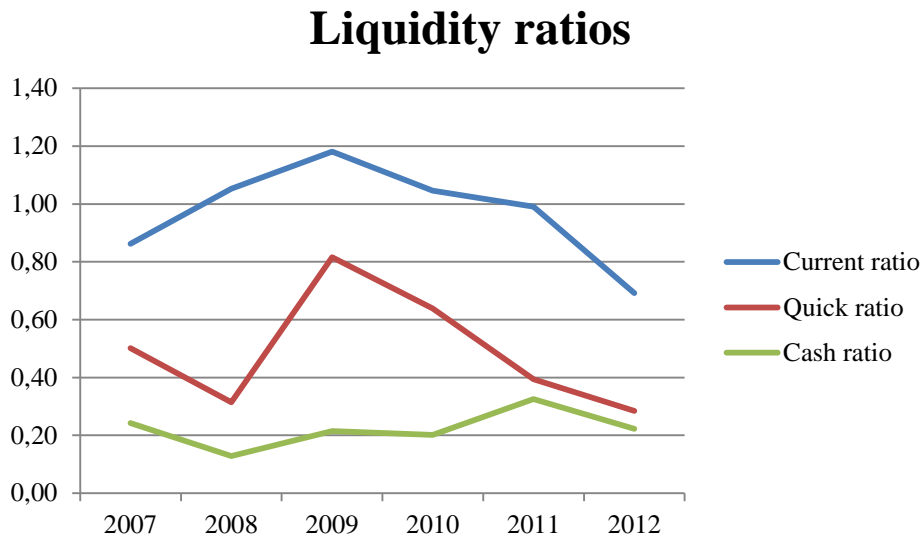


Figure 2: Liquidity ratios, source: own computation

The figure above shows that Aston Martin was generally most stable in terms of liquidity in year 2009. This can be understood as a consequence of financial crisis that broke up in 2008. The economic slump hit customers and this affected Aston Martin by increased receivables. This is obvious in current and quick ratios, whereas cash ratio rises moderately as it does not contain receivables in the numerator.

Despite the high current ratio in 2009, Aston Martin retains liquidity ratios low though the whole observed period of time. This definitely contributes to higher efficiency because the company does not tie capital resources in unnecessary current assets. On the other hand, we consider Aston Martin operations to be more risky when keeping liquidity ratios low.

In 2012, the liquidity ratios of Aston Martin fell heavily in comparison with previous years. This is a symptom of weakening financial situation. While current assets grew just slightly, current liabilities increased by 60%. The growth is significant particularly

in overdraft account which is one of the most expensive sources of debt capital. When working capital is properly managed in a company, overdraft is used only in situations of unexpected capital needs.

### 5.3.1.2 Profitability ratios

Profitability ratios examine profit creation of companies. We deal with three profitability ratios. Essential ROA and ROE ratios are accompanied by net profit margin (ROS).

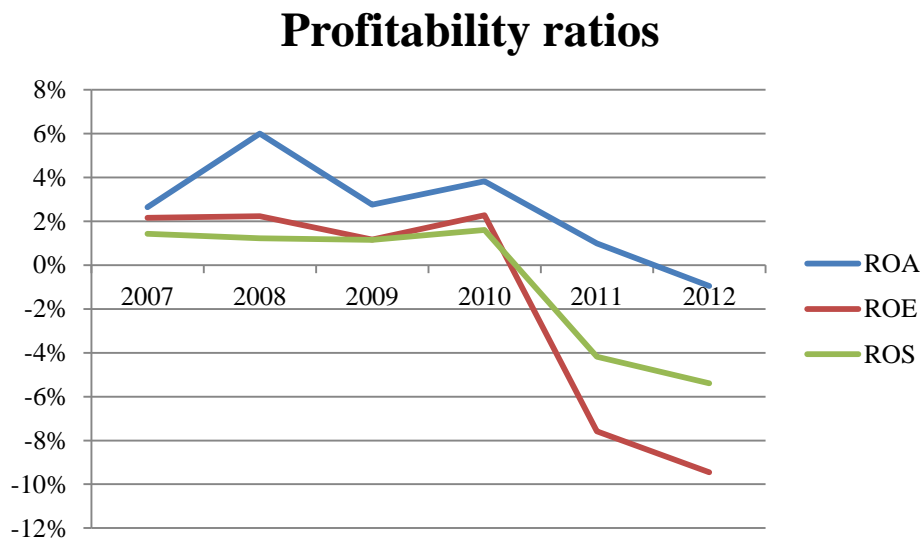


Figure 3: Profitability ratios, source: own computation

Profitability ratios fluctuate within the observed time period and all three indicators move along almost the same direction. In years 2007 and 2008, Aston Martin shows best overall profitability. A drop in 2009 was caused by revenue decline, which was reflected in decrease of EBIT as well as net income. Additionally, both assets and equity grew in 2009 which contributed to growing denominators of ROA and ROE.

Although the situation in 2010 slightly improved, Aston Martin's management cannot be satisfied with profit creation in years 2011 and 2012. In 2011, the company generated positive operating income but due to large interest payment, net profit was

negative. The situation became even more critical in 2012 when EBIT was negative. Consequently, pre-tax profit and net income were also negative.

To get broader perspective on profitability, Aston Martin's ROE of the period is compared to automotive industry average obtained from Damodaran's website.

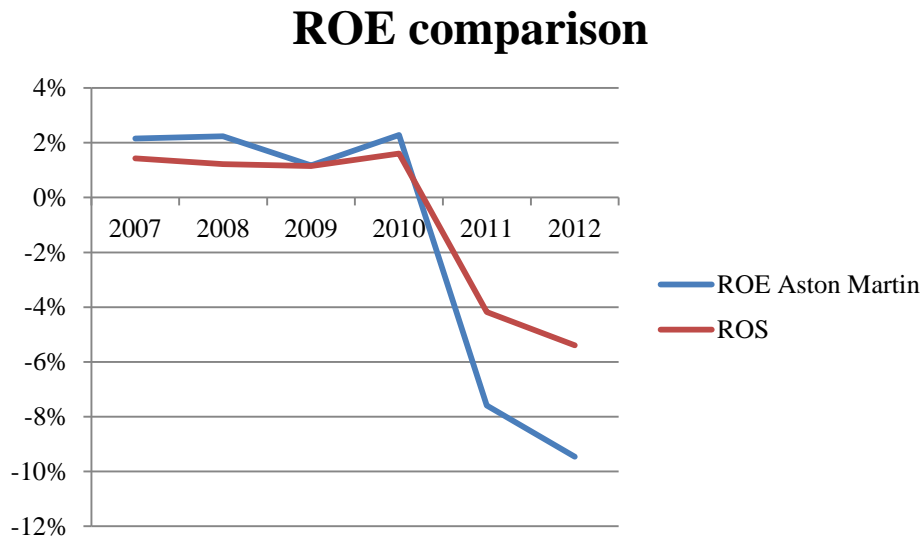


Figure 4: ROE comparison, source: own computation, Damodaran's website

Interestingly, Aston Martin was not the only car producer with negative profitability ratios. Nevertheless, we cannot state that moves of Aston Martin's ROE follow the pattern of industry. Instead, Aston Martin's ROE moves are somewhat lagged compared to other car manufacturers. Whereas industry reaches the bottom when the hit of recession was severe (2009, 2010), Aston Martin encountered serious problems in two subsequent years.

### 5.3.1.3 *Leverage ratios*

We can count many indicators within the group of leverage ratios. A lot of them deliver to the analyst same information but in different format. This is the reason why we choose only two indicators – debt ratio and cash flow coverage ratio. Firstly, cash flow coverage is examined. We use EBITDA as substitution for cash flow.



Leverage ratio	2007	2008	2009	2010	2011	2012
Cash flow coverage ratio	2.31	1.69	2.62	2.49	0.98	1.12

Table 4: Cash flow coverage ratio, source: own computation

Generally, we can say that cash flow coverage is sufficient and company is stable when the ratio reaches value of 3 or more. In order not to get into financial difficulties, the indicator should exceed value of 1.

Apparently, cash flow covers interest expenses in all years except 2011. In the year, Aston Martin paid enormous interest expense reaching more than £41 million which was higher than EBITDA of that year. In 2012, Aston Martin still retained risky position while sustaining high interest expense compared to cash flow. This was definitely one of the reasons for debt restructuring that Aston Martin has undergone on 2013.

Since debt ratio of Aston Martin is really high during the year 2007-2012, we compare leveraging of Aston Martin with industry average retrieved from Damodaran's website.

### Debt ratio comparison

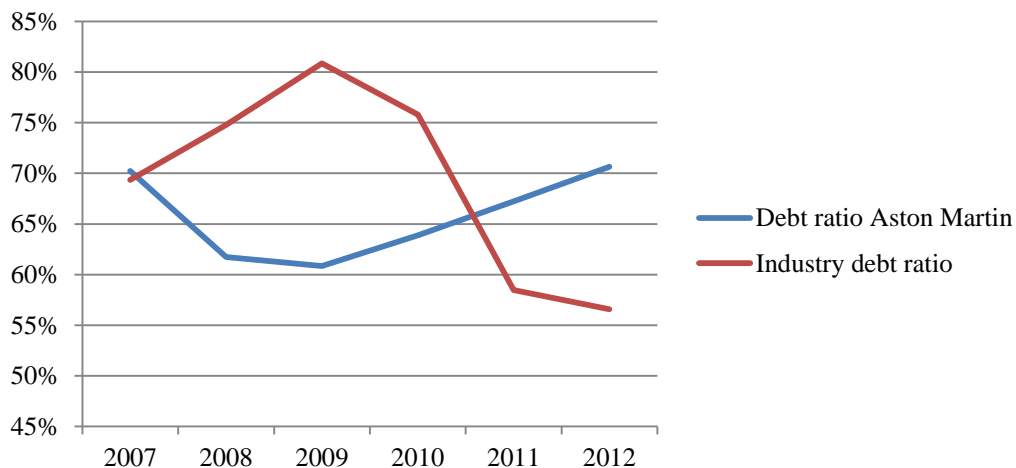


Figure 5: Debt ratio comparison, source: own computation

As we can see in the figure, the debt ratio is high for majority of companies in the automotive industry. Generally, the debt ratio in automotive is around 55-70% when the market environment does not suffer from recession. In spite of the high industry

average, management in Aston Martin should have worried about the increasing debt in years 2009 – 2012. Due to the gradual increment of debt, which was not accompanied by increase in earnings, leveraging in Aston Martin became uncontrollable in 2013 and the company was rescued based on collateral.

### 5.3.1.4 Efficiency ratios

In terms of efficiency ratios, we analyse number of ratios to evaluate performance of Aston Martin. The most comprehensive is assets turnover. Other ratios within the group deal with assets subcategory.

Efficiency ratios	2007	2008	2009	2010	2011	2012
Assets turnover	0.45	0.70	0.40	0.52	0.60	0.51
Inventory turnover	5.69	5.50	6.34	5.73	6.64	4.27
Average days in inventory (days)	64	66	58	64	55	86
Receivables turnover	7.38	23.18	3.17	5.03	51.32	32.72
Average collection period (days)	49	16	115	73	7	11

Figure 6: Efficiency ratios, source: own computation

Assets turnover was fluctuating during the whole time period. Based on the industry average from 2010, which is 1.38<sup>7</sup>, we state that the overall efficiency is not high at Aston Martin. The assets turnover never gets close to the average.

To have more detailed information, the inventory and receivables efficiencies are inspected. Inventory turnover also changes from year to year but the average days in inventory are high every year, particularly in 2012. This underlines the inefficient use of assets in Aston Martin. Analysis of receivables does not provide us with useful information because values of receivables turnover and average collection period vary significantly during 2007-2012.

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<sup>7</sup> Source: Motor vehicles and auto parts statistics. Bizstats. [Accessed on November 20, 2013.] Available at: <http://www.bizstats.com/corporation-industry-financials/manufacturing-31/transportation-equipment-manufacturing-336/motor-vehicles-and-parts-336105/show>

### ***5.3.1.5 Summary of financial analysis***

Financial analysis reveals many important facts about performance of Aston Martin in the period after 2007. In terms of liquidity, the company retains low values of ratios. This is risky but it increases efficiency. Nevertheless, drop in current ratio and quick ratio in 2011 and 2012 suggest upcoming financial problems.

Profitability ratios indicate that Aston Martin was not highly-profitable business during 2008-2010. The situation even worsened in following two years. In 2011, Aston Martin ended up with net loss of £21 million. In 2012, Aston Martin suffered losses even from core operations. The financial distress of last two analysed periods was highlighted by increasing proportion of debt and inability to pay interest payments. According to efficiency measures, Aston Martin management did not run the company efficiently.

Results from financial have important implications for the ex-post valuation on Aston Martin. The expected value of the company as of 2007, but based on real financial statements of following periods, may be severely low compared to the real value of Aston Martin in 2007. We already know that performance of the company was poor, especially within 2011-2012. Following DCF valuation should reflect this financial hardship and mirror it in the valuation outcome.

### **5.3.2 Ex-post valuation of Aston Martin**

In the following pages we value Aston Martin using enterprise discounted cash flow approach. The reason of selecting enterprise DCF version is that it represents the most used discounted cash flow approach to value privately-held companies.

The valuation steps use real financial data from time period 2008-2013 as input for calculating the value. In other words, the valuation does not follow ordinary procedure of valuation as described in methodological part of the thesis. Instead, financial statements and other sources of information from years 2008-2013 determine value of Aston Martin as of 2007. This ex-post valuation outcome is then compared to real value of Aston Martin at the time.

To determine the ex-post value, many inputs need to be defined and calculated. This chapter covers the whole process necessary to complete valuation of our case. Firstly,

we devote to identification of redundant assets in 2007. It is followed by analysis of discount rate and its components. Thirdly, cash flows are calculated. Four, we select the most appropriate method to indicate terminal value. Then, results are evaluated, compared to real value and discussed. Lastly, conclusions are drawn.

### **5.3.2.1 Redundant assets**

The first step of the ex-post analysis is to determine redundant assets. We already know that redundant assets mostly consist of short-term and long-term financial assets and miscellaneous assets. Based on the financial statements, we are able to scrutinize current assets.

Firstly, we deal with cash. The industry average of cash/sales ratio is 14.5% in 2007<sup>8</sup>. The amount of cash in Aston Martin is £42,158,000 and sales reached £332,766,000 in 2007. Therefore, Aston Martin indicates low cash/sales ratio (12.67%) compared to industry average. This is in accordance with the low liquidity ratios previously revealed in financial analysis. Hence, we do not consider cash kept by Aston Martin as redundant.

However, the whole amount of current miscellaneous assets belongs to the group of redundant assets. This is £12,419,000. Unfortunately, we do not have further details about asset structure to our disposal so these are the only conclusions we can make.

The overall amount of redundant assets of Aston Martin is £12,419,000 in 2007.

### **5.3.2.2 Discount rate**

Since we calculate enterprise DCF, we use weighted average cost of capital to discount cash flows. It is crucial to mention that the WACC changes every year in our valuation. Since we use real financial data from period 2008-2013, inputs of WACC formula changed within the time. For instance, expected returns of investors and creditors had been changing according to market situation. Also, conditions of individual firm change

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<sup>8</sup> Source: Damodaran, Aswath. The Data Page. [Accessed on November 27, 2013.] Available at: <http://pages.stern.nyu.edu/~adamodar/>

on yearly basis – we can name current structure of funding, future prospects, ... These all factors are included in the valuation analysis.

We already know the formula of WACC so input variables are computed in following paragraphs. Firstly, variables of cost of equity is determined using CAPM model. Later, we figure out cost of debt.

### **Risk-free rate**

A basic component of cost of equity is risk-free rate. For our purposes, risk-free rate is estimated via U.S. treasury bonds with 10 year maturity<sup>9</sup>. Since U.S. market and market in United Kingdom are comparable in terms of riskiness, we do not need to seek for risk-free rates in UK.

### **Market premium**

Risk premium for CAPM calculation is based on Damodaran's database. We use market premiums of United Kingdom in each year.

### **Beta**

We need to use more sophisticated procedure to pin down beta for every single year of the valuation. Most suitable way to identify beta of Aston Martin is analogy method described in methodological part of the thesis.

Firstly, we retrieve unlevered yearly betas of automotive industry from Damodaran's website. Secondly, we lever betas according to D/E ratio of Aston Martin. Further, betas are adjusted for tax shields using data from Corporation tax statistics in United Kingdom (Undre, a další, 2013). Outcome of the calculation is provided in the table below.

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<sup>9</sup> Source: Selected Interest Rates (Daily) - H.15. Board of Governors of Federal Reserve System. [Accessed on November 20, 2013.] Available at: <http://www.federalreserve.gov/releases/h15/data.htm>

<b>Beta calculation</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Beta unlevered	0.87	0.56	0.74	0.83	0.79
D/E ratio	1.61	1.55	1.77	2.05	2.41
Tax rate	28%	28%	28%	26%	24%
<b>Beta levered</b>	<b>1.88</b>	<b>1.18</b>	<b>1.67</b>	<b>2.09</b>	<b>2.22</b>

Table 5: Beta calculation, source: own computation

We see increasing beta of Aston Martin within the time period, always reaching values over 1. This signalizes high sensitivity of the business to market fluctuations. Definitely, this is the result of the nature of Aston Martin cars – luxurious goods are highly demanded in times of welfare, while considered as unnecessary in times of recession.

### **Cost of equity capital**

After determining all inputs of CAPM model, we can proceed to calculation of cost of equity capital.

<b>CAPM calculation</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Risk-free rate	3.66%	3.26%	3.22%	2.78%	1.80%
Risk premium	4.79%	5.00%	4.50%	5.00%	6.00%
Beta levered	1.88	1.18	1.67	2.09	2.22
<b>Cost of equity capital</b>	<b>12.66%</b>	<b>9.16%</b>	<b>10.74%</b>	<b>13.24%</b>	<b>15.14%</b>

Table 6: CAPM calculation, source: own computation

Growing beta and risk premium caused that the claims of shareholders increased during 2008-2012. The higher the expected returns are, the riskier the asset is.

### **Cost of debt capital**

Since we do not have internal information on cost of debt capital in Aston Martin to our disposal, we need to estimate it. Estimation uses procedure outlined by Damodaran and supported by Mařík (Mařík, 2007).

<b>Cost of debt capital</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
EBIT	46,103,000	24,095,000	35,256,000	8,370,000	-8,534,000
Interest expense	37,443,000	17,241,000	28,372,000	41,495,000	25,551,000
Interest coverage ratio	1.23	1.40	1.24	0.20	-0.33
Credit rating	CCC	B-	CCC	C	D
Risk premium	8%	6%	8%	12%	20%
Risk-free rate	3.66%	3.26%	3.22%	2.78%	1.80%
<b>Cost of debt capital</b>	<b>11.66%</b>	<b>9.26%</b>	<b>11.22%</b>	<b>14.78%</b>	<b>21.80%</b>

Table 7: Cost of debt capital calculation. source: own computation

The procedure begins with calculation of interest coverage ratio which is analogical to cash flow coverage ratio. The only difference is the use of EBIT in the nominator. Second, we identify credit rating using values of the interest coverage ratio. We can observe poor credit rating throughout the period. In particular, the ratings of 2011 and 2012 rank Aston Martin's debt into junk category with high risk premium. After adding the risk premium to risk-free rate, we obtain cost of debt capital.

### WACC results

The calculation of weighted average cost of capital is simple after collecting data on all inputs.

<b>WACC calculation</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
E / E+D	38%	39%	36%	33%	29%
D / E+D	62%	61%	64%	67%	71%
Tax rate	28%	28%	28%	26%	24%
Cost of debt capital	11.66%	9.26%	11.22%	14.78%	21.80%
Cost of equity capital	12.66%	9.16%	10.74%	13.24%	15.14%
<b>WACC</b>	<b>10.03%</b>	<b>7.64%</b>	<b>9.04%</b>	<b>11.69%</b>	<b>16.15%</b>

Table 8: WACC calculation, source: own computation

Apparently, WACC grows in time. This is caused by increasing rates of cost of debt and cost of capital. Both rates reflect increased riskiness of Aston Martin due to deteriorating financial situation. This confirms the conclusions of financial analysis where Aston Martin proves to be in serious financial distress in recent years.

### 5.3.2.3 Free cash flow

We span calculations of enterprise free cash flows over common 5 year horizon. It is 2008-2012 in our case.

<b>Enterprise FCF</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Operating profit	46,103,000	24,095,000	35,256,000	8,370,000	-8,534,000
Tax rate	28%	28%	28%	0%	0%
Operating profit less taxes	33,194,160	17,348,400	25,384,320	8,370,000	-8,534,000
Depreciation	17,268,000	21,021,000	35,416,000	32,111,000	37,158,000
Change in WC	15,834,000	89,003,000	-25,055,000	-77,371,000	-18,340,000
Capital Expenditures	29,899,000	28,325,000	69,042,000	33,531,000	41,314,000
<b>Enterprise FCF</b>	<b>4,729,160</b>	<b>-78,958,600</b>	<b>16,813,320</b>	<b>84,321,000</b>	<b>5,650,000</b>

Table 9: Enterprise free cash flow calculation, source: own computation

As visible, free cash flows fluctuate over time. Aston Martin reached positive values in all year besides 2009. Due to large increase in working capital, the free cash flow was negative. As already revealed by financial analysis, this was caused by worsening receivables collection period. This can be attributed to financial crisis and consequent inability of trade debtors (customers) to pay the receivables on time. Conversely, Aston Martin generated high free cash flow in 2011. Unfortunately, it cannot be attributed to increased operating profit. Instead, change in working capital, and specifically receivables, caused the high free cash flows.

We need to point out that tax rates of 2011 and 2012 are 26% and 24% respectively. In the table, we use expression “0%” because the company ended up with negative pre-tax income in the financial year. Therefore, Aston Martin did not pay taxes in these years. This caused that there is no money outflow related to tax burden.

### 5.3.2.4 Terminal value

There are many approaches to determine the terminal value which spans from 2013 to infinity. The most accurate one, for purposes of the thesis, is terminal value based on real deal. Such way of terminal value estimation is relatively similar to exit multiple



approach. Nevertheless, it provides us with outcome inherently including specifics of Aston Martin.

In the first chapter of practical part, we mentioned that 37.5% stake of Aston Martin was sold to Investindustrial for £150 million in 2013. Thus, we can use real value of 2013 instead of exit multiple. First step of the analogy is to find out value of the whole business in 2013. As we know, Investindustrial acquired only 37.5% stake. Knowing this information, we can estimate that the value of the entire company could have been £400 million.

In reality, the price of entire company would have been higher. The reason is that average price per share of controlling majority is usually higher than average price per share when buying a minority stake in company. However, we can only speculate by how much the incremental price per share would have been higher. Consequently, the most reasonable estimate of net worth is £400 million.

### ***5.3.2.5 Results of enterprise DCF***

After discounting free cash flows of 2008-2012 at calculated discount rates, we get £12,480,384. Exit value is discounted at the same rates, ending up at £238,755,359 in 2007.

When both values are summed up, we get £252,235,743. Nonetheless, this is a gross value of Aston Martin because it reflects the value of claims of shareholders as well as claims of creditors.

To obtain operating value of equity, we subtract value of interest-bearing debt from the gross value. In 2007, the interest-bearing debt was £376,713,000. This was determined as a sum of long-term debt, short-term debt and overdraft. Hence, the operating value is minus £125,477,257.

Obviously, it is desirable to calculate the total net value of equity in 2007. To do so, we add value of redundant assets to the operating value of Aston Martin. Redundant assets accounted for £12,419,000 so the ex-post value of Aston Martin is minus £113,058,257 in 2007.

### **5.3.3 Discussion over the results**

In the previous steps, we determined ex-post value of Aston Martin to year 2007. The value is based solely on financial performance of the company and is - £113,058,257. Compared to real value of Aston Martin (£519,000,000) based on purchase price in 2007 there is more than £600 million of difference. Although it might be surprising, there are many reason of such a low value determined by the ex-post valuation analysis.

As financial analysis suggests, Aston Martin did not perform financially well. The profitability was very low in all three main indicators ROA, ROE and ROS. High leverage resulted into large interest payments, which destabilized the financial situation particularly in 2011 and 2012 when Aston Martin incurred a negative bottom line. Also, the level of liquidity ratios was kept very low. Besides, Aston Martin did not use up assets properly, its turnover was low.

The internal financial problems were escalated by collapse in luxury sports car market during the financial crisis (Wright, 2011). Unstable revenues below the expected level were not fostered by promising expansion to emerging markets. These are the circumstances that influenced the ex-post valuation.

Despite them, there is a price premium as a reason for the disparity between calculated value and real value in 2007. We already know that the real value of Aston Martin in 2007 is in gross contradiction with value determined by our valuation analysis. As mentioned earlier, value of goodwill plays a considerable role in valuation of the luxurious car producer. Moreover, Kuwaiti investment funds acquired Aston Martin based on their own valuation analysis, which definitely included synergies that are unknown to external analyst. Naturally, such synergies are not reflected in financial statements which served to our valuation. Additionally, price negotiations between Ford and Kuwaiti investors also impacted on the final purchase price of Aston Martin in 2007.

The true nature of thoughts on price premium related with Aston Martin is underlined by following considerations. We know that the most accurate price estimate of Aston Martin in 2013 is £400 million (using the price of 37.5% stake owned by

Investindustrial). However, when we calculate the value of Aston Martin in 2013 via the most common industry multiple, enterprise value over EBITDA, we get £213,535,040<sup>10</sup>.

To conclude this section of the thesis, it is important to emphasise that the ex-post valuation relies solely on hard facts. Apparently, this is not the case of real business in which soft factors can even dominate the hard ones.

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<sup>10</sup> Based on EBITDA multiple of 7.46 for automotive industry for 2013. Source: Damodaran, Aswath. The Data Page. [Accessed on November 27, 2013.] Available at: <http://pages.stern.nyu.edu/~adamodar/>

## **6. Conclusions**

The diploma thesis copes with the topic of business valuation. We can consider valuation as one of the most important topics in current corporate finance practice. The number of mergers and acquisitions increase year by year and there is need to value companies before deals are signed.

However, various valuation techniques may deliver different values of a company. This is what the hypothesis of the diploma thesis states. In order to prove or disprove the hypothesis, we set three main objectives. Firstly, we perform valuation via several techniques and compare the results. Secondly, we compare the valuation outcomes to real price of transaction to find out whether factors that are not reflected in the valuation procedures exist. Thirdly, we assess the appropriateness of the real price of transaction.

After setting hypothesis and objectives, the thesis provides reader with methodological part. At first, valuation framework chapter describes four main approaches to valuation. Further, discounted cash flow valuation methods are categorized and explained in detail. We also deal with procedures to determine discount rate, such as weighted average cost of capital (WACC) and capital asset pricing model (CAPM). Added to this, methodology explores asset-based valuation techniques and relative valuation methods.

The next part of the thesis reviews literature resources that are closely related to the topic of the diploma thesis. Valuation methods are scrutinized in terms of appropriateness of their application. Another important topic of literature review is the positives and negatives of valuation methods. Analysts should be not only able to distinguish which method fits best to the situation given, they must be also aware of advantages and disadvantages of the methods. Last part of the literature review is devoted to previous research on comparison of valuation outcomes reached by other authors. Unfortunately, findings bring about contrasting conclusions. Some authors rather support proximity of results while other authors find disparities in valuation outcomes.

Analysis of the diploma thesis consists of three interrelated parts. Initially, we summarize important information on the object of case study - a luxury sports car producer Aston Martin. The emphasis is put on explanation of circumstances of acquisition of Aston Martin in 2007 as it is crucial for understanding the following parts of the thesis. Subsequently, we outline the after-deal events of the car manufacturer to date.

Second part of the analysis is dedicated to valuation of Aston Martin in 2007. Net assets method yields value £219 million. Then, six representatives of industry multiples are applied. Their outcomes range from £106 million to £417 million. Apparently, valuation methods reach dissimilar results. Therefore, the hypothesis of the diploma thesis is proved. Author of the thesis identifies different valuation logic of the methods as source of the disparity.

Apart from that, we find a striking gap between real value of Aston Martin in 2007 (£519,000,000) and valuation outcomes obtained. After decomposition of reasons, author emphasizes the value of goodwill related to Aston Martin brand. Furthermore, expected synergies of investors influenced their subjective valuation and, consequently, willingness to pay premium price. Lastly, negotiations between seller and buyer could have played an important role when setting the price of Aston Martin.

The third part of analysis is devoted to ex-post discounted cash flow (DCF) valuation of Aston Martin. This part aims at valuation analysis of the appropriateness of the price of Aston Martin in 2007. To do so, we analyse financial situation of the company at first. It reveals mostly weak performance of Aston Martin and serious financial distress in 2011 and 2012. Subsequently, we perform ex-post DCF valuation. Financial statements of Aston Martin in 2008-2012 as well as other sources of information are used to determine value of the company as of 2007. The outcome of the ex-post valuation is minus £113,058,257. However, the surprisingly low value has many explanations. Essentially, it is the financial troubles that Aston Martin was undergoing since 2007.

Moreover, this was underlined by collapse in luxury sports car market during the worldwide financial crisis.

Nonetheless, the real value of Aston Martin is not reflected perfectly in the model. The obtained ex-post valuation outcome relies solely on hard financial facts. As already mentioned, the real value of Aston Martin is greatly influenced by goodwill, investor's synergies and other factors that can hardly be recorded in financial statements or captured by external analysts.

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## 8. Supplements

### 8.1 Financial statements of Aston Martin 2007 - 2012

This is the outcome of DueDil.com database available to user upon registration. The only changes made are visual ones.

	2007	2008	2009	2010	2011	2012
Employees	886	1 460	1 272	1 188	1 187	1 173
Turnover	332 766 000	536 951 000	347 909 000	474 263 000	506 810 000	461 237 000
Cost Of Sales	286 943 000	428 257 000	288 692 000	389 566 000	439 016 000	313 099 000
Gross Profit	45 823 000	108 694 000	59 217 000	84 697 000	67 794 000	148 138 000
Op Profits	19 445 000	46 103 000	24 095 000	35 256 000	8 370 000	-8 534 000
Profit Pretax	6 475 000	8 660 000	6 854 000	6 884 000	-33 125 000	-34 085 000
Profit Posttax	4 747 000	6 557 000	4 003 000	7 593 000	-21 170 000	-24 884 000
Net Assets	219 685 000	293 805 000	341 925 000	332 663 000	278 902 000	263 133 000
Assets	738 098 000	767 716 000	873 583 000	920 883 000	850 915 000	896 257 000
Liabilities	518 413 000	473 911 000	531 658 000	588 220 000	572 013 000	633 124 000
Cash	42 158 000	16 138 000	39 116 000	43 342 000	46 631 000	50 413 000
Assets Tangible	157 638 000	170 269 000	177 573 000	211 199 000	212 619 000	216 775 000
Assets Intangible	430 380 000	465 635 000	480 510 000	484 546 000	496 419 000	522 581 000
Assets Fix	588 018 000	635 904 000	658 083 000	695 745 000	709 038 000	739 356 000
Assets Current	150 080 000	131 812 000	215 500 000	225 138 000	141 877 000	156 901 000
Stock	50 442 000	77 799 000	45 550 000	68 034 000	66 118 000	73 389 000
Assets Current Other	12 419 000	14 713 000	16 085 000	19 499 000	19 252 000	18 663 000
Assets Current Misc	0	0	5 096 000	0	0	339 000
Liabilities Current	174 113 000	125 218 000	182 484 000	215 291 000	143 253 000	226 945 000
Creditors	62 171 000	45 036 000	42 766 000	64 489 000	50 723 000	47 369 000
Trade Debtors	45 061 000	23 162 000	109 653 000	94 263 000	9 876 000	14 097 000
Overdraft	0	0	74 633 000	69 710 000	0	41 259 000
Short Term	32 413 000	17 620 000	5 568 000	8 605 000	12 167 000	21 236 000
Liabilities Current Misc	79 529 000	62 562 000	59 517 000	72 487 000	80 363 000	117 081 000
Long Term Other	35 813 000	36 318 000	0	0	0	0
Long Term	344 300 000	348 693 000	349 174 000	372 929 000	428 760 000	406 179 000
Salaries and Dividends	0	0	0	0	0	0
Wages Salaries	36 575 000	64 240 000	54 146 000	54 471 000	59 017 000	65 913 000
Dir Emoluments	894 000	905 000	986 000	2 075 000	915 000	951 000
Shareholder Funds	219 685 000	293 805 000	341 925 000	332 663 000	278 902 000	263 133 000
Dividends	0	0	0	0	0	0
Other						
Cost Of Sales	286 943 000	428 257 000	288 692 000	389 566 000	439 016 000	313 099 000
Audit Fees	20 000	10 000	10 000	10 000	12 000	12 000
Tax	-1 728 000	-2 103 000	-2 851 000	709 000	11 955 000	9 201 000
Retained Profit	0	0	0	0	0	0
Net Worth	-210 695 000	-171 830 000	-138 585 000	-151 883 000	-217 517 000	-259 448 000
Depreciation	10 491 000	17 268 000	21 021 000	35 416 000	32 111 000	37 158 000
Capital Employed	563 985 000	642 498 000	691 099 000	705 592 000	707 662 000	669 312 000