

Comparison of Discounted Cash Flow and Economic Value Added Valuation Methods

Protect Company LLC

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<p>Abstract</p> <p>There were two principle objectives in this thesis: a theoretical and a practical one. The theoretical aim was related to the comparison of two most-widely used business valuation methods, Discounted Cash Flow (DCF) and Economic Value Added (EVA). By comparing the two methods the author gave a recommendation which valuation approach would be more applicable in small entities and their appraisal processes. The practical objective referred to the actual valuation of the Client Company with the use of the selected methods.</p> <p>The theoretical framework of the thesis presents a description of what business valuation is, including its importance and misconceptions about it. Additionally, the theoretical part of the work provides a basic overview of different business valuation approaches and a deep study of the two most-widely used ones, DCF and EVA, along with their advantages and disadvantages, key components and the valuation processes.</p> <p>The result of the thesis is the Client Company's value, which can be used by the Company's management in negotiations with investors and debtors. Moreover, the Company might use the outcome of the study in case of merger or acquisition propositions. Besides that, the author, performing as the Company's consultant during the work, suggested to the Client's management a few methods of the future financial situation improvements.</p>			
Keywords Valuation, DCF, EVA, Value			

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GLOSSARY

CAPEX	Capital Expenditures
CAPM	Capital Asset Pricing Model
CFA	Chartered Financial Analyst
DCF	Discounted Cash Flow
EBIT	Earnings Before Interest & Tax
EBITDA	Earnings Before Interest, Tax, Depreciation & Amortization
EP	Economic Profit
EVA®	Economic Value Added
FCFE	Free Cash Flow to Equity
FCFF	Free Cash Flow to Firm
GDP	Gross Domestic Product
M&A	Mergers and Acquisitions
NOPAT	Net Operating Profit After Tax
NWC	Net Working Capital
PPE	Property, Plant & Equipment
R&D	Research & Development
SWM	Shareholder Wealth Maximization
TV	Terminal Value
WACC	Weighted Average Cost of Capital

1 INTRODUCTION

The thesis is a result of my internship at Protect Company LLC. I performed as an independent financial consultant, who was in charge of conducting valuation of the Client's business. The Company is a security systems installation and service provider, which is currently entering a new highly growing smart-home market and changing its strategy on gaining state contracts. So that, it is pursuing an aim to raise capital in order to support its current operations and invest in R&D. The Company runs its business in the Northwestern region of Russia and has some operations in the Middle East. So, the Company needs to be appraised in order to get leverage in negotiations with banks and potential investors.

For appraisal purposes I selected two different valuation approaches: Discounted Cash Flow (DCF) method and Economic Value Added (EVA) method, and explained several reasons behind choosing DCF and EVA. Moreover, in this work other valuation methodologies are discussed. In addition, it is worth noticing that in this document terms "the Case Company", "the Company", "the Client" or "the Firm" would sometimes be used instead of the actual name of the Company. In addition, the agreement of non-disclosure between me and Protect Company does not allow showing the Company's actual financial statements. Nevertheless, according to our mutual agreement, all the statements are rescaled, however the valuation process and calculations themselves are fully identical to the real work presented to the Protect Company LLC's management.

There are two principle goals of this thesis: a theoretical and a practical one. Theoretical objective relates to the comparison of the two most-widely used business valuation methods, particularly Discounted Cash Flow and Economic Value Added. By comparing these two methods I would like to give a recommendation which valuation approach would be more applicable in small entities and their appraisal processes.

The practical objective refers to the actual valuation of the Client Company with the use of the selected approaches. The result of the thesis work might be used by the Company in negotiations with investors and debtors. Moreover, the Company, knowing its approximate value, might use it in case of merger or acquisition propositions.

Since there are two principle goals of the thesis, I divided the thesis into two main parts: a theoretical and a practical one. The first one brings the theoretical framework regarding business valuation. The theoretical part begins with definition of the term "value". Then, the valuation itself is deeply described, including its importance and misconceptions about it. After that, I listed major valuation approaches and briefly characterized them. As the aim of the thesis is to compare DCF and EVA, I studied the methods scrupulously. More

specifically, this work presents advantages and disadvantages of both technics, key components and the valuation process with all needed formulas. Finally, I pondered, what possible results of DCF and EVA appraisals might mean.

The practical or empirical part of the thesis represents Protect Company's valuation process. I demonstrated the current situation of the Client's business, i.e. market and financial conditions. Along with that all needed information and data for the business appraisal using DCF and EVA methods is presented and applied in the valuation process. Additionally, the results of DCF and EVA valuation are compared. Following that, I compared two approaches on its applicability for small entity appraisal purposes and gave own recommendation which method is preferably to be used. Finally, I, being a consultant, provided several suggestions concerning possible ways of the Company's future financial situation improvements.

2 BUSINESS VALUATION PRINCIPLES

Financial Management is an essential part of any business. There are many different definitions of what is the financial management, but one of the most popular and acceptable was introduced by Kuchhal (1969): “Financial Management deals with procurement of funds and their effective utilization in the business”. In a simpler manner, financial management raises and solves two main questions: how to use funds in the most effective way, and where to get these funds from.

There are two main and broad objectives of financial management: profit maximization and wealth maximization.

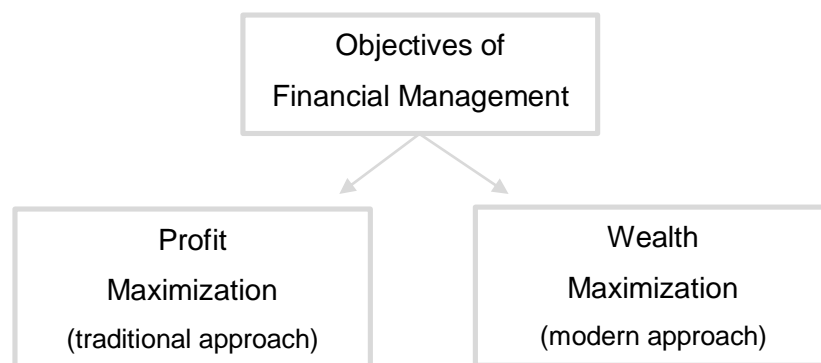


FIGURE 1. Objectives of Financial Management

As far as profit maximization is concerned, it consists of the following important features:

- a) financial managers are aimed at maximizing the efficiency of the business operations for profit maximization;
- b) core goal of the business is earning profits. Therefore, financial managers examine all the possible ways to boost the profitability of the business;
- c) profitability is one of the key parameter of measuring the efficiency of a company. Hence, it shows the entire position of the business;
- d) profit maximization objectives help reduce the risk of the business. (Paramasivan & Subramanian 2008, 5-6)

Regarding the wealth maximization objective, it is one of the modern approaches, which involves latest innovations and improvements in the business field. The ultimate idea behind wealth maximization is to maximize the value of the company or in other words to increase the value of equity shares which belong to the business shareholders. (Paramasivan & Subramanian 2008, 6-7). At the same time according to John R. Boatright and Duane Windsor (2010, 437) the shareholder wealth maximization (SWM) relates to the principle, that immediate operating goal and the ultimate purpose of a public

corporation is and should be to maximize return on equity capital. Therefore, under the principle, managers and investors should focus narrowly on SWM.

One of the essential tools of financial management is business valuation, which is dedicated to help managers make wiser business decisions and consequently succeed in pursuing above-mentioned objectives (Copeland, Koller, Murrin 2000, 3). Wherein Pablo Fernandez from IESE Business School (2004, 3) more concretely describes the importance of company appraisal as a tool for strategic decisions and strategic planning. He reckons that the valuation of a firm or business unit is essential for making decisions to continue in the business, sell, merge, grow or buy other companies. More than that, according to Fernandez (2004), organizations and the different business units is fundamental for understanding what products/business lines/countries/customers to maintain, grow or abandon. The author sums up, that the valuation provides means for measuring the impact of the company's possible policies and strategies on value creation and destruction.

As for the small private companies considering expansion, which the case for the appraised Company, valuation is a key that opens doors to the venture capitalists and private equity investors, who commonly require companies to be valued in order to make decisions on capital infusion. More than that, the investors are keen to see if a business would generate enough return. Thus, it is self-evident that in a bid to be more powerful in negotiations with investors or bidders (in case of M&A deals), a company should understand its value and have various estimations on its future results.

2.1 Introduction to value

Each asset has a value; no matter is it financial or real one. The crucial point in successful management of these assets is to understand not only how much they are worth but also what sources contribute to the price of the assets. (Damodaran 2010, 6). Value is a useful measure of performance because it takes into account the long-term interests of all the stakeholders in a company, not just the shareholders. The main goal of companies' management is to create value for its owners by investing cash now to generate more cash in the future. "The amount of value they create is the difference between cash inflows and the cost of the investments made, adjusted to reflect the fact that tomorrow's cash flows are worth less than today's because of the time value of money and the riskiness of future cash flows" (Koller, Goedhart, Wessels 2010, 17).

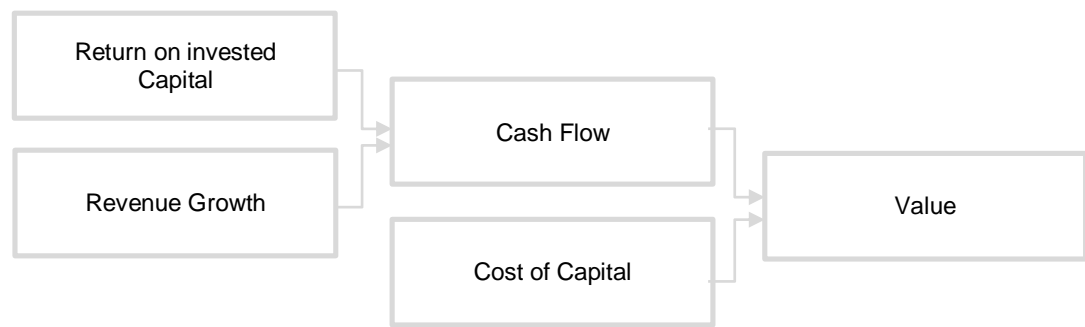


FIGURE 2. Value drivers.
(Koller, Goedhart, Wessels 2010).

In economics and financial management, the term “value” describes the merit of the benefits of the ownership of the assets. Put simply in case of business, the value of an interest in a business hinges on the future benefits that will be delivered to its owners. Therefore, the value of an interest depends upon a forecast of the future benefits and the required rate of return at which those future benefits are discounted back to present value. So, in theory it is correct to project some category or categories of the future benefits of ownership (commonly an economic income, such as cash flow, earnings or dividends) and calculate the present value of the benefits by discounting them in accordance with the time value of money principles and the risks associated with ownership. (Pratt & Niculita 2008, 56)

There are two general types of value: intrinsic and relative. In intrinsic valuation, the value of an asset is a function of expected cash flows on that asset. Theoretically, assets that have high and easily predictable cash flows should be worth more than assets with low and volatile cash flows. Intrinsic value of an asset is usually estimated with the use of discounted cash flow model, where the value equals to the expected cash flows on the asset. (Damodaran 2010, 6). It is generally accepted that intrinsic value is the actual value of an asset or a company, which considers all fundamental aspects of a business, including both tangible and intangible factors. Wherein, intrinsic (or fundamental) value may differ from the market value. For the sake of understanding, the market capitalization (market value) of a company is a price that investors are willing to pay for the company, whereas an intrinsic value shows how much the company is really worth.

Regarding the relative valuation, which is most commonly used in the financial world, the value of an asset or a company is determined by looking at the market prices of the similar assets or companies. For example, when buying a car, the buyer decides how much he or she is willing to pay by looking at the car prices in the nearest dealer center. As far as business valuation is concerned, by using the relative valuation investors determine

whether a company is undervalued (i.e. cheap) or overvalued (i.e. expensive) in comparison to its peers.

As usual, there are many debates regarding the question, which methodology is more reliable and more worthwhile. Analyzing the intrinsic value, an expert gains a more complete sense of what drives a business. However, it is not a rare outcome, when financial managers or investors make better decisions by determining the value of a business on the relative basis. Nonetheless, it is not binding experts to sort out one methodology, so the most optimal decision is to use both of them in the valuation process.

2.2 Importance of business valuation

Valuations of closely held businesses are conducted for a number of reasons. According to Institute of Management Accountants (2009, 1), the typical purposes include mergers, acquisitions, and initial public offerings. However, Richard Hayward in his article “The Importance of Business Valuation” (2016) highlights a couple of other reasons for business valuation, among which are shareholder disputes resolutions, business planning & future decision-making, determination of tax obligations and access to external sources of funding. The Figure III below represents the general reasons for business valuation.

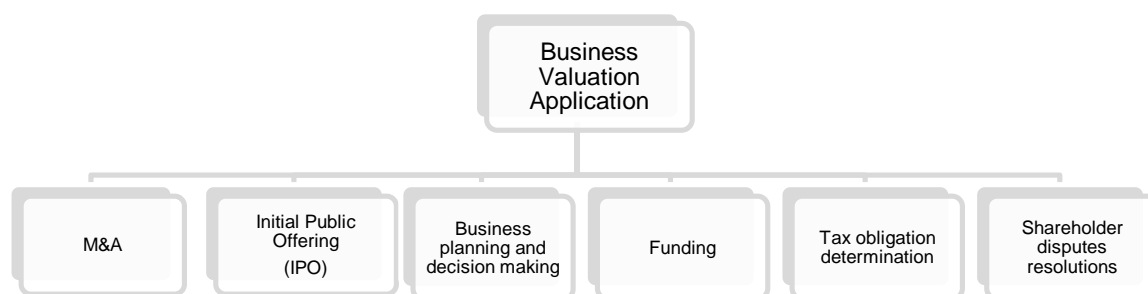


FIGURE 3. Business Valuation Application.

2.3 Misconceptions about valuation

Theoretical framework for business valuation is generally accepted, however its practical application in an unpredictable business environment is one of the most complex challenges of economic and financial theory and practice. (Gabehart Valuation Services 2003). CFAs Shannon P. Pratt & Alina V. Niculita (2008, 56), in their turn, reckon, that “the reasonableness of the business valuation conclusions usually depends upon whether the projections and assumptions used to estimate future economic income benefits are acceptable to the decision maker for whom the business valuation is being prepared”.

Business valuation merely is a process of an estimation of a company's future value. It is a tool to assess what a company's future financial profile might be, taking into consideration particular hypotheses about its future performance. Professor of Finance at New York University Stern Business School Aswath Damodaran in his papers "Damodaran on Valuation" (2006, 7) claims that the professionals should know the main misconceptions about valuation in order to make right decisions that are based on the results of the appraisal. The author highlights three general misconceptions.

The first misconception is that valuation does not identify the true value of a business because all valuations are completely biased. The bias mainly refers to truthfulness of the auditors and financial managers. For example, experts, who are interested in the client company's success, would likely come out with less realistic but more positive results. So, an appraised entity should always consider the biases of the analyst in order to make proper strategic decisions that would be based on the results of valuation. The second misconception is that valuation provides a precise estimate of the value. Damodaran (2012, 6) points out, that there are no precise valuations and that the payoff to valuation is greatest when valuation is least precise. Thirdly, it is not a truth that the more quantitative a valuation model, the more reliable are the valuation results. An expert's understanding of the valuation model is inversely proportional to the number of inputs required for the model. Also, Damodaran (2012, 6) states that the simpler valuation models come out with better results than complex ones. (Damodaran 2012, 6). For the sake of simplicity, the chart below represents all misconceptions of business valuation according to Damodaran.

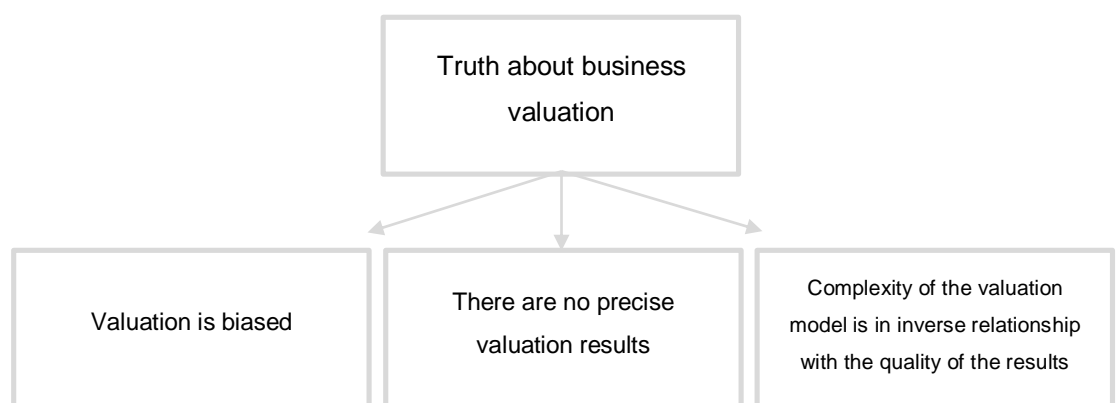


FIGURE 4. Truth about business valuation.
(Damodaran 2006-2012).

3 BUSINESS VALUATION APPROACHES AND METHODS

Analysts and consultants use a wide range of methods aimed at determining the value of a business. These methods differ from each other in terms of the valuation process and assumptions about the fundamentals that determine the value. Nonetheless, some methods have common features, so that they can be categorized into four different approaches: income approaches, market approaches, asset-based approaches and option-pricing approach. The figure below represents and summarizes these four approaches and the related methods.

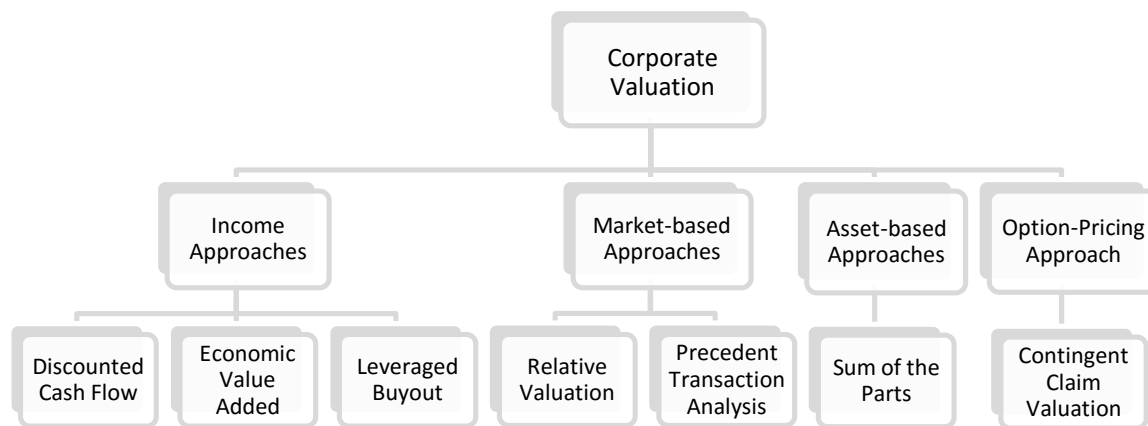


FIGURE 5. Valuation approaches and methods

The next chapter briefly presents the definition of the business valuation approaches and the situations when each approach is more relevant to be used. However, as long as the DCF and EVA methods are used in determining the value of the Case Company, the income approaches will be described more specifically. In addition, the next chapter shows the reasons behind selection of DCF and EVA methods, not others.

3.1 Income approaches

The most common valuation methods are based on earnings capitalisation. The income approach methods determine the fair value of a business based on its ability to generate desired economic benefit for the owners (Haleo Corporation 2002-2016). The value of an asset that is estimated by using the income approach methods is the present value of the expected cash flows on the asset, discounted back at a rate that reflects the riskiness of these cash flows (Damodaran 2012, 17). Institute of Management Accountants adds an important point that all of these methods calculate the present value of the future benefits (i.e. cash flows) that are multiplied by a discounted factor or rate based on the time value of money principles. Therefore, these methods require the determination of a discount

rate, which turns the future cash flow values into the present value (Institute of Management Accountants 2009, 6).

The appraisal result is the fair market value of the company. The main idea behind the income approach is that every asset has an intrinsic value that can be estimated based upon its characteristics in terms of cash flows, growth potential and risks. (AAAMP 2006-2015). Kapadia (2016, 3) states: “the asset has an intrinsic value that is based on its cash flows and risk characteristics.”

3.2 Market-based approaches

Despite the fact that the income approach methods are popular among professionals, in the reality most assets are valued with the use of the market-based approach models. In this type of valuation, analysts value assets by looking at how the market prices similar or comparable assets. For example, when buying a car, a client looks at what prices similar cars were sold for in the nearest car dealerships rather than doing an intrinsic valuation.

In other words, the general idea behind this type of valuation is that the real value of an asset or a company is the selling price of similar or comparable assets or companies the market is able to pay. In order to use market-based valuation methods, professionals must find relevant data on the similar or comparable assets and transform this data into standardized form. Then the so-called multiples, which relate the asset or business selling price to some value of business financial performance, are applied in the comparison process. However, as professionals from Haleo Corporation (2002-2016) noticed, in case of small private businesses valuation this approach is rarely used due to a few reasons, such as difficulty in identifying comparable companies or transactions, lack of comparable companies or transactions and shortage of available data.

3.3 Asset-based approaches

Whereas the two previous approaches focus on income statement activity, the asset-based approach uses a business' balance sheet. The approach utilizes the books of the company to determine the fair value of the assets (primarily tangible), and the liabilities to identify a net value of the company. The asset-based approach is commonly utilized when a company is no longer operating as a going concern and is preparing for liquidation (Tower59 LLC 2012). National Association of Certified Valuators and Analysts (NACVA) (1995-2012) agrees with this point, claiming that asset-based approaches can be valid in the context of a company which has very poor financial performance.

Additionally, according to an article on Tower59 LLC's website, the asset-based approach can be used, when the business is based on assets, and not on income, such as a production company. Actually in Finland this is a typical way of determining a business value, especially in case, when 100% stake of an industrial company is on sale. This is also an important matter and was explained by Anthony Charlton from FTI Consulting Inc. (2012): the asset-based approach could generally be an appropriate method while dealing with a controlling interest over a business. Mr. Charlton adds that "in respect of a minority shareholder with no control over a company's assets, a valuation would normally focus on the value of future dividends the minority shareholder could expect to receive."

3.4 Option-pricing approaches

Among mentioned methods the newest and most revolutionary is option-pricing approach or in other terms the Contingent Claim Valuation. In recent years, a massive amount of work was done to develop the approach that values such securities as options. "An option or contingent claim is an asset which pays off only under certain contingencies - if the value of the underlying asset exceeds a pre-specified value for a call option, or is less than a pre-specified value for a put option" (Damodaran 2006-2012). More and more analysts nowadays are using option-pricing models to value listed options, assets, businesses and equity stakes in businesses. However, the method can only be utilized when valuing assets that have option-like features.

According to Damodaran (2006-2012, 2), the option-pricing approaches are mostly applicable in the few cases. Firstly, the methods might be used in valuation of the equity in a troubled firm, i.e. a firm with high leverage, negative earnings and with a significant chance of bankruptcy. can be viewed as a call option, which is the option to liquidate the firm. Secondly, in appraisal of the assets of the natural resource companies, where the undeveloped reserves can be viewed as options on the natural resource. Thirdly, option-pricing approach is used for start-up companies or high growth firms, which derive the bulk of their value from the rights to a product or a service (e.g. a patent).

4 DISCOUNTED CASH FLOW VALUATION METHOD

4.1 Definition

In Discounted Cash Flow valuation, analysts determine the value of any asset or business by discounting the expected cash flows generated by that asset or business at a rate that reflects the riskiness. In case of appraising businesses, the companies' Weighted Average Cost of Capital (WACC) is commonly used as the discount rate. In other words, Discounted Cash Flow valuation method allows to measure the intrinsic value of an asset or a company. The value of any asset is a function of the cash flows generated by that asset, the life of the asset, the expected growth in the cash flows, and the riskiness associated with these cash flows. (Damodaran 2006-2012, 12.1). Experts at one of the biggest investment banks in history Bear Stearns, which was acquired by JP Morgan Chase & Co. in 2008, agreed with this statement, saying that the DCF approach values a business based on its future expected cash flows discounted at a rate that reflects the riskiness of the cash flows. Simply saying, the measured enterprise value is the present value of the expected cash flows generated by a company over its life.

There are three DCF models that are typically used by the specialists. The models are represented in the following table:

TABLE 1. Summary of Typically Used Cash Flow Models.

Value needed	Cash flow used	Discount rate	When to use
Free cash flow to equity (FCFE).	$EBIT \times (1-t)$ - Interest expense $\times (1-t)$ - Principal repaid + New debt issued - Preferred dividends + Depreciation & amortization - Capital expenditures - Change in working capital.	Discount rate is R_e (return on equity).	Good for companies growing at or below that of the economy.
Free cash flow of firm (FCFF) or Cash flow to invested capital.	$EBIT (1-t)$ + Depreciation & amortization - Capital expenditures - Change in working capital	Discount rate R_w (weighted average cost of capital – WACC).	Good for highly leveraged or cyclical firms.
EBITDA	EBITDA	Discount rate is pretax cost of capital.	Good for highly leveraged or cyclical firms where capital expenditures and working capital cannot be calculated.

(Fraizer Capital 2015, 126)

4.2 Advantages and disadvantages of the DCF valuation approach

As for the advantages of the DCF approach, it requires analysts to understand the businesses that they are valuing and ask searching questions about the sustainability of cash flows and risk (Damodaran 2006-2012). Thus the detailed design of the balance sheet and income statement, which includes all future inflows and outflows of funds, is composed. In this way, the projected balance is maximally tailored to real future balances. The result of estimates contributes to more accurate and more realistic value of the company. However, according to Vlaović Begović, Momčilović and Jovinthis (2013, 46), this advantage may turn to a limitation due to the complexity of the cash flow projection process.

Besides, the DCF valuation has some other limitations as well. Firstly, it is usually perceived as the most difficult approach among all valuation methods, since DCF requires a higher volume of input data to thoroughly estimate the output or, in other words, the intrinsic value of an asset or business. In addition, DCF approach can be used in appraising not all but those companies, which exist quite a long time, because experts should evaluate the future of the businesses by addressing and analyzing their past performances. Finally, as it was mentioned previously, the DCF analysis is fully bias of analysts since the inputs can be manipulated. (Damodaran 2005).

In order to utilize discounted cash flow valuation method in an appropriate way, analysts should be aware of all pros and cons of DCF. Moreover, it is the must for professionals to understand, in which cases DCF acts as the most applicable valuation method. In addition, as far as investors are concerned, they should understand that the approach is used to forecast the performance of an asset or a business over a long term. Also, investors should have at least fundamental knowledge of DCF to critically asses the analyses carried out by hired experts.

The next two sections discuss the key components of the DCF analysis and the valuation process itself.

4.3 Key components and inputs

According to Damodaran (2010), there are four inputs that are required to value any asset or any business in the Discounted Cash Flow model. These include the expected cash flow, the expected growth rate, the discount rate that is appropriate given the riskiness of these cash flows (the concept of Weighted Average Cost of Capital) and the Terminal Value (TV).

a. Expected Cash Flows

As far as cash flows are concerned, typically in DCF valuation approach used two types of the cash flow: free cash flow to firm (FCFF) and free cash flow to equity (FCFE). Due to the reasons mentioned above, the FCFF is used in the Case Company's appraisal process. Simply saying, the FCFF is the amount of cash available to all investors, both equity and debt holders. That is the cash left over after a company pays for all of its costs and invests in the short-term or long-term assets. In other words, FCFF consists of expenses, taxes and changes in the net working capital (NWC) and capital expenditures (CAPEX). (CFA Institute 2016, 2).

There are few ways of calculating FCFF, however in the most cases the measure is calculated by using Net operating profit after tax (NOPAT). The formula is represented below. In the next few paragraphs all the components of the formula are described.

$$(1.0) \quad FCFF = NOPAT + Depreciation - Changes in NWC - Changes in CAPEX$$

(Damodaran 2010, 46)

NOPAT: According to the Association of Chartered Certified Accountants (ACCA) (2011) and ManagementMania.com (2011-2013), NOPAT stands for Net operating profit after tax and reflects the operating profit generated by the core activity of a business adjusted for the impact of taxes. It equals earnings before interest and taxes (EBIT) minus taxes.

$$(2.0) \quad NOPAT = EBIT \times (1 - tax\ rate),$$

where tax rate is the Company's legal corporate tax rate.

(the Association of Chartered Certified Accountants (ACCA) 2011; ManagementMania.com 2011-2013).

Net working capital (NWC): Working capital is the capital available for conducting the day-to-day operations of the business or, more specifically, short-term financing to maintain current assets such as inventory (Hill & Bookboon.com 2013, 12). It consists of current

assets and current liabilities. Current assets are the assets that can be turned into cash during the normal operating cycle of a business. Cash and cash equivalents, in their turn, are also considered as current assets. Commonly on the balance sheet current assets consist of cash, inventories, accounts receivable and short-term investments. Liabilities are called current if they must be paid within one year. They usually include short-term debt and accounts payable. So, the net working capital (NWC) reflects the difference between current assets and current liabilities. If the NWC is positive, it is treated as a cost against free cash flow because more cash is tied up to working capital.

b. Discount Rates

In valuation, according to Damodaran (2010), the discount rates represent the riskiness of the cash flows. So, with the higher risk cash flows have higher discount rates and vice versa. The same thought expressed Martland (2011): “higher risks will require a higher discount rate”. There are two typical ways of viewing risk. The first is about the likelihood that a company would not be able to perform duties regarding the payments, such as interest or principal due. Such risks are called default risk. Taking an example of a consumer debt, the cost of debt (the rate the debtor pays on the debt) is the rate that reflects this default risk.

The second conception of the risk can be explained in terms of the variation of actual returns around expected returns. The actual returns on an investment can be very different from expected returns; the greater the variation, the greater the risk. (Damodaran A. 2006-2012). For instance, a company acquired a new facility abroad to produce products with an intention to have costs in the currency of that country. When the decision was accepted the currency rate was favorable, so that the production costs were relatively low making it possible to have high margins. However, suddenly the foreign currency appreciated for some reason, and the margins decreased, so that the return on the investment became lower than expected. This is where the market comes with its uncertainties. In valuation, the second conception of the risk is represented as the cost of equity, so the expected rate of return on the riskless investment plus a premium which reflects the market risk in the investment.

The discount rate used in valuation is commonly called the cost of capital. The cost of capital can be obtained by taking an average of the cost of equity and the cost of debt (the after-tax cost of borrowing), based upon default risk, and weighting by the proportions used by each. Such calculation leads to getting the Weighted Average Cost of Capital of

a company or WACC. The formula of WACC is shown below (Koller, Goedhart and Wessels 2005, 113):

$$(3.0) \quad WACC = \frac{D}{D+E} \times R_d(1 - T_m) + \frac{E}{D+E} \times R_e,$$

where:

D – value of debt;

E – value of equity;

R_d – the average rate the company pays for its debts;

R_e – rate of return by equity holders;

T_m – marginal tax rate.

Rate of Return (R_e) shall be explained in more detail. It is related to the Capital Asset Pricing Model (CAPM) which was introduced and developed independently by Jack Treynor, William F. Sharpe, John Lintner and Jan Mossin. The model describes the relationship between risk and expected return. The assumption is reflected in the following formula:

$$(4.0) \quad R_e = R_f + (R_m - R_f) \times B,$$

where:

R_e – expected rate of return;

R_m – expected market rate of return (historical rate of return);

R_f – risk free rate of return;

B – beta coefficient.

(Shannon P. Pratt & Alina V. Niculita 2008, 189)

Expected market rate of return (R_m) is usually determined by looking at the return of a specific index, which reflects the dynamics of the market a company operates in. Risk free rate of return, in its turn, is a return on a governmental bond (current yield), usually with an expiration within the period of the valuation analysis. (Damodaran 2006-2012, 5).

Beta coefficient is the most difficult input in the formula. Under the CAPM theory, Beta is a forward-looking risk measure. In the equity market, the indicator reflects the relationship between return of company's stock and return of company's market (or index). "In other words, beta measures the volatility of the excess return on an individual security relative to that of the market. Securities that have Betas greater than 1.0 are characterized as aggressive securities and are riskier than the market. Securities that have Betas of less than 1.0 are commonly characterized as defensive securities and have systematic risks lower than that of the market." (Pratt & Niculita 2008, 189). The Beta for a public company can be identified by taking a ratio of the retrospective covariance between the daily share price return and the daily index return (used as a proxy for the whole market) and the variance of the daily market return. (BNP Paribas 2015, 2) Wherein, Beta for a private

company is usually determined by taking average Beta of comparable public companies or Beta of the whole industry the company operates in. (Damodaran 2006-2012, 183)

c. *Expected Growth*

Most of confrontation among analysts comes around forecasting the growth rate of an equity value. Anyway, there are three widely used ways of estimating. The first one is based on retrospectivity. It means that a specialist analyses a company's past and uses the historical growth rate posted by that company. The main disadvantage here is that the future growth can seriously differ from the past one taking into consideration, for instance, market implications. The second approach is to obtain estimates of growth from specialized sources. There are two general options, either to utilize the estimates provided by a company's management or to take consensus estimates of growth made by analysts who follow a firm, a firm's sector etc. The bias associated with both these sources should raise questions about the resulting valuations. (Damodaran 2006-2012). Finally, the third way of growth rate estimation examines how much of the earnings are reinvested back into the firm and how well those earnings are reinvested. (Damodaran 2006-2012). However, the method is rarely used in the small entities' appraisal processes since typically there is lack of necessary data and no precise records of its investment activities.

d. *Terminal Value*

The Terminal Value is the value of a project's or a company's cash flow beyond the explicit projection period. The terminal value (TV) captures the value of a business beyond the projection period in all kinds of valuation methods, including the DCF analysis. (Macabus LLC. 2016).

For example, by analysing a firm's cash flow over a 5-year horizon only, the final company's value an analyst would calculate is the value of a business it accumulates during this projected period. However, in order to identify the company's value beyond that the Terminal Value should be added. "A high-quality estimate of terminal value is critical because it often accounts for a large percentage of the total value of the project in a discounted cash flow valuation" (Wärnelid 2011). The formula for calculating TV is represented below:

$$(5.0) \quad \text{Terminal Value} = \frac{FCFF_n \cdot (1+g)}{(r-g)}$$

where:

FCFF_n – Free Cash Flow to the Firm at the end of the projected period;

g - perpetual growth rate which is usually between GDP growth rate and inflation;

(Macabus LLC. 2016)

r – a firm's cost of capital (usually WACC). (Damodaran 2006-2012; Wärmelid 2011).

4.4 DCF Valuation Process

The process of the DCF valuation basically consists of few main steps.

Step 1. FCFF calculation

The first step suggests identifying what is the FCFF for a company taking into consideration the key financial statements such as EBIT, depreciation and amortization, current assets and liabilities.

Step 2. WACC and present values of FCFF calculation

The second step is about determining the Weighted Average Cost of Capital (WACC), which is the discount rate used in the valuation process. By Applying the discount rate analysts are able to calculate the present value of all expected FCFF and sum them up to identify the value of the firm over the period under review. The formula of the company's value is represented below:

$$(6.0) \quad \text{Value of Firm} = \sum_{t=1}^{t=x} \frac{FCFF_t}{(1+WACC)^t}$$

(Damodaran 2006-2012, 15.8)

Step 3. Terminal Value and the total entity's value calculation

However, in a bid to calculate the value of future cash flows beyond the projection period the Terminal Value should be added to the formula above (Corality 2014). Then the formula turns into a new one (Damodaran 2006-2012, 12.27):

$$(7.0) \quad \text{Value of Firm} = \sum_{t=1}^{t=x} \frac{FCFF_t}{(1+WACC)^t} + \frac{\text{Terminal Value}}{(1+WACC)^n}$$

In order to assess the company performance, analysts check the result of the formula. A constant positive result of DCF over the period indicates that the company is in a good shape and increases its value. On the other hand, if a company's DCF results are negative

or neutral, its managers should take actions to save the company's future by employing risk management tools.

5 ECONOMIC VALUE ADDED VALUATION METHOD

5.1 Definition

Stern Stewart & Co, a consulting firm based in New York, introduced the concept of EVA as a measurement tool in 1989, and trademarked it. The EVA concept is often called Economic Profit (EP) to avoid problems caused by the trade marking. It further became one of the most useful and widely used valuation methods. It is fully accepted that EVA has the same applicability in the financial world as DCF.

Economic value added (EVA) method is one of the income approaches to an asset valuation. EVA is based on a simple concept; if any investment achieves a return that is more than the investor requires then value has been added to the investment. (John Wilson 1997). Geyser & Liebenberg (2003, 107) explained EVA concept in more complex manner: EVA is a value based financial performance measure, an investment decision tool and a performance measure reflecting the absolute amount of shareholder value created. In other words, it reflects the excess return made on an investment, i.e. EVA is an estimate of true economic profit, or the amount by which returns or earnings exceed or fall short of the required minimum rate of return investors could get by investing in other securities or projects, which have comparable risk (Geyser & Liebenberg 2003, 107).

More concretely, EVA is based on the residual profitability which is calculated by subtracting the opportunity cost of invested capital from net operating profit after taxes (NOPAT). The opportunity cost of invested capital or the capital charge is determined by multiplying WACC and the capital invested. (Stewart III, 1991)

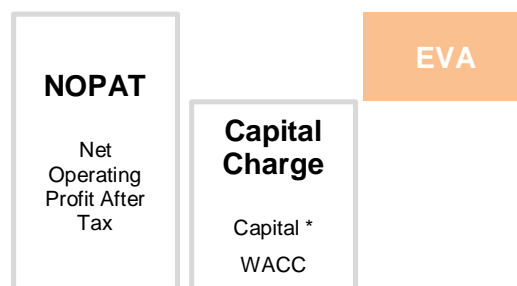


FIGURE 6. The Economic Value Added Conception.
(Stewart III, 1991)

5.2 Advantages and disadvantages of the EVA valuation approach

Economic value added approach is associated with a single, simple method that provides a real picture of shareholder wealth creation. The EVA system helps managers to make better investment decisions, identify improvement opportunities and consider long-term and short-term benefits for the company. The EVA method effectively measures the quality of managerial decisions. (Geyser & Liebenberg 2003, 3). More than that, conduction of EVA analysis for management purposes helps managers act more like owners, what brings an abundance of benefits for the business (Roztocki & Needy, 1).

There are basically four main advantages of Economic Value Added method: efficiency, ability to increase managers' motivation, applicability and simplicity. All of them are represented and described in the table below:

TABLE 2. Advantages of EVA Method.

Advantage	Description
Efficiency	EVA can make managers and firms be more efficient by the means of showing "what value was created from what capital was used; in this way it can judge efficiency". (Rago 2008, p.16).
Ability to increase managers' motivation	One of the founders of EVA concept G. Bennett Stewart III points out that companies may base their managers' bonuses on an adjusted percentage of EVA, suggesting that the managers may get a portion of the actual value they create for shareholders. (Rago 2008, p.16).
Applicability and simplicity	EVA calculation is simple, since only main data contained in income statement and balance sheet is needed. Interpretation of the valuation results is simple: positive EVA indicates value creation while negative EVA indicates value destruction showing the need of changes. In addition, EVA helps to understand the concept of profitability even by employees not familiar with finance and accounting. In small companies (what is important), managers can make the EVA concept transparent to all employees in a short time, so that motivating them to work more efficient in accordance with management plans. (Mäkeläinen and Roztocki 1998, 5-7).

As far as disadvantages are concerned, according to Brewer, Chandra and Hock (1999), EVA method have four limitations. All of the disadvantages are reflected and described in the table below:

TABLE 3. Disadvantages of EVA Method.

Disadvantage	Description
Size difference	The EVA analysis of the value created by different-size business units of a company does not represent the real picture of management effectiveness since the results are absolute numbers. For example, a division with the highest EVA can have a lower Return on Investment (ROI). (Brewer, Chandra, Hock 1999; Kaplan Financial Limited 2012).
Financial orientation	EVA is a computed number that relies on financial accounting methods of revenue consolidation and expense identification. So, there is a chance that managers would manipulate these numbers by altering their decision making processes in their own favour. (Brewer, Chandra, Hock 1999).
Short-term orientation	This disadvantage is about the EVA method as a tool of managers' compensation. The cons of using EVA to evaluate managers' incentives is that the payrolls should be executed during the accounting period in accordance with a performance of projects handled. However, in case if projects fail to create value during short-time period (accounting period) the effectiveness of managers' work may be unfairly questionable. Sometimes it leads to lower compensations, downshifting processes or even layoffs. It then creates a disincentive for managers to invest in innovative products/projects, the costs of which are usually recognized by accountants immediately while benefits or revenues are recognized only after few years forward. (Brewer, Chandra, Hock 1999).
Results orientation	Results-oriented financial numbers, such as EVA, that are accumulated at the end of an accounting period do not reflect the actual causes of operational inefficiencies. Therefore, if not thoroughly interpreted by the accountants, these measures offer limited useful information to people charged with the responsibility of managing non-financial business processes. (Brewer, Chandra, Hock 1999).

5.3 Key components

Economic value added method is simpler and shorter than DCF approach. In EVA analysis professionals basically look for three main inputs: NOPAT, company's Capital and company's Cost of Capital. All this information can be found in the company's Income Statement and Balance Sheet. (Mäkeläinen and Roztocky 1998, 7).

The formula for calculating EVA is represented below:

$$(8.0) \quad EVA = NOPAT - Capital \times Cost \text{ of Capital}$$

NOPAT and cost of capital (WACC) were discussed in the thesis earlier (Formulas 2.0 and 3.0), so that only Capital (C) is worth describing in the section. The company's Capital is interest bearing liabilities which are equal to total liabilities minus non-interest liabilities (Mäkeläinen and Roztocki 1998, 13). According Gallinger (2016, 8) this is called operating approach. The formula is represented below:

$$(9.0) \quad Capital = Total \text{ liabilities} - Account \text{ Payable} - Accrued \text{ Expense}$$

There is also another way of calculating the Capital (financing approach), the formula of which is shown below (Gallinger 2016, 9):

$$(10.0) \quad Capital = Short - term \text{ debt} + Long - term \text{ debt} + Owner's \text{ Equity}$$

5.4 EVA Valuation Process

As it was previously mentioned the Economic Value Added valuation method is easier to implement than the DCF analysis. So, the process takes less time and it is relatively clear. Basically the process consists of five main steps and one more which is about the identification of the final company's value taking into consideration Terminal Value of EVA. All needed data to be gathered and the process itself are represented on the chart below; the description of the steps is discussed further. (Roztocki, Needy, 2-4; Mäkeläinen and Roztocki 1998, 11-15)

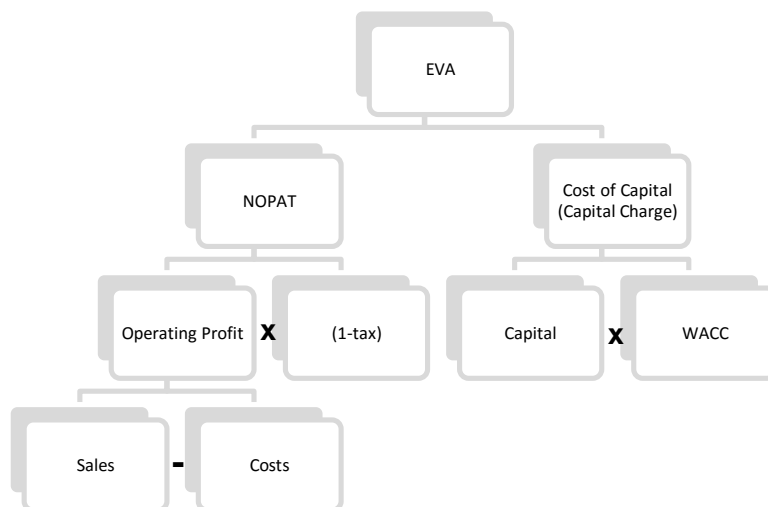


FIGURE 7. EVA valuation process.
(ManagementMania.com 2011-2013).

Step 1. Review the company's financial data

Almost all needed information for EVA valuation can be obtained from a company's income statements and balance sheets. Some of the needed data may also be found in the notes to financial statements. Wherein most commonly the two most current years of data are sufficient to appraise the company with the use of EVA method. (Roztock, Needy, 2)

Step 2. Calculate Net Operating Profit After Tax (NOPAT)

As it was already mentioned NOPAT reflects the operating profit generated by the core activity of a business adjusted for the impact of taxes. It equals earnings before interest and taxes (EBIT) minus taxes. (Mäkeläinen and Roztock 1998, 10-12)

Step 3. Identify the Company's Capital (C)

In addition to what was discussed earlier A company's capital, C, is all of the money invested in the company. A company's capital can be estimated by adding all debts to owners' equity. An alternative way is to subtract all non-interest-bearing liabilities from total liabilities (or total assets). (Roztock, Needy, 2).

Step 4. Determine the Company's Cost of Capital or WACC

This step is the hardest in EVA valuation process especially when it is about a small company. Estimating the capital costs of a small business is always a challenge, because it depends on the company's financial structures, business risks, current interest level, and investors' expectation. So, in such case analysts identify Weighed Average Cost of Capital (WACC), the formula of which was demonstrated in this document earlier. (Copeland, Koller, & Murrin, 1996; Roztock, Needy, 2-3).

Step 5. Calculate Economic Value Added

Finally, the EVA is calculated by subtracting the so-called Capital Charge (Cost of Capital x Capital) from NOPAT. If the result is positive, the company created value for its owners, while If the EVA is negative, owner's wealth was reduced. (Roztock, Needy, 4).

Step 6. Identify the company's total value

The final step is the same as the one in DCF analysis. Firstly, the Terminal Value of EVA should be determined by using the following formula:

$$(11.0) \quad \text{Terminal Value} = \frac{EVA_n * (1+g)}{(r-g)}$$

where:

EVA – EVA generated in the last analyzed period;

g - perpetual growth rate which is usually between GDP growth rate and inflation (Macabacus LLC 2016);

r – firm's cost of capital (usually WACC).

Then the Terminal Value is added to the Value of the firm aggregated during the projected period. It should be done to calculate the value of the company beyond the projection period. The following formula is used:

$$(12.0) \quad \text{Value of Firm} = \sum_{t=1}^{t=x} \frac{EVA_t}{(1+WACC)^t} + \frac{\text{Terminal Value of EVA}}{(1+WACC)^n}$$

In the next chapter the DCF and EVA valuation of Protect Company are implemented and compared.

6 VALUATION OF PROTECT COMPANY

6.1 Methodology and Justification

Valuation Methods Justification

The methodology used in the thesis work is semi-qualitative. During the work I communicated with Protect Company's management on the constant basis in order to determine the assumptions for the financial models, identify the current market situation and future developments inside the Company. The interviews gave me all necessary information about the market the Firm operates in and the Company's situation itself. The data I acquired was used in the valuation process and had impact on the recommendations that I provided to the Company's management.

As far as valuation methods are concerned, I and Protect Company's management decided to select income-based valuation approaches, DCF and EVA in particular, due to one general reason: the methods are the most widely used, so that the results of the DCF and EVA appraisal would be perceived by investors and banks as solid and reliable. Surely, the other methods are reliable as well, however in the Company's case there was no possibility and no relevance to utilize them. Regarding market-based approaches, the methods were not selected because of lack of comparable companies or transactions and shortage of available data. Asset-based approach was not chosen since the Firm is not considering liquidation and has not only tangible but a significant portion of intangible assets. Moreover, the Company's management is not planning to sell a majority stake in a bid to save the control over the business. Finally, Protect Company, being a small entity, does not possess assets with option-like features, therefore the option-pricing approaches were also rejected.

In addition to DCF and EVA methods selection justification, the choice of using Free cash flow of firm (FCFF) or Cash flow to invested capital model of DCF, represented in the Table I, needs to be explained. The model is utilized in the appraising process of Protect Company since the Company's business is fully cyclical, what means that the financial situation of the Company is better in periods of economic prosperity and expansion, and worse in periods of economic downturn and contraction. The nature of the Firm's business is so that during the economic downturns people and entities cut as many costs as they can afford, including expenses on security. On the other hand, when economy is in good shape, there is a possibility to invest in security-related projects with the general aim at saving assets. However, the essential point is that in Russia in times of crises people and companies tend to put some means aside for improving security systems in order to avoid

safety concerns. The reason is an increasing level of criminality in the country that is usually associated with deterioration of the economic state. Therefore, the Company's performance during downturns might be identified as moderately positive or moderately negative depending on the scale of the contraction.

Financial Data, Indicators and Assumptions for Valuation Process

All the necessary data was provided by the Company's management during my internship at the Firm. Since the Company is a small business, it does not keep financial records in accordance with IFRS standards, therefore one of my main tasks was to adapt the documents to the standard form in order to properly use selected valuation methods. Also, it is worth to be mentioned that under the agreement between me and the Company, it is forbidden to disclose any real numbers, so that in the Thesis I decided to rescale the results leaving all the proportions unchanged.

The table below shows the general assumptions that were used within valuation processes. All of them are based on the retrospective analysis of the Company's past performance and the Company's management projection which, in their turn, are based on many various factors, such as: macroeconomic and geopolitical situation, sector trends and fiscal policies. All the assumptions were provided by the Company's management during the interviews with the managers. The alteration of the indicators within the projected period are made in accordance with the Company's plans.

Moreover, the decrease of the corporate tax should be described in more detail. In Russia small entities recently switched to the taxation form that is income-based. Before that small Russian companies were taxed by a fixed sum depending on the size of the business. Currently Protect Company's tax rate is 7%, however the Company's management expect that in 2018 the government would lower it to 6%. This assumption is based on the officials' discussions regarding the future of corporate taxation in Russia.

TABLE 4. Assumptions.

	2016E	2017E	2018E	2019E	2020E
Revenue growth rate	8.0%	8.0%	8.0%	8.0%	8.0%
Cost of revenue as of % of revenue	62.1%	60.0%	60.0%	60.0%	60.0%
Sales and marketing costs as of % of revenue	10.0%	7.8%	5.4%	5.1%	5.0%

General and administrative cost as of % of revenue	8.4%	8.4%	8.4%	8.4%	8.4%
Research and development cost as of % of revenue	2.7%	2.7%	2.7%	2.7%	2.7%
Amortization and depreciation as of % of starting PPE	6.0%	6.0%	6.0%	6.0%	6.0%
Total operating expenses as of % of revenue	18.3%	18.3%	18.3%	18.3%	18.3%
Interest expense as of % of EBITDA	15.0%	10.0%	9.0%	9.0%	9.0%
Provision for income taxes as of % of EBIT (Corporate Tax)	7.0%	7.0%	6.0%	6.0%	6.0%

The following table presents used factors and ways of their calculation. Despite the calculation descriptions shown in the table, few factors are needed to be justified in more detail.

As it was mentioned in theoretical part of the thesis, expected market rate of return (R_m) is usually determined by looking at the return of a specific index, which reflects the dynamics of the market a company operates in. However, in the Company's case, since it is a small business operating in specific segment, there are no such an indicator, that is why it was decided by the Company's management to integrate the 5-year retrospective average growth rate of the Russian real GDP with official forecasts. My supervisors at Protect Company did not recommend to use the average economic growth rate of Northwestern region of Russia, where the Firm mainly runs its business. The reason behind the suggestion is that the economic growth rate of Northwestern region of Russia is historically higher than the one of the Russian real GDP. So, due to the crisis situation in the country, the management decided to make growth expectations more realistic by lowering them.

Risk free rate of return (R_f), in its turn, is a return on a governmental bond (current yield), usually with an expiration within the period of the valuation analysis. In the Company's case the analysis is conducted over five-year horizon, that is why the yield of the five-year Russian governmental bonds is used.

Finally, the Beta coefficient is calculated as the weighted average Beta of comparable public American companies. The reason behind choosing the method for identifying the indicator is that there are no such index or comparable firms in Russia, where the Beta might be taken from. The assumption is that the Beta of the Company is 0.55, meaning that investments in Protect Company is less risky and less volatile than in the whole Russian equity market. I and the Company's management accepted the assumption referring to the fact that the Firm's business mainly performs better than the economy

during downturns due to the rising level of criminality in Russia and consequently relatively high spendings on security.

TABLE 5. Factors.

Factors	Value	Calculation
Expected market rate of return (R _m)	9.36%	5-year retrospective average growth rate of Russian real GDP along with official forecasts (Federal State Statistics Service 2016).
Perpetual growth rate (g)	6.8%	10-year retrospective average growth rate of real GDP and inflation in Russia (Federal State Statistics Service 2016).
Risk free rate of return (R _f)	9.10%	5-year Russian governmental bond yield on 13.03.16 (Fusion Media Limited 2007-2016)
Beta coefficient (B)	0.55	Weighted average Beta coefficient of the most similar American companies*.
Cost of Equity (R _e)	9.24%	Result of the following formula: $R_f + (R_m - R_f) * B$.
Cost of Debt (R _d)	17.80%	Average interest rate the Company's pays to its debtors.
WACC	10.90%	Result of the WACC formula (3.0)

*Universal Security Instruments, Magal Security Systems, Napco Security Technologies, Vicon Industries.

6.2 Protect Company LLC

Overview

Protect Company LLC was established in 2002 in Russia. The core asset of the company are specialists who have more than 20 years of experience in the electronic security systems field. The Company offers services in planning, installation and maintenance of security systems for corporate and private customers. The company cooperates with the leading producers of security software and equipment, and conducts design and estimate documentation in accordance with the latest standards and requirements.

The organization participated in several pilot projects connected with integration of innovative technology to some organisations' operational processes. The Company operates mainly on the Russian market, but it also possesses international experience - for example, in Afghanistan and Kazakhstan. The organization has established

partnership with several electronic security companies in Saint-Petersburg, Moscow and other important cities across Russia.

Financial situation

Over the last five years Protect Company has been recovering from the global financial crisis which took place in 2008. A year before that the Company demonstrated record results that are about to be reached in the near future. Surely, current economic situation in Russia is not favorable especially for small businesses. More than that, the market conditions may only deteriorate in 2016 and even in 2017 if the government would not present core structural reforms and the price of oil would linger on the current multi-year lows.

Despite of all these factors the Case Company only gains perspectives in some way, because usually the criminality level in the country increases during the economic downturns. Due to this reasons households, businesses and government are forced to boost expenditures on security services. Apart from that, taking into consideration sanctions and so-called import-replacement programs, the government heavily invests in strategically important fields. Protect Company has a wide experience in government procurement processes, so that it plans to continue participate in projects backed by the state. Based on the aforementioned drivers the Company's management along with me believe that there is still huge potential for the earnings growth in the foreseeable future.

Below are represented an adjusted and rescaled income statement and balance sheet of the Company.

TABLE 6. Adjusted and rescaled Income Statement of Protect Company
(all numbers in thousands RUB)

	2014	2015
REVENUE	6,970.00	6,680.00
Cost of revenue	4,251.70	4,147.90
GROSS PROFIT	2,718.30	2,532.10
Operating expenses		
Sales and marketing	470.40	524.10
General and administrative	320.80	349.30
Research and development	120.00	180.20
Amortization and depreciation	147.60	170.50
Total operating expenses	1,058.80	1,224.10
OPERATING PROFIT (EBIT)	1,659.50	1,308.00
Interest expense	120.90	163.50
Other income/(expense), net	0.00	0.00

INCOME BEFORE INCOME TAXES	1,538.60	1,144.50
Provision for income taxes	107.70	80.12
NET INCOME	1,430.90	1,064.39

TABLE 7. Adjusted and rescaled Balance Sheet of Protect Company
(all numbers in thousands RUB)

	2014	2015
ASSETS		
Current assets:		
Cash and Cash Equivalents	367.90	197.70
Accounts receivable	814.20	733.00
Other current assets	0.00	0.00
Total current assets	1,182.10	930.70
Long-term assets:		
Property, Plant and Equipment, net	2,523.60	2,860.80
Other long-term assets	387.50	394.10
Total long-term assets	2,911.10	3,254.90
Total assets	4,093.20	4,185.60
LIABILITIES		
Current liabilities:		
Accounts payable	103.00	114.20
Other current liabilities	0.00	0.00
Total current liabilities	103.00	114.20
Long-term liabilities:		
Deferred Revenue	0.00	0.00
Long-term debt	845.70	918.50
Total long-term liabilities	845.70	918.50
Total liabilities	948.70	1,032.70
OWNERS' EQUITY		
Shared capital	2,430.00	2,580.00
Retained earnings	714.50	572.90
Total owner's equity	3,144.50	3,152.90
Total liabilities and owner's equity	4,093.20	4,185.60

6.3 Discounted cash-flow valuation

Data gathering and Calculation Process

As it was mentioned in the Chapter 4, in DCF valuation approach there are several key components, such as: Free Cash Flow to the Firm (FCFF), Net Operating Profit After Taxes (NOPAT), Depreciation, Net Working Capital (NWC) and Capital Expenditures (CAPEX). All needed data was extracted from the Company's Income Statement and

Balance Sheet. Total Current Assets, Total Current Liabilities and CAPEX values are calculated as a percentage of Revenue. The calculation was conducted on the basis of retrospective analysis of the Company's performance and forecasts of the Company's management. Depreciation and Amortization values, in their turn, are calculated as a percentage of Property, Plant and Equipment (PPE), which are, according to historical records, around 6% of PPE value. The next few paragraphs briefly describe the steps of DCF analysis that are explained in the Chapter 4. For the sake of clarity, the Table VIII. with the key calculations is also presented below.

In the beginning of the valuation process all of the aforementioned assumptions are applied to the model and the first main component (EBIT) is calculated. After that the taxes are deducted from EBIT in order to identify the next main component – NOPAT. Then, referring to the assumptions and Formula 4.1, FCFF for the projected period is calculated. The next step is to discount FCFF values taking into account WACC as a discount rate. In the table below the term discount factor is used in order to simplify the calculation of DCF. Discount factor is found by the following formula:

$$(13.0) \quad \text{Discount factor} = \frac{1}{(1+WACC)^2}$$

Therefore, DCF values can be calculated by only multiplying FCFF by discount factor. The process is presented in the table below.

TABLE 8. Case Company DCF Calculation.
(all numbers in thousands RUB).

	2016E	2017E	2018E	2019E	2020E
REVENUE	7,214.40	7,791.55	8,414.88	9,088.07	9,815.11
Revenue growth rate	8%	8%	8%	8%	8%
EBIT	1,027.88	1,445.14	1,762.71	1,930.99	2,095.29
EBIT Margin rate	14.25%	18.55%	20.95%	21.25%	21.35%
(less taxes on EBIT)	(71.95)	(101.16)	(123.39)	(135.17)	(146.67)
NOPAT	955.92	1,343.98	1,639.32	1,795.82	1,948.62
add D&A	184.14	198.88	214.79	231.97	250.53
(less increase in WC)	(860.87)	(467.49)	(504.89)	(545.28)	(588.91)
Total Current Assets	1,005.16	623.32	673.19	727.05	785.21
Total Current Liabilities	144.29	155.83	168.30	181.76	196.30
(less CAPEX)	(721.44)	(623.32)	(420.74)	(454.40)	(490.76)
FCFF	(442.24)	452.04	928.47	1,028.10	1,119.48
Discount factor	0.90	0.81	0.73	0.66	0.60
DCF	(398.81)	367.61	680.90	679.92	667.64

Basically there are three minor steps left to finish the DCF valuation process. Firstly, the Terminal Value is calculated and discounted by using Formula 4.7. After that all DCF

values are summed up by using Formula 4.6. Finally, both figures added up. The Company's total value calculation is represented in the table below.

TABLE 9. Company Value Calculation (DCF approach).
(all numbers in thousands RUB).

Terminal Value (TV)	29,240.12
Present Value of Cash Flows	1,997.27
Present Value of TV	17,438.38
Total Value of the Case Company	19,435.65

So, according to the DCF valuation, the value of the Case Company is 19,435,650 RUB. As far as it is a positive number, investors and banks will treat the Company as an entity able to manage its obligations and liabilities. Therefore, the chance of getting capital infusions or obtaining loans with favorable terms increases.

6.4 Economic value added valuation

Data gathering and Calculation Process

According to Chapter 5, there are three main inputs that professionals look for: NOPAT, company's Capital and company's Cost of Capital. At that analysts can find these indicators by only using Income Statement and Balance Sheet. The calculation of NOPAT was demonstrated in the previous section and the Cost of Capital, i.e. is already known. So that, Capital is the only thing which needs to be calculated under EVA method. As it is seen from Formula 10.0 Capital (C) is a sum of short and long-term debts and owner's equity.

The table below demonstrates the Economic Value Added calculation process. In EVA valuation approach the Company's NOPAT is the same, so the upper part of the table is identical to the upper part of the DCF table. However, EVA is found by using another formula, i.e. by subtracting the result of multiplication of Capital and Cost of Capital (Capital Charge) from NOPAT. Then the next step is to discount EVA to the present values by using discount factor which is described in the previous section.

TABLE 10. Protect Company EVA Calculation.
(all numbers in thousands RUB).

	2016E	2017E	2018E	2019E	2020E
REVENUE	7,214.40	7,791.55	8,414.88	9,088.07	9,815.11
Revenue growth rate	8%	8%	8%	8%	8%
EBIT	1,027.88	1,445.14	1,762.71	1,930.99	2,095.29
EBIT Margin rate	14.25%	18.55%	20.95%	21.25%	21.35%
(less taxes on EBIT)	(71.95)	(101.16)	(123.39)	(135.17)	(146.67)
NOPAT	955.92	1,343.98	1,639.32	1,795.82	1,948.62
(less Capital Charge)	(675.31)	(690.13)	(706.14)	(723.42)	(742.09)
Capital	6,200.89	6,336.96	6,483.92	6,642.63	6,814.04
Cost of Capital	0.109	0.109	0.109	0.109	0.109
EVA	280.61	653.85	933.19	1,072.40	1,206.53
Discount factor	0.90	0.81	0.73	0.66	0.60
Discounted EVA	253.05	531.73	684.36	709.22	719.56

After that, the Terminal Value of EVA is calculated through Formula 11.0 and all discounted EVA values are summed up. And finally, these two numbers are added up and the Company's value is identified. The Company's total value calculation is represented in the table below.

TABLE 11. Company Value Calculation (EVA approach).
(all numbers in thousands RUB).

Terminal Value (TV)	31,513.78
Present Value of Cash Flows	2,897.91
Present Value of TV	18,794.36
Total Value of Protect Company	21,692.28

According to the EVA valuation, the value of Protect Company is 21,692,280 RUB. EVA analysis also indicates that the Company, taking into consideration market condition and its plans, would yield positive results. Therefore, stakeholders, among which are potential investors and debtors, would optimistically consider future cooperation with the Company.

6.5 Comparison of the results

There was a number of studies, pointing out that the results of DCF and EVA valuation methods are identical. For example, Mark Storrie and David Sinclair from Arizona State University in their paperwork "Is EVA equivalent to DCF" (2016, 1) quote Steve Stetz, corporate vice president at Monsanto, that EVA and DCF valuation methods produce equal results. Wayne E. Blackburn, FCAS, Derek A. Jones, ACAS, Joy A. Schwartzman,

FCAS, and Dov Siegman from Casualty Actuarial Society (2016, 1), proved this point of view in their work *“The Application of Fundamental Valuation Principles to Property/Casualty Insurance Companies”* (2016, 11-20) by using simple DCF and EVA models.

Theoretically, it is fair that both approaches should generate identical result because EVA is basically a mathematical modification of DCF (Modesti 2007, 67). However, in the real business world there is a chance that both methods would lead to different results. In the Company's case the results are not the same and the difference is around 2,260,000 RUB. The Company's management and me agreed on the fact that this outcome could be caused by two main factors. The first one is that the financial records of the Company were transformed from Russian standards for small entities to IFRS standards and hence some values to some extent were improperly identified. The second reason refers to the basic concept of valuation – bias, i.e. possible manipulations with the numbers. Based on this the Company's management accepted the differences and is planning to use them in negotiations as lower and upper bounds.

7 CONCLUSION AND RECOMMENDATIONS

In this chapter I give an answer to the principle question of the thesis: which method, DCF or EVA, is better to be used in case of appraising small-sized company. Apart from that, I perform as a consultant giving few advises to Protect Company regarding the ways of the future financial situation improvements.

Valuation is an essential tool for a small private companies which aim to better management performance and to obtain some leverage in negotiations with investors, banks or other companies regarding capital infusions or acquisition matters. I chose two valuation methods which refer to income approaches: Discounted Cash Flow method and Economic Value Added method. The aim was to compare the appraisal process and results of two methods. DCF analysis demonstrated that the value of the Company is 19,435,650 RUB, while EVA analysis led to the value of 21,692,280 RUB. So that, the difference between two results is about 2,260,000 RUB and such an outcome was accepted by the Company's management. More than that, the Company plans to use these two numbers as the lower and upper bounds in negotiation processes with potential investors and debtors. Anyway, the positive results show that the Company is attractive for those who is looking for investment opportunities in SME segment in Leningrad region, Russia.

During the thesis work I deeply explored the two most-widely used valuation methods, hence I can give recommendations which method is more applicable within small entities appraisal processes. Observations headed me to an opinion that the Economic Value Added approach might be preferred by analyst over the Discounted Cash Flow method due to few reasons. The first reason is simplicity; I fully agree with E. Mäkeläinen and N. Roztock, who consider that only main data contained in income statement and balance sheet is needed to conduct EVA valuation. Moreover, it is easy to interpret the valuation results: positive EVA indicates value creation, while negative EVA indicates value destruction. Additionally, I express the same opinion as Wayne E. Blackburn, FCAS, Derek A. Jones, ACAS, Joy A. Schwartzman, FCAS, and Dov Siegman (2016, 19); in particular, that EVA is more straightforward to apply and avoids potential complications. That is why invented in 1990s by Stern Stewart & Co the Economic Value Added method became so popular among financial professionals.

Within the internship program and the thesis writing process I scrupulously inspected the Company's business and its financial situation and therefore am able to propose some assumptions and suggestions to the Company's management regarding refining its performance in the futures making the Company more attractive for all current and

potential stakeholders. There are typically two ways: increase sales or cut costs. The first option was already planned by the Company. Specifically, the company is heavily investing in marketing projects and developing its strategy on gaining state contracts. However, as far as expenditures are concerned, the Company has not prepared a thorough program aiming at optimizing its cost structure. Therefore, I mainly concentrated on bringing solutions regarding possible spending cuts. Variable costs compose most of the expenditures. The Company's Variable cost are basically expenditures related to procurement of security systems equipment and wages to outsourced installers.

Hence, the Company may shrink aforementioned spendings, nonetheless it would not rather be able to negotiate less favorable terms for installers taking into account negative economic situation in Russia and a fall in household income. For this reason, the only option is to decrease procurement costs by signing long-term contracts with equipment resellers. This measure may save up to 20-30% of purchasing costs. Another method is to start procuring the equipment in Asia, particularly in China or South Korea. This way, in its turn, let the Company reduce costs by 15-40%. Moreover, the Company may find ways of buying security systems, for example, in Finland in a bid to receive back value-added tax of 24%.

As for other costs, an apparent measure is to conduct refinancing projects. Currently, the Company pays relatively high interests on its debts. However, as time passes by, the economic conditions in the country would ameliorate and consequently the rates would descend. This would give an opportunity to the Case Company of lowering its current interests by refinancing measures.

8 DISCUSSION

There are two principle goals of this thesis: the theoretical and the practical one. Theoretical aim relates to the comparison of the two most-widely business valuation methods, particularly Discounted Cash Flow and Economic Value Added. The objective of the comparison is to give a recommendation on what method is better to be used by professionals in small entities appraisal processes. The practical aim, in its turn, refers to actual valuation of the Client Company with the use of two aforementioned approaches. The result of the thesis work might be used by the Company in negotiations on capital infusions conducted either by investors or by debtors. Moreover, the Company, having its approximate price, might use it in case of merger or acquisition propositions. So that, the thesis is basically divided into two main parts: the theoretical and the practical one.

The first half of the thesis consists the theoretical framework regarding business valuation. All of the presented information is taken from highly reliable sources, such as books, lectures of worldwide-appreciated professors, studies conducted by financial professionals and topic-specific websites. The theoretical part begins with definition of the term “value”. Then the valuation itself is deeply described, including its importance in the business world and, essentially, misconceptions about it. After that, I list major valuation approaches and briefly characterize them. As the aim of the thesis is to compare DCF and EVA, I study the methods scrupulously. More specifically, this work presents advantages and disadvantages of both technics, key components and the valuation process with all needed formulas. Finally, I ponder what possible results of DCF and EVA appraisals might mean.

The second or practical part of the thesis represents Protect Company valuation process. For the beginning, I give an overview of the Client Company in order to clarify the Company’s business and its current financial and market situation. Then, I represent the financial statement (Income Statement and Balance Sheet) of the Firm along with all the assumptions regarding the future growth rates, margins and proportions, tax rates, WACC and its components. After that, the above mentioned indicators are applied in valuation processes under DCF and EVA approaches. The result of the appraisals are the tables which show the financial situation of the Case Company over 5-year period from 2016 to 2020. The final outcomes of the DCF and EVA valuation are the Company’s values of 19,435,650 RUB and 21,692,280 RUB respectively. Knowing its value, the Company gets a leverage in negotiations with potential investors, debtors or bidders. By conducting a deep study of the methods and practicing them for the real case, I recommend using EVA approach for appraising a small company, since the method is less complex than DCF and interpretation of its results is apparent. Additionally, I perform as a consultant

suggesting the Company to take few actions for improving its future financial situation. The advises mainly refer to cutting variable costs by building long-term and trustful relationships with security equipment producers, modifying its procurement strategy. Apart from that, I propose to the Company to refinance its debts when the economic situation in Russia betters and rates drop.

8.1 Reliability and validity

Reliability and validity are vital in qualitative research. Nahid Golafshani from University of Toronto (2003, 598) considers that a research might be called reliable if the results of a study can be reproduced under a similar methodology. As for validity, according to Robert W. Thatcher, Ph.D. (2010, 5), it is defined by the extent to which any measuring instrument measures what it is intended to measure. Also validity determines how truthful the research results are (Golafshani 2003, 599).

Generally, I reckon that the thesis is reliable. This is proven by the fact that I use only internationally accepted frameworks of corporate valuation. In order to study the thesis topic deeply, I use exceptionally reliable sources, such as: books, worldwide-known universities' materials, the topic-specific and widely-used internet resources and my own experience. The latter relates to the experience I gained through my 2,5-year working life in investment and consulting business. Concerning the validity, the research results were accepted by the Client Company and would be used for management purposes, for example, in financing processes.

8.2 Limitations

I suggest two basic limitations of the thesis: lack of universality and uncertainty factors. The first limitation relates to the fact that the conducted study and appraisal refer only to Protect Company. Therefore, presented assumptions and models cannot be applied for any other company. Every case is individual, so that valuation processes and data differ from one business to another. The second limitation of the thesis is about possible discrepancies between the valuation results determined by me and the real situation at some point in future. There are an abundance uncertainties factors in the business world, which are generally split into two categories: microeconomic and macroeconomic. These factors might affect the business, so that the real performance might slightly or significantly vary from my expectations.

8.3 Suggestions for further studies

There are three main suggestions I would like to share with researchers interested in business valuation topic.

First of all, the business valuation is a tough topic, however there are an abundance of various theoretical and concrete practical studies regarding the matter. The researchers should thoroughly study the theoretical framework of the valuation before trying to put it into practice. Also analysts should be aware of all the misconceptions about valuation in order to avoid serious mistakes which are usually faced by inexperienced professionals. Particularly, the researchers have to realize that the valuation might be manipulated in a number of ways.

Secondly, as far as business valuation is concerned, the researchers should deeply understand a client company's business while conducting appraisal in a bid to draw up maximally accurate assumptions concerning the company's future financial situation. Additionally, analysts should comprehend the purposes of valuation. By this means the researchers would be able to select the most appropriate valuation method.

Finally, finance is a precise science and valuation results might lead to bringing big business decisions to the table. Therefore, during the process of appraising a business, the researchers should refer only to reliable sources while searching for insights on valuation or looking for information needed in the process. Moreover, the analysts should carefully select and consider internal and external factors influencing the business, since they may significantly differ from one company to another. Following these three suggestions the researchers would be able to conduct a highly professional valuation of a client's business.

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