OULUN YLIOPISTO
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STRATEGY VALUE-ADDED CONCEPT (SVAC) – AN ALTERNATIVE APPROACH TO VALUE RAPIDLY, VIA STRATEGIC INVESTMENTS GROWING COMPANIES

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Abstract

In this thesis, the additional firm value created by strategic investments has been studied. Additionally, a new and innovative firm valuation method is developed. The new method takes the dual nature of investments into account and emphasizes the effect of strategic investments on value creation in a way that is groundbreaking in firm valuation.

The new method is called the Strategy Value-Added Concept (SVAC). The SVAC method is based on modern theories in management accounting and investment appraisal. According to the SVAC theory, the firm value consists of two elements: pre-strategy value and strategy value. Pre-strategy value is the present value of the remaining operating cash flow from the company's business, without any further strategic investments. The strategy value is the present value of the cash flow from strategic decisions and investments in the future.

Based on the SVAC theory, the ability of the discounted dividend model (DDM), the discounted cash flow method (DCF) and the Economic Value Added model (EVA) to recognize the value created by strategic investments is analyzed. Based on the results, the DCF method and the EVA method have proven to be applicable only for pre-strategy value analysis. The weaknesses of the DDM method were observed.

In this thesis, a firm valuation application based on the SVAC theory has been engineered on Excel spreadsheet. The SVAC model is verified by calculating the value per share for a case company and comparing the results with the results given by conventional valuation methods. Additionally, a thorough sensitivity analysis has been carried out.

The valuation comparison on the case company demonstrates the unique ability of the SVAC model to identify the future value potential caused by strategic investments whereas the conventional valuation methods have a tendency to undervalue the case company as the strategy value created by investments is not recognized.

Keywords
Firm valuation, Cash Value Added, CVA, security analysis process

Additional information

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Tiivistelmä

Tässä työssä tarkastellaan yritysten tekemien strategisten investointien luomaa lisäarvoa. Lisäksi tässä työssä on kehitetty uusi ja innovatiivinen yrityksen arvonmääritysmenetelmä. Kehitetyllä menetelmällä pystytään huomioimaan investointien dualistinen luonne sekä määrittämään strategisten investointien arvoa lisäävää vaikutus uraauurtavalla tavalla.

Kehitetty arvonmääritysmenetelmä, Strategy Value-Added Concept (SVAC), perustuu moderniin johdon laskentatoimen ja investointilaskelmien teoriaan. SVAC-teorian mukaan yrityksen arvo muodostuu kahdesta osatekijästä: perusosasta (engl. pre-strategy value) ja strategisten investointien luomasta lisäarvosta (engl. strategy value). Yrityksen arvon perusosalla tarkoitetaan yrityksen tuottamien kassavirtojen nykyarvoa ilman uusia investointeja. Strateginen lisäarvo puolestaan tarkoittaa tulevien strategisten investointien tuottamien kassavirtojen nykyarvoa.

Tässä työssä on arvioitu perinteisten arvonmääritysmallien (osinkomallin, kassavirtamallin ja lisäarvomallin) soveltuvuutta strategisen lisäarvon määrittämiseen. Tulosten perusteella kassavirtamalli ja lisäarvomalli soveltuvat ainoastaan yrityksen arvon perusosan määrittämiseen. Osinkomallin havaittiin sisältävän rajoituksia SVAC-teorian soveltamisessa.

Tässä työssä on myös kehitetty SVAC-teoriaan perustuva arvonmääritystsovellus. Sovellus on rakennettu Microsoft Excel -laskentataulukkoon. SVAC-arvonmääritysmallin ja kehitetyn arvonmäärityssovelluksen toimivuus on varmennettu soveltamalla niitä julkisen kaupankäynnin kohteena olevan yrityksen osakkeen arvonmääritykseen. Tuloksia on verrattu perinteisten arvonmääritysmallien antamiin tuloksiin. Lisäksi tulosten herkkyyttä ennustetuille parametreille on analysoitu.

Tulokset osoittavat SVAC-mallin ainutlaatuisen kyvyn ilmaista tulevien strategisten investointien tuottaman arvonnousun potentiaalin. Perinteiset arvonmääritysmallit aliarvioivat investoivien yrityksen arvon, sillä ne jättävät investointien tuottaman lisäarvon noteeraamatta.

Asiasanat
Arvonmääritys, Cash Value Added, CVA, arvonmääritysprosessi

Muita tietoja

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1 INTRODUCTION

1.1 Introduction to the research topic

Firm valuation has conventionally played an important role in business world and, consequently, financial accounting research. Company's stakeholders including investors and creditors need reliable asset valuation as a basis for decision making. Especially, qualified valuation of the firm is a requirement in mergers and acquisitions. (Kallunki 2000.)

Investment is considered to be an operation that employs thorough security analysis and promises safety of principal and a satisfactory return. Individual skill and chance play a key role in determining success and failure in investment, and thus it is not by nature an exact science. Security analysis, on the other hand, has a scientific aspect since it targets to study available facts and draw conclusion based on established principles. An operation that does not meet the requirements of deep analysis, safety of principle and satisfactory return, is called speculation. (Graham & Dodd 1934: 14, 54.)

An elemental method to evaluate the firm value is to use price multiples, for example price-to-earnings or price-to-sales ratios. More sophisticated valuation models base on the theory that suggests that the value of the firm is the present value of all its expected cash flows that the firm will distribute in the future. Cash flows can be either expected dividends, free cash flow or accrual earnings which are discounted with the cost of capital that also reflects the investors' rate of return.

Typically, free cash flow models assume that free cash flow is growing at a constant rate beyond a specific terminal time period. However, infinite cash flow streams are hard to estimate with perfect accuracy. Nevertheless, cash flow models provide more accurate forecasts of the value of the firm if compared with the price multiple techniques. (Cruise 2012; Kallunki 2000.)

When valuating companies using free cash flow methods, investments are subtracted from revenues. This is an obvious procedure since investments do not appear in the income statement but they still are actual cash expenses that are not directed to the investors.

There is, however, an alternative angle to review investments. Research (e.g. Alkaraan & Northcott 2007; Weissenrieder 1997) classifies investments into two categories, strategic and non-strategic investments. Strategic investments are clearly done to increase firm value and non-strategic investments are meant for maintain the current value. Practice has shown that this kind of classification is in use, for example, in manufacturing industry where strategic investments in plant and machinery are sizeable, and maintaining the equipment regular.

The most commonly used conventional valuation techniques are discounted dividend model (DDM), discounted cash flow method (DCF) and the residual income valuation method e.g. Economic Value Added (EVA). In these conventional firm valuation methods, the dual nature of investments in value creation and particularly the value created by strategic investments are only partially covered in the analysis as only the impact on future growth rates of annual sales and net income are modeled. Therefore when analyzing companies that generate substantial growth by strategic investments, a new theory and approach to firm valuation is needed.

1.2 Previous studies

1.2.1 Valuation models

In theory, a company can only have a certain fixed value at a certain time. This value takes into the consideration the complete history and the complete future of the company. As the history is rather well known but the future is completely unknown, all the valuation models are only giving an approximation upon the value. This approximation is based on the assumptions that are used as parameters describing the future.

There are several valuation models mentioned in literature. Gordon's (1959) discounted dividend model (DDM) is considered as the base of valuation theory. Several models, including discounted cash flow (DCF) (presented by e.g. Miller &

Modigliani 1961), residual income method (Ohlson 1995), compounded cash flow method (Speranda 2012) and H-model (Fuller and Hsia 1984) are founded on the principle of discounted incomes distributed to investors.

The advantages and disadvantages of firm valuation methods are studied as well as valuation techniques are compared widely in accounting research. Penman and Sougiannis (1998) compared the discounted dividend techniques, discounted cash flow analysis, and techniques based on accrual earnings when each is applied with finite-horizon forecasts. Their findings indicate that valuation errors are lower using accrual earnings techniques rather than cash flow and dividend discounting techniques. However, it has to be noted that dividend discount method is not always applicable because there are companies that do not distribute dividends.

Francis, Olsson and Oswald (2000) presented a comparison of the three conventional valuation models: DDM, DCF and abnormal earnings. Even if in theory, identical estimates of equity values should be the outcome, in practice, however there is variety in results if the forecasted parameters e.g. growth rates, or discount rates are inconsistent. The results show that abnormal earnings technique estimates value of the company significantly better than discounted dividend or free cash flow value techniques.

In his study, Plenborg (2002) presented an evaluation on the discounted cash flow approach and the residual income model. The study concludes that simplifying assumptions in firm valuation made by the practitioners cause biases in firm value estimates. The study also shows that in some cases, the residual income technique produces more accurate firm value estimates, while in others the discounted cash flow approach generate more accurate estimates.

Bailey, Brown, Potter and Wells (2008) compared dividend discounted, free cash flow and residual income valuation models. The results indicate that the residual income model provides better estimates of firm value than two other commonly used models. Valuation errors are minimized when the terminal value bases on future dividends with growth. They also state that with a residual income approach, there is no need to forecast returns as far into the future. Additionally, a terminal value based on a constant future return, or relatively low growth rates, can be used with the residual income model. This obviates the need to estimate an expected long-term growth rate, which on the other hand is always problematic.

Lundholm and O'Keefe (2001) examined why practitioners and researchers get different estimates of equity value when they use a discounted cash flow model versus a residual income model. They conclude that when started with forecasted financial statements and an exogenous cost of equity capital, getting the same value estimate out of each model is only a matter of care. Research efforts in valuation would be better spent on the study of how to make more accurate forecasts of financial statement data, instead of representing and discounting the resulting flows of value.

Richardson, Tuna and Wysocki (2010) identified the valuation methods that are used by practitioners e.g. analysts, brokers and capital investors and, on the other hand, by accounting academics in their valuation purposes. Majority of research scientists use some version of residual income valuation or discounted cash flow methods. As for the practitioners, book value and cash flow multiples as well as discounted cash flow techniques play a key role.

As all valuation methods described above are having their own set of approximations and assumptions upon the future, they also give different approximations upon the company value. It is a fact that future parameters, e.g. cash flows and discount rates, etc. cannot be forecasted accurately. The more parameters there are to be given a forecasted value, the more inaccurate results are provided. Since the methods based on accrual earnings require the minimum number of forecasted figures, they produce the most accurate and reliable valuation results.

1.2.2 Strategic investments

Investments can be divided into operational and strategic investments depending on their nature. According to Alkaraan and Northcott (2007), strategic investments involve high level of risk, produce hard-to-quantify or intangible outcomes, and have a significant long-term impact on corporate performance. Operational or non-strategic investments, on the other hand are made to maintain the value the strategic investments create (Weissenrieder 2007). A typical example of the latter one is an investment that is mandatory for maintaining the machinery but is not aiming to increase the production capacity.

Slagmulder, Bruggeman and van Wassenhove (1997) examined companies' capital budgeting practices with respect to strategic investments in advanced manufacturing technologies. In their study, the traditional capital budgeting methods are heavily criticized. They found out that instead of financial reasoning the strategic issues are dominating in investment decision making process. Consequently, traditional methods like discounted cash flow technique are no longer adequate.

Arnold and Hatzopoulos (2000) studied the strategic investment appraisal techniques that are employed by the most significant UK corporations. The aim of the study was to find out why price multiples techniques are still commonly in use in capital budgeting. Their findings indicate that majority of companies applies discounted cash flow techniques in investment appraisal. However, managers consider the simpler approaches as tried and trusted methods which enrich inputs to decision-making. The older valuation techniques have numerous positive qualities which modern techniques are not able to provide.

Strategic investment appraisal methods were also studied by Chen (1995). In this research, evaluation techniques were analyzed in three different investment categories. The categories were the investments for equipment replacements, investments in expansion of existing products, and expansion into new products respectively. The results indicate that in all investment categories, discounted cash flow based methods are significantly more important than methods that are based on payback period. Furthermore, appraisal methods that are based on payback period are more important than the methods that are based on accounting the rate return. It is also notable that non-financial techniques play major role in capital budgeting. In evaluating projects of equipment replacement and expansion into new products, the non-financial techniques are as important as discounted cash flow techniques. However, in evaluating projects of expanding existing products, the discounted cash flow techniques are clearly the number one choice among the sample firms, with non-financial techniques and payback period ranked next.

As a conclusion, it can be said that there are two different kind of investment types: strategic and non-strategic. Strategic investments are made for increase firm value and non-strategic to maintain it. There are several methods to appraise the profitability of strategic investments. Discounted cash flow techniques are commonly used but they are not capable to evaluate intangible benefits. Sometimes, investment decisions are done using purely strategic reasons, regardless of financial aspects.

1.2.3 Value creation by strategic investments

Ottosson and Weissenrieder (1996) determine company's stock market value to consist of two parts: pre-strategy value and strategy value. Pre-strategy value is the present value of the remaining operating cash flow from the company's business, without any further strategic investments. This pre-strategy value can probably be fairly well calculated and is probably well managed in most companies. The profitability of past investments does not affect the stock price. The strategy value is the present value of the cash flow from strategic decisions and investments in the future. Thus, the profitability of the strategic investments determines the strategic value of the company. Traditional investment appraisal methods do not provide accurate enough information on the actual profitability of the strategic investments.

Ottosson and Weissenrieder (1996) introduced the Cash Value Added (CVA) method in order to have a more efficient tool for capital budgeting. Since 1997, CVA has been used as a strategic planning tool for example by SCA, one of the most profitable forest industry companies in Europe. SCA evaluates all its strategic investments, including expansion investments in machinery and plants or company acquisitions, in accordance with the CVA model. (SCA 2007.)

It is notable that regardless of the same name, the CVA model presented by Ottosson and Weissenrieder (1996) is not the same as the CVA model developed by the Boston Consulting Group and presented e.g. by Fernandez (2013).

1.3 Purpose of the thesis

In this thesis, the impact of strategic investments on value creation in companies is studied. The theoretical frame is based on the assumption that a stock value of a company consists of a so-called pre-strategy value and strategy value created by historical and future investments as suggested by Ottosson and Weissenrieder (1996).

The target is also to develop a cash flow based valuation model based on the Strategy Value-Added Concept which, unlike the conventional valuation methods, takes the dual nature of investments into account and emphasizes the impact of strategic investments on value creation.

In this thesis, the effect of strategic investments on firm value is modeled by combining in an innovative way the principles of discounted cash flow techniques and the modern theory of Cash Value Added presented by Ottosson and Weissenrieder (1996). The concept developed in this thesis is first time applied for stock price valuation purposes.

1.4 Relevance and contribution

The approach of this thesis to accounting research is constructivist. Kasanen, Lukka and Siitonen (1993) define a constructive research to be a process where, a practically relevant problem with academic research potential is identified. After innovating and demonstrating a solution to the problem, the theoretical connections and the contribution to research are shown in the process. Furthermore, Labro and Tuomela (2003) state that aims to make innovations and to make a theoretical contribution are major factors differentiating between consulting and constructive research.

This thesis contributes to modern theories in management accounting and capital budgeting by developing them further and applying them in external firm valuation. The new firm valuation theory presented in this thesis, provides a solution to a practically relevant problem which is both mentioned in literature and observed in practice. The new theory is verified with simulations using the firm valuation application also engineered in this thesis. Finally, the theoretical connections and the research contribution of the solution are shown.

1.5 Structure of the thesis

This thesis consists of eight chapters. In Chapter 2, the fundamentals of security valuation process including business analysis, financial statement analysis, forecasting and valuation are studied. Chapter 3 focuses on classic valuation methods presenting discount dividends, free cash flow and the abnormal earnings techniques. Additionally, the limitations that the classic firm valuation methods are having on evaluating the value element that is created by strategic investments are discussed. Chapter 4 deals with the concept of capital budgeting and introduces the CVA investment mapping concept. In Chapter 5, a new firm valuation theory is presented. The theory is verified with simulations and the simulation results are shown in Chapter 6. In Chapter 7, the verified theory is applied in a valuation model. Finally, a discussion is provided in Chapter 8.

2 SECURITY ANALYSIS PROCESS

Soffer and Soffer (2003: 14) divide the security analysis in four phases: business analysis, financial statement analysis, forecasting, and valuation. The relations between these four phases are illustrated in Figure 1.

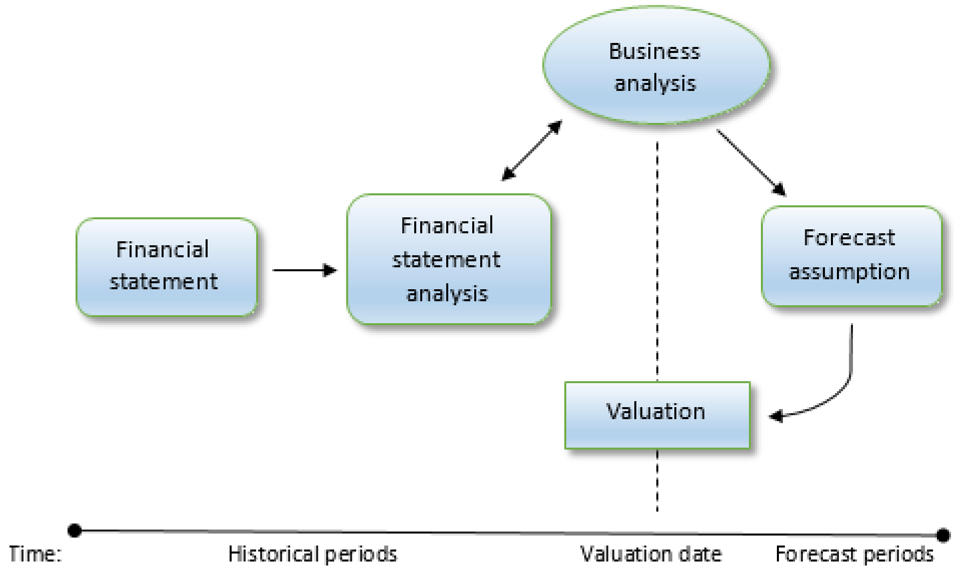

Figure 1. A picture of the security analysis process (Soffer & Soffer 2003: 14).

Howitt (1993) lists eight key factors to be considered in a security valuation:

1) The nature and history of the business,
2) Overall and specific industry economic outlook,
3) Book value and financial condition of the business,
4) Earnings capacity of the company,
5) Dividend-paying capacity,
6) Goodwill or other intangible assets,
7) Prior sales of the stock; the size of the block, and
8) The market price of stocks of comparable publicly traded entities.

Soffer and Soffer (2003: 14), as well as Howitt (1993) state that there is, however, not any fixed formula or sequence for using the various factors. The importance of relative weight of these factors varies case by case.

2.1 Business analysis

According to Howitt (1993) reviewing the history of the business and considering its stability, growth rate and diversity, are needed to evaluate the risk level of the business. Additionally, the current and future economic situation of both the general economy and the target company and the whole industry have to be examined. The aim is to find out what is the ability of the company to be competitive within the general economy and within its industry.

Soffer and Soffer (2003: 14–15) state that the purpose of the business analysis is to understand the key business drivers affecting the firm. Kallunki and Niemelä (2012: 76) complete that analyzing company's business and strategy is essential to reach deep understanding of the company as an investment. Business analysis targets to recognize the economic success and risk factors related the company. Economic success factors are, for example, growth of the market and product segments, the market position of the company, and the decisions made by the management. (ibid.)

Soffer and Soffer (2003: 42) split the business analysis in two parts: external and internal analysis. In external analysis, the economic structure of the industry is studied, each individual competitor is assessed, the current and future customer base are learned, and the regulatory environment is examined. Internal analysis focuses on understanding everything about the firm that may influence its future cash flow. Company's targets, mission, products and services, product life cycle, pricing and differentiation, marketing and selling strategies, supply chain, human resources, investment priorities, and financial health are observed. The idea is to understand the target firm's competitive advantage, what makes this firm successful, what separates this firm from the competition, and how long this success can continue. (Soffer & Soffer 2003: 54.)

Kallunki and Niemelä (2012: 76) divide the business analysis into two parts: operational analysis and strategic analysis, as illustrated in Figure 2. Operational analysis focuses on sales and customer mix as well as prices, costs and working capital movement. In strategic analysis, the business environment and the factors creating the competitive edge are evaluated.

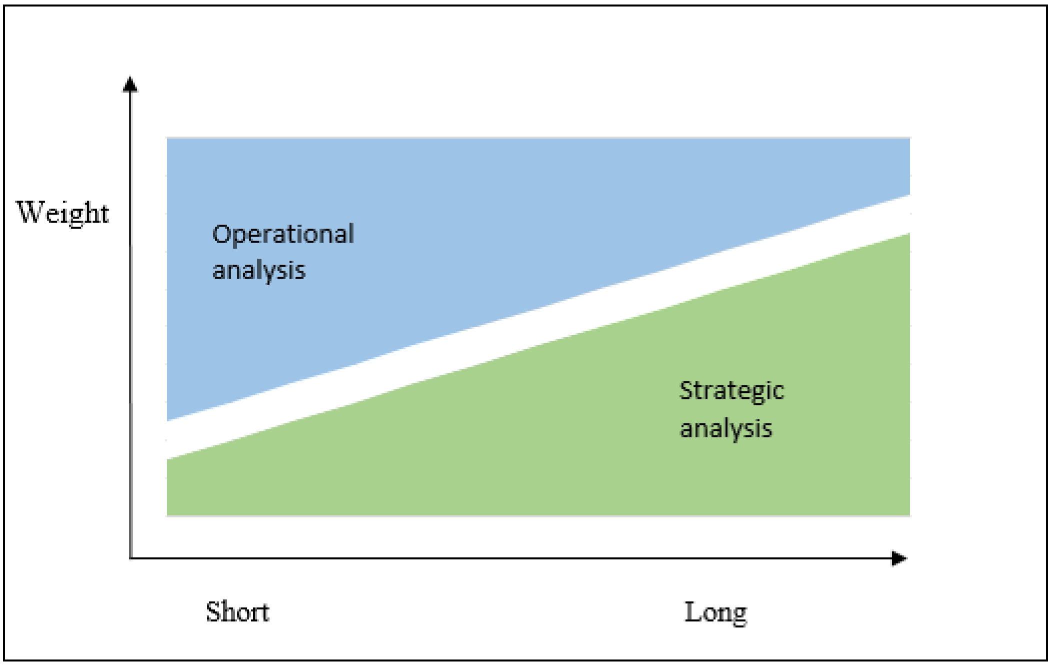

Figure 2. Operational and strategic analysis weights in different forecasting horizons (Kallunki & Niemelä 2012: 77).

2.2 Financial statement analysis

Financial statement analysis works hand in hand with business analysis completing each other. In this phase, the financial statements are used to study about the firm's profitability, growth, and resource needs. (Soffer & Soffer 2003: 15.)

According to Kallunki and Niemelä (2012: 36), financial statement provides a general view on the previous financial development of the company on which the future forecasts base. Howitt (1993) argues that income statements and balance sheets for at least two and preferably five years preceding the valuation date should be obtained to get deep enough understanding of the company's financial position.

An important element of financial statement analysis is accounting analysis. This is also called the quality of earnings analysis. In accounting analysis, the company's accounting policies are considered. Additionally, it is evaluated how its estimates, accounting choices, and judgments affect the reported numbers. As a part of this work, recasting of financial statement is needed to get it in a format that is more closely aligned with a particular analytical framework than the financial reporting standards. This may include adjusting the financial statements to exclude items that are not likely to recur and include items that financial reporting standards and frameworks ignores. (Soffer & Soffer 2003: 15.)

Howitt (1993) says that an analysis of income statement and balance sheet should provide an understanding of gross revenues, operating expenses, net income, amount of dividend paid, book value of fixed assets, working capital, long-term debt, equity, and cash flow. To evaluate company's previous development and compare the results with its competitors, key ratios are determined. Soffer and Soffer (2003: 102) divide financial ratios into three classes: operating ratios, credit ratios and investment ratios. Kallunki, Lantto and Sahlström (2008) name them profitability, liquidity, efficiency and solvency ratios.

According to Soffer and Soffer (2003: 100), operating ratios are used to understand elements of a company's business, such as profitability and capital efficiency. This information is used in forecasting future earnings and cash flows. Commonly used operating ratios are: gross margin percentage, operating margin percentage, number of days payables outstanding, number of days receivables outstanding and inventory turnover.

Soffer and Soffer (2003: 101) determine gross margin percentage being gross margin divided by revenues as follows:

$$\text{Gross margin-\%} = \frac{Gross\ margin}{Revenues} \times 100\%\,, \qquad (1)$$

where gross margin is revenues less cost of goods sold. Gross margin reveals potential pricing issues of the company. (Soffer & Soffer 2003: 101.)

Operating profit margin percentage shows the profit from operating the business before taxes and financing costs and is calculated using formula:

$$\text{Operating margin-\%} = \frac{EBIT}{Revenues} \times 100\% \,, \tag{2}$$

where revenues exclude extraordinary items, for example proceeds from sale of assets (Kallunki et al. 2008: 126; Soffer & Soffer 2003: 100).

The number of days sales outstanding measures how many days it takes for the company to collect its receivables. According to Kallunki et al (2008: 163) it is calculated the following way:

$$\text{Days sales outstanding} = 365 \times \frac{Average\ A/R\ balance}{Revenues} \,. \tag{3}$$

The number of days payables outstanding shows the average time in days it takes a company to pay its invoices. Kallunki et al. (2008: 167) calculates the variable as follows:

$$\text{Days payables outstanding} = 365 \times \frac{Average\ A/P\ balance}{Cost\ of\ sales} \,. \tag{4}$$

Soffer and Soffer (2003: 101–102) argue that a too low number of days payables outstanding indicates that the company is not using its available trade credit to its benefit. A too high ratio indicates a problem in making payments.

According to Deloof and Jegers (1996), most firms have a significant amount of cash invested in accounts receivable. Additionally, accounts payable is a major source to finance daily operations. Raheman and Nasr (2007) found a significant negative relationship between net operating profitability and the sales collection period and average payment period. Their results suggest that a company can create value for its shareholders by reducing the number of days sales outstanding and inventories to a reasonable minimum. Furthermore, less profitable firms wait longer to pay their bills. However, Gill, Biger and Marthur argue that a larger inventory reduces the risk of exhaustion of stock, and thus may increase sales.

Long, Malitz and Ravid (1993) found out that trade credit may allow a buyer to demand product quality before paying, and thus stimulate sales. Schwartz (1974) found out that larger, more financially secure companies, which are able to collect cash at relatively low cost, offers trade credit to smaller, less financially secure customers which have to pay higher expenses to external investors. When credit is tight, financially stable firms will increasingly offer more trade credit to maintain their relationship with their smaller customers, which have not access to direct credit market. (ibid.).

According to Kallunki et al. (2008: 159) the current ratio measures the liquidity of the company. The current ratio is calculated as follows:

$$CR = \frac{Current\ assets}{Current\ liabilities} \tag{5}$$

and it is assumed that company's current assets can be realized in short-term to pay its short-term liabilities. Kallunki et al. (2008: 159) states that CR over 2 indicates good liquidity, 1–2 acceptable liquidity and less than 1 means weak liquidity. Soffer and Soffer (2003: 103) state that, however, firms do not attempt to have extremely high current ratios, because it is costly to hold a greater amount of current assets than is necessary and it might indicate an inefficient use of working capital.

Kallunki et al. (2008: 156) note that the quick ratio measures the liquidity of the company even more tightly than the current ratio since only cash and cash equivalents are included in the numerator. This ratio is determined as follows:

$$QR = \frac{Cash + short\text{-}term\ investments}{Current\ liabilities} \tag{6}$$

and it measures the firm's ability to pay its obligations quickly. As well as with current ratio, firms do not attempt to have very high quick ratio because it is costly to hold additional assets (Soffer & Soffer 2003: 103).

Kamath (1989) argues that both current ratio and quick ratio are insufficient methods due to their static nature and the insufficiency of using them as measures of future cash flows and liquidity. According to Kamath, and Bolek and Grosicki (2012), cash gap (also called cash conversion cycle, CCC) is considered a more suitable liquidity measure than CR and QR due to its dynamic features. Eljelly (2004) raises the fact that CR and QR consist of both liquid financial assets and operating assets. However, operating assets which are tied up in operations should not be included into liquid ratios.

According to Soffer and Soffer (2003: 105) the return on common equity (ROE) is determined the following way:

$$\text{ROE} = \frac{Net\ income}{Average\ common\ equity} \tag{7}$$

and it measures the return to common stockholders by comparing the net income available to common shareholders to average common equity. The return on investment (ROI) measures the return to the invested capital and is calculated as follows:

$$\text{ROI} = \frac{net\ income + finance\ expenses + taxes}{total\ assets - interest\text{-}free\ liabilities}. \tag{8}$$

ROI is one of the most utilized performance indicator (Kallunki et al. 2008: 130).

For firms with little leverage, return on investment and return on common equity are usually very close to one another. For firms with more leverage, such as industrial companies, return on capital will be significantly lower than return on common equity. (Soffer & Soffer 2003: 105–106.)

Net debt rate is modeled mathematically in following way:

$$\text{Net debt-\%} = \frac{Total\ debt - cash}{Equity}, \tag{9}$$

and it measures company’s solvency and leverage level. Kallunki et al. (2008: 143) states that net debt rate under 100% indicates a good level.

Bates, Kahle and Stulz (2009) studied the cash holdings of U.S. industrial companies between 1980 and 2006. They found out that net debt levels have commonly decreased. Most of this decrease in net debt is explained by the increase in cash holdings which, on the other hand, is closely related to the disappearing dividends. (ibid.)

Hall, Mateus and Mateus (2014) studied cash holding behavior of privately held and publicly traded companies in Europe. Their empirical results show that private firms usually hold more cash than public companies. Moreover, companies in market economy countries have larger cash reserves than the companies in less market-oriented countries.

Strebulaev and Yang (2013) studied zero-leveraged companies. They argue that the main reasons of a company to remain free from net debt are governance characteristics, for example CEO ownership, board size and its independence, and family control status. According to Strebulaev and Yang, net debt-free companies pay significantly higher dividends, are more profitable, pay higher taxes, issue less equity, and have higher cash reserves than other companies of the same size and industry. However, Devos, Dillon, Jagannathan and Krishnamurthy (2012) argue that conservative approach to debt financing cannot be explained with governance mechanisms. In their opinion, a company uses little debt because it is lacking of external financing due to limited access to the debt market. Other option is that the management has a strategic decision to mitigate underinvestment incentives and preserve financial flexibility.

The interest coverage ratio measures the number of times interest expenses have been earned and is calculated using the following formula:

$$\text{Interest coverage ratio} = \frac{EBIT}{Interest\ expenses}. \tag{10}$$

The higher the rate is, the better the firm’s ability to make interest payment. The ratio of less than one suggests that the company is not earning enough to pay its interest requirements. (Soffer & Soffer 2003: 104.)

2.3 Forecasting

In the forecasting phase, the information gathered about the business in the previous phases is used to predict financial results in the future (Soffer & Soffer 2003: 16). Kallunki and Niemelä (2012: 111–112) state that forecasts are usually made over next two years. In practice, this means calculating future income statements, balance sheets, and cash flow statements over the examination period.

Soffer and Soffer (2003: 16) argue that the forecasted parts of the financial statement or financial ratios depend on the selected valuation technique. If a free cash flow method is used, each component of free cash flow, from sales through reinvestment requirements are projected. Additionally, ratios such as the sales growth rate, operating margins, and investments to sales are used to construct the forecast. In the residual income model, different set of variables are examined. (Soffer & Soffer 2003: 16.)

2.4 Valuation

The fourth phase of security analysis is valuation. In valuation phase, the forecast and selected valuation model are used to determine the value of the firm's equity. There are several valuation techniques which can be employed in valuation phase. Discounted dividends, discounted cash flow and residual income methods are presented in Chapter 3. Additionally, Coyle (2000: 45) lists some rules of thumb techniques – for example gross revenue multiples, earnings multiples and asset-based multiples – which can be utilized.

In theory, a company can only have a certain fixed value at a certain time. However, Coyle (2000: 45) argue that there are a number of valuation techniques and each of them produces a different valuation. According to Coyle, several valuation techniques should be used and taken together to evaluate the market price level. Damodaran (2010: 24) lists the variables which are needed for firm valuation. When valuing companies using discounted free cash flow methods, essential parameters are: cash flow from existing assets, growth in income, discount rate, and terminal value. In discounted dividend model, amount of distributed dividend, growth rate and discount rate are needed. In valuation model, which is based on accrual earnings, the estimated parameters are earnings, dividends and equity cost. (Kallunki & Niemelä 2012: 222, 236.)

3 CONVENTIONAL VALUATION METHODS

3.1 Discounted dividends model (DDM)

Discounted dividends model (DDM) is a traditional equity valuation method. More advanced valuation methods, such as discounted free cash flow model are based on DDM. (Kallunki & Niemelä 2012: 221.)

According to Pike and Neale (2006: 104), the value of a share now, P_0, is the sum of the stream of future discounted dividends $D_1, D_2, \ldots D_n$ plus the value of the share as and when sold, in some future year *n* as follows:

$$P_0 = \frac{D_1}{(1+R_E)} + \frac{D_2}{(1+R_E)^2} + \cdots + \frac{D_n}{(1+R_E)^n} + \frac{P_n}{(1+R_E)^n}, \tag{11}$$

where R_E indicates the equity cost and P_n is the terminal value which is determined as follows:

$$P_n = \frac{(1+g_d) \times D_n}{(R_E - g_d)}, \tag{12}$$

where g_d indicates the anticipated dividend growth rate. If the lifetime of the firm is assumed infinite and the annual dividend is constant, the value of a share is:

$$P_0 = \sum_{t=1}^{\infty} \frac{D_t}{(1+r_d)^t} = \frac{D_1}{r_d}, \tag{13}$$

where $D_1 = D_2 = D_3$ etc (Pike & Neale 2006, 106).

3.2 Discounted free cash flow method (DCF)

When the discounted dividend model values only a single share, free cash flow model determines the whole enterprise value – the value of the firm to both equity holders and debt holders. According to Berk, DeMarzo and Harford (2012: 284) the enterprise value is calculated using following formula:

$$Enterprise\ value = Market\ value\ of\ Equity + Debt - Cash \tag{14}$$

and can be interpreted as owning the unlevered business.

Kallunki and Niemelä (2012: 225) state that the firm's current enterprise value V_0 can be estimated using the discounted free cash flow method (DCF) as follows:

$$V_0 = \sum_{t=1}^{n} \frac{FCF_t}{(1+r_d)^t} + \frac{V_n}{(1+r_d)^n}, \tag{15}$$

where FCF_t indicates the free cash flow in year t, and is calculated using following formula:

$$FCF = EBIT \times (1 - Tax\ rate) + Depreciation - CAPEX \pm Changes\ in\ net\ working\ capital\ . \tag{16}$$

The terminal value in year n, V_n, can be estimated following way:

$$V_n = \frac{FCF_{n+1}}{(r_d - g)} = \left(\frac{1+g}{r_d - g}\right) \times FCF_n\ , \tag{17}$$

where g is the estimated long-run growth rate of the firm's revenues (Berk et al. 2012: 285). Benninga (2008: 115) lists additional methods to determine the terminal value when the investment horizon is finite, for example 5–10 years. The terminal value can be either:

- Year-*n* book value of debt + equity,
- P/E ratio * year-*n* profits + year-*n* book value of debt, or
- Constant multiple between 5 and 6 times year-*n* anticipated EBITDA.

A key difference between the DCF model and the DDM is the discount rate. In DDM, the firm's equity cost of capital is used as the discount rate. However, the free cash flow will be paid to both debt and equity holders. Hence, the firm’s weighted average cost of capital (WACC) has to be used as the discount rate. (Berk et al. 2012: 285.)

Kallunki and Niemelä (2012: 181) defines WACC as follows:

$$WACC = \frac{E}{E+D} \times R_E + \frac{D}{E+D} \times R_D(1-T_C)\,, \tag{18}$$

where E is equity book value, D is debt book value, R_E is the cost of equity, R_D is the cost of debt, and T_C is the corporate tax rate.

The cost of equity is calculated using capital assets pricing model (CAPM) as given by Berk et al. (2012: 366):

$$R_E = r_f + \beta_i\big(E[R_{Mkt}] - r_f\big)\,, \tag{19}$$

where r_f is the risk-free rate, β_i is the amount of systematic market risk, and $E[R_{Mkt}] - r_f$ indicates the market risk premium proportional to the amount of systematic risk in the investment.

The price per share is calculated using Equation (14) to solve the market value of the equity and then divided by the total number of shares outstanding as follows:

$$P_0 = \frac{V_0 + Cash - Debt}{Shares\ outstanding}\ . \tag{20}$$

The advantage of the free cash flow approach is that it removes the problem of confining investment financing to retentions as in the DDM. On the other hand, it is challenging to forecast future growth opportunities and their financial needs. Furthermore, financial reporting for revenues and operating costs may fail to reflect cash flows due to movements of working capital. For example, a sales increase may raise reported profits, but if made on lengthy credit terms, the effect on cash flow is delayed. The effect may be also negative if suppliers of additional raw materials insist on payment before debtors settle. For these and similar reasons, accurate estimation of cash flow involves forecasting not merely all future years' sales, relevant costs and profits, but also all movements in working capital. (Pike & Neale 2006: 101.)

3.3 Economic value added (EVA)

The economic value added (EVA) is the trademark of an American management consulting company Stern Stewart & Co. It bases on the accounting concept of residual income, which is simply the accounting profit adjusted for the cost of using the capital tied up in an activity. However, the Stern Stewart version is rather more sophisticated as it attempts to adjust the recorded profit in various ways. (Pike & Neale 2006: 111.)

The EVA formula can be written as:

$$EVA = NOPAT - cost\ of\ capital\ \times capital\ invested\ , \qquad (21)$$

where NOPAT is net operating profit after tax, and financial requirements are the return required by shareholders for the net assets, or shareholders' equity. (Pike & Neale 2006: 111.)

The price per share is calculated using following formula:

$$P_0 = \frac{E + \sum_{t=1}^{n} \frac{EVA_t}{(1+R_E)^t}}{Shares\ outstanding} \qquad (22)$$

where E is the book value of equity and R_E is the cost of equity.

3.4 Issues on classic valuation models

3.4.1 Discounted dividend model (DDM)

The main disadvantage of the DDM is the fact that there are companies which do not pay any dividends. Bagwell and Shoven (1989) state that shareholders can get cash from corporations through cash-financed acquisitions and share repurchases in addition to dividends payments. However, Berk et al. (2012: 503) show that in the perfect capital markets settings, the dividend distribution method does not affect the net income of the shareholder. Bagwell and Shoven (1989) argue that in the actual market, dividend paying equity appears to be the most heavily taxed capital instrument available. It is a subject to two levels of taxation i.e. the state corporation income tax and personal income tax if the shares are owned by households.

Another issue with valuating equity using dividends rises from the phenomenon Sousa (2010) calls “dividend recapitalization” or “leveraged recap”. With recapitalization, Sousa means the process of borrowing money to issue a special dividend to shareholders. When dividends are paid using debt, the DDM does not give a reliable image on the company’s capability to produce additional value to its shareholders.

3.4.2 Discounted free cash flow method (DCF)

The main disadvantages of the DCF method are discussed by at least Speranda (2012); Slagmulder et al. (1997); Ottosson and Weissenrieder (1996); Logue and West (1986); and Hayes and Garvin (1982). The major claim is the fact that the DCF method relies on the future cash flow forecasts which are based on historical data and questionable assumptions of future. Furthermore, these fuzzy money flows are discounted at rather arbitrary discount rate. Additionally, the DCF techniques are fraught with biases in accounting that discourage long-term investments.

When valuing companies using DCF method, investments reduce free cash flow. Cash flow calculation is corrected with assumption that investments provides a pay-off in terms of future growth. (Damodaran 2010: 26). However, this method requires several adjustments to future income statements and balance sheets.

3.4.3 Economic value-added (EVA)

In literature, EVA is a heavily criticized method. Weissenrieder (1997) raises the fact that for EVA, many adjustments and corrections to accounting have to be done in order to simulate cash flow. According to Maditinos, Šević and Theriou (2007), there might be up to 164 performance measurement issues to overcome. As an example, they raise inventory costing and valuation, depreciation, revenue recognition, the write off of bad debts, as well as the capitalization and amortization of R&D expenses being problematic to evaluate.

Pike and Neale (2006: 112) state that EVA requires a lot of calculation power for firm valuation purposes. Additionally, the financial requirements are calculated based on the book value of assets or equity, rather than market value. Venanzi (2010) completes that accounting principles provide companies with room to manipulate the book values. Furthermore, Hasani and Fathi (2012) argue that EVA is an impractical tool to evaluate companies that have been established recently or operate in investment sector.

3.4.4 Conclusion

As a conclusion, it can be said that each of the three conventional valuation methods presented above has its own advantages and limitations. It is obvious that the DDM is not a suitable method to evaluate the value of modern companies that can use for example share repurchases or reinvestments to distribute earnings. The DCF and EVA models are more sophisticated to define the value creation although the high number of future parameters to be forecasted brings a lot of uncertainty in calculation process.

4 STRATEGIC INVESTMENT APPRAISAL

4.1 Strategic investments

Strategy is the creation of a unique and valuable position, involving a different set of activities and match among those activities. The essence of strategy is choosing to perform activities differently than competitors do. Strategic positioning means performing different activities from competitors' or performing similar activities in different ways. Otherwise, a strategy is nothing more than a marketing slogan that will not withstand competition. The success of a strategy depends on doing many things well – not just a few – and integrating among them. (Porter 1996.)

Pike and Neale (2006: 174) list Michael Porter's (1985) three coherent strategies for a business unit:

1) to be the lowest-cost producer,
2) to focus on a niche or segment within the market, and
3) to differentiate the product range so that it does not compete directly with lower-cost products.

To carry out the strategy, strategic investments are usually needed. According to Knüpfer and Puttonen (2012: 100), accepting and rejecting investments should base on the estimation how well they earn compared to the requirements. Pike and Neale (2006: 174) argue that the attractiveness of the strategic investment does not depend only on the rate of return offered but also on the strategic importance of the sector. Slagmulder et al. (1995) showed that strategic issues might even dominate the decision making about investments.

The selected strategy and thus future strategic investments are planned based on the company's business strength and common market attractiveness. The attractiveness of the market or industry is expressed by the size and growth of the market, ease of entry, competition level, and industry profitability. Company's business strength is quantified using firm's market share and its growth rate, brand loyalty, profitability, and technological and other comparative advantages. (Pike & Neale 2006: 174.)

Three basic investment strategies are highlighted in the McKinsey-General Electric portfolio matrix (Pike and Neale 2006: 175) shown in Figure 3. When company's business strength and market attractiveness are high, pursuing growth is justifiable. Growing may mean significant investments in property, plant and equipment, working capital, research and development, brand development and training. Where the market is not highly attractive and the business less competitive, the strategy is to maximize or maintain cash flows, while incurring capital expenditure mainly of a replacement nature. If the market attractiveness is low and no actions can be taken to improve own competitiveness, divesting as a strategic investment is reasonable.

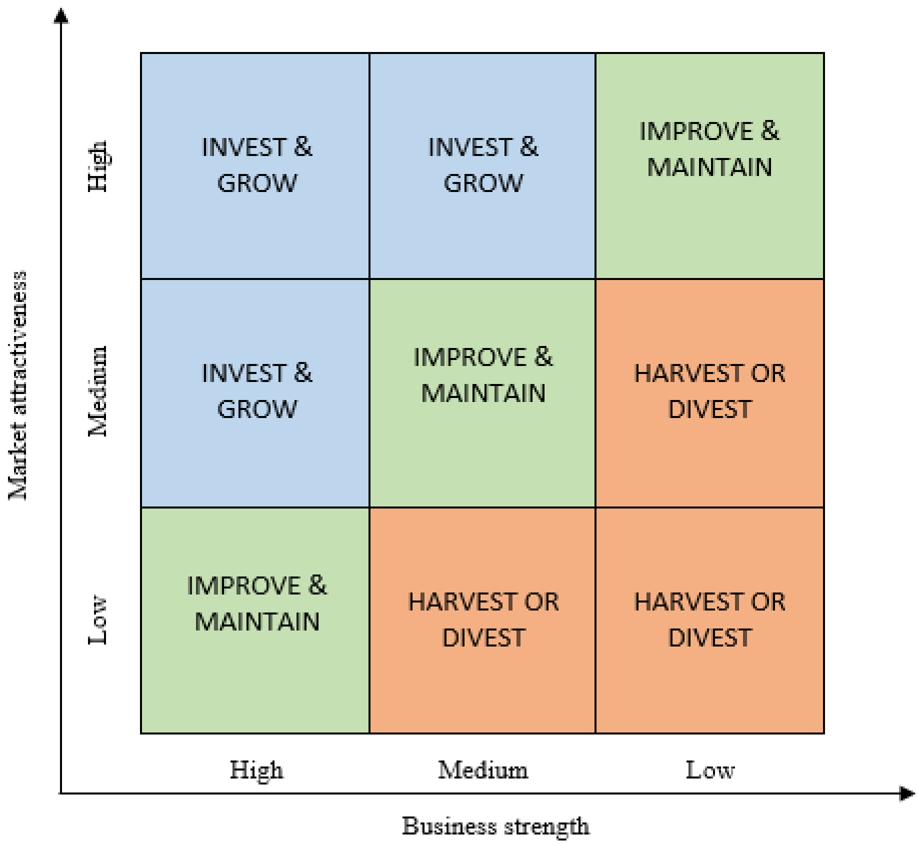

Figure 3. McKinsey-GE portfolio matrix adapted from Pike & Neale (2006: 175).

4.2 Classic investment appraisal techniques

According to the research (e.g. Abdel-Kader & Dugdale 1998; Chen 1995; Kim & Farragher 1981) calculating the net present value (NPV), the internal return rate (IRR) and the payback time are the most commonly used capital budgeting methods.

NPV is calculated the following way:

$$NPV = \sum_{t=1}^{n} \frac{CF_t}{(1+r_d)^t} - I_0 \,, \tag{23}$$

where I_0 represents the investment outlay, CF_t indicates the future cash flows received in particular year and r_d is the discount rate. If the rate of return from the project is greater than the return from an equivalent risk investment in securities traded in the financial market, the NPV will be positive. Positive NPV indicates that the investment should be accepted. If the rate of return is lower than the return from an equivalent risk investment in securities traded in the financial market, the NPV will be negative and the investment should be rejected. A zero NPV calculation indicates that the firm should be indifferent to whether the project is accepted or rejected. (Drury 2008: 295.)

The IRR can be identified by varying the discount factor in Equation (23) until the NPV equals to zero. If the IRR exceeds the required return, the investment is profitable. Otherwise the investment is not profitable. Usually, IRR and NPV indicate a parallel result – if an investment is profitable using the NPV it is very often profitable also by using the IRR. (Ross, Westerfield & Jordan 2010: 277–278.)

4.3 CVA investment mapping

The Cash Value Added (CVA) investment mapping method is a sophisticated management accounting and control tool for capital budgeting purposes presented by Ottosson and Weissenrieder in 1996. The CVA method is not typically applied to evaluate the profitability of an isolated strategic investment. Instead, it examines an entire long-term investment strategy which contains of investments already made as well as future investments. (Ottosson & Weissenrieder 2011.)

The CVA technique classifies investments into two categories, strategic and non-strategic investments, and hence differs from the traditional capital budgeting methods. This dual nature of investments is based on the fact that many companies make a large investment followed later on by many smaller ones during the entire life of the large initial investment. The large investments target to create value and smaller ones are made to maintain the value the large investments create. (Ottosson & Weissenrieder 2006, 2011.)

The principle of the CVA investment mapping is presented in Figure 4. In mapping the strategic investments in assets are described by blocks in XY axis where each asset needs to generate an annual cash flow (Y-axis) to reach an NPV of zero over the strategic investment's economic life time (X-axis). The cash flow requirement is called the operating cash flow demand (OCFD) and is presented as the red solid line in the figure. The first year's OCFD for an investment with an economic life of *n* years can be mathematically defined as follows:

$$OCFD_1 = \frac{Investment\ amount}{\frac{1}{r_d - r_i} - \frac{\frac{(1+r_i)^n}{r_d - r_i}}{(1+r_d)^n}}, \tag{24}$$

where r_d indicates the discount rate and r_i inflation rate. The OCFD is assumed to be the same in real terms each year. Hence, the cash flow in the nominal calculation changes only with historic outcome of inflation, if the CVA analysis is made on historic data, and future estimated inflation, for remaining OCFD. (Ottosson & Weissenrieder 1996, 2011.)

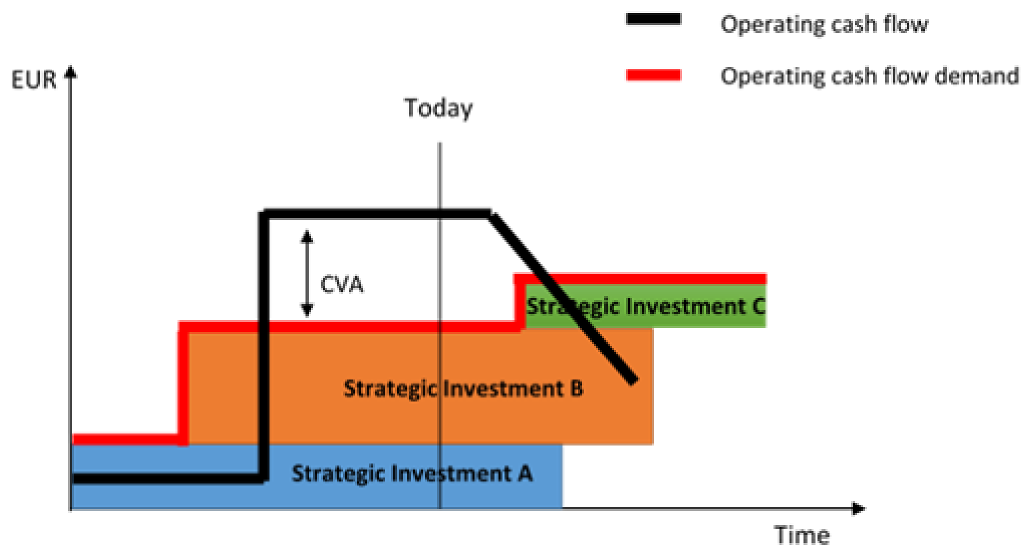

Figure 4. The CVA investment mapping adapted from Ottosson & Weissenrieder (2011).

The profitability of the strategic investments, and hence strategy value of the company, is determined using the operating cash flow (OCF). The OCF is shown as the black solid line in Figure 4 and is calculated as the sum of EBITDA, working capital movement and non-strategic investments I_n as following way:

$$OCF = EBITDA \pm \Delta NWC - I_n \,. \tag{25}$$

The difference between the OCF and the OCFD is called CVA. The CVA over the strategic investment's life cycle is modeled mathematically as follows:

$$CVA = \sum_{t=1}^{n} \frac{OCF_t - OCFD_t}{(1 + r_d)^t} \tag{26}$$

where r_d refers to discount factor, subscript 1–n is observation year, and n is the economic life of the investment (Ottosson & Weissenrieder 1996.)

The quality of the strategic investments is evaluated using the CVA index which is calculated as the quotient of the operating cash flow generated by the investment and the cash flow requirement as follows:

$$CVA\ index = \frac{OCF}{OCFD}. \tag{27}$$

A CVA index of 1 indicates that the strategic investment gives NPV of zero. An investment with CVA index above 1 creates additional value to the shareholders, while an investment with the CVA index below 1 destroys value. (Ottosson & Weissenrieder 1996.)

5 EVALUATING STRATEGY VALUE ADDED

5.1 Value creation through strategic investments

Investments play a key role in value creation. According to Damodaran (2010), a firm can generate higher earnings in future only by reinvesting in new assets or using existing assets more efficiently. On the other hand, only the growth with returns exceeding the financial requirements creates value, not growth itself.

As suggested by Ottosson and Weissenrieder (1996), company’s stock market value consists of two parts: pre-strategy value and strategy value where pre-strategy value is the present value of the operating cash flow from the company’s business, without any further investments. The strategy value is the present value of the cash flow from strategic decisions and investments in the future. Thus, one could argue that value creation is solely driven by strategic investments. Operational or non-strategic investments on the other hand maintain the value the strategic investments create (Weissenrieder 2007).

5.2 Value creation – limitations on conventional valuation methods

In conventional valuation methods, investments typically are having a negative impact on the calculated firm value as capital expenditures are subtracted from revenues. Often this negative impact is partially compensated by assuming a higher growth rate on top-line and net income. Conventional valuation methods, however are having serious limitations in their ability to describe the value creation coming from investment.

5.2.1 Discounted dividend model (DDM)

As shown in Formula (11), only dividends are driving value creation. Investments are not having any direct impact on firm value. However, one could conclude that investments are indirectly influencing the firm value if investments are having a positive or negative influence on company's ability to pay dividends.

If the company invests too much, it is possible that it loses its capability to distribute dividends to shareholders. At least the monetary amount of dividends may reduce. This has a straight, negative impact on firm value although the investments were done for increasing the firm value. On the other hand, if the company distributes constant dividends as assumed in Formula (13), the calculated value of the company is not at all influenced by the investments.

5.2.2 Discounted free cash flow method (DCF)

As shown in Formulas (15) and (16), investments are having a direct negative impact on free cash flow and consequently on the firm value. Theoretically, the positive or negative influence of investments on firm value should be visible on future years' EBIT. According to Damodaran (2010: 61), the DCF model does not make the linkage between reinvestment and growth explicit. Thus, analysts often estimate growth rates and capital expenditure as separate inputs (ibid.) However, estimating the EBIT development over the economic life of the investments is cumbersome and may lead to major errors in valuation process.

When valuing companies using DCF method, investments reduce free cash flow. Cash flow calculation is corrected with assumption that investments provides a pay-off in terms of future growth. (Damodaran 2010: 26).

5.2.3 Economic Value Added (EVA)

As shown in Formula (21), investments are having an indirect impact on firm value through EBIT and depreciations. However, Damodaran (2010: 267) reminds that margin and returns at growth firms change significantly over time. Thus, estimating EBIT and depreciations for future years substantially increases the uncertainty in the assumptions behind the key value drivers in the modeling.

5.2.4 Conclusion

As shown in Subsections 5.2.1-5.2.3, conventional methods for firm valuation are having significant weaknesses when analyzing firm value created by strategic investments, as the conventional valuation methods do not treat strategic investments as a value creating subject at all. Thus, conventional valuation methods are not able to differentiate the growth generated by successful strategic investments from the growth caused by general price increases. According to Damodaran (2010: 3), only the growth with returns exceeding the financial requirements creates value, not growth itself.

One can conclude that when analyzing companies that are growing through large investments, conventional methods for firm valuation may lead to a too low valuation in evaluation process. Additionally one can conclude that this calculated value is more describing the pre-strategy value of the company rather than the created strategy value.

5.3 Strategy value-added concept (SVAC) – a new firm valuation method

As shown in Sections 5.1 and 5.2, the role of strategic investments in value creation is underestimated in firm valuation when conventional valuation methods are applied. On the other hand, no theory has been presented in literature which takes the dual nature of the investments into account when analyzing value creation. Thus, in this thesis a new theoretical model for analyzing firm value created particularly by strategic investments has been developed. The new firm valuation method is based on the philosophy presented by Ottosson and Weissenrieder (1996), whereby the value of a company consists of two elements, pre-strategy value and strategy value. The new firm valuation method developed in this thesis is called Strategy Value-Added Concept (SVAC) and it is defined as:

- Firm value = Pre-strategy value + Strategy value.

The pre-strategy value of a company is assumed to be the value given by the traditional DCF method without a presumption of significant future strategic investments.

According to Damodaran (2010: 3), the value added by future investments can be estimated making judgments on the magnitude and quality of the investments. The magnitude refers to the relative size of the investments compared to the size of the company's earnings. The quality of the investments is measured in terms of excess return, i.e. the difference between the return, generated by the investments, and the cost of capital.

In the new firm valuation method, the value added created by future investments, i.e. the strategy value is estimated by applying a modified formulation of the CVA technique presented by Ottosson and Weissenrieder (1996).

Since the CVA method is planned for capital budgeting and strategy development purposes, it is not applicable for external firm valuation without modifications. Additionally, some basic assumptions are needed to make the concept applicable in share valuation.

The main assumption is that every strategic investment achieves the fixed, average CVA index ψ in their economic life as follows:

$$CVA\ index = \frac{\mathrm{OCF}_t}{\mathrm{OCFD}_t} = \psi \ \ \forall\ t \in \mathbb{N}\ . \qquad (28)$$

By reformulating Equation (28), OCF is calculated as follows:

$$OCF_t = \psi \times OCFD_t\ . \qquad (29)$$

By writing CVA as (26), the relation between the cash value added and operating cash flow demand is:

$$\begin{aligned} CVA_t &= OCF_t - OCFD_t \\ &= \psi \times OCFD_t - OCFD_t \\ &= (\psi - 1) \times OCFD_t. \end{aligned} \qquad (30)$$

When the life time of the investments is assumed to be *n* years, the cash value added of the strategic investments can be calculated using the following formula:

$$\sum_{t=1}^{n} \frac{CVA_t}{(1+WACC)^t} = (\psi - 1) \times strategic\ investment \tag{31}$$

The additional terminal value is determined to be a constant multiple α times the sum of the year's n operating cash flow of each strategic investment made in the period under review as follows

$$V_n = \alpha \sum_{n} OCF_n \text{ ,} \tag{32}$$

where the multiple α depends on the determination method of terminal value of pre-strategy value analysis, being for example an EBITDA multiple.

The enterprise value is calculated as the discounted sum of the pre-strategy value V_0^P determined using the traditional DCF method without a presumption of future strategic investments and strategy value-added V_0^S. Thus, the value per share is calculated using the following formula:

$$P_0 = \frac{V_0^P + V_0^S - Debt + Cash}{Shares\ outstanding} \text{ .} \tag{33}$$

6 VERIFACTION OF THE NEW VALUATION METHOD

Since the Strategy Value-Added Concept (SVAC) introduced in this thesis is based on a theory that has not been applied in firm valuation earlier, a thorough analysis has been carried out in order to verify the applicability of the method.

The SVAC method deals with cash flows, thus the risk of manipulation of accounting figures and book values are minimized. Furthermore, the new approach emphasizes strategic investments, and thus eliminates the myopia, that arises in the traditional DCF method and discourages long-term investments.

The applicability of the SVAC valuation method was verified by using it in external firm valuation purposes and comparing the results with the values given by traditional valuation techniques. For verification purposes, a firm valuation application was developed and a case company was analyzed.

Additionally, a sensitivity analysis for SVAC method as well as for traditional valuation methods has been carried out in order to analyze the impact that different parameters are having on valuation outcome.

6.1 Firm valuation application

The simulator developed for stock price valuation is implemented on Microsoft Excel spreadsheet. The application determines the stock price based on four different valuation methods i.e. DDM, DCF, EVA and SVAC methods.

The valuation application creates also a sensitivity analysis. According to Kallunki and Niemelä (2012: 232) sensitivity analysis is needed to evaluate the impact of the presumptions to the final results because even small changes in key variables may affect the stock price fundamentally.

For the DDM valuation, the dividend distribution rate is an input. Additionally, the future growth percentage of the annual dividends is given for terminal value calculation purposes. Terminal value is calculated using Equation (12). The price per share is computed using Equation (11). The cost of equity calculated with Equation (19) was selected as the discount rate R_E.

In the DCF technique, the free cash flow is calculated using Equation (16). The terminal value is computed as an anticipated year-5 EBITDA multiple. WACC, calculated in Equation (18), is used as the discount rate. The value per share is estimated using Equation (20).

To evaluate stock prices using EVA, Equation (22) is utilized. The application calculates the net income, decreases the estimated dividends and adds the sum to the previous year's equity. The cost of capital is calculated using Equation (11).

The SVAC method determines the additional value created by strategic investments according to Equation (31). The OCF is computed using Equation (25) and the OCFD with Equation (24). The non-strategic investments are assumed to be the average capital expenditure (CAPEX) of previous four years. The amount of future strategic CAPEX is input manually and it is considered to be non-strategic investments multiplied by at least three. The value per share is computed using Equation (33). The average future CVA index is input manually.

6.2 Business analysis

6.2.1 Overview on the case company

Exel Composites Plc has been selected as the case company since the company is expected to announce significant strategic investments as part of its growth strategy in near future. Hence, the value creation caused by strategic investments will be a very relevant element and consequently the differences between SVAC analysis and other conventional valuation methods should become visible.

Exel Composites is a listed, Finnish technology company which designs, manufactures and markets high-quality composite profiles and tubes for industrial applications. The company is one the leading composite profile manufacturers in the world focusing on attractive and growing niche segments. (Exel Composites 2014a: 3.) This strategy is outlined in Figure 5.

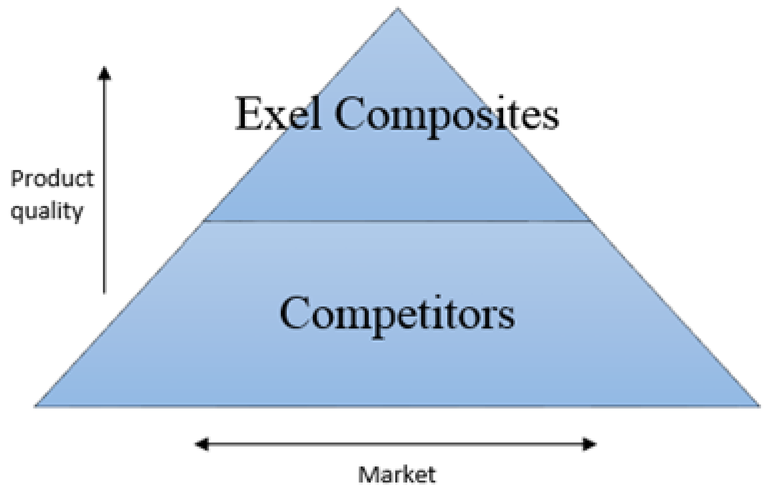

Figure 5. Exel Composites' strategy.

The group consists of the Finnish parent company and six operating subsidiaries locating in Austria, Belgium, Germany, UK, Australia and China. The competitive edge bases on the pultrusion technologies developed and patented by the company itself. Pultrusion refers to pulling plastic raw material through a preformer. Other utilized production techniques are pull-winding, co-winding, continuous lamination and extrusion. (Exel Composites 2014b.)

The company pursues profitable growth by developing new innovations in co-operation with customers and via acquisitions. It also maintains a sustainable customer portfolio. (Exel Composites 2014a: 5.)

6.2.2 Nature and history of the business

Exel Composites started its operations by producing electronic detonator caps in 1960. The company's name was derived from the words "Explosive Electronics". In 1970s, the product development focused more on sports. The manufacture of industrial applications started in 1980. In 1990s and early 2000, the company reorganized its operations, expanded via several acquisitions and concentrated on pultrusion technology. Nowadays, Exel Composites is the largest pultruder in the world. (Exel Composites 2014b.)

The business operations rely on high technology products, wide product range and a strong market position in selected segments with a strong quality and brand image. The company is not dependent on only one customer or industrial sector because varied production techniques make diverse customer and product segments possible. The industrial sectors Exel Composites serves are: transportations, building, construction and infrastructure, energy industry, telecommunication, paper industry, electrical industry, cleaning and maintenance, sports and leisure industry, and machine industry. The customer portfolio consists of growing markets such as electrical and telecommunications industry as well as more defensive sectors as transportations, construction and sports industries. (Exel Composites 2014a: 19–20.)

6.2.3 Overall and specific industry economic outlook

Pultrusion market can be considered as a growing market. Carbon and glass fiber profiles provide higher strength property with significantly lower weight than steel or aluminum profiles. The price of the carbon and glass fiber products is a little bit higher than competitive materials but when market grows the production costs will reduce. So far, the market is quite small and profits are good.

Over 80% of Exel Composites’ net sales is recognized in Europe (Exel Composites 2014c: 16). Currently, when Europe suffers from poor economic situation, the growth might be higher in Asia, Middle East and Latin America. Potentially over centered sales in Europe can be considered a weakness. Additionally, price competition with steel products is a long-term challenge.

Strong market position and consequently strong pricing power are company’s strengths. Customized, high-quality products provide wide customer base. Company’s cost structure is good and business profitable. Exel Composites has good opportunities at growing and developing markets with its new product innovations. The company also has capital to spread its operations and sales to new regions via acquisitions.

6.3 Financial statement analysis

Key financial ratios were calculated to evaluate past development and to forecast the future cash flows. The key ratios are illustrated in Table 1. As shown, the gross margin has dropped from best days but still remains on a quite high level. Operating margin was stable in 2010 and 2011 but dropped dramatically in 2012 and 2013. The reason was that other operating expenses as well as employee benefit expenses remained constant although net sales decreased.

Exel Composites gives more than 40 days of time to its customers to pay their bills. This number has remained quite fixed over years. However, the company has managed to extend the pay time of its invoices up to three months. This has a good effect on liquidity.

Current ratio and quick ratio indicate that liquidity has been on very good level until year 2012 and remains on satisfactory level in 2013. However, it can be argued that the company has had too good liquidity and it is a deliberate decision to decrease liquidity assets balance.

Table 1. Exel Composites' key figures.

Key Figures	2010	2011	2012	2013
Operating ratios				
Gross margin-%	37.9 %	36.0 %	34.6 %	34.4 %
Operating margin-%	12.4 %	12.9 %	4.4 %	6.9 %
Days sales outstanding	45	40	44	45
Days payables outstanding	74	73	85	90
Credit ratios				
Current ratio	2.32	2.43	2.51	1.16
Quick ratio	1.90	1.61	1.69	0.81
Net debt-%	-4 %	-5 %	-3 %	15 %
Interest coverage ratio	19.44	31.94	13.76	22.42
Investment ratios				
Return on investment	22.1 %	26.5 %	8.9 %	13.9 %
Return on common equity	23.3 %	23.5 %	6.1 %	11.3 %

Changes in net debt percentage indicate that the company has raised its leverage level. However, the company has not had net liabilities before year 2013. The gearing level is still very low and currently there is no significant risk to become overburdened with debts.

Interest coverage ratio also indicates quite good liquidity and ability to cover interest expenses. The ratio has varied during years but remained on a satisfactory level.

ROI has been outstandingly high with the exception of year 2012. ROI has been very close to ROE which supports the observation of low leverage level. Both ratios indicate that the business has been very profitable in 2010–2011, year 2012 was very difficult but 2013 showed better profitability and forecasts for 2014 indicate good profitability.

6.4 Forecasting

Forecasting future cash flows bases on previous financial statements and company's own reports and forecasts. CEO's outlook presentation for fiscal year 2014 reveals that Exel Composites has made reinforcements to its organization to work on sales development as well as on operational efficiency and productivity improvement. The company believes that market has stabilized but remains challenging. Uncertainties relating to general growth prospects in the economy continue, however some positive signs can be seen especially in laminate and demanding carbon tubes market. The general market development will be monitored and actions will be planned to react to the business environmental changes. When the market recovers, Exel Composites is well-positioned to grow its profitability. (Exel Composites 2014a: 4.)

6.4.1 Sales

Company’s net sales for the first half of fiscal year 2014 increased by 13.9 per cent from the corresponding period in 2013. Order intake increased by 12.5 per cent. Operating profit more than doubled and net operative cash flow increased. (Exel Composites 2014c.)

Market demand increased in the cleaning and maintenance, machine industry and general industries compared to the first quarter and in telecommunications, transportation and building market in the second quarter compared to the corresponding periods in 2013. However, market remains challenging. (Exel Composites 2014c.)

Sales in APAC region declined by 30.7 per cent in the first quarter but recovered in the second quarter. It is obvious that the company is going to boost more sales promotion in APAC region in future.

Based on the assumption that sales remains stable in Q3 and Q4, the estimated net sales for fiscal year 2014 is €72,362. For next four years, it is assumed that the net sales grows 8% annually. Especially the increasing potential in APAC region, keeps the growth percentage significantly high next four years. Long-term growth rate after year 2018 is assumed to be 5% based on the presumption of pultrusion market being still a growing market.

6.4.2 Profitability

Based on the realized figures in first half of 2014, it is expected that the gross margin-% increases to 37.1% in 2014 and 38.3% in 2015-2018. EBIT-% is assumed to increase up to 10.1% this year. For next four years, it is assumed that the company is likely to boost more sales promotion in APAC region. Due to the growth potential in APAC region, it is assumed that increasing marketing expenses are covered with increasing sales revenue. The estimated operating margin -% for years 2015-2018 is 11.9–12.1%.

It is also very likely that the company rationalizes and reorganizes its production and organization. This will cause additional non-recurring expenses but those items are excluded from the profitability analysis.

6.4.3 Investments

It is likely that the company expands its sales to American market by acquisitions in near future. Investments in property, plant and equipment for China manufacturing site as a response to the rising demand in APAC region are also likely.

The company’s capital structure and financial position support significant strategic investments in the near future. Company’s current leverage level is very low, and thus it is likely that the company gets external capital for financing its investments.

Operational investments are assumed to be 4% of annual revenue. Additionally, future strategic investments to be implemented in 2015-2016 are assumed to be 11 million Euros totally. Out of this, 35% will be implemented in 2015 and 65% in 2016. The investment is financed 50/50 with equity and debt.

Based on the previous strategic investments, the management is capable to do lucrative investment decisions with reasonable capital cost. Therefore, the company is able to achieve at least the average CVA index of 1.2 for its strategic investments.

As a benchmark, SCA is has set a CVA index target of 1.2 to be reached as a minimum for all its strategic investments (SCA 2003).

In valuation calculation, the CVA index of 1.2 will be used in the SVAC modeling. In conventional valuation methods DDM, DCF and EVA, a corresponding improvement in income statement and cash flow statement are included.

6.4.4 Financial risk and WACC

Credit ratios indicate that the liquidity is on satisfactory level. Interest coverage ratio is high and gearing level is very low. The probability of credit or financial risk in short-term is low.

When calculating Exel Composites' weighted average cost of capital, the cost of equity has to be calculated. Cost of equity was calculated using CAPM formula (19). Risk free rate E_f was assumed to be 2% which equals the Finnish government ten-year bond coupon interest (Central Government Debt Management). Beta is assumed to equal to average market risk, 1. Since the company does not seem to have any credit rating, the market risk premium is assumed 8%. Thus, the total equity cost is:

$$R_E = 2\% + 1 \times 8\% = 10\%. \tag{34}$$

The debt cost was determined using the rolling previous 12 months financial expenses and debt amounts. Tax rate was assumed to be 20%. The capital structure used in the calculations was as in the end of Q2 2014. The WACC of 8.7% was calculated using Equation (18).

6.4.5 Simulation parameters

The valuation was carried out based on Exel Composites performance as reported after Q2 2014. The financial statements in 2009–2013 as well as interim reports of Q1 and Q2 2014were analyzed.

6.5 Valuation

In this section the results of the valuation calculated on the application developed in this thesis are presented. The results were calculated using the SVAC method as well as using the three conventional valuation methods i.e. DDM, DCF and EVA models. Some further assumptions were applied respectively.

6.5.1 Discounted dividend model (DDM)

The company announced to distribute at least 40 per cent of net income in dividends (Exel Composites 2014a). Therefore, it is estimated that dividend per share grows 8% annually for next five years. For terminal value calculation, the long-term dividend growth rate is 5% based on the assumption that the profitability will decrease in long-term.

The strategic investment is assumed to produce more sales. The estimated additional annual sales equals to 15.5% of initial investment. The economic life is assumed to be 7 years. Thus, annual depreciation increases one seventh of the initial investment. The interest rate is assumed to remain at current level based on the strong financial position of the company.

6.5.2 Discounted free cash flow method (DCF)

It is assumed that the ratio of cash flow from operations to net income remains constant in next five years. Additionally, it is assumed that the relation between annual capital expenditure and net income equals the long-term average. The terminal value is supposed to be 6 times year 2018 EBITDA. The WACC of 8.7% was used as the discount rate.

The strategic investments as described in Subsection 6.4.3 were implemented.

6.5.3 Economic Value Added (EVA)

Net income will grow to 4.8 million Euros in 2014 which corresponds to 6.7% of total revenue. In 2015–2018, the net income will be 8.2–8.4% of total revenue. The company pays dividends annually 40% of its net income. The economic requirement was determined to be the cost of equity multiplied by equity after dividends.

The strategic investments in 2015 and 2016 generate more sales and higher COGS, depreciation and finance expenses correspondingly.

6.5.4 Strategy Value-Added Concept (SVAC)

The pre-strategy value of the company equals the enterprise value given by the DCF method before strategic investments.

The strategic investments are assumed to achieve an average CVA index of 1.2 in the economic life of 7 years. The terminal value of the strategic investment is assumed to be 6 times OCF produced by the investment in 2018.

6.6 Results

The pre-strategy value i.e. the firm value before strategic investments as well the firm value after strategic investments were calculated using the application developed in this thesis. In calculations, SVAC, DDM, DCF and EVA methods were applied.

The valuation analysis based on Exel Composites' 2Q 2014 interim reporting is summarized in Table 2.

Table 2. The results.

DDM	€4.12
DDM excluding investments	€4.59
Strategy value	€-0.47
CVA	N/A
DCF	€6.80
DCF excluding investments	€7.29
Strategy value	€-0.49
CVA	0.93
EVA	€7.78
EVA excluding investments	€7.72
Strategy value	€0.06
CVA	1.01
SVAC	€8.29
SVAC excluding investments	€7.29
Strategy value	€1.00
CVA	1.14

In Table 2, the calculated firm value excluding strategic investments i.e. pre-strategy value as well as the calculated value added created by strategic investments i.e. strategy value when using DDM, DCF, EVA and SVAC respectively is presented. In Table 2, the strategy value equals to the total value minus pre-strategy value as suggested by Ottosson and Weissenrieder (1996). The results are also illustrated in Figure 6.

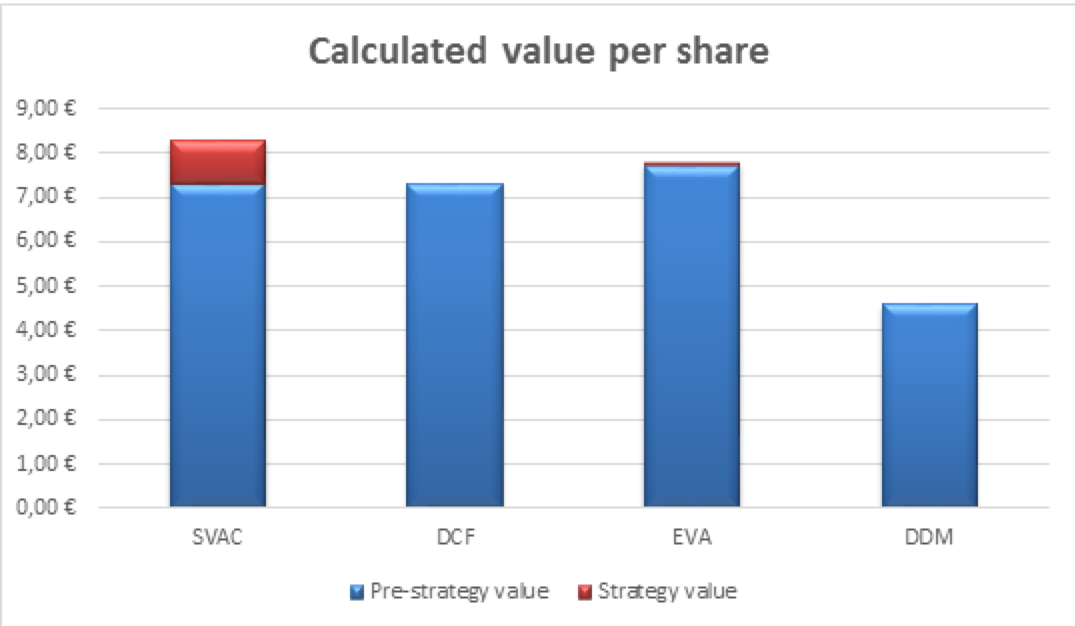

Figure 6. Calculated value per share.

6.7 Sensitivity analysis

Several studies are emphasizing the uncertainty in valuation process caused by inaccuracy in forecasts or assumptions (e.g. Penman and Sougiannis 1998; Lundholm and O'Keefe 2001). Therefore in this thesis, a thorough sensitivity analysis has been carried out in order to evaluate the influence of certain factors in valuation process and calculated firm values.

6.7.1 Discounted dividend model (DDM)

As shown in Formula (12), the terminal value in the DDM valuation method depends on equity cost and long-term growth rate, thus being very sensitive to the changes in those variables. When the dividend growth rate g_d approaches the equity cost R_E, the terminal value approaches infinity. If the dividend growth rate is higher than the equity cost, the terminal value is negative.

The sensitivity of the DDM valuation on the dividend distribution level and the annual dividend growth rate has been simulated. The results are shown in Figure 7 where the red line refers to a distribution level of 50% and the blue line to a distribution level of 40% respectively.

If the long-term dividend growth rate is only 4%, the calculated value per share is between €3.56 and €4.45 depending on the dividend distribution level. The average share price in September 2014 of €7.80 is achieved with the long-term dividend growth rate of 7.2% (distribution level 40%) and 6.8% (distribution level 50%).

It also can be seen in Figure 7 that when the dividend growth rate approaches the equity cost of 10%, the calculated value per share grows to infinity as $R_E - g_d$ in Formula (12) becomes zero.

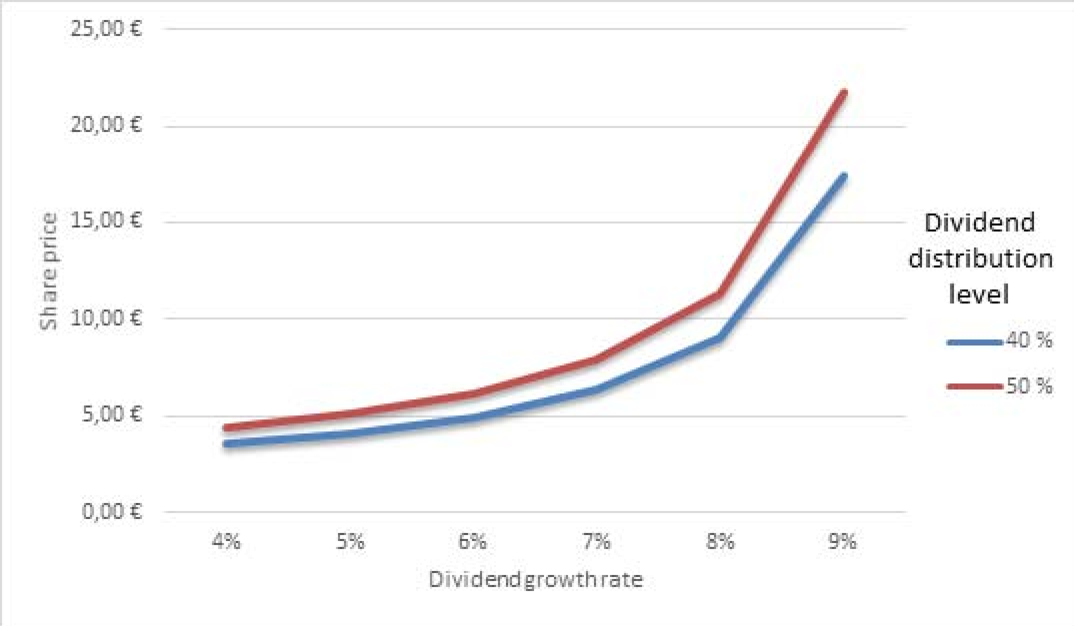

Figure 7. DDM sensitivity analysis.

6.7.2 Discounted free cash flow method (DCF)

In the DCF valuation model in this thesis, the terminal value of an EBITDA multiple is applied. Therefore, the impact of annual sales growth rate on calculated value per share is not as considerable as in the case when the terminal value is calculated using the long-term growth as in Formula (17). This procedure substantially decreases the sensitivity of the DCF model.

The effect of sales growth rate and the WACC on the DCF valuation is shown in Figure 8. The most conservative scenario assumes WACC to be 10% and annual sales growth rate to be 7%. In that case, the calculated value per share would be €5.59. The most optimistic scenario, when the WACC is 7% and annual sales growth rate is 10%, the calculated value per share would be €7.82.

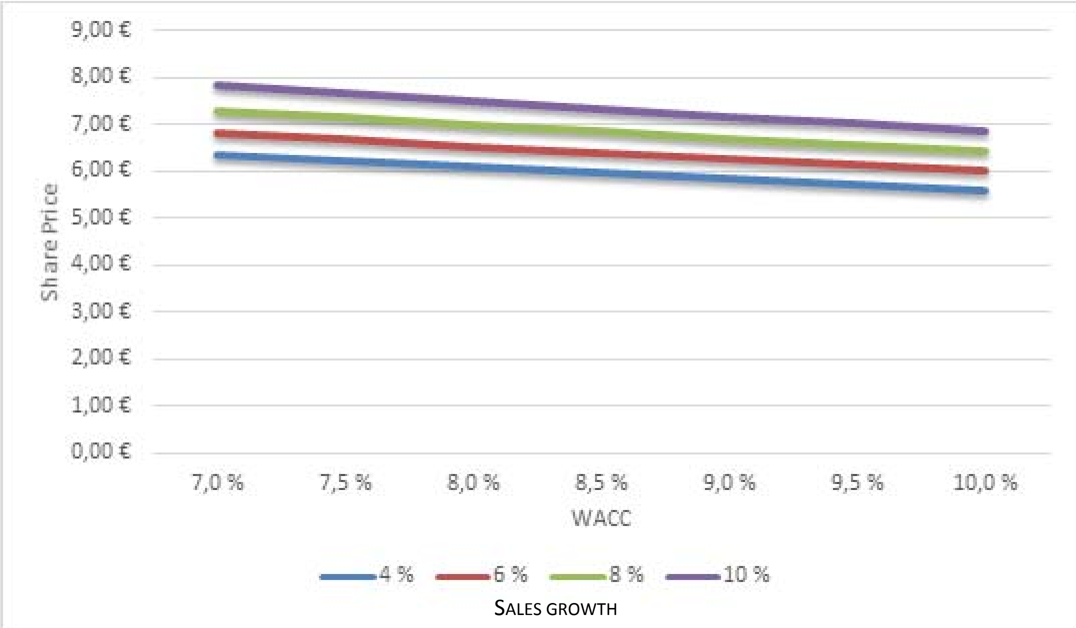

Figure 8. DCF sensitivity analysis.

6.7.3 Economic Value Added (EVA)

In the EVA valuation model in this thesis, the terminal value of an EBITDA multiple is applied. This reduces the sensitivity of the model to the long-term growth and the discount rates compared to the infinity growth rate model.

Figure 9 illustrates the effect of equity cost and sales growth rate on calculated value per share when EVA valuation technique is used. In the most optimistic scenario, when equity cost is 6% and annual sales growth rate 10%, the calculated value per share is €10.02. In the most pessimistic scenario, the sales grows only 4% annually and equity cost is 10%. Then the calculated value per share approaches €6.99.

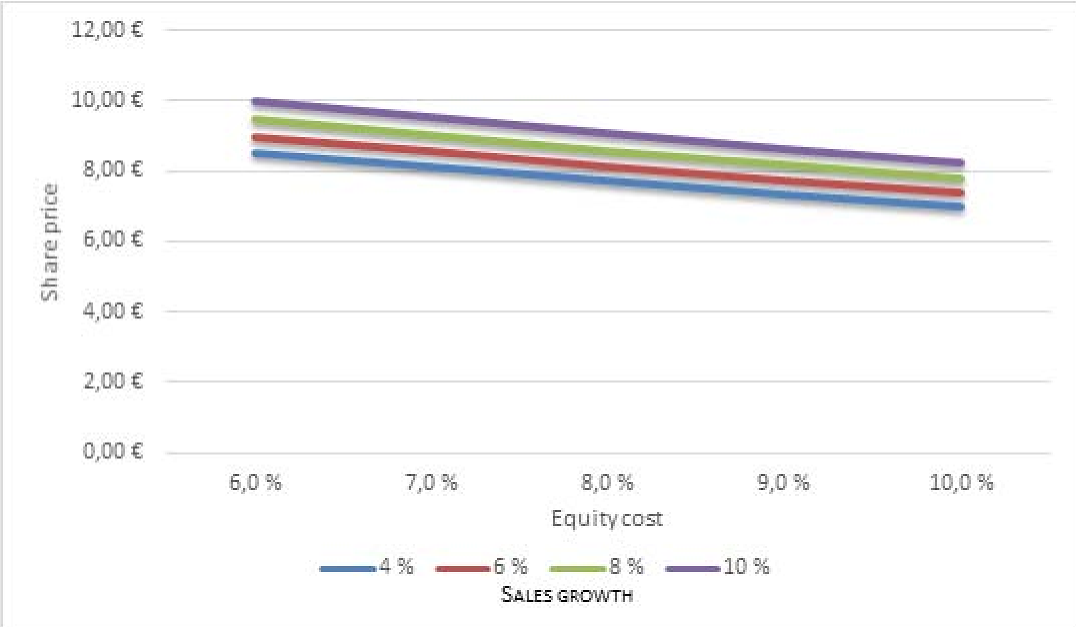

Figure 9. The effect of sales growth rate and equity cost on calculated value per share.

6.7.4 Strategy Value-Added Concept (SVAC)

In the SVAC valuation model when calculating the pre-strategy value the sensitivity analysis presented for the DCF method in 6.7.2 is applicable.

In the SVAC valuation model, the variables affecting the strategy value and thus the calculated value per share are the magnitude and the quality of the strategic investments i.e. the investment sum and the CVA index.

Figure 10 below presents the effect of the CVA index of the assumed future strategic investments as presented in Subsection 6.4.3. The pre-strategy value per share i.e. the value per share corresponding the CVA index 1.0 is €7.29. Assuming the CVA index being 1.2, the calculated value per share given by the model is €8.29. In an optimistic scenario, the strategic investment achieves the CVA index of 1.5. In that case, the calculated value per share climbs up to €8.73. In a pessimistic scenario, the average CVA index of the strategic investment is only 0.5. According to this scenario, the calculated value per share drops to €6.54.

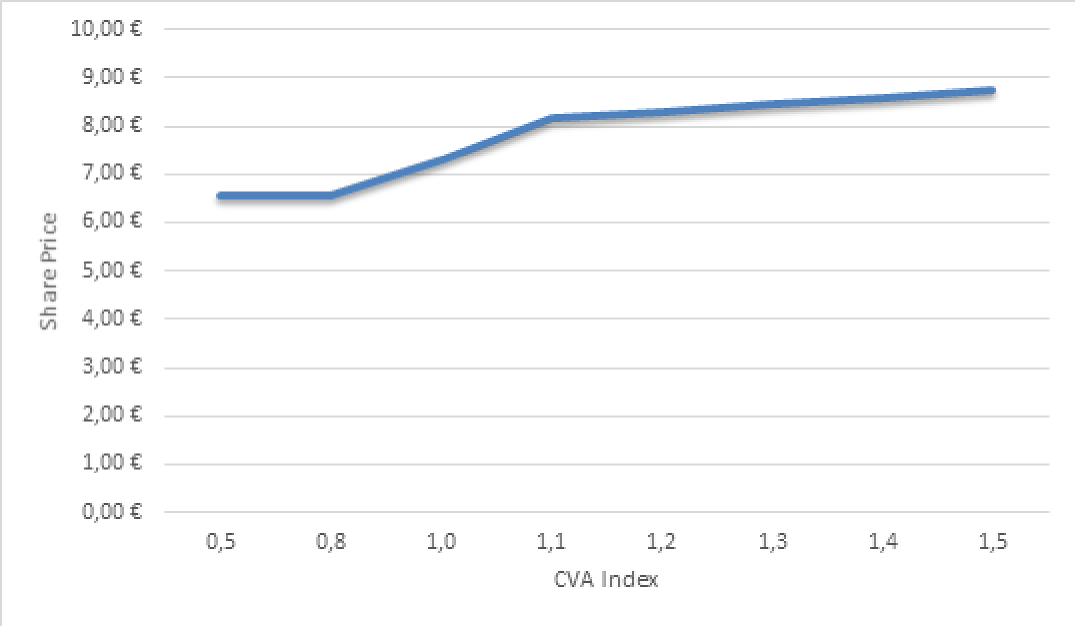

Figure 10. The effect of CVA index on calculated value per share.

In Figure 11, the calculated value per share on three different CVA index levels and three different investment levels respectively are illustrated. As shown in Figure 11, the additional value created by strategic investments i.e. strategy value equals to zero regardless of the investment level when the CVA index is 1.0.

When the strategic investments achieve the average CVA index of 1.1, the calculated value per share climbs up to €7.83, €7.99 and €8.15 on investment levels 7MEUR, 9MEUR and 11MEUR respectively. Having the average CVA index of 1.2, the corresponding values per share are €7.93, €8.11 and €8.29.

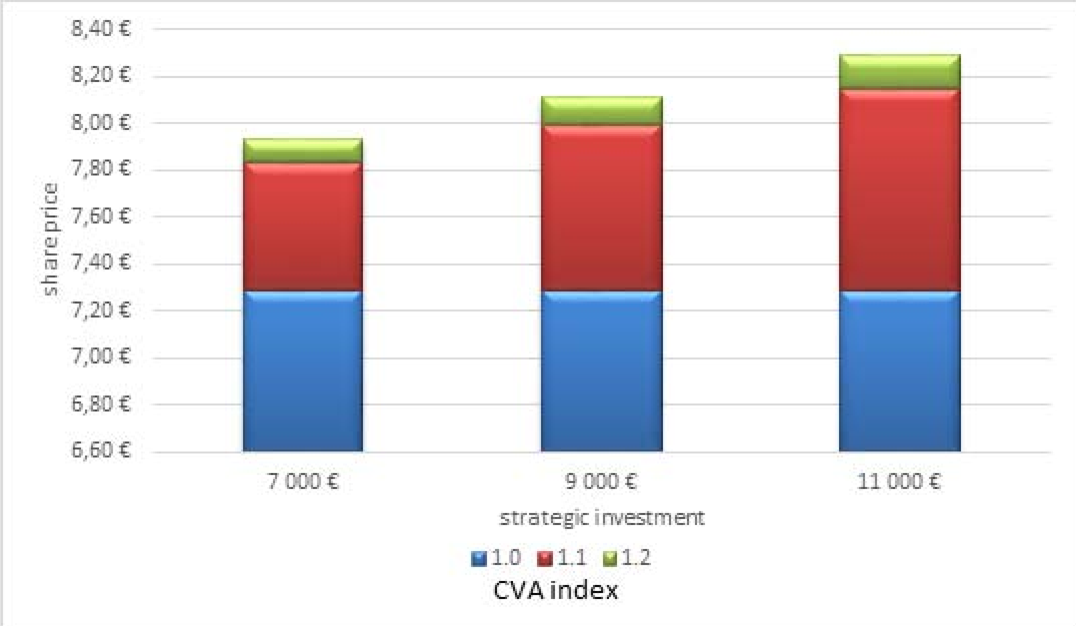

Figure 11. The effect of strategic investment amount on calculated value per share.

6.8 Analyzing the results

6.8.1 Calculations with non-strategic investments, pre-strategy value

Various researches (e.g. Bailey et al. 2008; Plenborg 2002; Francis et al. 2000; Penman and Sougiannis 1998) argue that valuation models may provide unequal firm values. This is also observed in this thesis when the calculated values given by the conventional valuation methods were analyzed assuming that there are no strategic investments implemented.

The calculated value per share given by the DDM valuation method was clearly the lowest. The DDM technique showed its limitations because the studied case company did not distribute dividends every year and forecasting the long-term dividend growth rate was very challenging. Additionally the company did not repurchase its own shares from market nor announced reinvesting the retained earnings instead of dividends. Thus, the theory of Bagwell and Shoven (1989) about alternative ways to distribute earnings could not be applied.

The calculated value per share given by the DCF method was clearly higher than the value given by the DDM but somewhat lower than the value given by the EVA method.

The calculated value per share given by the EVA method was the highest. Earlier research (Bailey et al. 2008; Plenborg 2002; Francis et al. 2000; Penman and Sougiannis 1998) has found out that valuation techniques, which are based on abnormal earnings provide the most accurate value to the company, thus the value given by EVA method can be considered as most reliable when strategic investments are excluded.

The calculated value per share given by the SVAC method was, as expected identical with the calculated value per share given by the DCF method being the pre-strategy value of the company. It is notable that the pre-strategy value calculated by the SVAC method is identical to an investment case having the CVA index of 1.0.

6.8.2 Calculations when strategic investments are included - strategy value creation

In this thesis, a strategic investment having a CVA index of 1.2 was modeled in the SVAC analysis and a corresponding improvement in income statement and cash flow statement were modeled in the DDM, DCF and EVA analysis. Although identical assumptions and scenarios were applied in all three conventional valuation methods and a corresponding CVA index was applied in SVAC analysis, major differences were identified when calculating the impact on value creation coming from strategic investments i.e. strategy value.

Based on the simulation results presented in this thesis, the calculated strategy value is negative and consequently the strategic investments seem to be value destroying when using the DDM modeling. As in the DDM modeling only dividends are value creating and as strategic investments by definition are assumed to be significant by size thus reducing the company's ability to pay dividends, the strategic investments are negatively affecting value creation in the DDM modeling. Thus, one can conclude that the DDM model is not able to recognize the value created by the investments.

Based on the simulation results presented in this thesis, the calculated strategy value is negative and consequently the strategic investments seem to be value destroying also when using the DCF modeling even though a prudent top-line growth scenario was built in the model. The observed CVA index for the scenario with the strategic investment was 0.93. It is obvious that the assumed increase on income level was not sufficient to offset the negative impact of strategic investment on free cash flow. In the DCF modeling a number of parameters need to be estimated. Uncertainty when estimating variables e.g. sales growth rate, working capital movements etc which have a significant impact on free cash flows create complexity in valuation process especially when the added value created by strategic investments is concerned. Thus one can conclude that the DCF modeling is having serious weaknesses in quantifying the value creation coming from strategic investments.

Based on the simulation results presented in this thesis, the calculated strategy value is very marginal but positive when using the EVA modeling. The observed CVA index for the scenario with the strategic investment was 1.01. A likely explanation is that the profit improvement which more than offsets the higher depreciations can be considered as value creating.

It is notable that even if the assumptions and scenarios were identical for all three conventional valuation methods, only the EVA model was able to recognize the value creation coming from strategic investments.

Based on the simulation results presented in this thesis, the calculated strategy value is significantly positive when using the SVAC method. The observed CVA index for the scenario with the strategic investment was 1.14. This is due to the fact that the investment projects with the CVA index of 1.2 were scheduled to 2015 and 2016. The overall CVA index is a discounted value of those investments.

The results presented in this thesis highlight the unique ability of the SVAC method to recognize the value added created by strategic investments i.e. strategy value in valuation process.

6.8.3 Comparison to the actual market price in September 2014

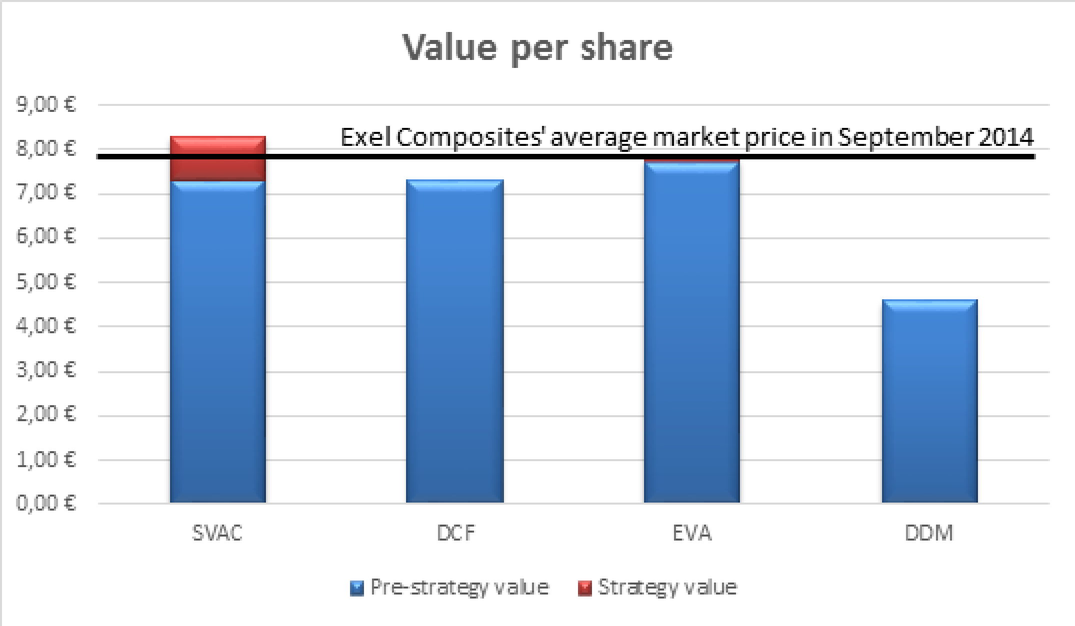

Figure 12. Exel Composites - Calculated firm value vs. actual market price (average September 2014).

In September 2014, the average share price in Nasdaq OMX Helsinki for Exel Composites was €7.80.

In Figure 12, the average share price as well as the calculated value per share given by the conventional valuation methods as well as the SVAC method are presented.

As presented in Figure 12, the calculated value per share given by the EVA model is very close to the actual market price in September 2014.

The calculated value suggested by the SVAC method when the strategy value is included is somewhat higher than the actual market price suggesting that Exel Composites was somewhat undervalued by the market.

The calculated value given by the DCF model was lower than the average market price suggesting that Exel Composites was somewhat overvalued by the market.

The calculated value given by the DDM model was substantially lower than the average market price suggesting that Exel Composites was clearly overvalued by the market.

7 APPLYING THE SVAC MODEL

7.1 The elements of the SVAC model

In this chapter, the elements of the SVAC model i.e. a complete Excel calculation model based on the SVAC theory are presented.

Based on the simulation results presented in previous chapter, it is obvious that the DDM model is not applicable for evaluating the pre-strategy value of the company especially in case when dividends are not paid

In this thesis when formulating and verifying the SVAC theory in Chapters 5 and 6, the DCF model was used when calculating the pre-strategy value. However, based on the previous research (e.g. Francis et al. 2000; Penman and Sougiannis 1998), one can conclude that the EVA model should be preferred in firm valuation as it is claimed to produce more accurate firm value estimates than the DCF model. On the other hand, the DCF model is widely used by practitioners as mentioned by Richardson et al. (2010). Therefore in this thesis, both the DCF and EVA models are included for pre-strategy value calculation purposes when applying the SVAC model.

Based on the simulation results presented in previous chapter, it is also obvious that the DCF model and the EVA model are not applicable for evaluating the strategy value i.e. the value created by strategic investments. Therefore in this thesis, only the SVAC theory is applied for strategy value calculation purposes.

Thus in this thesis, the SVAC model consists of the following elements:

- **Pre-strategy** value given by the DCF + **Strategy** value according to the SVAC theory as presented in Chapter 5

or alternatively

- **Pre-strategy** value given by the EVA + **Strategy** value according to the SVAC theory.

7.2 Comparison to the actual market price in December 2014

In the Interim reporting Q3 2014, Exel Composites announced their aim to accelerate growth in China through strategic investments. This announcement coincidentally by in large validated the investment assumptions that have been behind the valuation modeling presented in Subsection 6.4.3.

A valuation analysis was carried out using the SVAC model described in Section 7.1.

The financial figures published in Q3 were input to the SVAC model. Additionally, the strategic investment monetary amount was updated. The new data was analyzed using the SVAC model. The pre-strategy value was calculated using both the DCF and EVA methods as described in Section 7.1. The results as well as the average share price for Exel Composites in December 2014 are shown in Figure 13.

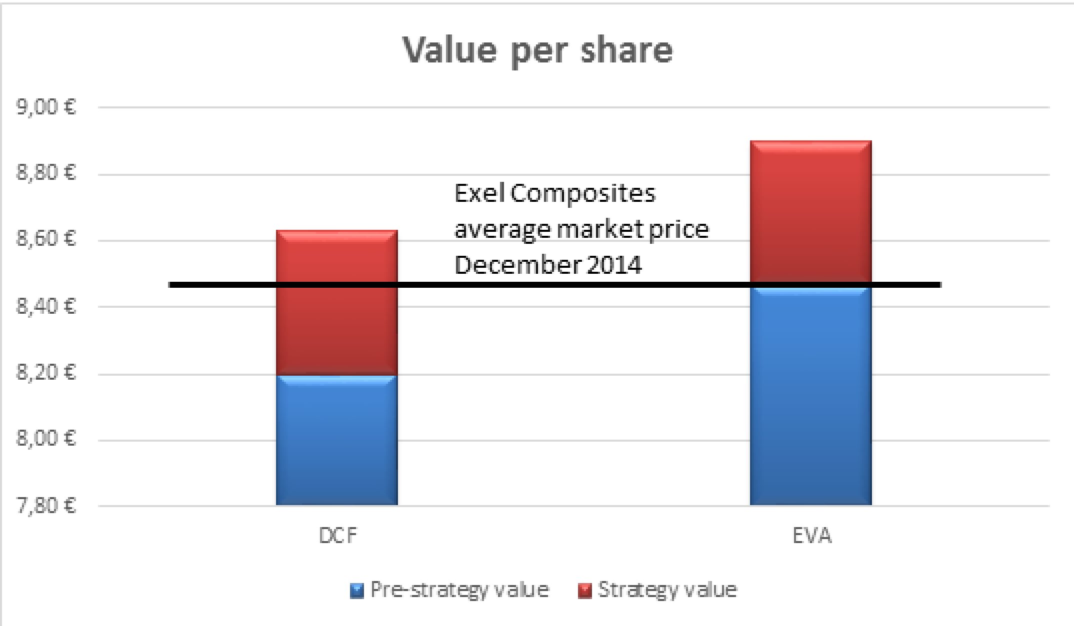

Figure 13. Comparison, pre-strategy value calculated with DCF and EVA.

It is notable that after the 3Q 2014 interim reporting, the average market price appears to be exactly the same as the calculated value per share when using the EVA method. This was already noticed after the 2Q 2014 as presented in Figure 12. One can conclude that the market reaction is at least partially driven by the perceived firm value that is based on the EVA method.

It is also notable that after the 3Q 2014 interim reporting, the average market price appears to be higher than the calculated value per share when using the DCF method. This as well was already noticed after the 2Q 2014 as presented in Figure 12. One can conclude that the DCF model has a tendency to undervalue the company.

After the 3Q 2014 interim reporting, the SVAC modeling is suggesting an upside potential on the share price. This upside potential is due to the strategic investments that the company has planned to 2015. This value creation potential has not been recognized with the DCF or EVA methods. Only the SVAC method is able to highlight the upside potential.

8 DISCUSSION AND CONCLUSIONS

In this thesis, the limitations and challenges that the conventional firm valuation methods face when evaluating the impact on the value that the strategic investments are having, have been addressed. Furthermore, a new theory and a model for properly analyzing the value created by strategic investments in firm valuation has been developed. Contrary to the conventional valuation methods, the full impact of the dual nature of investments is covered in analysis.

In this thesis, the Strategy Value-Added Concept (SVAC) has been applied when analyzing the value created by strategic investments. Additionally, the SVAC model i.e. a firm valuation application based on the Strategic Value-Added Concept has also been engineered. The application has been used for verifying the new theory by comparing the valuation results given by the SVAC method with the results for the most common and frequently used valuation methods DCF, DDM and EVA. The application is implemented on Microsoft Excel spreadsheet.

The new model Strategy Value-Added Concept (SVAC) differs from conventional discounted cash flow methods in terms of evaluating the cash flow generated by strategic investments without requiring any manual adjustments into cash flow calculations. In practice, this means that an analysts does not have to estimate additional sales growth nor costs yield by the new assets and hence rebuild the future cash flow statement. Analysts have only to evaluate the monetary amount, the economic life and the relative profitability of the investment to find out the strategy value-added.

Exel Composites Oyj was chosen as the case company for the verification process. Exel Composites is a company that is very likely to announce major strategic investments as part of its growing strategy in near future. Additionally, there is sufficient data available upon the company. Thus, the company suits very well for verification purposes.

The valuation process contained 4 sub-processes presented by Soffer and Soffer (2003). The business analysis covered the nature and the history of the business. The industry outlook was also analyzed. The company's mission, targets and products were presented in Chapter 6. Hence, the analysis in this thesis has a full coverage on the factors effecting the target company's competitive advantage as described in literature (e.g. Kallunki & Niemelä 2012; Soffer & Soffer 2003; and Howitt 1993).

In valuation and sensitivity analysis, the financial data was according to Exel Composites Q2 2014 interim reporting. Financial statement analysis provided a full understanding on profit and loss statement as well as the balance sheet items. Thus, it covers the all essential requirements set by Howitt (1993) for a financial statement analysis. Based on the financial statement analysis, financial figures for next five years were forecasted. Since several valuation methods were used, an extensive income and cash flow calculation was needed. This is in line with the argument of Soffer and Soffer (2003).

The final valuation for Exel Composites was carried out by using the SVAC model and the financial data based on Exel Composites' 3Q 2014 interim reporting.

8.1 Results and evaluation of research

The new theory and the model for firm valuation developed in this thesis has proven to be applicable in valuation cases where a significant part of value creation is due to the strategic investments. The new theory and the model is able to take the dual nature of investment into account. This becomes evident when comparing the results from the SVAC analysis with the results from the conventional firm valuation methods.

When analyzing the strategy value i.e. the value created by strategic investments, the results presented in this thesis highlight the inability of the DCF method and the EVA method to recognize the added value created by future investments. However, the DCF method and the EVA method have proven to be applicable in analyzing the pre-strategy value. In this thesis, the DDM method has proven to be inapplicable in modern valuation purposes.

Based on the results, strategic investment projects having the CVA index above 1 are clearly increasing the net present value of the firm when calculated with the SVAC model.

The advantage when using the SVAC model became visible when the case company Exel Composites announced a strategic investment for 2015 in their 3Q 2014 interim reporting. The upside potential based on the strategic investment the SVAC modeling is suggesting is not at all recognized by the DCF method or the EVA method. The DCF method and the EVA method seem to have a static nature in their ability to describe value creation.

It has also proven to be a clear advantage to use the CVA index in calculations as only a simple formulation is needed to evaluate the impact of strategic investments. By using the CVA index, uncertainty related to the future scenarios has no impact on the results.

A very significant benefit of the SVAC algorithm is the fact that the user does not have to recalculate the net income and cash flow produced by the investments. This obviously reduces the time an analyst needs to publish buy/sell recommendation after the analyzed company has come out with its financial reporting or investment plans.

Since an analyst only have to estimate the magnitude and quality of the future strategic investments in terms of CVA index to find out the strategy value of the company, the SVAC valuation method is a practical solution to Damodaran's (2010) suggestion. Furthermore, this study takes Ottosson's and Weissenrieder's (1996) study about CVA on the next level by presenting a new financial accounting application of the CVA concept which is traditionally considered to be a management accounting tool. In this thesis, the CVA is first time used for external firm valuation purposes.

Determining the CVA index of the future strategic investments is, however, challenging. As mentioned by Weissenrieder (2014), the CVA index of 1 is very hard to achieve, especially in large-scale industry. Previously, industrial companies have achieved only the average CVA index of 0.5 for their acquisitions and investments in machinery (ibid.). There is no statistical evidence of the average CVA index of the strategic investments made in composite profile industry. Thus, accurate estimating the profitability of the future strategic investments made by Exel Composites is demanding.

According to Weissenrieder (2014) the pre-strategy value of the companies is very often overestimated due to the major impact of the non-strategic investments. If the machinery requires significant maintenance or replacement investments, it has to be taken into account in terms of the CVA index of the original strategic investment. However, the investment profitability analyses are not typically public material, and thus evaluating the pre-strategy value of Exel Composites accurately is not easy. This issue has been overcome with the presumption that the machinery of Exel Composites is quite new and does not require significant maintenance or replacement investments in near future.

8.2 Possible future study topics

In this thesis, the value creation due to strategic investments has been analyzed only with one case company Exel Composites Plc. Exel Composites was chosen as a case company because it was considered as an interesting investment object due to a solid financial performance in the past. In the beginning there was however no clear idea upon the future plans of the company. Coincidentally, the case company announced a major strategic investment to accelerate growth in China. This investment project will be sizeable compared to the projects the company has carried out in the past. Hence, Exel Composites appears to be an interesting object and a case company for valuation analysis, as the impact the investment will have on firm value in the future will be visible and measureable. This can be considered as an interesting future research topic.

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APPENDICES

Appendix 1

Income Statement	Financial Definitions	2009	2010	2011	2012	2013	Last 12 months	2014E	2015E	2016E	2017E	2018E
Revenue												
Sales	[Revenue Stream 1]	70,005	72,872	85,136	75,998	69,290	74,077	72,362	78,151	84,404	91,156	98,448
Other operating income	[Revenue Stream 2]	1,296	3,481	849	909	667	706	651	664	677	691	705
Total	[Revenue]	71,301	76,353	85,985	76,907	69,957	74,783	***73,013***	***78,815***	***85,081***	***91,847***	***99,153***
COGS												
Materials and services	[Cost Stream 1]	27,400	28,598	33,933	29,185	24,750	26,131	25,819	27,540	29,729	32,093	34,646
Employee costs	[Cost Stream 2]	17,994	18,833	21,133	21,077	21,128	21,399	20,444	21,054	22,727	24,535	26,486
Total	[Cost of Revenue]	45,394	47,431	55,066	50,262	45,878	47,530	46,263	48,594	52,457	56,628	61,133
Revenue-Costs:	[Revenue]-[Cost of Revenue]	25,907	28,922	30,919	26,645	24,079	27,253	26,750	30,222	32,624	35,219	38,020
Costs and expenses												
SG&A	[Selling, General & Administra	-	-	-	-	-	-	-	-	-	-	-
R&D	[Research & Development Exp	-	-	-	-	-	-	-	-	-	-	-
Depreciation	[Depreciation (&Amortization	3,028	2,880	2,702	5,387	2,691	2,651	2,669	2,803	2,969	3,149	3,343
Other Expenses		14,889	16,613	17,134	17,858	16,545	17,092	16,688	18,014	19,446	20,992	22,662
Total	[Expense]	63,311	66,924	74,902	73,507	65,114	67,273	65,619	69,410	74,872	80,769	87,138
Operating Income	[Operating Income]	7,990	9,429	11,083	3,400	4,843	7,510	7,394	9,405	10,209	11,077	12,015
	EBIT -%											
EBITDA		11,018	12,309	13,785	8,787	7,534	10,161	10,063	12,208	13,179	14,227	15,358
Interest Income	InvestmentIncomeInterest	1,258	178	350	306	378	100	99	102	110	119	129
Interest Expense	[Interest Expense]	1,277	672	634	734	664	710	657	430	464	501	541
EBT	[Earnings Before Taxes]	7,971	8,935	10,799	2,972	4,557	6,900	6836	9,077	9,855	10,695	11,602
Taxes	[Income Taxes]	2,025	2,165	2,852	940	1,477	2,193	1960	2,603	2,826	3,066	3,326
Net Income	[Net Income attributable to co	5,946	6,770	7,947	2,032	3,080	4,707	4,876	6,475	7,030	7,629	8,276

Appendix 2

Balance Sheet		2009	2010	2011	2012	2013	Most Recent	2014E	2015E	2016E	2017E	2018E
Assets												
Cash	[Cash & Cash Equivalents]	12,597	11,606	9,840	9,245	9,438	9,931	9,520	10,277	11,094	11,976	12,929
A/R	[Accounts Receivable, Current	9,896	9,160	10,173	9,032	8,987	9000	8,787	9,485	10,239	11,054	11,933
Inventory	[Inventory]	8,782	9,600	10,499	9,129	7,936	9,286	8,761	9,457	10,209	11,021	11,898
Other Current Assets		386	957	811	481	287	3,856	3,765	4,064	4,387	4,736	5,113
Total Current Assets	[Current Assets]	31,661	31,323	31,323	27,887	26,648	32,073	30,833	33,283	35,929	38,786	41,872
A/R, Non-Current	LongTermAccountsNotesAndL	-	-	-	-	-	-	-	-	-	-	-
Fixed Asset, at cost		45,868	45,331	47,758	49,902	51,556	51,556	52,946	56,063	59,428	63,061	66,983
Acc. Depreciation of PP	[Accumulated Depreciation of	29,310	31,983	34,308	37,207	38,733	41,384	41,402				
Acc. Depreciation of Le	PropertySubjectToOrAvailabl	2,725	2,881	1,786	1,796	1,806	1,806	2,199				
Total Acc. Depreciation		32,035	34,864	36,094	39,003	40,539	43,190	43,601	46,403	49,373	52,522	55,865
PPE, Net	[Net of Property, Plant & Equi	10,073	10,393	11,589	10,667	10,791	10,835	10,292	11,110	11,993	12,947	13,977
Leased PPE, Net	PropertySubjectToOrAvailabl	763	34	24	14	4	4	4	4	5	5	5
Goodwill	[Goodwill]	9,968	11,637	11,939	10,898	9,393	9,823	9,823	9,823	9,823	9,823	9,823
Other Non-Current Assets		4,839	4,075	2,173	2,036	1,632	1,587	2,246	3,205	4,241	5,359	6,567
Total Non-Current Assets		25,643	26,139	25,725	23,615	21,820	22,249	22,365	24,143	26,062	28,134	30,372
Total Assets	**[Assets]**	57,304	57,462	57,048	51,502	48,468	54,322	53,199	57,426	61,991	66,921	72,244
Liabilities												
A/P, Current	[Accounts Payable and Accru	9,427	12,253	12,016	9,255	8,538	9,000	9,904	10,692	11,541	12,459	13,450
Employee Related Liabi	AccruedLiabilitiesAndEmploy	-	-	-	-	-	-	-	-	-	-	-
Total Current A/P		9,427	12,253	12,016	9,255	8,538	9,000	9,904	10,692	11,541	12,459	13,450
Long-Term Debt, Curren	[Long-Term Debt, Current]	2,324	15	10	11	11,105	10,440	2,906	3,137	3,386	3,655	3,946
Other Current Liability		3,048	997	884	1,842	3,381	5,814	1,745	1,884	2,034	2,196	2,370
Total Current Liabilities	[Total Current Liabilities]	14,799	13,265	12,910	11,108	23,024	25,254	14,556	15,712	16,961	18,310	19,767
Long-term Debt, NonCur	[Long-Term Debt, Noncurrent]	16,346	10,204	8,088	8,168	1,761	1,046	3,788	4,089	4,414	4,765	5,144
Long-term Deferred Rev	DeferredRevenueNoncurrent	-	-	-	-	-	-	-	-	-	-	-
	[Noncurrent Liabilities, Other	578	911	931	788	842	904	5,903	6,372	6,878	7,425	8,016
Total Non-Current Liabili	[Total Noncurrent Liabilities]	16,924	11,115	9,019	8,956	2,603	1,950	9,691	10,461	11,292	12,190	13,160
TotalLiabilities	**[Total Liabilities]**	31,723	24,380	21,929	20,064	25,627	27,204	24,246	26,173	28,254	30,500	32,927
Equity	**[Stockholders Equity]**	25,580	32,507	35,118	31,438	22,841	27,118	30,044	33,929	38,146	42,724	47,689
Total Liabilities&Equity	**[Liabilities & Equity]**	57,303	56,887	57,047	51,502	48,468	54,322	54,290	60,102	66,400	73,224	80,616

Appendix 3

Cash Flow Statement		2009	2010	2011	2012	2013	Last 12 months	2014E	2015E	2016E	2017E	2018E
[Cash From Operations ((	**[Cash From Operations (CFO)]**	**14,219**	**11,992**	**9,560**	**8,193**	**7,788**	**8,310**	8,484	9,158	9,886	10,672	11,521
	EBITDA	11,018	12,309	13,785	8,787	7,534	10,161					
	Change in NWC	2,309	1,729	(2,216)	1,223	1,658	(349)					
	Net Financials	47	(489)	(411)	(334)	(370)	(395)					
	Taxes Paid	427	(2,296)	(2,067)	(1,897)	(668)	(1,249)					
	Other Operating Cash Items	418	739	469	414	(366)	142					
[Cash From Investing (CFI	**[Cash From Investing (CFI)]**	**195**	**(1,570)**	**(3,208)**	**(2,830)**	**(2,767)**	(2,624)	(2,450)	(2,645)	(2,855)	(3,082)	(3,327)
	[Capital Expenditures (CAPEX)	(1,440)	(1,570)	(3,208)	(2,846)	(2,767)	(2,624)	(2,757)	(3,117)	(3,365)	(3,633)	(3,922)
[Cash From Financing (CFI	**[Cash From Financing (CFF)]**	**(9,852)**	**(11,414)**	**(8,118)**	**(5,958)**	**(4,828)**	(2,639)	(7,126)	(7,692)	(8,304)	(8,964)	(9,677)
	[Payment Of Dividends]	-	(2,974)	(5,948)	(5,948)	(3,569)	-	(5,650)	(7,503)	(8,146)	(8,840)	(9,590)
	[Interest Paid]	(9,852)	(8,440)	(2,170)	(10)	(1,259)	-2,639	657	430	464	501	541
[Total Cash, Change]	**[Total Cash, Change]**	**4,562**	**(991)**	**(1,766)**	**(595)**	**193**	493	82	757	817	882	953

Appendix 4

DCF Valuation					
DCF Calculation	***2014E***	***2015E***	***2016E***	***2017E***	***2018E***
Cash flow from operations	8,484	9,158	9,955	10,945	12,014
Cash flow from investments	(2,450)	(6,495)	(10,025)	(3,161)	(3,469)
Free Cash Flow	6,034	2,663	(69)	7,784	8,545

SVAC Valuation					
SVAC Calculation	***2014E***	***2015E***	***2016E***	***2017E***	***2018E***
Strategic investment		3,850	7,150	-	-
Cash value added	-	-	-	-	-
Terminal value					-

DCF Calculation	***2014E***	***2015E***	***2016E***	***2017E***	***2018E***
Free Cash Flow	6,034	2,663	(69)	7,784	8,545
Terminal Value					96,092
Total FCF	6,034	2,663	(69)	7,784	104,637

SVAC Valuation	**2014**
Pre-strategy value	86,677
Strategy value-added	17,649
Equity Value per Share	**8.29 €**

DCF Valuation	***2014***
EV	82,411
Net Debt	1,555
Equity Value	80,856
Shares Outstanding	11,896.48
Equity Value per Share	**6.80 €**

DDM Valuation					
	2014E	***2015E***	***2016E***	***2017E***	***2018E***
Dividend per Share	0.16 €	0.22 €	0.22 €	0.22 €	0.25 €
Terminal Value					5.35 €
Total Dividend	**0.16 €**	**0.22 €**	**0.22 €**	**0.22 €**	**5.60 €**
Share Price	**4.12 €**				

EVA Valuation					
	2014E	***2015E***	***2016E***	***2017E***	***2018E***
Net Income	4,876	6,475	6,459	6,518	7,364
Dividend paid	1,950	2,590	2,584	2,607	2,945
Equity after Dividend	25,767	29,652	33,527	37,438	41,856
EVA	2,299	3,510	3,107	2,774	3,178
Terminal Value					96,092
NPV of EVA	65,435				
Value of Equity	27,118				
Share Price	**7.78 €**				

Appendix 5

SVAC Valuation					
SVAC Calculation	***2014E***	***2015E***	***2016E***	***2017E***	***2018E***
Strategic investment		4,600		-	-
Cash value added	-	920	-	-	-
Terminal value					6,616

DCF Calculation	***2014E***	***2015E***	***2016E***	***2017E***	***2018E***
Free Cash Flow	6,722	2,656	7,833	8,455	9,127
Terminal Value					101,966
Total FCF	6,722	2,656	7,833	8,455	111,093

SVAC Valuation	**2014**
Pre-strategy value	97,593
Strategy value-added	7,536
Equity Value per Share	**8.63 €**

EVA Valuation					
	2014E	***2015E***	***2016E***	***2017E***	***2018E***
Net Income	5,246	7,041	7,647	8,301	9,007
Dividend paid	2,099	2,816	3,059	3,320	3,603
Equity after Dividend	25,989	30,214	34,802	39,782	45,187
EVA	2,648	4,020	4,167	4,323	4,489
Terminal Value					101,966
NPV of EVA	72,156				
Value of Equity	28,561				
Share Price	**8.47 €**				