

**Credit Risk Management of SMEs  
through Financial Ratio Analysis  
Case: Company Y**

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Abstract  <p>The objective of the thesis was to analyze the financial health of the case company and their preparedness to expand into international markets. Various financial techniques such as the financial ratio analysis and the Altman Z-Score were used in order to measure the current condition of Company Y. Small and Medium-Sized Enterprises are considered riskier than larger corporations. Therefore, various risks that SMEs encounter throughout their lifetime were also explored. In particular, the author focused on credit risks that are a subtype of financial risks.</p> <p>For this research, the data was collected using a mixed-method approach, and the case study approach was used as part of the research strategy. The data on the company was acquired from the CEO in the form of financial statements of 2010 to 2014. The accounting data was carefully analyzed and then used for the calculation of the different financial ratios. Each ratio was carefully described and analyzed in relation to the background of the case company. For further robustness, the Altman Z-Score Model was utilized.</p> <p>The results represent the dynamics of the ratios over the five-year period and the level of distress at Company Y. The results of the ratio analysis indicate that Company Y is, generally speaking, financially sound. However, some particular ratios should be paid attention to as they refer to unfavorable features. Furthermore, the Altman Z-Score Model result lies exactly between the figures for bankruptcy and non-bankruptcy. This indicates that the company, with regard to the important Z-Score result, might develop or go into reverse in the future. The usage of the results is limited to Company Y. However, the theoretical framework can be useful for other SMEs.</p>		
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# 1 Introduction

Companies, regardless of their age and size, are constantly exposed to different business risks as they borrow money from various sources and cooperate with stakeholders. These risks can harm the company, if they are not detected and managed on time. Small and Medium-Sized Enterprises (hereafter, referred to as SMEs) are more vulnerable to risks than larger firms. Thus it is essential to be aware of all the potential dangers in order to keep the company's operations default-free. The owner of an SME needs to be aware of the special analysis tools that are applicable to SMEs in particular as closures of SMEs are higher than closures of larger corporations all around the world.

The Case Company analyzed in this thesis is a Finnish-based SME. It is a family-owned manufacturing company that has been successfully operating in the domestic market for over 40 years. At the moment, the company is seeking internationalization into the German and Austrian markets in order to expand their production and increase the profit. Before getting involved in such a big expansion, it is necessary to evaluate the company's preparedness and financial health. The author decided to narrow down this research to the exploration of the financial risks that the company is exposed to and credit risks, in particular. Even though SMEs comprise 99% of all the EU economic activities and play such an important role in employment (European Commission ed. 2014, 75), they still face a lot of problems with business financing due to their low assets diversification and inability to prove their creditworthiness. However, more in-depth research regarding the SME special structure has seldom been conducted by academics. There is a limited amount of literature available on the financing of SMEs and credit risk management of SMEs.

The author found it particularly interesting to research how to evaluate the financial health of SMEs and how to detect an upcoming default, if the company is exposed to such, especially by analyzing a small Finnish company as an example.

An extensive literature review supported the author in exploring the abovementioned research problem and formulating the following research questions:

- 1) What is the extent and type of credit risk faced by the case company?
- 2) How does credit risk affect the operations of the case company?
- 3) How can the company prepare itself for such credit risks?

Considering the nature of the research questions, an appropriate research method and design were chosen. After that, a suitable method of data collection was applied and followed, finally, by data analysis. The research aims are to analyze how credit risks might affect the financial health of Company Y through different techniques and estimate their readiness for starting an expansion to new markets.

## **2 THEORETICAL FRAMEWORK**

As this thesis seeks to analyze financial health of the Case Company, it is essential to describe the background of the company and the challenges and risks that the company can come across with during their existence and future internationalization. First, the notion of Small and Medium-Sized enterprises around the world and in Finland will be described as Company Y belongs to SMEs category that have their own specific challenges that differ from larger corporations. Then, the risks that enterprises generally face will be covered. The author is mainly interested in the financial risks that can potentially harm the company and the ways of their detection and prevention. Therefore, in the following chapter the concepts of SMEs, financial risks, credit risks (as a subtype of financial risk), financial ratio analysis and credit risk management will be described and evaluated.

### **2.1 SMEs and their role in the overall economy**

Many authors emphasize the significance of SMEs in a world's economy in their researches. Authors such as Altman and Sabato, Wellalage and Locke state that SMEs are reasonably considered the backbone of the economy of many countries all over the world and provide two thirds of all the employment

in OECD countries. In fact, in the European Union (EU) around 99 per cent of the economic activities are connected to SMEs and they provide two-third of all the jobs in a private sector (European Commission ed. 2014, 75). In 2013 nine out of every ten enterprises belonged to SME category providing 88.8 million jobs within the EU zone (European Commission 2015, 3).

The term “small and medium-sized enterprise” has no universal definition. Usually SMEs can be defined either by the number of employees or by a sales turnover (Ardic, Mylenko, & Saltane 2011, 2). However, the definition of SMEs varies due to the scale of economies of different countries. For example, in China SMEs are the companies that employ less than 1000 employees and/or having total annual sales of less than US dollar 63 million, whereas in the EU these numbers are considerably lower (Hendrix, & Cheung 2012, 7). Since the case company that is being analyzed in this research paper is established in the EU economic zone and is operating under a Finnish law, the author of this thesis will be paying close attention to how SMEs are defined in the EU framework in particular.

The EU is intending to create a prosperous environment for SMEs future development. Support grants for the development are distributed among SMEs based on specific criteria but the lack of common definition of SMEs for all the EU member states hinders the establishment of an equal competition between the companies and complicates the application process. (European Commission 2011, 3) Thus, it is very important to identify common definition of SMEs applicable to all the EU member states. First definition appeared in 1996. It was then updated in 2003 by EU Commission and it is used up until today (Altman, Sabato, & Wilson 2008, 6). Table 1 describes the parameters for EU SMEs by the amount of employees and annual Turnover.

**Table 1. Definition of Micro, Small and Medium-Sized Companies (European Commission 2011)**

Enterprise Category	Headcount annual work unit (AWU)	Annual turnover
Medium-sized	< 250	≤ EUR 50 Million
Small	< 50	≤ EUR 10 Million
Micro	< 10	≤ EUR 2 Million

The Case Company falls into category “small business” by the EU definition as it employs less than 50 people and their turnover did not exceed EUR 7 881 040. The Case Company is going to be fully described in chapter 2.1.2. In order to proceed with the research, the author believes that it is crucial to fully understand the nature of SME organization and its functions, also advantages and disadvantages of such enterprises. Ekazheva (2015, 11) in her dissertation lists following advantages and disadvantages of Small and Medium-Sized companies.

Advantages of SMEs:

- Relatively low expenses esp. operating expenses
- Flexibility and efficiency in making and executing decisions
- Fast reaction to opportunistic changes, an ability to maneuver resources
- An ability to diversify production and products in regards to a local market demand, local traditions, preferences and other customers' characteristics
- High receptivity of small businesses to innovations

Disadvantages of SMEs:

- Dependency on large corporations in regards to production and sales of products and services
- Lack of managerial experience of owner and less professional employees
- Weak resource database

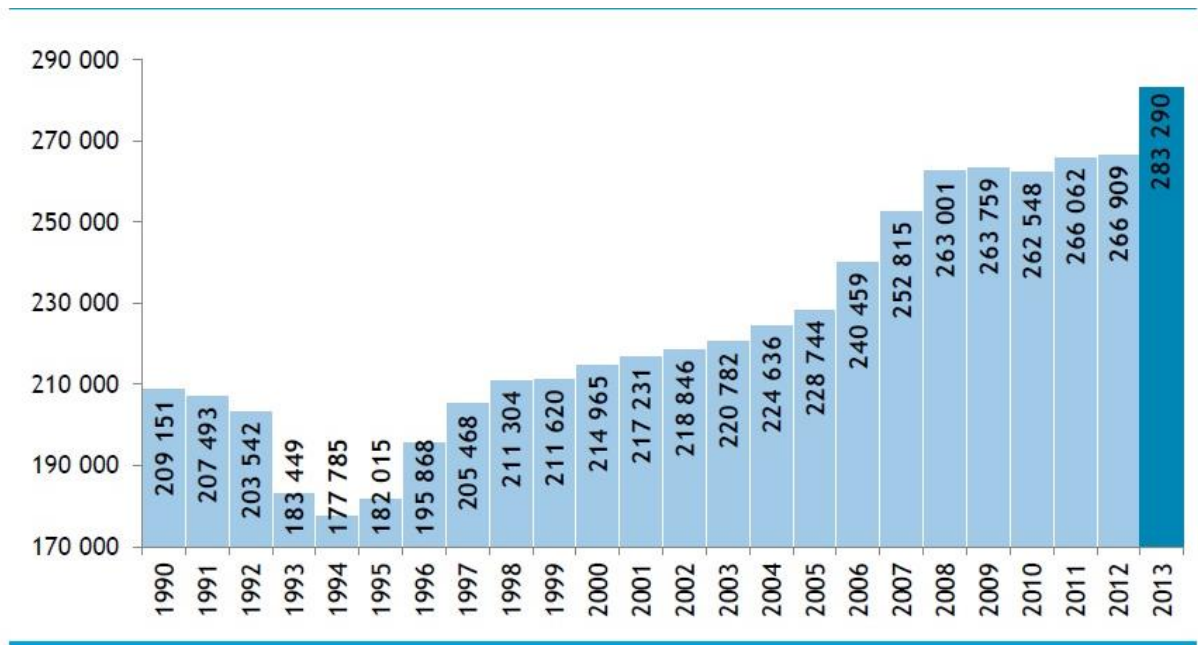
- Small client list
- High vulnerability to unpleasant micro environment changes
- Worse conditions for diversification
- Worse access to inside info and possibilities to learn the market
- Higher dependency on loans from outside
- The limitation of own savings (14-15.)

Since SMEs play such a significant part in the overall economy, the author of this thesis found it intriguing to analyze financial health of a small company that has been operating for over 40 years and that is seeking internationalization today. The researcher is interested to identify challenges and risks that Company Y might come across with and methods of their prevention.

### **2.1.1 SMEs in Finland**

As was mentioned above, the analyzed case company is located in Finland. Thus, it is important for the future research to understand the notion of SMEs in a Finnish context and to define the role of SMEs and their significance in the Finnish economy. As Finland constitutes one of the EU member states, the definition of SMEs in Finland is the same as in the European Union (See Table 1 above).

The number of enterprises established in Finland between the years 1990-2013 is summarized in Figure 2. In the chart we can notice that since 1994 the number of new established companies has been steadily growing reaching its highest point in 2013 (283 290 firms).



**Figure 1. Number of Enterprises 1990-2013 (Yrittäjät, 2013)**

As Yrittäjyyskatsaus (2011) reports, in 2009, 99.8% of 263 759 companies in Finland belonged to the SME category. In addition, 62% of the workplaces were provided by SMEs.

Family business in Finland comprises a large share of all the companies. In fact, family companies comprise 86% from all the businesses and employ 75% of the Finnish SME workforce. (Tihula 2008, 66.)

Despite the number of SMEs constantly growing in Finland, there have been business closures. Table 2 shows the number of business closures from 1995 to 2010, and the share of the total stock of enterprises as a percentage. In 2010, almost 21,000 companies were liquidated. Taking into account that 99,8% of all enterprises in Finland are SMEs, it is expected that the majority of this closure befell SMEs.

**Table 2. Business closure in Finland in 1995-2010 (adapted from Akola, &, Havupalo 2013, 3)**

	Enterprise closures	Share of total stock of enterprises, %
1995	15,059	7.0
1996	16,234	7.1
1997	15,795	6.6
1998	19,098	7.7
1999	19,638	7.8
2000	20,044	7.9
2001	19,953	7.8
2002	19,404	7.5
2003	20,156	7.6
2004	21,460	7.9
2005	20,692	7.4
2006	21,617	7.4
2007	22,525	7.4
2008	26,315	8.4
2009	25,250	7.9
2010	20,828	6.4

According to Akola and Havupalo (2013, 9), Saarikko (2009) states that “common reason for failure is the lack of risk management”. Finnish companies tend to ‘put all their eggs into the same basket’ and rely heavily on one customer. When a firm’s assets and turnover become solely dependent on one project or one customer, it puts the company into a category of higher risk when turbulent times come and makes it, naturally, more vulnerable to a crisis. (9.)

### **2.1.2 The Case Company**

The Case Company is a manufacturing, family-owned company that is located in the central Finland. It was established in 1975 and the production was mainly focused on tractors. However, nowadays Company Y specializing on tractor parts and awarded by the Ministry of Trade and Industry of Finland for

their expertise. The company started their internationalization first by opening a subsidiary in China with the same high quality production standards as in Finland. Then, several alliances in Europe, China and India have been formed. At the moment the company is willing to expand their export to two European countries and enter the market of the Southern Germany and Austria.

Company Y falls into a category of “Small Business” by both definition determined by EU commission. First, according to the financial statements of the company, the amount of employees has ranged from 23 in 2010 to 14 in 2014, reaching the highest number of 35 employees in 2013. Secondly, as financial statements report, turnover was ranging from EUR 6 396 986 in 2010 to EUR 7 070 740 in 2014 reaching the highest number of EUR 7 881 040 in 2012 in the five-year period.

### **2.1.3 Internationalization of SMEs**

“Globalization and technological advances have reduced distances and the significance of national borders in various areas, and enabled the exchange of previously non-tradable goods and services”. Internationalization of the companies today brings some competitive advantages; however, obstacles that come on the way of internationalization are considerably higher for SMEs than for larger firms. (European Commission ed. 2014, 101.)

The EU encourages each country in the economic zone to try to internationalize in order to maintain the competitiveness level and merge it together with innovation for future progress. Ireland, Finland and Norway are the countries where this process has already started. (European Commission 2007, 4.) In Finnish policy programs during 2000s, growth and internationalization of companies are considered as primary goals. It is encouraged in order to keep Finnish firms’ competitiveness at a high level in international markets. (Akola, & Havupalo 2013, 1.) “Internationally active SMEs are generally more productive and more innovative and employ a larger share of skilled workers” (European Commission ed. 2014, 75). In addition, those companies that have activities abroad have more positive effect on sales in domestic market as well as their value increases at a home market.

Furthermore, European companies' analysis shows the result that exporting activity affects positively on company's employment and sales growth. (Wagner 2002, Tomasi 2008, cited in European Commission ed. 2014, 78.) Nevertheless, on the way of internationalization, companies face many barriers. Serving foreign market requires many extra costs such as fixed, variable and sunk costs. These costs are significant and it is challenging for the companies to cover them and to start to generate profit. In order to succeed in the internationalization process, the company needs to hold some proprietary assets such as patents or firm expertise etc. that would give them a competitive advantage (ibid., 77.) European Commission (2007) reports that "1 % of Finnish SMEs that have 1-9 employees are exporters, whereas among SMEs that have 50-249 employees, the corresponding figure is 54%". In Finland and in the EU zone, larger SMEs are usually more internationalized (Akola, & Havupalo 2013, 8).

There are many companies among Finnish SMEs that are "born global"<sup>1</sup>, but the majority of companies having a more traditional way of internationalizing. (ibid., 10.)

The Case Company has been operating in the domestic market (Finland) since 1975 and started its internationalization first in 2007, therefore it can be noticed that the Company Y internationalizes in a more traditional way, which is referred to as "Uppsala model" and characterized as "gradual, learning progression from the domestic market in question to foreign operations" (Johanson, & Vahlne 1977, cited in European Commission ed. 2014, 76).

What would Company Y be motivated to internationalize?

Finnish market is relatively small, thus growth opportunities is one reason for the case company's internationalization. As "European SMEs reveal that SME export decisions are primarily motivated by the growth and size of the host market in question, combined with a small domestic market size" (Crick 2007, cited in European Commission ed. 2014, 80). Case company is a manufacturing company and as Akola and Havupalo (2013, 8) report, SMEs that operate in transportation and manufacturing field have more interest in

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<sup>1</sup> "Born global" is a young company that intend to internationalize even before it is created, mostly common among technology-intensive firms (Akola, 2013; drivers of SME internationalization)

pursuing exports options.

SMEs face more barriers when internationalizing than larger corporations. These barriers include financing, information and management capacity constraints. On the way of international expansion there are external barriers such as (1) strong competition, (2) difficult access to foreign markets due to existing business regulations and distribution channels” (European Commission ed. 2014, 81).

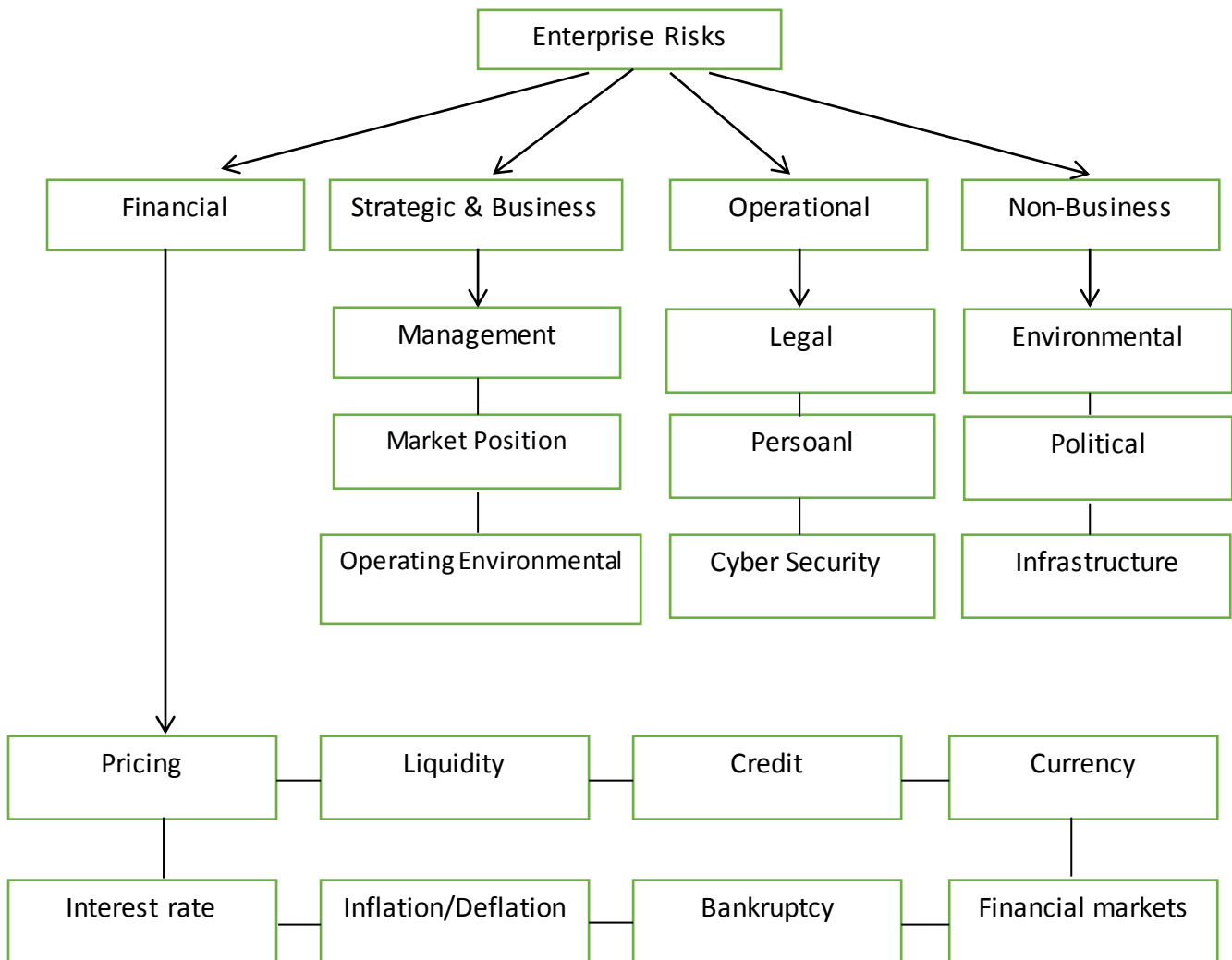
## **2.2 Types of risks SMEs are exposed to**

The term “risk” is defined by the English Oxford Dictionary (Oxford University Press n.d.a) as “a situation involving exposure to danger”. Chapman and Cooper (1983) opened up risk definition as “possibility of suffering economic and financial losses or physical and material damages, as a result of an inherent uncertainty associated with the action taken”. Later the term **risk** developed into the situation that might not only result negatively but also bring positive effect to the company’s operational and financial objectives (BBA. et al. 1999, cited in Verbano, & Venturini 2013, 187).

Since companies operate in order to generate profit at the end, it is very important to mitigate risks that make future expected profits volatile. Especially when doing business today, decision-making should be based on the recognition of financial risks. Managers need to predict whether a project will pay off itself and understand possible outcomes of the situation if such risks occur. (Bahramov, & Gluhov 2011, 124; Merna, & Al-Thani 2008, 9.) Figure 2 provides an overview of the risks that companies are exposed to.

Risks are divided into systematic and unsystematic. Systematic risk is the risk that comes from the market and cannot be diversified. Inflation, economic decrease, interest rate changes, customs tariffs etc. belong to systematic risk category. Unsystematic risk, on the other hand, is diversifiable. These risks depend on the actions of the enterprise. Lack of competitive advantage, decrease of quality of goods, increase of account payable, incorrect marketing analysis etc. are the examples of unsystematic risks. (Bahramov, & Gluhov 2011, 126; Brealey, Myers, & Allen 2011, G-10, G-14.)

**Figure 2. Enterprises' risks (Modified by the author from multiple sources<sup>2</sup>)**



According to Burgstaller and Wagner (2015, 74), SMEs often face great challenges. “SMEs profit less often from economies of scale, and fewer have access to a wide resource base” and “less resources and structural features result in a greater vulnerability to risk” (Verbano, & Venturini 2013, 187).

Despite the fact that SMEs comprise such a large portion in the economy of many countries in the world, their notion has not been studied deeply. Institutions only recently started to recognize that SMEs have their own

<sup>2</sup> Sources: Bahramov, & Gluhov 2011  
Bugrova 2005  
Brealey, Myers, & Allen 2011

special needs and features that need to be analyzed more in detail in order to create special risk management tools that are better applicable to SME structure. SMEs are also “structurally weaker and exposed to the danger of failure when facing unexpected risks.” (Verbano, & Venturini 2013, 187-194; Altman, & Sabato 2007, 8.)

Ekazheva (2015, 15) finds that the majority of risks that SMEs are exposed to do not fall under the standard risks classification. The author of this thesis modified two lists of risks created by Falkner and Hiebl (2015) and by Ekazheva (2015), and created a list of common risks faced by SMEs based on their researches. These risks are described below:

- Interest rate risk

The literature on interest rate risk suggests that SMEs are highly dependent on a bank loan. When it is not available, however, SMEs have to extend trade credit to customers and generally, be dependent on trade finance. (Altman et al. 2008; Mutezo, Gama, & Geraldles, cited in Falkner, & Hiebl 2015, 125).

- Raw material prices risk

According to Falkner and Hiebl (2015, 130), Moore and colleagues (2000) report that SMEs might experience raw material risks especially in agriculture and energy industries. Since they are unable to invest money into technologies, it is harder for them to switch the supplier if prices go up. Due to the intense market competition, it is no longer possible to shift commodity prices increase on to customers.

- E-business and technological risks

Faults in online security system have an influence on company's reputation and customers' trust. Managers working in SMEs report that “customer confidence is one of the most important factors in online business”. However, SMEs are at higher risk of cyber-attack, online threats, credit card fraud etc. (Sukumar, Edgar, & Grant 2011, cited in Falkner, & Hiebl 2015, 130.)

- Supply chain risks

In modern days companies often can no longer concentrate only on a local market. Also they have to offer wide range of products to customers. These two points together complicate the structure of SMEs and constraint their supply chain. (Thun, Drüke, &Hoenig 2011, cited in Falkner et al. 2015, 131.)

- Growth risks

A company's growth is considered to be a sign of development and increasing profit but some SME's managers explain that when company grows, it is not always ready to cover the expansion costs as "international ventures are viewed as highly speculative and potentially very costly for SMEs".

Additionally, SMEs might not always have know-how or techniques in order to arrange a growth effectively. (Gilmore, Carson, & O'Donnell 2004, Marcelino-Sàdaba, Pérez-Ezcurdia, Echeverría Lazcano, & Villanueva 2014, cited in Falkner et al. 2015, 131.)

- Management and employees

When a skillful employee leaves the small enterprise, it creates a significant loss of knowledge, as there might be no other worker who could perform the same responsibilities in a particular field. Falkner and Hiebl (2015, 132) in their research find that employee development programs can be helpful to reduce the knowledge risk; however, despite the fact that owners of SMEs understand what risk of losing a skillful employee might cause, these programs are not very common at SMEs. (Gilmore et al. 2004, cited in Falkner, & Hiebl 2015, 132.) Risks connected to employees' health and security as well as unfortunate hiring choices also fall into this category (Ekazheva 2015, 20).

- Property damage risks

Risks caused by natural disasters, fire and water damage risks, breakage of the equipment, transportation risks etc. (ibid., 20).

- Stakeholder risks

Risks connected to the relationships between the company and the clients, investors, suppliers, governmental bodies etc. (ibid., 20-21.)

- Financial risks

Decrease in profit risk, liquidity risk, credit risk, risks when production pauses.

Financial risks are explained more detailed in the following chapters.

Čančer and Knez-Riedl (2005,144) also add that SMEs come across as “inspiring mistrust and prejudices on the part of other business partners”.

Supply chain and networking are important in business and SMEs are prevented from creating these by big chains (Holmlund, & Kock 1996, cited in Čančer, & Knez-Riedl 2005, 144).

### **2.2.1 Financial risks in SMEs**

According to Horcher (2005, 3), financial risks usually arise when an enterprise makes any transactions with financial institutions such as “sales, purchases, investments, loans or various other business activities”.

Risks can arise as a result of legal transaction, new projects, mergers and acquisitions, debt financing, the energy component of costs, or through the activities of management, stakeholders, competitors, foreign governments, or weather. (2.)

A Financial risk can also be defined as a proportion of borrowed capital to own funds. If borrowed funds prevail, loan acquiring becomes more complicated as well as its repayment, which can ultimately slow down or even stop the production due to the inability to deliver raw materials on time etc. (Bahramov, & Gluhov 2011, 127.)

The author of this thesis modified two lists of financial risks offered by two researches by Bahramov and Gluhov (2011, 127) and by Horcher (2005, 23) and created a common list of major financial risks that companies are exposed to:

- Credit Risk is associated with non-payment of the principal and the interest by the enterprise.
- Interest-rate risk is associated with losses that happen when the interest rate on the loan is growing.

- Investment risk is associated with the money that has been invested into the project that brings lower income than expected or even losses in the future.
- Currency risk is associated with the change of currency exchange rate that might bring losses when engaging in international ventures.
- Operation risk is associated with losses that are caused by the pitfalls in financial transactions.
- Solvency risk is associated with inability to finance long-term obligations.
- Equity price risk is associated with the decrease of value of equity.
- Liquidity risk is associated with a delay of securities sales or the inability to meet short-term obligations.

Horcher (2005, 3) highlights that financial risks appear due to three main reasons: (1) when an organization deals with changes in the market price (interest rates, exchange rates etc.); (2) when cooperating with vendors, customers etc.; and (3) when risks come from within the company as a consequence of a particular event or a mistake of an employee etc.

All the companies face financial risks sooner or later regardless of their size, and they cannot be completely avoided (Bablenkov 2009, 4). For small or medium-sized enterprises, financial risks can differ from the risks encountered by large companies. Since SMEs comprise 99% of the EU economic activities, the competition on the market is high. Therefore, it is particularly important for SMEs to fully understand the causes of financial risks in order to be able to detect and control them on time and also to survive on the market and support further development (Shuying, & Mei 2014, 514).

SMEs undoubtedly appear to be the most flexible form of business and are able to react fast to the changes in the economic system. SMEs, however, are exposed to several financial risks. Financial risks affect the results of financial transactions and financial stability of SMEs, and as a consequence, limit business activities and the flow of funds. The funds of the SMEs are limited and loans from financial institutions (long-term and short-term) dominate in their capital structure, which leads to the loss of financial independence.

(Bablenkov 2009, 1-2; Napp 2011, 15.) The pre-bankruptcy and bankruptcy of SMEs affects the wide range of stakeholders and increases a financial constraint on partners, financial institutions, clients etc. (Harrison, & Wicks 2013).

### **2.2.2 Credit risks in SMEs and their impact**

Credit risks belong to a subcategory of financial risks. The author found it interesting to focus specifically on credit risks at SMEs, therefore this study is limited to credit risk analysis techniques of the case company.

According to Westgaard and Wijst (2001, 339) credit risk can be defined as “a risk that a borrower/counterparty will default, i.e., fail to repay an amount owed to the bank. Credit risk includes all of the counterparties and reasons for which they may default on their obligations to repay”.

Credit risk is specifically dangerous for SMEs as their low equity ratio makes them sensitive to external events in comparison to larger companies (Altman et al. 2008, 7). Furthermore, SMEs are not as well diversified as larger enterprises with their credibility and assets, thus their cash flow can be less stable and the probability of bankruptcy increases. For example, Hendrix and Cheung (2012) find that among Chinese SMEs, there are more bankruptcies than among larger firms. The reason for it is a limited access to a bank loan that supports SME's operations. (7.)

Another credit risk that SMEs are exposed to is trade credit risk. SMEs tend to extend credit to customers in order to keep them and offer them better payment options which puts them in danger of cash flow difficulties (Altman 2008, 12).

SMEs often face problems with business financing that procrastinate their development.

Small firms find it difficult to obtain commercial bank financing, especially long-term loans, for a number of reasons, including lack of collateral, difficulties in proving creditworthiness, small cash flows, inadequate credit history, high risk premiums, underdeveloped bank-borrower relationships and high transaction costs. (IFC 2009, cited in Ardic et al. 2011, 3).

## 2.3 Financial ratio analysis and how it affect company's strategy

Prior to the development of quantitative techniques, qualitative analysis of company's creditworthiness dominated. Among the examples is famous Dun & Bradstreet Inc. that date back to 1849, which was established to estimate merchants' creditworthiness (Altman 2002, 7). In 1928 financial ratio analysis theory was applied with great success by Benjamin Graham who was a professor at Columbia Business School and a highly successful investor (Hundal 2016).

In 1966 and 1968 the original work on failure prediction performed by Beaver and Altman accordingly, turned out to be a base for many more future company distress prediction studies and models. In his work Beaver (1966) used univariate analysis, which means that he "examined the predictive ability of ratios, one at a time" five years prior to companies' actual bankruptcy. In the subsequent research regarding financial ratio analysis, Altman (1968) went further and used multivariate analysis of failure prediction in a form of multiple discriminant analysis. He grouped several financial ratios under one weighted index and named it Z-Score Model. The model is still very widely used and it is considered to be one of the superior methods of financial health barometer (Laitinen, & Kankaanpää 1999, 84). Altman Z-Score Model together with financial ratio analysis are chosen in this research as two methods of Company Y's financial health estimation. The full structure of Z-Score model and its implementation to the case company's accounting data will be fully described in chapter 2.5.

Financial ratios are calculated using company's financial information such as income statement, balance sheet and cash flow statement (Drake N.d.a, 1). As "ratios describe the relationship between different items in the financial statements" (Elliott, & Elliott 2011, 697), there are plenty of ratios that can be calculated using company's accounting data. However, different ratios project various angles of company's well-being, thus it is important to understand which ratios are needed for certain situation and who they will be useful for, e.g. investors, sole proprietors, risk managers etc.

Additionally, they are calculated in order to measure company's productivity and to assess and improve company's performance. Furthermore, they serve

as an indicator of company's dysfunction and help to draw the attention to the problematic parts of business that need to be analyzed more in detail. This helps to identify and fix the problem on the earlier stages, or even have it eliminated before it started to affect the business. Ratio analysis can also be used to compare one company to the competitors in the same industry.

(Auerbach 2007, 4-5; Elliott, & Elliott 2011, 697-698; Laitinen 1991, 649.)

As a researcher aims to evaluate the performance of the case company from the last five years, financial ratio analysis will be used as a tool to do so since Auerbach (2005) states that financial ratio analysis can be used to review company's current performance in comparison to the performance in the past. The results can be compared to the previous quarter or to several years back.

(5.) The case company is a private enterprise and the availability of competitors' private accounting data is very limited, thus the author of this thesis will be comparing the ratio results to the historical data of the case company.

Elliott and Elliott (2011) emphasize the usefulness of ratios when they are analyzed properly. They will be the most useful when analyzed together with other sources of information such as "international, national and industrial statistics and projections, trade association reports, market and consumer surveys, and reports prepared by professional analysts". (722.) Hundal (2016) also adds that financial statements should be analyzed from a critical perspective.

Despite all the advantages and predictive power of the financial ratio analysis, it is important to mention its weaknesses before applying the analysis to the case company. Laitinen (1991) emphasizes that ratio analysis is based on the theory that all the companies gradually decline in ratio indices before the bankruptcy. However, enterprises do not always have similar failure processes, thus it is not possible to develop a common pre bankruptcy ratios behavior that will be common for all the companies. (649-651). Furthermore, several authors highlight the value of qualitative information when performing a financial ratio analysis as "it identifies key risks in the industry where the borrower operates and provides a tangible method to rate and rank borrower performance within the industry" (Hendrix and Cheung 2012, 15). In addition,

qualitative analysis is “compensating for a slight loss in predictive power of the financial ratios “(Beaver, McNichols, & Rhie 2005, 117).

Besides accounting, market and economic data that should be analyzed in financial analysis, one should also pay attention to the events occurred at the company that might have had an influence on the company’s present condition or onto future prospects. Additional questions to the company may include the following: (1) did the company suffer recently from a significant loss? Or (2) did the company invest a significant amount to R&D? (Drake n.d., 2.) Furthermore, the lack of uniformity standards of financial statements composition that is constantly addressed by IASB and FASB is an important factor to mention as financial ratio analysis will only be useful when the same accounting policies are used (Elliott, & Elliott 2011, 722).

In conclusion, there are high bankruptcy rates among SMEs around the world; therefore there is a need for developing policies and regulations specifically for SME category in order to reduce high closure rates. (Carter, & Auken 2006, 510-511; Wellalage, & Locke 2012, 14-15.)

## **2.4 Credit Risk Management by SMEs**

The process of risk management at any enterprise is aimed at developing preventative methods in order to avoid loss or events that would harm the company. Risk management is as well a process of “planning, organizing, directing, and controlling resources” that help to reach set goals when bad event occurs (Head, 2009, 12). SMEs owners that apply risk management methods from the beginning of the firm’s existence have more chances to survive in the market (Ekazheva 2015, 15-16).

Prediction of corporate bankruptcy is picking the interest of investors, creditors and academics. However, credit risk management solutions particularly for SMEs have not been addressed before (Altman, Sabato, & Wilson 2008, 4). Altman and colleagues heavily examined and applied their credit risk model on 2,010 US firms in 2005 and on 5,8 million small UK firms in 2008 and concluded that SMEs should be managed differently to larger firms. The authors advise different financial institutions to reconsider the way they model credit risk tools for SMEs in order to mitigate their losses and to ensure the

flow of finance. This includes development of specific instruments such as credit risk models developed specifically for SMEs structure. (ibid., 4-9; Altman, & Sabato 2007.) Altman (2002, 34) points out that it is necessary to develop a “credit culture” where financial institutions will be constantly evaluating credit risks both in good and bad times. Failing to recognize credit risks can lead to damaging consequences such as bankruptcy, for example, which can constraint a wide range of stakeholders, this is why corrective and preventative methods within the company should be well thought through (Carter, & Auken 2003, 510; Aziz, & Dar 2004, 25).

“Relationships between financial ratios and credit risk vary significantly among big public and small non-traded companies” (Sobehart Keenan, & Stein 2000, cited in Serov 2011). Considering the role that SMEs play especially in Finland, protecting this sector is very important in order to avoid complications on a national economic level. (Aziz, & Dar 2004, 25).

There are several models that have been developed to identify financially distressed firm. This includes univariate analysis, multiple discriminant analysis (MDA), logit analysis, neural networks etc. developed at different times. This research will focus on the Altman Z-Score Model developed by Edward I. Altman and based on multiple discriminant analysis. This model will be fully described in following chapter.

## **2.5 Altman Z-Score Model**

Altman Z-score Model in one of the superior methods of company’s financial failure predicton. Different methods have been developed after Altman introduced his Z-score. Those include:

- Linear Discriminant Analysis: Beaver (1966), Edmister (1972)
- Logit Analysis: Martin (1977), Ohlson (1980)
- Survival Analysis: Luoma and Laitinen (1991), Lane et al. (1986)
- Human Information Processing: Libby (1975), Casey (1980)

The author of this thesis found it more interesting to use the original model developed by a pioneer of financial failure prediction Edward I. Altman as “the Z-Score model has become a prototype for many of these internal-rate based

models” (Altman, Iwanicz-Drozowska, Laitinen, & Suvas 2014, 2). This model suits for bankers, investors, asset managers as well as for the distressed firms themselves. (2).

Even though Z-Score method has been developed in 1968, Laitinen (1991, 84) highlights that after the practical comparison of the methods listed above, “no superior method has been found even though the failure prediction accuracy varied depending on the prediction model applied”. “Although Z-Score Model has been in existence for more than 45 years, it is still used as a main or supporting tool for bankruptcy or financial distress prediction both in research and practice” (Altman et al. 2014, 3).

Z-Score Model was developed in 1968 and it is based on a multivariate description analysis, which means that instead of separate financial ratios that are often unreliable and misleading, Altman united the most relevant ones under one formula that he named Z-Score. Five ratios were chosen out of 22 during the research process on the basis of (1) popularity, and (2) potential relevancy.

The original Z-Score formula developed in 1968 (Altman 1968, 594).

$$Z = .012 X1 + .014 X2 + .033 X3 + .006 X4 + .999 X5$$

X1 = working capital/total assets,

X2 = retained earnings/total assets,

X3 = earnings before interest and taxes/total assets,

X4 = market value of equity/book value of total liabilities,

X5 = sales/total assets, and

Z = overall Index or Score (4)

This model, however, in the case of this research has a limitation since it is created for listed manufacturing companies and a number for market value for Company Y cannot be found. Therefore the researcher will be using the adjusted Z'-Score model for private and manufacturing companies re-estimated in 1983, where market value of equity was substituted by book value of equity. The indices are also recalculated by E. Altman. European data set helped the re-estimation. (Altman et al. 2014, 21.)

Z'-Score developed in 1983 that was applicable to private companies

$$Z' = 0.717X1 + 0.847X2 + 3.107X3 + 0.420X4 + 0.988X5$$

Where

X1 = Working capital/Total assets

X2 = Retained Earnings/Total assets

X3 = Earnings before interest and taxes/Total assets

X4 = Book value of equity/Book value of total liabilities

X5 = Sales/ Total Assets. (ibid., 6).

After the calculation of Z-Score using company's accounting data, the results ought to be estimated by the benchmarks set by Altman. The benchmarks for Z' results are following:

- Financially sound if greater than **2,9**
- Likelihood of bankruptcy is high if below **1,23**
- Average for non-bankrupt companies **4,14**
- Average for bankrupt companies **0,15**

Altman (1968) explains following variables:

**(X1)** The Working capital/Total assets ratio

Is "a measure of the net liquid assets of the firm relative to the total capitalization" Current assets to total assets decline when the company goes through operation losses.

**(X2)** The Retained Earnings/Total assets ratio

Is "an earned surplus of a firm over its entire life"

This ratio together with X4 measures a cumulative profitability taking into account the firm's age.

**(X3)** The Earnings before interest and taxes/Total assets ratio

Is "a measure of the true productivity or profitability of the assets of a firm"

As the purpose of the firm is to exceed their assets, this ratio is very suitable for credit risk studies as it reflects "the earning power of the assets"

**(X4) Book value of equity/Total liabilities ratio**

Shows the total equity of shareholders in relation to total liabilities.

**(X5) The Sales/Total Assets ratio**

Shows “the sales generating ability of the assets of a firm”. (595.)

When first tried in 1968 Z-Score Model showed an accuracy of 94% correct predictions two years prior to actual bankruptcy (ibid., 609). Despite calculations, qualitative information plays a very important role in the analysis.

Quantitative variables are not sufficient to predict SME default and that qualitative variables (such as the number of employees, the legal form of the business, the region where the main business is carried out, the industry type, etc) are useful in improving the models' prediction power. (Lehmann 2003 and Grunet et al. 2004, cited in Altman 2007, 13.)

Qualitative elements give 30-50% explanation to the model and prediction accuracy improves up to 13% with addition of non-financial information (Altman et al. 2008, 24; Altman 2002, 6).

It is essential to note that the model is one of the measuring tools and it cannot be fully descriptive on its own. An example of powerful global company Enron going down despite all the prediction models applied by the sophisticated and experienced investors shows that one model is simply not enough. What needed is a “credit-culture” with a constant credit risk evaluation. (Altman 2002, 34; Culpán, & Trussel 2005.)

Even though the model is perceived as “reasonable, simple and consistent”, Altman advises to be careful when using the model due to different features such as long observation period and the analysis of only manufacturing companies. (Altman et al. 2014, 6.)

## 3 METHODOLOGIES

### 3.1 Research approach

Research approaches and designs differ depending on the topic and the research questions formulated. An appropriate type of research needs to be chosen in order to meet the research objectives, taking into account access to data, time, location etc. (Saunders, Lewis, & Thornhill 2009, 141-142).

The purpose of this research is to analyze the financial health of the company through different diagnostic tests based on the financial information given by the company and an extensive secondary data collection. Therefore, descriptive and explanatory studies are considered the most suitable as a *descriptive study* aims “to portray an accurate profile of persons, events or situations” (Robson 2002, 59); and an *explanatory study* intends “to establish causal relationships between variables”.(ibid. 59; Saunders et al. 2009, 139-141.)

By inquiry, approaches are divided into qualitative, quantitative and mixed-methods. Due to the nature of this research and research questions, both numerical and non-numerical data was used. Therefore, a mixed-method approach was used by the author as qualitative and quantitative approaches together provide a better understanding of the problem and “confirm findings and increase their reliability” (Kananen 2008, 10–11). In this research, a quantitative approach is presented in the form of calculations of financial ratios and the calculation of Altman Z-Score Model, which is then followed by a qualitative approach used to justify the results of the ratios taking into account the firm’s specific characteristics and the country of operations. And indeed, as Saunders and colleagues (2009, 153) report that when using a mixed-method approach, it is possible to take quantitative data and “convert it into narrative that can be analyzed qualitatively”.

A case study approach is used in this thesis to thoroughly explore the financial situation of Company Y using different sources of information to enrich the background. The financial information of the company was collected and calculated through different tests. The results were then interpreted and

analyzed in order “to gain a rich understanding of the context of the research and the processes being enacted” (Morris, & Wood 1991, cited in Saunders et al. 2009, 146). Such approach is called inductive, and it is recommended when “small sample of subjects” are tested and if the researcher is “interested in understanding why something happened” (Saunders et al. 2009, 124).

### **3.2 Methods of data collection**

In this research only secondary data was used in order to answer the research questions. The secondary data was collected from online articles, journals and books, which were then critically analyzed in terms of validity and credibility, avoiding personal biases (Kumar 2011, 154). Theories were carefully reviewed from different angles and perspectives based on the works of different researchers within a vast period. This helped to follow the development and transformation of several notions and terms.

The financial information of the company was obtained from the company’s representatives and consisted of financial statements from 2010 to 2014 and minutes of the meetings. Financial statements are the official form of reporting and, therefore, considered to be reliable. Accounting information was available only in a Finnish language, thus the author of this thesis translated them thoroughly into English in order to be able to get accurate information.

All of the main terms and definitions were justified by the works of leading researchers in the field and through careful synthesis, the most accurate explanations were found.

### **3.3 Methods of data analysis**

Methods of analyzing data differ depending on the nature of the research and the research approach that is chosen. Data analysis is the process of data conversion and interpretation, leading to the conclusions and validation of the results. (Kumar 2011, 88).

For the more clear structure, the author divided case company’s financial information into four standard ratios categories: Profit and Performance, Firm Efficiency, Leverage and Liquidity. As ratios should not be analyzed separately but in conjunction with other ratios, the researcher decided to

analyze four to six ratios from each category. The ratios and their benchmarks will be explained below. The structure and the division of ratios are presented in Table 3.

**Table 3. Four categories of financial ratios**

Profit and Profitability	<ul style="list-style-type: none"> <li>• Profit Margin (Net income/Annual Sales)</li> <li>• Return on Assets (Net income/Total Assets)</li> <li>• Return on Equity (Net income/Total Equity)</li> <li>• Operation Return on Equity (operating profit/Shareholders' equity )</li> <li>• Return on Capital Employed (Operating profit/ capital employed)</li> </ul>
Firm Efficiency	<ul style="list-style-type: none"> <li>• Asset Turnover (Total Sales/Total Assets)</li> <li>• Inventory Turnover (COGS/ Inventory) COGS= Turnover-OP</li> <li>• Trade Creditors/Trade Debtors</li> <li>• Inventory/working capital</li> </ul>
Leverage	<ul style="list-style-type: none"> <li>• Interest coverage (Operating Profit/Interest Expenses)</li> <li>• Debt Equity ( Total Debt/Total Equity)</li> <li>• Retained Earnings/Total Assets</li> <li>• Financial Leverage Multiplier (Capital Employed/Shareholders' equity)</li> </ul>
Liquidity	<ul style="list-style-type: none"> <li>• Cash/Total Assets</li> <li>• Quick Ratio</li> <li>• Current ratio</li> <li>• Working capital/Total Assets</li> </ul>

### **Profit and Profitability**

“Profitability ratios are to measure the operating efficiency of the company” (Rama Gopal 2008, 59). Profit ratios are important for lenders as they indicate if the company is able to pay interest on loans and the principal. For owners, these ratios are important because they estimated rate of return on investment. They also present “the combined effects of liquidity, asset management, and debt on operating results”. (Ehrhardt, & Brigham 2009, 98; Rama Gopal, 2008, 59.)

Profitability ratios “express individual expenses as a proportion of sales or cost of sales. These ratios will identify any irregularities or changes in specific expenses from year to year” (Elliott, & Elliott 2011, 714).

#### Net Profit Margin (Net income/Annual Sales)

“The ratio shows how much money is kept in the company after all the expenses compared to revenue” (Drake N.d, 7).

For example if net profit margin equals 10%, it means that the company keeps \$ 0.10 of every earned dollar. However, it is important to mention that if the company is financed by debt, then part of this revenue has to be paid as interest.

Net profit margin is one of the ratios that help investors to evaluate the stock. Net income that is used to calculate profit margin is an income from which taxes and interest have been subtracted, this means that this ratio of company’s profitability will vary from country to country since tax rate differs greatly all over the world.

#### Return on Assets (Net income/Total Assets)

Indicates “the relationship between the profits of the company and the total assets” The ratio is compared to a historical performance or competitors in the same industry. The ratio shows how efficiently assets of the company are utilized for generate profit purposes. Average ROA for non-bankrupt companies is 0.05 and for bankrupt is -0.03, -0,04, -0,10 declining further until the bankruptcy. (Beaver, McNichols, &Rhie 2005, 104; Auerbach 2005, 15.) ROA will differ from one industry to another as manufacturing and service companies will have very different amount of assets, therefore it is advisable to compare ROA within the same industry.

#### Return on Equity (Net income/ Shareholders’ equity)

Part of equity that is financing the business belongs to shareholders; therefore, it is management’s task to constantly increase the profit of shareholders. When funds of shareholders are utilized in company’s operations, Return on Equity ratio helps them to analyze the profitability that their equity generates. The higher the ratio, the more profit is generated in

order to be distributed among equity shareholders. (Bragg 2007, 382; Rama Gopal 2008, 64.)

#### Operating Return on Equity (operating profit/Shareholders' equity)

This ratio represents the percent of operating profit to total shareholders' equity. The operating profit before tax deduction is presented in this ratio. In comparison to the return on equity ratio described above, operating return on equity shows how much equity is generated before taxation that significantly varies around the world. Therefore, this ratio is able to indicate generated equity of the company without the influence of any government's regulations.

#### Return on Capital Employed (Operating profit/Capital employed)

ROCE is a popular strategic planning indicator. It indicates how well the company is able to generate profit for stakeholders from all the capital available. (Elliott, & Elliott 2011, 701.) The higher the number the better as the higher number means that the company uses the capital more efficiently. Examining ROCE of the same company from year to year, helps to spot performance trends. (ibid., 701.)

#### **Firm Efficiency (Activity Ratios)**

Firm efficiency ratios show how efficient company's assets are utilized. Company assets consist of their own funds and the funds from outside, and when those assets are invested, the profit is expected to be generated. Activity ratios show the connection between assets and sales as the faster assets turn into sales, the higher the profit will be. Activity ratio such as asset turnover show the value produced by all the assets, whereas specific activity ratios such as inventory turnover, for example, show the value that obly this asset produced. The higher the turnover, the more effective the asset management. (Drake n.d., 7; Rama Gopal 2008, 54.)

#### Asset Turnover (Total Sales/ Total Assets)

Shows company performance as measuring "the number of times that one dollar of assets results in a dollar of revenue" (Elliott, & Elliott 2011, 702). The higher the asset turnover, the better it is as if it increases, then total value of

revenue is increasing or the capital asset base is decreasing, or both. (ibid., 702).

#### Inventory Turnover (COGS/ Inventory)

“It indicates how many times inventory is created and sold during the period” (Drake n.d., 7). When estimating inventory turnover ratio, it is essential to assess the level of the competitors in the same sector and compare to previous periods of the same company in order to detect the change (Elliott, & Elliott 2011, 711). Any change should be followed by an investigation in order to explain exactly why the change occurred. The possible reasons can be the inventory minimization, pre-emptive business decision or simply misrepresentation. Higher ratio is a good sign as it indicates the amount of times inventory turned over. (ibid., 711; Auerbach 2005, 12.)

#### Inventory/working capital

In some businesses inventory can comprise a large portion of working capital. When the ratio is too high, then there are concerns that the company is able to generate cash for current needs, especially if inventory turnover rate is low and the company owns too much old or unused inventory. When inventory does not convert to cash quickly in order to repay a loan, bank officers decide to not grant the loan after estimating a trend line of several years. Estimated together with inventory turnover, gives a better picture about liquidity of inventory. If inventory convert to cash quickly, then high inventory to working capital measurement is not a problem. However, “a continual increase in the ratio is indicative of operating problems involving poor sales forecasting, inadequate purchasing control, or increasing levels of obsolete inventory. (Bragg 2002, 81.)

#### Trade Creditors/Trade Debtors

The ratio indicates the proportion of what the company owes to what it owns in a short time frame. When trade creditors exceed trade debtors, it indicates poor cash management as the company is obligated to repay their debts to various institutions. This ratio shows both firm’s efficiency and liquidity.

## **Leverage**

A company has two ways of financing: through equity or debt. When financed through equity, the company is not always obligated to pay anything as the decision about dividends is taken during the board meetings whereas debt financing legally binds the company to pay off the interest and the principal that has been borrowed. Even though debt financing is favored by management because it is less expensive, it can bring significant financial risks to the company when it is over-leveraged. (Drake n.d, 7; Bragg 2007, 38). Therefore, leverage ratios are crucial for determining the extent of financial risks a company is exposed to. Additionally, these ratios measure the level of debt financing in the enterprise's assets. (Rama Gopal 2008, 51.) "Under-leveraged is a major challenge in SMEs all over the world" as it is very challenging for SMEs to get external financing. On the contrary, high leveraged companies show a low chance of bankruptcy. (Wellalage, & Locke 2012, 6.)

### Interest coverage (Operating Profit/Interest expenses)

"The interest coverage ratio measures the ability of a company to pay the interest on its outstanding debt" (Accounting tools n.d.a). A high Interest Coverage ratio means that the company is strong to pay its interest expenses and for lenders, it indicates that the company is less risky. A low ratio indicates a failure to pay its loan payments. A dangerous benchmark is 1.5, below which an enterprise is at risk of default. Lenders and creditors would be reluctant to offer additional lending in this case. (ibid.; Rama Gopal 2008, 53.)

### Debt to Equity (Total Debt/ Shareholders' equity)

"Is a measure of how dependent a company is on debt financing as compared to owner's equity. It shows how much of a business is owned and how much is owed." (Bragg 2007, 382)

The result of this ratio always depends on the industry in which the company operates. Debt to Equity 1:1 is perceived as satisfactory. A result higher than 1 means that borrowed capital dominates. The implication of having high ratio results is an unfavorable position of the company concerning future loans. (Auerbach 2005, 16; Rama Gopal 2008, 52.)

### Retained Earnings/Total Assets

Is “the earned surplus of a firm over its entire life” (Altman 2002, 15).

The higher the ratio, the more company finances their assets using retained profit rather than debt. “This ratio highlights either the use of internally generated funds for growth (low risk capital) or OPM (other people’s money) - higher risk capital.” (ibid., 15).

### Financial Leverage Multiplier (Capital Employed/Shareholders’ equity)

“Demonstrates that assets funded by sources other than the owners will increase the profit or loss of the company relative to shareholders’ equity.”

(Elliott, & Elliott 2011, 701) The increase of the ratio indicates the increase in the total liabilities within the capital employed, which means that investors have financed fewer assets than creditors. A lower ratio, on the other hand, indicates less dependency on debt financing. The ratio presents a company’s risk to creditors and shows to both, creditors and investors how leveraged the firm is.

### **Liquidity**

“Liquidity ratios provide information on a company’s ability to meet its short-term, immediate obligations” (Drake N.d, 2).

Liquid assets are recorded as current assets because they are easily convertible into cash. Company needs liquid assets in order to keep its day-to-day operations. Current assets also represent working capital as resources of a company. The balance between excess liquidity and lack of liquidity needs to be achieved by the company because excess liquidity results in unused funds that could have been invested and lack of liquidity leads to delay in payments to suppliers and creditors, which can later hard the reputation of a company or lead to a loss of suppliers and decline in loan obtainment. There is no number that indicates appropriate amount of liquidity. In general, higher ratio indicates a better ability to cover short-term credit as having liquid assets and cash is seen as lower failure probability. (Rama Gopal 2008, 43; Drake N.d, 3; Altman et al. 2008, 21.)

Following liquidity ratios will help to estimate a situation of liquid assets in the company and detect an imbalance.

#### Current ratio (Current Assets/Current Liabilities)

“The current ratio is a short-term measure of a company’s liquidity position” (Elliott, & Elliott 2011, 702).

Current ratio should be calculated on a monthly or quarterly basis. The results can be compared to industry average or to a company’s historical data.

The rule of thumb, 2:1 can be applied but the appropriateness of the ratio depends of company’s financial structure and industry sector as well as on the nature of current assets and liabilities. Exceeding current assets can be a sign of an ability to cover immediate obligations. However, a high current ratio might indicate inefficient and low-earning assets investment which will bring lower profits. In order to balance current ratio, for example, selling fixed asset or obtainment of long-term loan is possible. (ibid., 702; Auerbach 2005, 10-11; Drake N.d, 6.)

#### Quick Ratio (Current Assets-Inventory/Current Liabilities)

Quick ratio, that is also called Acid test, measures company’s most liquid assets compared to current liabilities. Quick Assets include cash, marketable securities and accounts receivables. This test helps to identify how quickly a company can pay its bill in case if risky situation occurs. Current Assets exclude inventory as sometimes, it takes time to convert it into cash straight away. “In general, quick ratios between 0.5 and 1 are considered satisfactory, as long as the collection of receivables is not expected to slow.” (Auerbach 2005, 11; Elliott, & Elliott 2011, 709.)

#### Cash/Total Assets

Indicates proportion cash to total assets.

“Thus companies with a high ratio of cash to total assets exhibit a lower propensity to fail as also companies that can adequately cover interest payments on loans out of profits” (Altman et al. 2008, 18).

#### Working capital (Working capital/Total Assets)

“Is a measure of the net liquid assets of the firm relative to the total capitalization” (Altman et al. 2014, 5).

Working capital is the difference between current assets and current liabilities that is required to finance company’s day-to-day operations. Working capital to total assets ratio assesses corporate distress. A higher ratio indicates the ability to finance its obligations; therefore suppliers would prefer to deal with financially sound companies. A low ratio, on the other hand, indicates that operating losses are causing current assets to shrink and leading to cash flow difficulties.

### 3.4 Definition of key variables

**Capital employed** defined as “intangible assets + property, plant and equipment + investments + accumulated goodwill amortization + inventories + trade accounts receivable + other assets including prepaid expenses” (Elliott, & Elliott 2011, 208).

**Cash** is “money in coins or notes, as distinct from cheques, money orders, or credit” (Oxford dictionary, n.d.b).

**Cost of goods sold (COGS)** is “accumulated total of all costs used to create a product or service, which is then sold” (Bragg 2002, 298).

**Current Assets** is “typically the cash, accounts receivable, and inventory accounts on the balance sheet, or any other assets that are expected to be liquidated within a short time interval” (Bragg 2002, 299).

**Current Liabilities** is “typically the accounts payable, short-term notes payable, and accrued expenses accounts on the balance sheet, or any other liabilities that are expected to be liquidated within a short time interval” (Bragg 2002, 299).

**Interest Expenses** is “the cost of funds loaned to a business by a lender, and recognized within an accounting period. The amount of interest is typically expressed as a percentage of the outstanding amount of principal (Accounting tools n.d.b).

## **Inventory**

“is an asset that is intended to be sold in the ordinary course of business. Inventory may not be immediately ready for sale. Inventory is typically classified as a short-term asset, since it is usually liquidated within one year” (Accounting tools n.d.c).

**Operating Profit (Income/ EBIT)** is "the profit that a business earns from its operating activities. It reveals the financial viability of the core operations of a business before any extraneous financial or tax-related effects" (Accounting tools n.d.d).

**Quick Assets** are any asset that can be converted into cash on short notice. This is a subset of a current asset, because it does not include inventory. Its most common components are the cash, marketable securities, and accounts receivable accounts. (Bragg 2002, 301-302)

**Retained Earnings** are “the cumulative amount of earnings that have not been paid out as dividends” (Ehrhardt, & Brigham 2009, 51).

**Sales/Turnover** is “total revenue, less the cost of sales returns, allowances, and discounts” (Bragg 2002, 301).

**Shareholders’ equity (Net worth)** equals total assets – total liabilities. It is the money that is left for investors to be shared in case the company is liquidated. (Bragg 2002, 119-120.)

**Short-term debt** is “a company’s commitment to return to a lender both the interest and principal on an initial or series of payments to the company by the lender. Short-term debt is typically paid back in full within one year” (Bragg 2004, 349).

**Total Assets** equaling total equity and liabilities (Elliott, & Elliott 2011, 194).

**Total Debt** is “the sum of short-term debt and longterm debt and excludes other liabilities, including pension liabilities” (Ehrhardt, & Brigham 2009, 719).

**Total Equity (Shareholders’ equity)** is “the difference between the total of all recorded assets and liabilities on the balance sheet” (Bragg 2002, 299).

**Total Liabilities** is the sum of company's short-term and long-term liabilities.

**Trade Creditors (Account Payable)** are "current asset on the balance sheet, representing short-term amounts due from customers who have purchased on account" (Bragg 2002, 297).

**Trade Debtors (Account Receivables)** are "current liability on the balance sheet, representing short-term obligations to pay suppliers" (Bragg 2002, 297).

**Working Capital** is "the amount of a company's current assets minus its current liabilities" (Bragg 2002, 302). It ought to be a positive number (Auerbach 2005, 16).

## 4 RESEARCH RESULTS

The analyzing process consisted of calculations based on the accounting data of Company Y using different techniques that help to analyze the financial health of the company and interpret them. The analysis of financial ratios is divided into four common categories for convenience. The result of each ratio is presented in the form of a graph depicting a five-year period change compared to historical data of the case company. This way it is possible to clearly see a trend line of each ratio and determine the development of the company. Furthermore, for further robustness Altman's Z-Score Model for private companies was calculated in order to determine the creditworthiness of Company Y. Some ratios are presented in a percentage format, and some indicate the coefficient that was estimated against benchmarks. The following chapters present the results of the company's financial ratio analysis and Altman Z-Score Model.

### 4.1 Financial ratio analysis results

#### Profit and Profitability

##### **Profit Margin**

Figure 3 shows the trend line of the profit margin ratio. As the profit margin indicates how much money the company keeps from their sales, it can be seen that in 2010 the Company Y had actually been losing money but after 2010 the profit margin has been steadily growing reaching its highest point of 8.7% in 2013. However, after that the ratio has declined. The reason for the decline in the last year can be a decrease of the net profit of a company because of a decrease of total assets or an increase of total liabilities, for example. On the other hand, total sales in the denominator could have increased, which is a good sign but perhaps, the company had to pay extra costs after selling more products.



**Figure 3. Profit Margin (Annual reports of Company Y)**

### **Return on Assets**

Return on Assets depicts a similar trend as the profit margin, starting from the negative point that indicates that the assets were not utilized in the most efficient manner and growing until 2013 by up to 16% (see Figure 4). The possible explanation for the growth of the ratio can be a gradual increase in net income.



**Figure 4. Return on Assets (Annual reports of Company Y)**

### Return on Equity



**Figure 5. Return on Equity (Annual reports of Company Y)**

The equity return has shown a significant growth from 2010 when it indicated a -25% equity utilization rate. In the following year, a considerable growth of almost 50% occurred. After 2011, the return on equity has been positive, but

in the last year the trend started to move downwards (see Figure 5). The possible explanation for the decrease can be the increased amount of taxes that the company had to pay in that year or the repayment of the interest has increased. For example, if the firm did not pay taxes in the year 2013, the return on equity grew, but in 2014 they could have paid taxes for both years 2013 and 2014 at once, which might have caused such a drop.

### Operating Return on Equity

The year 2010-2011 has shown a significant increase in operating return on equity. After 2011, the ratio has been quite stable with only minor fluctuations, which can indicate that the company has quite stable operating profit in relation to shareholders' equity. Unlike return on equity described above, operating return on equity shows the profit before tax and interests and indicates clear productivity and profitability of the company before any influence from the government and other institutions (see Figure 6).

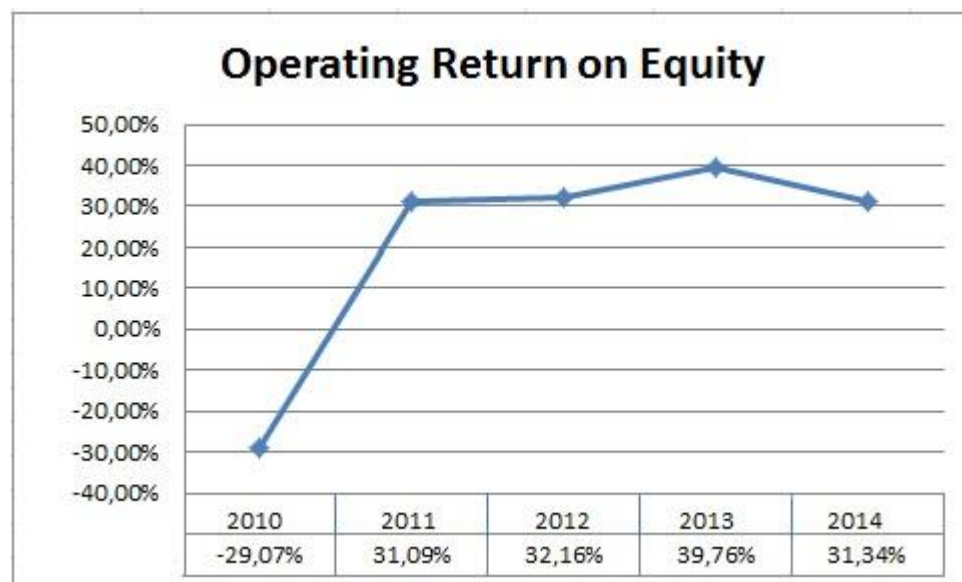


Figure 6. Operating Return on Equity (Annual reports of Company Y)

### Return on Capital Employed

The higher number of ROCE indicates the more efficient utilization of capital, bringing the value to all stakeholders. ROCE of Company Y was inefficient in

2010. After 2010, it grew for 36% reaching its highest point in 2013 (27%). In 2014, however, the ratio is again declining (see Figure 7). The possible explanation for the decrease in year 2014 might be decrease in operating profit that stands in the numerator of the ratio or an increase of capital that the company uses, which is a good sign but it is not visible yet on the ratio results, as operations might not have picked up yet on the increased capital.



**Figure 7. Return on Capital Employed (Annual reports of Company Y)**

### **Firm Efficiency**

#### **Asset Turnover**

Figure 8 shows Asset Turnover trend line. Asset turnover of the case company has been a positive number over the five-year period. The higher the number, the more times assets have been used. The highest point was reached in 2012 when assets “turned” 1.8 times. Then the ratio has been declining reaching 1.6 in 2014. Possible reasons for the decrease might be the decreasing sales, on the other hand, increasing assets in denominator can be a reason for the decrease of the ratio. The increase of assets is a good sign as the company will be able to utilize them in order to generate more

profit in the future. Decrease might have happened because the sales did not pick up yet on the increased assets.



**Figure 8. Asset Turnover (Annual reports of Company Y)**

**Inventory Turnover (Turnover-OP/ Inventory)**



**Figure 9. Inventory Turnover (Annual reports of Company Y)**

Figure 9 shows the changes in inventory turnover. The ratio did not change very drastically over the five-year period. This indicates stability in efficiency of the company. However in 2014 the lowest point was achieved at 2.453. It can be assumed that the expenses made in order to create a product have decreased in the numerator or the inventory base has been increasing. The inventory base, for example, can be an investment of the company in order to be able to produce more products in the future.

### Trade Creditors/Trade Debtors

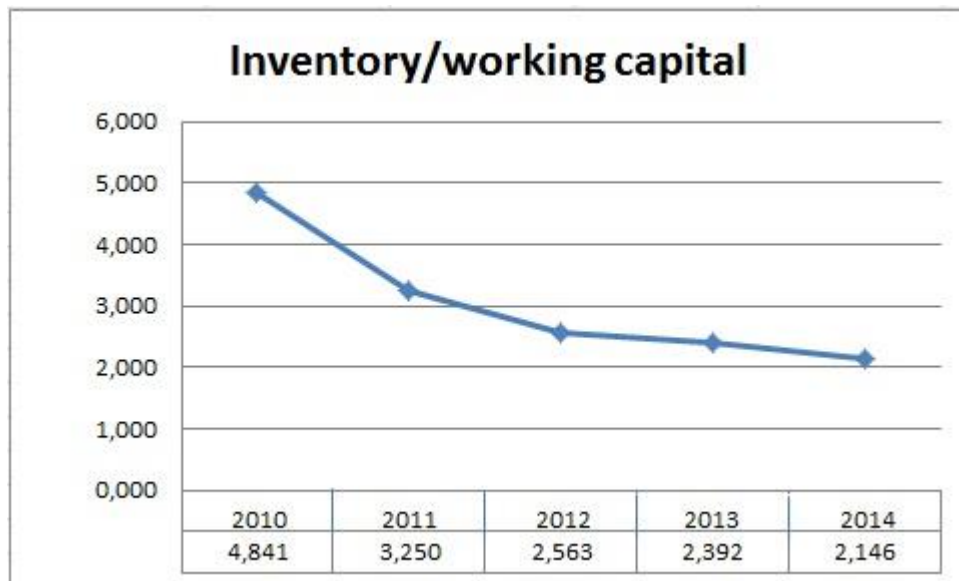
The graph depicts significant fluctuations over the five-year period. Furthermore, the ratio depicts quite disturbing situation. As this ratio indicates the proportion of what the company owes to what it owns, it is visible that even though there is a downward trend, the amount of trade creditors significantly outweighs the amount of trade debtors. This means that the company owes much more to various financial institutions that it is supposed to receive. As the company is planning on expansion, this ratio should be carefully reviewed and brought to a satisfying level.



**Figure 10. Trade creditors/ Trade Debtors (Annual reports of Company Y)**

### Inventory/ working capital

The ratio *Inventory to Working Capital* shows what part of working capital is comprised by the inventory. The trend line *Inventory/Working Capital* gradually decreases, reaching its lowest point of 2.146 in 2014. The possible explanation for the decrease of this ratio can be the reduction of the inventory in numerator or the increase of working capital that is other than inventory. The increase of working capital is a good sign, but it might have not yet been visible in the overall ratio result (see Figure 11).



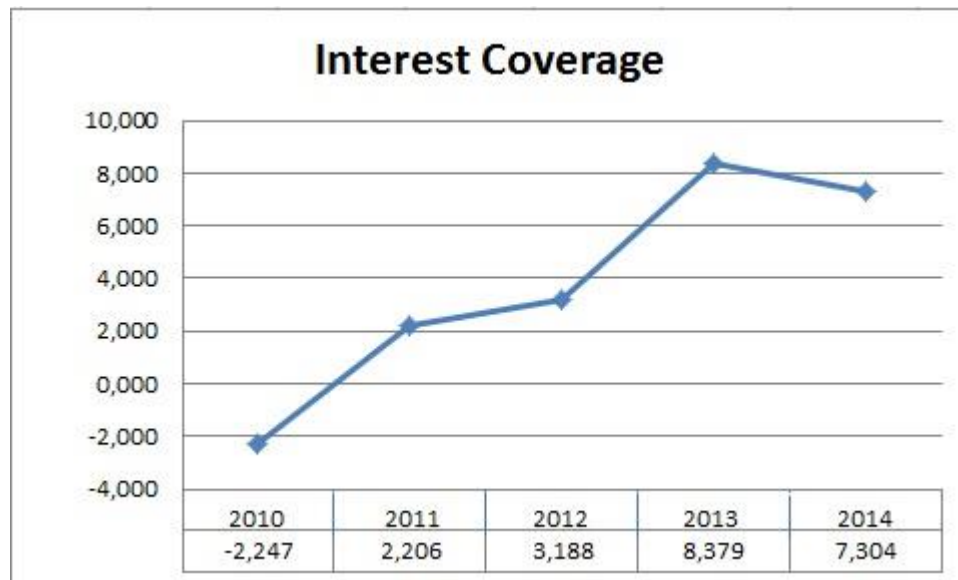
**Figure 11. Inventory/working capital (Annual reports of Company Y)**

## Leverage Ratios

### **Interest coverage**

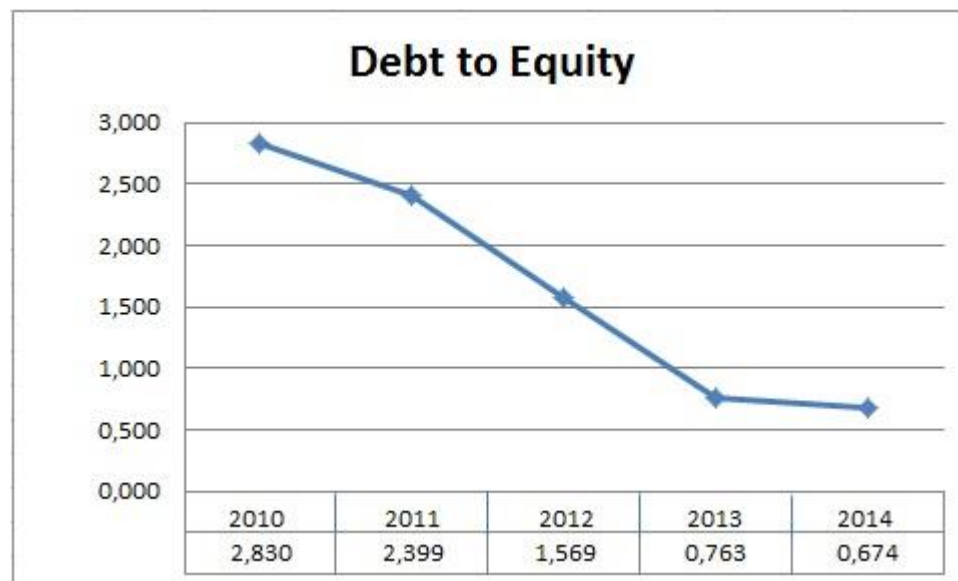
Figure 12 depicts the result line of Interest Coverage ratio. The ratio shows if the company is able to pay interest on its debt. In 2010 the result was negative. In the following years, however, it has grown over 10 points, reaching 8.38 in 2013. After year 2011 when the company was in unfavorable position, all the figures were strongly above a dangerous benchmark of 1.5 that indicates a close default. The reason for the ratio increase might be an increased operating profit. On the other hand, the interest expenses might have been insignificant what caused the ratio to increase. Decrease of the

ratio in 2014 is insignificant. Generally, over the five-year period the company has a very strong level of interest coverage.



**Figure 12. Interest Coverage (Annual reports of Company Y)**

### Debt to Equity Ratio

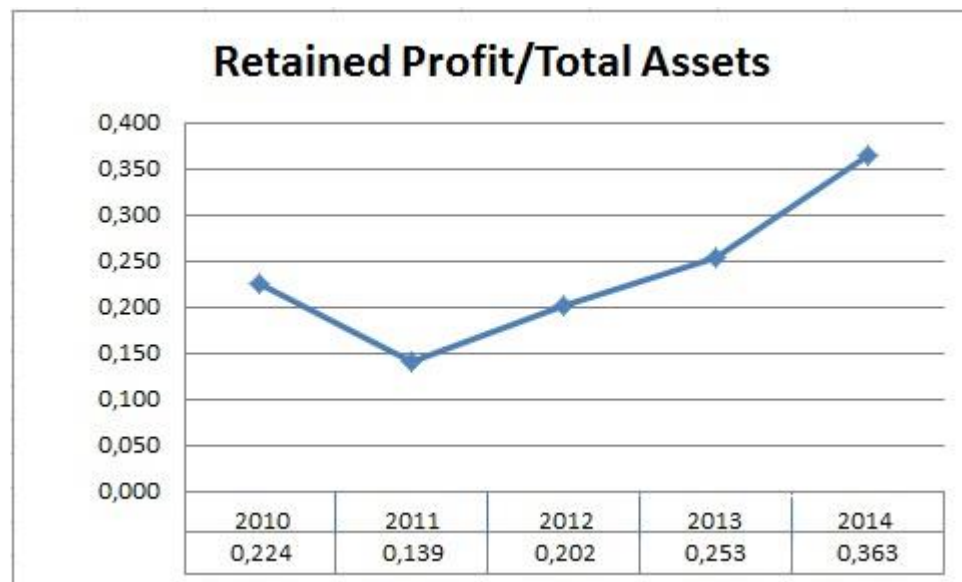


**Figure 13. Debt to Equity ratio (Annual reports of Company Y)**

Figure 13 represents firm's financing, whether a borrowed capital or shareholders' equity dominating. As can be noted, in 2010 company was highly financed by borrowings (2.83) and debt financing prevailed, which might cause the difficulties in later borrowings. However, over five-year period, the amount of debt has been significantly declining. The satisfactory and balanced level of Debt to Equity ratio is 1:1. In 2014 the ratio was 0.67 (the lowest of the period) turning the company into more equity-financed firm.

### Retained Profit/Total Assets

The ratio shows how much of asset financing comes from retained earnings instead of debt (see Figure 14). In 2010 the ratio result was 0.224. After the gap in 2011, the ratio started to grow steadily, reaching its highest point in 2014 at 0.363. Company Y shows a positive trend of Retained Profit to Total Assets ratio that indicates that the company is less dependent of the debt financing when it comes to the investment of their assets.

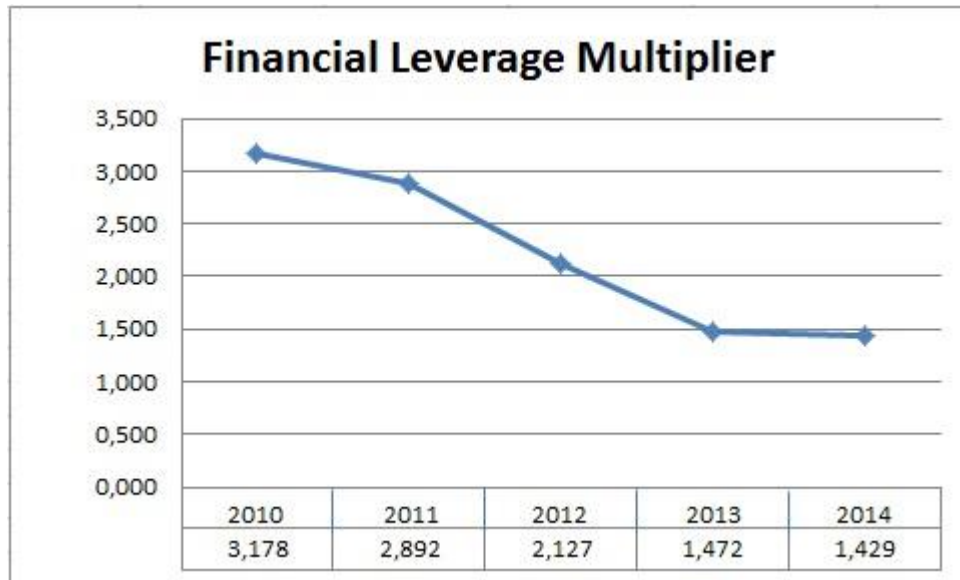


**Figure 14. Retained Earnings to Total Assets**

### Financial Leverage Multiplier

Figure 15 indicates the proportion of debt and equity financing. The dynamic of Financial Leverage Multiplier is constantly decreasing over five-year period.

This means that the company decreases the amount of borrowings or increases equity financing, or both.

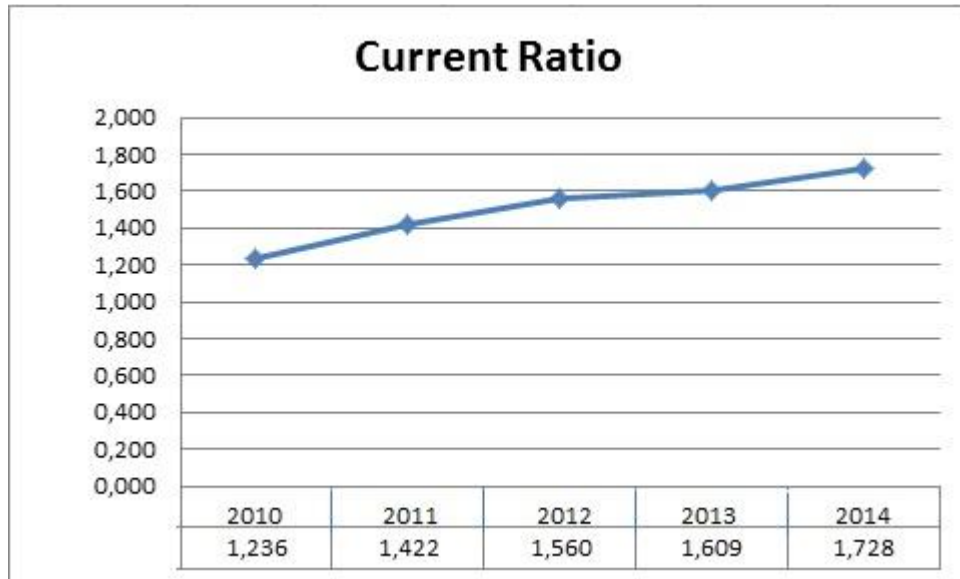


**Figure 15. Financial Leverage Multiplier**

### Liquidity ratios

#### **Current Ratio**

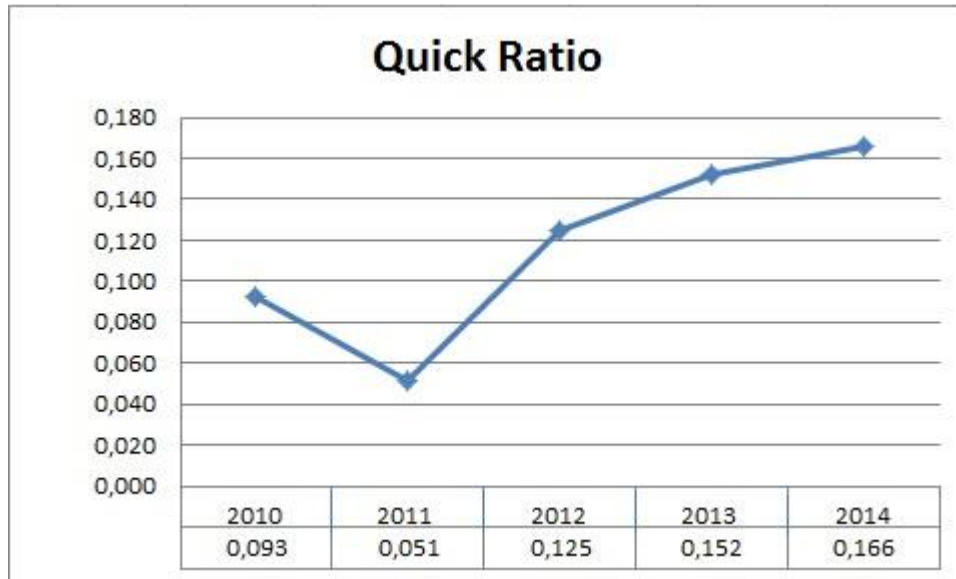
The Current ratio measures how liquid the company is. Throughout all five years, the amount of current assets has dominated over the current liabilities and the ratio has been constantly increasing. Exceeding current assets indicates that the company is able to pay its immediate obligations. A satisfactory ratio is considered to be 2:1. In the case of Company Y, the ratio is below this level. However, the ratio has been gradually growing over the five-year period. This indicates that the company is improving their liquidity and ability to repay their immediate obligations when such arise (see Figure 16).



**Figure 16. Current Ratio**

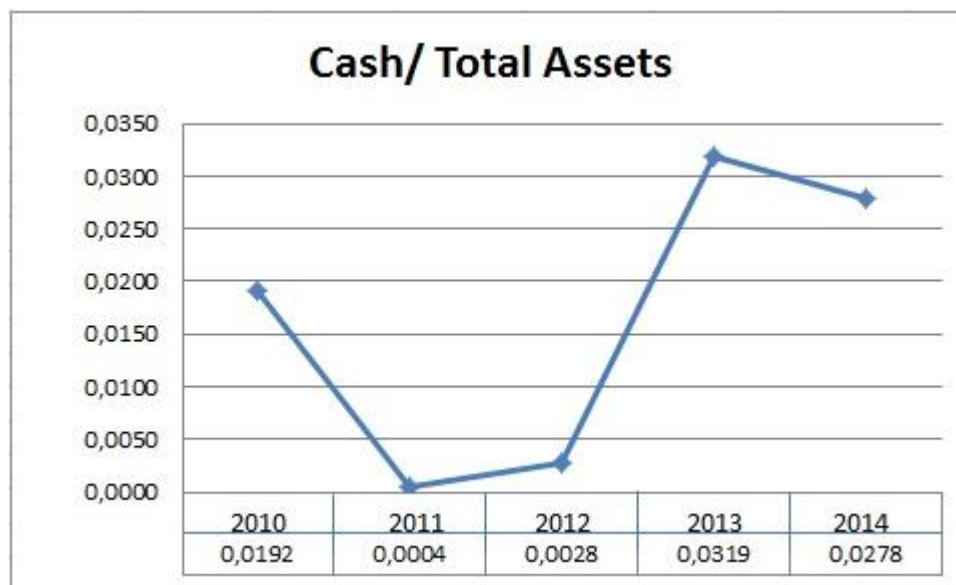
### Quick Ratio

Figure 17 depicts the behavior of the liquid assets (excluding the inventory) towards current liabilities. The ratio shows if the company is able to get cash quickly if risky situations occur. A satisfactory level for the Quick Ratio should be between the numbers 0.5 to 1.0. However, despite the very confident growth from 2011 to 2014, the results are still far below the recommended level. This might indicate that the company is not able to generate a sufficient amount of cash in times of immediate financial obligations. When compared to the Current Ratio above, it can be noted that the inventory comprises a large part of the current assets, as Company Y is primarily a manufacturing enterprise.



**Figure 17. Quick Ratio**

#### Cash/total assets

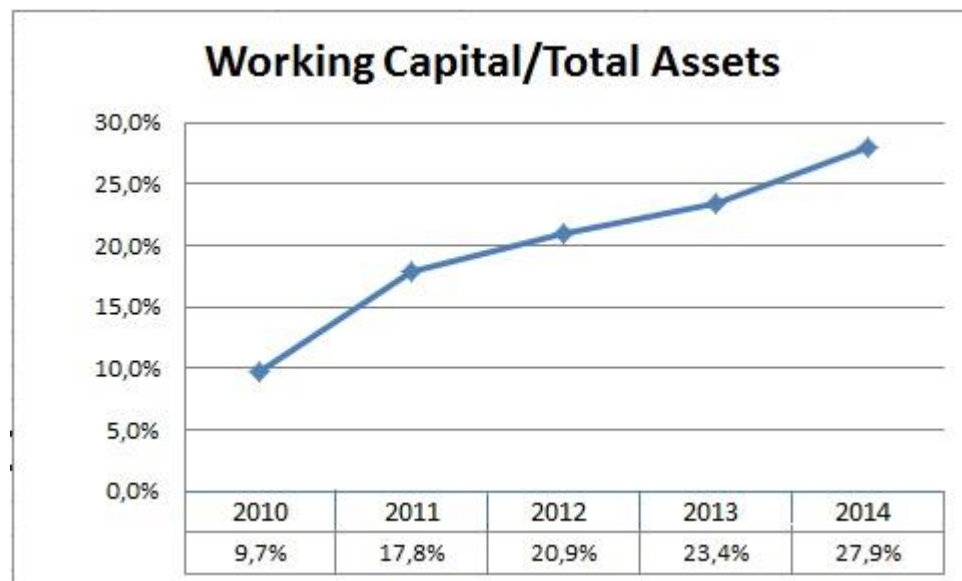


**Figure 18. Cash to Total Assets**

The ratio shows how much cash comprises total assets. As can be seen from the Figure 18, during five-year period cash was only a minor part of Company Y's total assets. However, the result fluctuates greatly during five years,

reaching its highest point in 2013. When companies have higher cash/total assets ratio, they can cover their obligations faster, what indicates a lower propensity to failing. High Cash to Total Assets ratio is especially important when the company is aiming to build new ventures and therefore, need a lot of cash to cover their obligations.

### Working capital/Total Assets



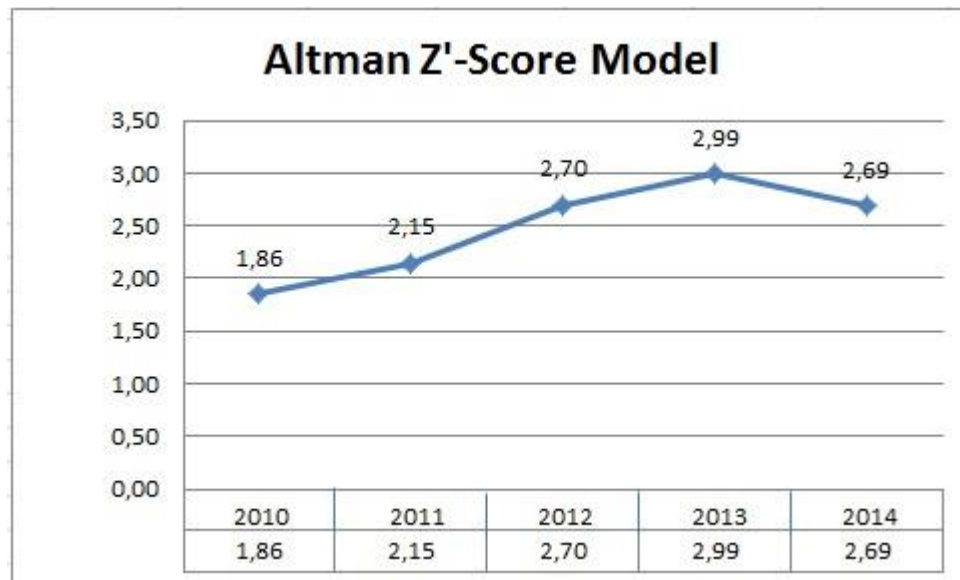
**Figure 19. Working Capital to Total Assets**

The dynamic of the ratio over the five-year period is strongly positive, meaning that the company is less and less exposed to distress and it can finance its financial obligations (see Figure 19). As working capital is a difference between current assets and current liabilities, the increase of the ratio might indicate the growth of current assets or a decrease of current liabilities.

## 4.2 Altman Z-Score Model results

In this subchapter the results of Altman's Z'-Score Model over the years 2010-2014 are presented (see Figure 20). The model was calculated using case company's accounting data. In this case, Z'-Score Model for private

companies was used as our Company Y is a private manufacturing firm. Z'-Score indicates financial solvency of the company with high rates of accuracy.



**Figure 20. Altman Z-Score**

According to Altman, the results should be estimated against following benchmarks:

- Financially sound, if greater than 2,9
- Likelihood of bankruptcy is high if below 1,23
- Average for non-bankrupt companies 4,14
- Average for bankrupt companies 0,15

The results of Case Company show that in 2010, Z'-Score was 1,86, which is close to a bankrupt indicator (1,23). However, in the following years Z'-Score has confidently grown to the level of 2,99 in 2013, which shows financial soundness. Next year (2014) Z'-Score dropped to a level of year 2012.

The average of non-bankrupt and bankrupt companies ranges between 4,14 and 0,15 accordingly. The average of Company Y is 2,48.

$$\text{Average } Z' = (1,86 + 2,15 + 2,70 + 2,99 + 2,69) / 5 = 2,48$$

In 2014, Company Y is placed exactly in the middle of bankrupt and non-bankrupt indicators. It is a very important time for the company to review what causes the fluctuation of Z'-Score Model in order to be able to keep creditworthiness at a high level, especially at times of future internationalization, as the company might be dealing with a lot of financial institutions later on. Also, in order for the company to be able to borrow for their internationalization needs, Altman Z'-Score should be at a confident level.

## 5 Conclusions

Any enterprise is exposed to financial risks at any time of its lifetime. Identifying risks and preventing them on time is difficult. It is especially challenging for SMEs due to their high vulnerability to unpleasant microenvironment changes, worse diversification conditions, high dependency on loans etc.

SMEs are considered to be more risky than larger corporations and risk management tools developed for large enterprises do not work in the same way for small and medium-sized companies. Risks that are especially harmful for SMEs only recently started to attract the attention of the academia and the financial institutions. E. Altman is one of the first researchers who emphasized the need of developing special risk management tools for SMEs due to their special structure. During the research, the author found that the literature on SME's creditworthiness is very limited. This limitation challenged the author and raised her interest even more. The interest of the researcher to analyze a well-functioning company has been sparked by the opportunity to apply risk management tools on the real financial data of the company in order to understand major challenges that the company might come across with when it is expanding.

The researcher aimed primarily to analyze the financial health of Company Y using financial ratio analysis and Altman Z-Score Model as well as to estimate the firm's preparedness to expand into new markets. Also, the research sought to answer research questions using different sources of data. The

main objectives were to identify what credit risks the Company Y is exposed to and to find how they can prepare for the influence of these risks. The research questions connected to possible credit risks are mainly answered during the theoretical framework, as it was not detected during the calculations that the case company is in danger of any credit risks specifically. Company Y might find it interesting to update themselves about the possible financial and credit risks that are especially dangerous for SMEs in order to be able to check them before internationalization. For example, the extension of trade credit to customers might constraint the cash flow of the company. Therefore, especially before further internationalization, it is essential for the company to review the risks that Company Y might be exposed to. In order to prevent the development of these risks, the company ought to constantly analyze their financial health through techniques that they find the most comfortable for them. When the analysis is done regularly, then it is possible to detect the risks at the earlier stages and manage them before they can harm the company.

The chapter “results” shows a detailed analysis of Company Y. It shows the usage of financial ratio analysis and Altman Z-Score Model in order to estimate the financial health of the case company. Both of the techniques used in this thesis are based on the accounting data of the Company Y. Ratio analysis showed mostly a positive trend in the development of the company and the growth in turnover and assets. In comparison to 2010 when the company showed negative trends in the majority of ratios, the situation has improved greatly in the following years and the majority of ratios grew confidently. Altman Z-Score Model was an important tool to estimate the creditworthiness of the company and it showed an average result for Company Y. This means that if the company is planning on expansion, Altman Z-Score should be at a comfortable level and higher than the benchmark defined by Altman. Furthermore, when expanding to other markets, financial health of the company should be in the excellent condition, as internationalization is a challenging process and requires financial soundness. It is expected that the results obtained in this thesis will be useful for the company, as it shows the dynamic of every ratio during the five-year period. This can help the company to notice the pitfalls and downward trends of some

particular ratios and to find the cause of it faster. Additionally, Company Y can review their financial health by taking a close look at Altman Z-Score and determining what element of Z-Score is causing a decrease in order to prevent unfavorable changes in the future. Z-Score Model helps to estimate the creditworthiness of the company. When internationalizing it is very important that the company is eligible for bank loans or other borrowings as expansion requires a lot of extra resources.

## **5.1 Recommendations**

This subchapter provides a few recommendations for the Case Company that they might take into account in order to be able to improve their financial health before the internationalization process.

First, before the expansion the company needs to make sure that it generates enough cash in order to be able to pay many short-term obligations. New ventures require a lot of cash. Therefore, it is crucial to keep track of liquidity ratios and keep them at a satisfactory level or higher. Secondly, the company needs to keep their interest repayment ability on loans, which can be controlled by interest coverage ratio, for example, as the expansion process is usually followed by loans obtainment and other borrowings.

Generally, it is recommended to constantly review the financial health of the company in order to be able to notice downward trends early enough to fix them that they do not harm the company. Before internationalization process, it is important to improve financial health and detect what variables might cause an extra pressure on the company that could complicate the expansion.

## **5.2 Credibility of the research**

In order to ensure the credibility of this research, the channels of quantitative and qualitative data collection were carefully chosen. Furthermore, the research style was also thoroughly considered and the interpretation of the results critically done in order to avoid the author's personal bias and influence on the research. As Rogers(1961) emphasizes:

Scientific methodology needs to be seen for what it truly is, a way of preventing me from deceiving myself in regard to my creatively

formed subjective hunches which have developed out of the relationship between me and my material.

The use of a mixed method approach and a triangulation of data collection establishes rigor and credibility (Creswell 1998, 197; Saunders et al. 2009, 146).

Like any other piece of research, this work has its limitations, which are to be acknowledged. First, it is important to note that the data provided by organizations is difficult to assess. Even if the firm claims the data to be reliable, there are several inconsistencies and inaccuracies. (Saunders et al. 2009, 274). Secondly, the official reporting language of the firm is Finnish, which is regarded as a limitation of the study since the translated terms might have been misinterpreted. Furthermore, the lack of the uniformity of the definitions in the reporting documentation all around the world is also regarded by the author as a limitation in this research. As only secondary data has been used in this research, suitable and reliable sources have been found in order to ensure the quality of the information. The use of secondary data is seen as advantageous because secondary data already available and ready to be evaluated (Stewart and Kamnis 1993, cited in Saunders et al. 2009, 272).

A case study approach was used in this research in order to generate and explain the results only related to the particular Case Company. Therefore, the results of this study are neither generalizable, nor applicable to other companies.

The quantitative part of the research was based on the official accounting data of Company Y. The ratios calculated were based on the formulas used in textbooks and compared to commonly accepted benchmarks. An Altman Z-Score was calculated based on the formula and explanations provided by the numerous works of Edward Altman, which ensures reliability and credibility.

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