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THE GROWTH OF FINNISH SOFTWARE COMPANIES IN 2008-2011
Empirical Investigation of Financial Ratios as the Determinants of Growth

Entrepreneurship
Master's Thesis
May 2014

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Title

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Subject	Type of work:
Entrepreneurship	Master's Thesis
Time (Month/Year)	Number of pages
May 2014	87 + 3

Abstract

The purpose of this study is to examine the relation of growth and the financial ratios of a company. The theoretical portion of the study focuses on the concept of growth in entrepreneurship theory. The empirical portion consists of examination of the financial ratios of 162 Finnish software companies in 2008-2011 by means of quantitative analysis methods. Statistical analysis methods, including analysis of variance, correlation and regression analysis, are used in the analysis. The objective of the study is to reveal how growth affects the financial ratios of a company and which ratios can be used to predict growth. The effects of companies' age, geographical location and industrial classification on their financial ratios are also examined.

The findings of this study reveal that the Finnish software industry inhabits a considerably high amount of growth companies. Younger companies were found to exhibit higher growth rates and absolute profitability than older ones. The findings suggest that a heightened level of cash is tied to the operations of companies exhibiting an especially slow or fast rate of growth. Companies exhibiting high growth were found to produce high levels of return on investment, but high growth was also found to put a company's short term profitability and liquidity at risk. Only weak correlations were found between growth and the financial ratios of a company. The regression analysis revealed that a model combining 10 financial ratios may be used to predict the net sales growth of a company. Implications and future research proposals are provided.

Keywords

Entrepreneurship, growth entrepreneurship, financial ratio analysis, financial ratios, software industry, software business

Location

Jyväskylä University School of Business and Economics

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1 INTRODUCTION

This study focuses on the growth of Finnish software companies. Companies of high growth are important for national economies in many ways. Their innovativeness leads to new products, services and operating methods that fuel dynamism and renewal in the entire market (EK, 2008). Their contribution on employment is also significant. The *Finnish Ministry of Employment and Economy* (TEM, 2012b) estimates that in 2007-2010, growth companies accounted for half of the creation of new jobs. In terms of revenue and added value, growth companies also play a central role (TEM, 2012b). This study does not focus merely on growth companies, but examines company growth as a cause and effect in relation to the financial situation of a company.

Growth is studied in the context of Finnish software companies during the years 2008-2011. The Finnish software industry provides an interesting topic for the research due to many reasons. Historically, in the global software market, Finland may be best known for the development of the Linux operating system. However, recent success stories such as *Rovio* and *Supercell* have sparked interest towards especially the gaming industry. In a recent interview, Taizo Son, billionaire investor and the owner and chairman of the board of *GungHo*, a Japanese gaming company, stated that he regards Finland as one of the top five gaming industry leaders along with the United States, Japan, South-Korea and Great Britain (Helsingin Sanomat, 2013). Interest towards Finnish startups is further fueled by events such as *Slush*, a startup conference held in Helsinki, bringing together international investors from around the world and startup businesses mainly from northern Europe, the Baltics and Russia.

The Finnish software marketplace has also felt the effect of *Nokia* during the past years. During the peak of its success, *Nokia* fueled the growth of many companies specializing in mobile software through subcontracting contracts. The recent layoffs have also caused a new wave of startups to emerge as former *Nokia* employees have combined their expertise and founded new companies. These effects can be seen concretely as concentrations of IT and software companies in Finland tend to be located near current or former *Nokia* offices. All of the previously mentioned aspects make the Finnish software industry an interesting and current topic for this study. In addition, while annual studies of Finnish growth companies and the software industry are conducted, company growth is rarely examined by means of ratio analysis, which also serves as basis to conduct this study.

The theoretical background of this study lies in entrepreneurship. Growth, as stated by Shane (2003, 5-6), is one of the core measures of entrepreneurial performance and can capture the improvement of an entrepreneurial effort over time. Different growth models seek to explain and describe growth from a theoretical perspective. These models will be discussed and their suitability for software companies will also be examined. Another important theoretical stepping stone of this study can be found in accounting. In this study, growth,

its effects and predictors, are studied by means of financial ratio analysis. The aim is to provide answers for three research questions regarding growth and the software industry represented by the convenience sample. The three research questions are the following:

1. How do companies differ from each other based on different levels of materialized growth?
2. Which financial ratios predict growth?
3. Do the sample companies differ from each other in light of their key financial ratios based on their geographical location, industrial classification and age?

The data for the study has been provided by *Balance Consulting*, which is the data analysis company of the Finnish financial newspaper *Kauppalehti*. The final convenience sample of the study consists of the financial ratios of 162 companies operating under the industrial classification code TOL 62, Computer programming, consultancy and related activities. The research method can be defined as quantitative due to the nature of data as well as the statistical analysis methods that are used. The research design combines descriptive and exploratory elements.

This study is structured in the following manner. The second chapter provides an introduction to the concept of growth in the context of entrepreneurship. The third chapter focuses on the accounting perspective of this study in the form of an introduction to financial statement analysis. Detailed explanations for the financial ratios used in this study are also provided. Chapter four provides an overview of the software industry in general as well as in the context of this study. Then a description of the data used in this study is provided before discussing the methodology and research questions. Chapter five presents the results. First, the results of analysis of variance tests based on background variables, followed by similar tests based on growth groups, are presented. Finally, the results of correlation and regression analysis are preseented revealing the dependencies of growth with different financial ratios. Chapter six presents a summary of the relevant results proposed by this study along with suggestions for future research.

2 GROWTH OF FIRMS

Firm growth is a complex phenomenon and can present itself in many different ways (Davidsson, Delmar & Wiklund, 2006: 5: Delmar, Davidsson and Gartner, 2003). Edith Penrose's (1914-1996) definition of firm growth is still referred to most often in growth research. In her book, *The Theory of the Growth of the Firm (1980: 1*), originally published in 1959, Penrose establishes that growth usually represents one of two meanings. It can either mean simply an increase in amount, such as an increase in sales or output, or it can refer to an increase in size or improvement in quality through a process of development.

2.1 Entrepreneurship and growth

Growth can be seen as an essential ingredient of entrepreneurship, even to the extent that Sexton (1997: 97) describes it as "the very essence of entrepreneurship". However, the degree to which entrepreneurship is concerned with growth is dependent on the chosen definition of entrepreneurship (Davidsson, Achtenhagen & Naldi, 2005). It is therefore crucial to examine briefly the connection of entrepreneurship and growth in theory, before focusing more deeply on growth discussion.

In his book, *The General Theory of Entrepreneurship* (2003), Scott Shane defines entrepreneurship in the following manner:

> Entrepreneurship is an activity that involves the discovery, evaluation and exploitation of opportunities to introduce new goods and services, ways of organizing, markets, processes, and raw materials through organizing efforts that previously had not existed (Shane 2003, 4).

As the presented definition describes, the concept of entrepreneurial opportunities is in the core of entrepreneurship. The academic field of entrepreneurship examines entrepreneurial opportunities and the processes and strategies through which they are discovered, evaluated and exploited, as well as the individuals that execute these processes and strategies (Shane, 2003, 5).

There are two major perspectives on entrepreneurial opportunities: the Kirznerian view, according to which existing information, viewed in a new manner, is sufficient enough to create new opportunities, and the Schumpeterian view, according to which new information is essential for entrepreneurial opportunities. Schumpeterian opportunities are created by the three main forms of change: technological change, political/regulatory change, and social/demographic change. Little information is available on the sources of Kirznerian opportunities due to less interest in studying them due to their tendency to be lower in value (in contrast to Schumpeterian), as well as the idiosyncrasy of their emergence, since they tend to originate from mistakes made by prior decision makers or inefficiencies in processes (Shane 2003, 20-33).

Entrepreneurial opportunities come in different forms. In entrepreneurship literature, business opportunities are most often described simply as new ways to reorganize resources resulting in new products or services (Shane 2003, 33). However, Schumpeter (1934) recognized that opportunities may occur in five different forms: (1) new goods, (2) new methods of production, (3) new markets, (4) new sources of supply of raw materials or half-manufactured goods, or (5) the new organization of any industry.

The individuals that discover entrepreneurial opportunities are known as entrepreneurs. They are not only capable of discovering opportunities, but create ideas on how to exploit them in order to create profit, develop products or services for customers, obtain resources and design organizations or other modes of opportunity exploitation and develop strategies to pursue the opportunities. (Shane 2003, 10)

Entrepreneurial individuals are equipped with life experiences, search processes, and social ties that grant them access to information regarding opportunities before that information is generally available. Their knowledge advantage enables them to develop new means-ends frameworks to exploit discovered opportunities in a manner that creates a higher return in value than their costs (Shane 2003, 252). Also individual psychological characteristics influence the propensity to exploit and expected value from exploiting opportunities. In addition to individual characteristics, it is obvious that industry and institutional influences affect the willingness and ability of an individual to exploit an opportunity. (Shane 2003, 12-13, 253-256)

The process that an opportunity and entrepreneur go through - from the emergence of an opportunity to the execution of its exploitation - is described by the entrepreneurial process. Shane's (2003, 11) model of the entrepreneurial process, displayed in figure 1, describes the entrepreneurial process and its elements.

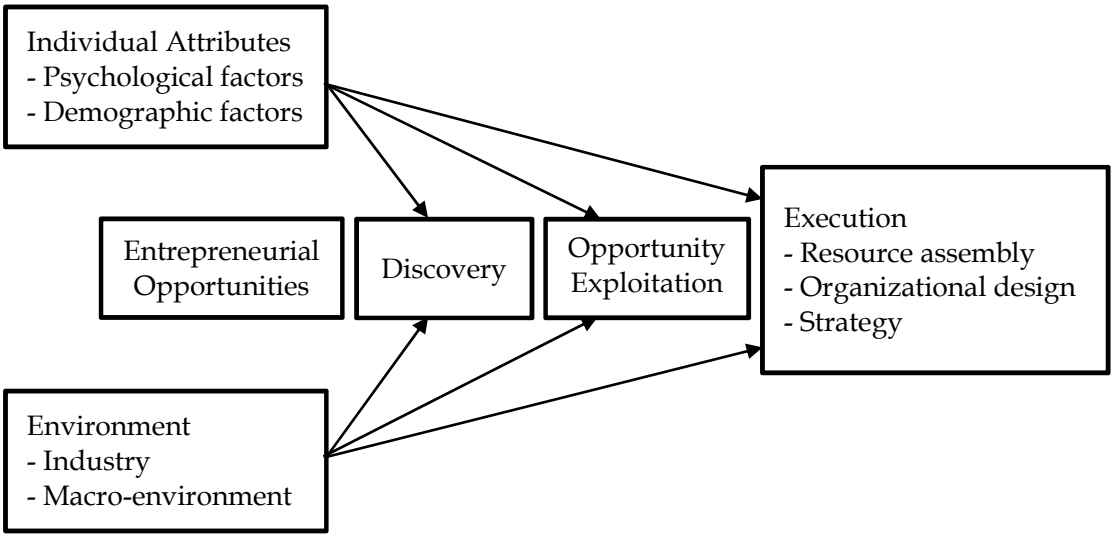

FIGURE 1 A model of the entrepreneurial process (Shane 2003, 11)

The entrepreneurial process is built upon the fact that the economy operates in a state of disequilibrium and change, which enables individuals to transform resources in a new manner that they believe will create more value than their creation cost (Venkataraman, 1997). As mentioned above, the process starts with the assumption that an entrepreneurial opportunity exists. The opportunity is discovered by an entrepreneurial individual, the entrepreneur, who then faces the decision of whether or not to exploit it. The exploitation decision is followed by execution, which includes gathering the needed resources, organizing them into a new combination, and developing a strategy for the new venture. Each part of the entrepreneurial process is affected by both individual attributes as well as influences from the operating environment, such as the business sector and institutions. (Shane 2003, 10).

Performance in entrepreneurial activities can be measured in various ways. Shane (2003, 5-6), proposes four separate operational performance measures to be used: survival, growth, profitability and experiencing an initial public offering.

Survival, defined by Shane (2003, 5) as "the continuation of the entrepreneurial effort", is an important performance measure because most entrepreneurial efforts fail. Shane points out a study by Aldrich (1999, according to Shane 2003, 5), which found that approximately half of all entrepreneurs fail to complete their organizational efforts, as well as findings by Taylor (1999, according to Shane 2003, 5) that suggest that 40 % of firms founded in the US do not survive one year. Furthermore, Shepherd and Wiklund (2009), in their extensive study, examined a population of nearly 69 000 companies registered in Sweden between the years 1994 to 1998, out of which nearly half seized to exist during their first six years of existence.

The second operational measure of entrepreneurial performance is growth, which Shane (2003, 6) defines as an increase in sales or employment. Sales and employment are also recognized as common growth measures by Witt (2007) and Delmar et al. (2003) in their research on the topic. Shane (2003, 6) continues to note that growth is an important performance measure due to it being rare and because entrepreneurial efforts tend to start small. It can capture the improvement of an entrepreneurial effort over time and can therefore be used to separate high and low performing entrepreneurial efforts from each other.

Profit is the third measure of entrepreneurial performance. It is a logical measure of performance, since it indicates the reward that exploiting an opportunity produces. Shane (2003, 6) notes that profit is suitable as a performance measure since it is a rare among the self-employed, yet undoubtedly a desirable outcome of entrepreneurial activity. The fourth operational measure of performance is the achievement of an initial public offering. In practice this means the sale of stock to the public. This measure does not relate closely to entrepreneurship theory, but it is a measure that captures the idea of significant success in the performance of an entrepreneurial venture (Shane, 2003, 6).

2.2 Growth measurement

As stated, firm growth is a complex phenomenon, thus measuring it is not a straight forward task. It is therefore important not only to establish how company growth can be defined, but also how it implements itself, how it can be measured and where the data needed for analysis can be acquired.

Growth is commonly associated with firm success. Firm success evaluation needs to be examined more closely in order to understand the reasoning behind this. Peter Witt (2007) examined the performance of startup companies and suggests that different performance measures should be used for firms in different stages of the startup process. He suggests that success in the early phases, i.e. idea and planning and foundation phases, can be indicated merely by completion of the phase at hand, or based on the entrepreneur's subjective evaluation. Neither of these evaluation methods are precise and, in addition, are dependent on the subjective opinion of the entrepreneur. This poses a problem because peoples' opinions and expectations tend to affect their level of satisfaction, thus leading to separate people not being equally satisfied with a given level of performance (Chandler & Hanks, 1993 according to Witt, 2007). This in turn can lead to skewed performance evaluation.

As stated by Witt (2007), the subjectivity of the previously presented evaluation methods call for non-subjective, company-related (vs. entrepreneur-related) success measures. Witt continues to propose a set of non-subjective performance measures. As mentioned previously, it is a commonly known fact that a large number of companies fail during their first years of operation. This leads Witt (2007) to suggest firm survival as a viable option for a success measure for young companies. This type of success evaluation is also relatively easy to conduct by verifying the state of each company from a list of registered companies of a certain year. Witt suggests that this can be done by directly contacting the companies or through their web pages. A more practical approach, whose availability is dependent on national policies, is verification through national trade registers - a route chosen also by Shepherd and Wiklund (2009). This type of approach is practical especially in cases regarding a large set of data.

When using firm survival as a success measure, it is important to keep in mind that all companies do not stop operations due to failing, but can be e.g. acquired by a larger companies and therefore no longer operate as separate entities. Witt (2007), studying the success measures of startup companies, notes that defining the point of success chronologically can be hard, since initial survival can be the result of high levels of initial capital. Conversely, determining the point of success to a later point can shift the focus to established companies. This implies that selecting the correct success measure in relation to the target company group is important. Whether a startup or established company, survival on the long term does indicate a level of success, since the company has managed to sustain its operations on the long term.

Another common method for firm performance evaluation is growth rates. In addition to being commonly used, growth has also been considered to be the best indicator when studying small firms that survive the startup phase (Brush & VanderWerf, 1992 according to Witt 2007). Commonly used growth indicators are measures such as sales, number of employees or the balance sheet total (Witt, 2007). Also Delmar et al. (2003) recognize these three indicators in their list of the six most common growth indicators: assets, employment, market share, physical output, profits, and sales. As in the case of acquiring information regarding firm survival, Witt (2007) proposes the data needed for the analysis to be obtained through interviews or questionnaires. The use of public databases provides a practical alternative. In this study, the data, though compiled by *Balance Consulting*, has been collected from companies' annual financial statements, which, according to Finnish legislation, are public and companies are required to register them with the *Finnish Trade Register* annually.

Using growth rates as indicators of success in a data set consisting of companies with a wide range of sizes can prove problematic. On one hand, small companies tend to have considerably larger relative growth rates compared to large companies. On the other hand, large companies tend to dominate the data set in terms of absolute growth. (Witt, 2007; Delmar et al., 2003) The wide range of growth measurement methods also poses a problem, and the multitude of used research methodology has been suggested to cause differences in research results (Davidsson & Wiklund, 2000). Delmar et al. (2003) examined a group of 1 501 Swedish high-growth companies from 1987 to 1996, and found that they exhibited different growth patterns that were not necessarily discoverable using only one growth measurement indicator. They found that a different group of companies qualified as growth companies depending on the indicator chosen. Delmar et al. (2003) continue to suggest, contradictory to common scholarly opinion, that the aim should not be towards one or a few unified growth measurement methods, but rather that different measures and methods should be used to measure different forms of growth and therefore various measures and methods are needed.

Shepherd and Wiklund (2009) tackled the problem of the loss of comparability due to various measurement methods by examining the concurrent validity of different growth measurement methods, i.e. the correlation of results obtained by using different growth measurement methods. In a literature review of 82 articles regarding growth, they listed the most commonly used indicators to measure growth.

1. Sales growth, 60,0 %
2. Employee growth, 12,5 %
3. Profit, 8,7 %
4. Equity/assets, 5,8 %
5. Other measures, 14,4 %

(Shepherd & Wiklund, 2009)

The findings of Shepherd and Wiklund (2009) are also backed by Delmar (1997). In a study of 55 academic papers, Delmar found turnover/sales being the most frequently used dimension of growth with 17 occurrences followed by employment with 16, indicating that the two are the most commonly used growth indicators. In their research, also Delmar et al. (2003) focused on these two most commonly used indicators of growth due to the wide use of them in growth research.

TABLE 1 Measures of growth that have concurrent validity (Shepherd & Wiklund, 2009)

Measure	**Measure**	**Mean concurrent validity**
Absolute and relative formulae, same indicator		
Relative employee growth (1-year time span)	Absolute employee growth (1-year time span)	Moderate to High
Relative equity growth (1-year time span)	Absolute equity growth (1-year time span)	Moderate
Absolute growth, different indicators		
Absolute employee growth (1-year time span)	Absolute sales growth (1-year time span)	Moderate
Absolute asset growth (1-year time span)	Absolute equity growth (1-year time span)	High
Relative growth, different indicators		
Relative sales growth (1-year time span)	Relative asset growth (1-year time span)	Low to Moderate
Relative asset growth (1-year time span)	Relative equity growth (1-year time span)	Moderate
Absolute growth, different time spans		
Absolute employee growth (1-year time span)	Absolute employee growth (3-year time span)	High
Absolute sales growth (1-year time span)	Absolute sales growth (3-year time span)	High
Absolute profit growth (1-year time span)	Absolute profit growth (3-year time span)	Approaching High
Absolute asset growth (1-year time span)	Absolute asset growth (3-year time span)	High
Absolute equity growth (1-year time span)	Absolute equity growth (3-year time span)	High
Relative growth, different time spans		
Relative employee growth (1-year time span)	Relative employee growth (3-year time span)	High
Relative sales growth (1-year time span)	Relative sales growth (3-year time span)	High
Relative equity growth (1-year time span)	Relative equity growth (3-year time span)	Approaching High

In addition to variance in growth measurement indicators, Shepherd and Wiklund (2009) found variance also between formulas used to calculate growth. Relative measurements, in which growth is calculated as a percentage in relation to the starting value, were used in 45 % of the studies. Absolute measurements, where growth is simply the increase in amount, were used almost as often, being utilized in 39 % of the studies. Most of the studies were conducted on a 1-5 year time span. The main findings of the study are summarized in the table 1. Combinations with low or no concurrent validity have been left out.

The findings, listed in table 1, suggest that studies using absolute formulas are poorly comparable to studies using relative formulas. Only two indicators, employee growth and equity growth, were found to have significant concurrent validity between their relative and absolute counterparts. When examining studies using absolute formulas, moderate concurrent validity was found between employee and sales growth, and high between asset and equity growth. The study of relative formulas revealed that studies using relative sales growth are comparable, at least to some extent (low to moderate concurrent validity), with studies using relative asset growth. Then again relative asset growth and relative equity growth seem to have moderate concurrent validity as indicators. The only indicators that did not have at least moderate concurrent validity across different measurement time spans were relative profit and asset growth. Those measures are thus not included in table 1. Other examined measures indicated that studies exploiting different time spans but same growth measures could well be comparable.

In this study, company growth rates are the main determinant of company success and also the main means of categorization of companies. In addition, possible companies that have failed to continue their operations are examined through the reasons their operations have been discontinued. As mentioned previously, all companies that no longer operate have not necessarily failed, but can instead be acquired by other companies and therefore do not operate as separate entities. These cases can also represent successful implementation of an owner's or entrepreneur's exit strategy.

2.3 Growth models

Various multi-stage models have been presented to describe phases of growth in the organizational life-cycle. These stage of growth models differ in number of stages and the suggested paths that companies follow, however, they all share the same underlying logic that organizations go through separate phases in which they have to address sets of tasks or problems. In order to enable them to solve the problems arising from growth, organizations need to undergo transformations in their design characteristics. According to most of the models, the solving of one set of problems leads to a new set of problems or tasks to emerge that the company has to address. (Kazanjian & Drazin, 1989) This type of continuous sequence is especially well depicted in Greiner's (1972) five-

staged model, in which an organization faces evolutions and revolutions in the form of internal crises relating to leadership, control and coordination. By resolving the current crisis at hand, the organization simultaneously plants the seeds for the next arising crisis.

Quinn and Cameron (1983) reviewed nine models of organizational life cycles that described organizations in different stages of their development. Based on the findings that all nine models progressed through similar stages, Quinn and Cameron formed a summary model consisting of four stages that each have their own organizational characteristics (figure 2):

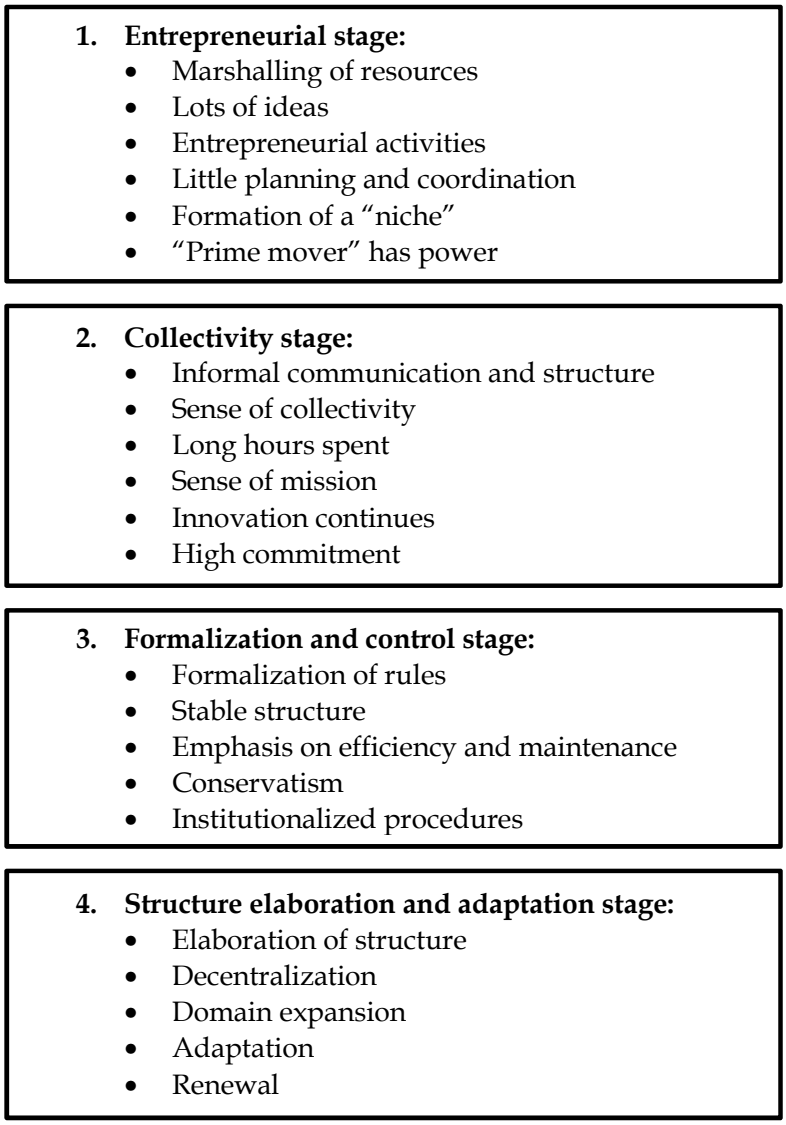

FIGURE 2 An integration of nine life cycle models (Quinn & Cameron, 1983)

Although some models were found to divide the above major stages into multiple sub-stages and some to exclude either the first or last stage, the four-staged model reflects the consensus of characteristics of developmental stages that an organization moves through in its life cycle (Quinn & Cameron, 1983). Quinn and Cameron (1983) found that firms move through four consecutive stages:

The Entrepreneurial stage, Collectivity stage, Formalization and control stage and Structure elaboration and adaptation stage. The characteristics of each stage are listed in figure 2. In terms of planning, coordination, and structure, firms start with little or none formal structures in the Entrepreneurial stage and gradually develop more elaborate structures and more formal planning as they move through later stages.

Building on other similar models, such as the previously explained model of Quinn and Cameron (1983), Kazanjian (1988) applied a four-stage model (figure 3) in his research on technology based firms in particular. He tested the connection between dominant problems, i.e. issues viewed as most problematic for an organization at a certain point in time, and stages of growth. The model suggests that certain dominant problems force an organization to react through changing its organizational structure and routines, which in turn leads to growth and the emergence of new dominant problems.

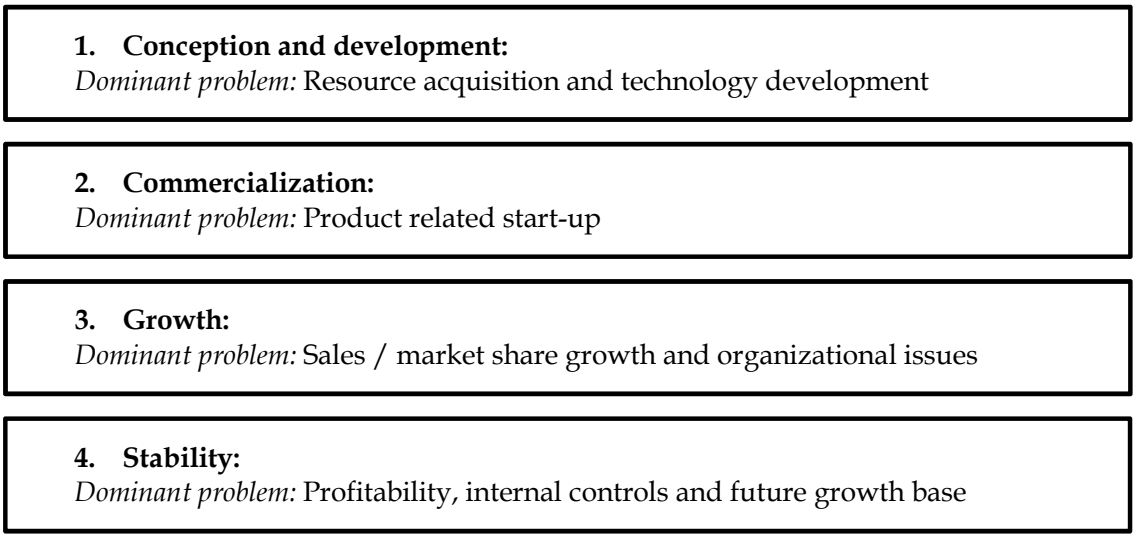

FIGURE 3 Relation of dominant problems to stages of growth (Kazanjian, 1988)

Kazanjian (1988) found that there were significant differences in dominant problems between separate stages of growth. Even though some deviation from the proposed patterns was found, the model in general was supported by the results. Kazanjian's model was tested further by Kazanjian and Drazin (1989), who conducted an empirical test on the model through a longitudinal sample of 71 companies in the computer and electronics industries. Although all of the studied companies did not progress as expected, the results supported the model. The pitfall of Kazanjian's (1988) model is that it only explains internal growth, i.e. it does not explain growth achieved by acquisition or merger. In addition to this, it can be assumed that, since the late 1980's, a considerable amount of focus in the technology industry has moved from selling actual physical products to software and services.

In his model, McHugh (1999, 21) focused strictly on the growth of software companies. He proposed an Early software growth profile (figure 4) con-

sisting of four stages. In McHugh's model, software companies move from Version 1 to Roll-out when they start selling their product to initial customers. The Pre-requisites filter represents the first of two growth filters that screen companies using the pre-requisites for success. At this point, most companies drop into a Steady state zone, where they remain due to limited ambition or inherent constraints of the company's make-up. A group of successful companies pass through the first filter into the Early growth stage until they face the second growth filter, Accelerators filter. Only companies that successfully ramp up their activities break into the High growth stage. McHugh considers executing a winning business model and clear export strategies as the two principal success accelerators. In addition to being flexible and dynamic, a winning business model requires the use of partnerships and indirect channels. Successful tactical acquisitions can also strengthen a company's strategic position. A clear export strategy requires commitment of significant effort in generating overseas revenues even though exporting is often started opportunistically. (McHugh, 1999, 21-26)

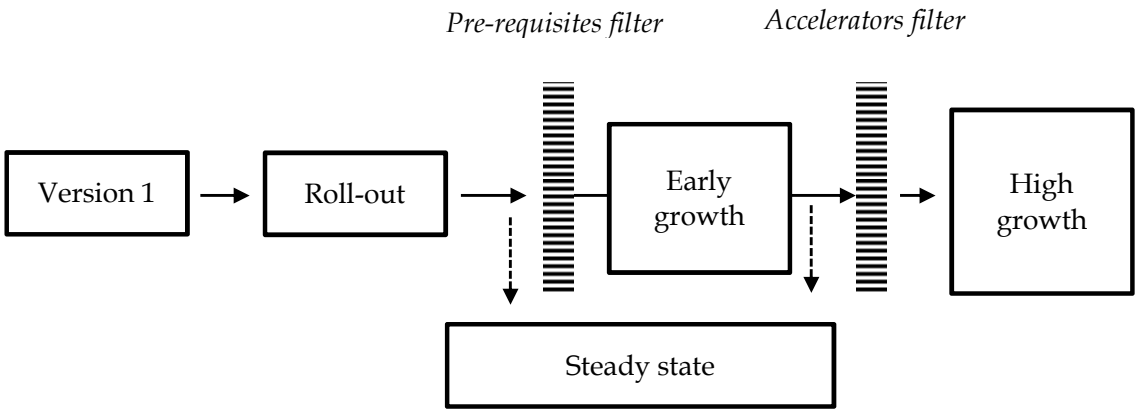

FIGURE 4 Early software growth profile (McHugh, 1999, 21)

McHugh's model is especially interesting in regards to this study since it deals with specifically software companies. Elements of traditional growth are apparent in the model. As in traditional models, stages at which companies exhibit different levels of growth exist. In addition, the two filters presented in the model share similarities with the dominant problem logic of Kazanjian's (1988) previously presented model by implying that companies face different sets of problems in different stages of growth. McHugh's model focuses only on the early stages of software company growth, which might prove problematic in applying it to the sample companies. However, the data for this study consists of companies that are relatively young, which increases the likelihood of its suitability.

In their article, Kelley and Marram (2010) illustrate the stages an entrepreneurial firm typically passes through. The illustration in figure 5, also known as the life-cycle of a firm, consists of phases that are apparent in most of the models presented previously. The model differentiates between two stages of

growth within a company's life cycle, which are highlighted in figure 5. The company enters the Early Growth phase as its sales start to increase. As sales accelerate to higher volumes, the company enters the Later Growth phase. As the company matures, it enters a stage of decelerated growth, Maturity. Eventually the company is faced with the phase of Renewal or Decline, in which the company has to rejuvenate its business or face decline. (Kelley & Marram, 2010)

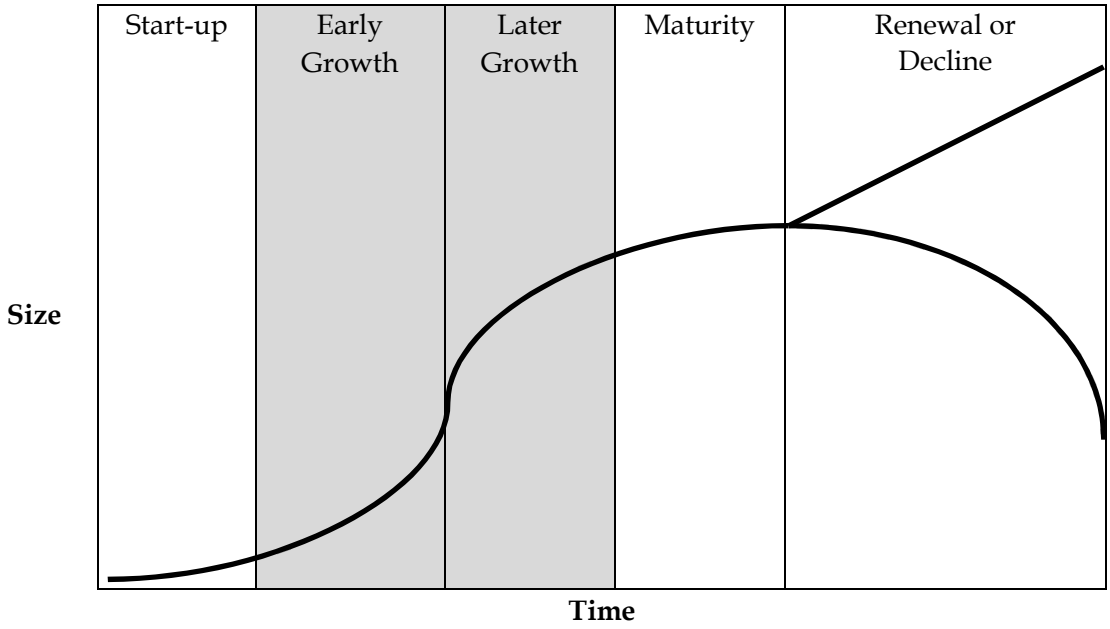

FIGURE 5 The company life-cycle (Kelley & Marram, 2010)

As in the previously presented models of Quinn and Cameron (1983), and Kazanjian (1988), Kelley and Marram (2010) also recognize that companies are faced with different problems depending on what stage they are at. Managing growth is a balancing act of expanding sales with limited resources, which can easily lead to neglect of planning. If left untended, growth will eventually overwhelm the organization. If the entrepreneur understands the nature and requirements of growth, he or she is better positioned to anticipate and prepare for growth instead of being forced to react under extreme conditions. In the early stages of a venture, entrepreneurial skills are critical. However, these skills have to be balanced by managerial skills in order to prepare the company for growth. Young firms have an upper hand against older firms in their ability to recognize innovative opportunities and bringing them to market rapidly. Businesses need to exploit these opportunities, scale them, improve them and even produce complementary products or services. As the operating environment changes, the advantages of established businesses fade. Therefore it is essential for organizations to maintain their flexibility and innovativeness in order to not only maintain their current advantage, but seek future growth paths that enable them to survive the Renewal or Decline phase. (Kelley and Marram, 2010)

Different crises or turning points are often tied to discussion surrounding the life-cycle theories. One of the most commonly discussed turning points is

that of the "Death Valley". The Death Valley is usually the first crises that a company faces and it usually occurs around a company's third year of operations. At this point, the seed funding has been used to get the company up and running, but the generated net sales is not sufficient enough to cover for what is ahead. Many companies have grown to a size at which their home markets do not enable future growth and are therefore facing internationalization, commercialization and organizational development issues, which require increased levels of resources. (EK, 2008)

Born-Globals

Many companies start international operations at an early stage, and it has been argued that previous models regarding foreign market involvement are not applicable in today's global environment, in which especially small companies internationalize more rapidly (Oviatt & McDougall, 2005). Oviatt and McDougall (2005) define an international new venture (INV) as "a business organization that, from inception, seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries." These type of INVs tend to be formed in small open economy (SMOPEC) countries (Fan & Phan, 2007), such as Finland. In addition, these companies are often found in the high-tech industry (Autio, George & Alexy, 2011).

Oviatt and McDougall (2005) categorized INVs further into four separate groups by the number of value chain activities that are coordinated across countries and by the number of countries entered: (1) export/import start-up, (2) multinational trader, (3) geographically focused start-up, and (4) global start-up. The fourth category, global start-ups, consists of companies that have entered the most countries and have the most wide spread of activities globally. These global start-ups are often referred to as Born Globals (e.g. Gabrielsson, Kirpalani, Dimitratos, Solberg & Zucchella, 2008; Knight & Cavusgil, 2004). However, while Oviatt and McDougall's (2005) grouping provides a distinct definition for a Born Global, the term is also used interchangeably with the term INV (e.g. Fan & Phan, 2007; Gabrielsson & Gabrielsson; 2013).

While traditional growth models have been argued to be not applicable to INVs, recent research has found that INVs also evolve in stages (Coviello, 2006; Park & Bae, 2004; Rialp-Criado, Galván-sanchez, & Suárez-Ortega, 2010). In a recent cross case study of four INVs, Gabrielsson and Gabrielsson (2013) developed a dynamic model of growth for international business-to-business new ventures. The model, presented in figure 6, takes into account the State and the Change aspect of the INV. The model's State aspect is a combination of the INV's growth phase and survival status with a set of opportunities, resources as well as the entrepreneurial orientation. The Change aspect is comprised of decisions on growth advancement or retrenchment, and solving management and survival crises. The change aspect includes also learning from these activities. The dynamism of the model relates to the interaction between these two aspects. Decision making is affected by both aspects. Knowledge of opportunities or networking is assumed to affect the growth decisions of the INV, while solving

survival crises will enable the company to enter a new growth position. (Gabrielsson & Gabrielsson, 2013)

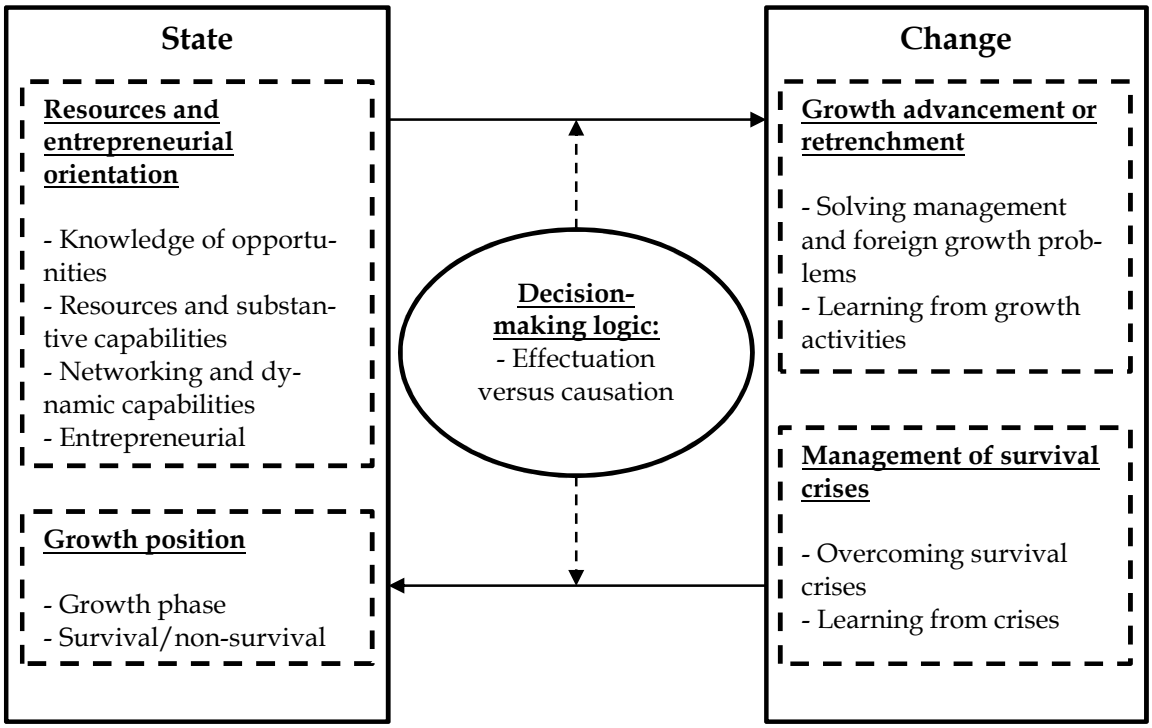

FIGURE 6 A Dynamic model for the growth and survival of INVs and the effect of decision-making logic in the high technology, business-to-business field (Gabrielsson & Gabrielsson, 2013)

In the studied case companies, Gabrielsson and Gabrielsson (2013) found four distinct growth phases following the logic of Kazanjian and Drazin's (1989) dominant problem logic: (1) INV creation, (2) commercialization and foreign entries, (3) rapid growth, (4) rationalization and foreign maturity. Problems relating both to management and foreign business were found to be distinctively different between different development phases. In addition to moving forward through the phases, firms were also found to retrench to the previous phase, or even file for bankruptcy when confronted with a survival crisis that they could not overcome.

The previously presented growth models provide an understanding of the stages of growth that companies face as they grow. In this study, the applicability of the models to software companies will be observed based on the financial ratios of the sample companies. Although the testing of the applicability of the models is not in the core of this study, the results can provide valuable information for different interest groups of the company.

2.4 Growth strategies

In literature, growth strategies are divided into internal (organic) and external (inorganic) growth strategies (Gilbert, McDougall & Audretsch, 2006). Internal growth mechanisms refer to companies using internal means and resources such as innovative product development and marketing practices in order to grow their customer base (Gilbert et al., 2006). Innovations vary according to their nature from revolutionary to evolutionary. Amason, Shrader and Thompson (2006) distinguished between the two in the following manner:

> At one end are the revolutionary innovations that spark dramatic and radical change for whole segments of an industry. At the other end are that evolutionary innovations that modify and refine existing practices.

Banbury and Mitchell (1995) found that established firms, in contrast to new entrants, are more dependent on incremental (evolutionary) innovations and that early adoption of important incremental product innovations resulted in greater market share. New entrants into markets were not found to benefit from incremental innovations due to their lack of complementary assets such as distribution systems and business reputation. However, introducing entirely new products (radical innovations) enable new market entrants to build market share and maintain it even when competitors enter the market.

External growth can further be divided into growth by partnership or growth by acquisition. Growth by partnership refers to licensing deals or partnerships with other companies. (Chen, Zou & Wang, 2009) Licensing deals are especially important in regards to this study, since software companies commonly license their products to their customers (Cusumano 2004, 4, 24-29). Rothaermel and Boeker (2008) summarized previous research (such as Shan, Walker & Kogut, 1994; Rothaermel & Deeds, 2004; Baum, Calabrese & Silverman, 2000) on the topic, and listed that companies form alliances in order to overcome market failures, accrue market power, learn from one another, share risks, access complementary assets, enhance legitimacy, build new competences, enter new markets and technologies, enhance innovativeness and new product development, and improve early performance. In their own research, Rothaermel and Boeker (2008) found that alliance formation is common especially in high-technology industries that face radical technological change. In these situations, established firms tend to seek alliances with new entrants in order to adapt to change, while new entrants see these alliances as opportunities to commercialize their new technologies. The other form of external growth, growth by acquisition, refers to purchasing companies in related or unrelated business areas (Chen et al., 2009). By the means of acquisition, companies can strengthen their offerings or extend their reach into new markets and not have to develop the needed resources and competencies internally (Penrose, 164-166, 1980). In their study, Kuuluvainen, Pukkinen & Stenholm (2008) studied resource acquisition as one means of growth. They found that companies invest-

ing in new technologies did not necessarily achieve growth benefits due to lacking skills to utilize them. Company acquisitions solve this problem by delivering not only new technologies, but the competencies and resources needed to utilize them. Thus the company does not need to develop them internally. However, as Oliveira and Fortunato (2006) point out, especially small and young firms rely on financing their growth through retained earnings and are thus constrained by the quantity of internally generated finance. Hence, while new ventures with high levels of financial abundance can pursue growth through acquisition (Chen et al., 2009), this growth strategy is more common within established firms.

In their study, Mascarenhas, Kumaraswamy, Day and Baveja (2002) analyzed 45 rapidly growing, profitable firms and revealed five growth strategies that the companies followed. *(1) Product proliferation* was found to be dominant in companies that operated in internet related products or services that had short life-cycles, but high scalability. Key to this strategy is being the first mover and executing rapid expansion. *(2) Mass market development* relies on reconfiguring a manufactured product in a manner that changes expectations and reveals a new mass market potential. Effective execution requires focusing on a segment with high market potential, developing the market over time and overcoming barriers relating to regulations, culture, transportation, production and cost. *(3) Increasing value to select customers* is an effective strategy in companies that are constrained by competition, resources or other factors. The companies leverage their limited resources and add value to a smaller set of selected customers. *(4) Distribution innovation* strategy stems from situations where industry leaders' underserve certain segments of their market and thus enable new market entrants to take ground. Market leaders may not want to risk damaging their distribution relationships by introducing new channels. Facilitating technical change, such as credit card use, new postal systems or Internet access may lead to exploitable distribution innovation strategies. *(5) Acquisition and consolidation strategy* is pursued in fragmented industries in which industry deregulation and innovation create market disequilibrium. Deregulation drives companies to merge in order to remain competitive, while innovations lead to new technologies or operation methods that larger companies aim to exploit through acquisition. Each of Mascarenhas et al.'s (2002) five growth strategies cannot be defined strictly as internal or external, rather they can be viewed as more applied versions, combining elements of both organic and inorganic growth.

2.5 Growth entrepreneurship in Finland

The *Finnish Ministry of Employment and the Economy* (TEM) publishes a review of entrepreneurship in Finland, *Yrittäjyyskatsaus*, annually. The report has been produced annually from the year 2003 onward. In 2011 and 2012, the entrepreneurship review has been accompanied by a review of growth entrepreneurship, *Kasvuyrittäjyyskatsaus*, which focuses specifically on growth companies.

In its reports, TEM uses the definition of *OECD/Eurostat* to define a growth company. In order to fulfill the requirements, a company has to employ at least ten people in the beginning of the observation period, and during the three following years the employment growth has to be over 20 % on an annual average. Respectively, the population of companies that serve a s a comparison base, is formed by companies that also employ 10 people in the beginning year and continue their operations throughout the same observed three years. It is worth noting that these restrictions limit the population of companies heavily and shifts the focus of TEM's reports towards larger companies. E.g. in 2007-2010, companies fulfilling the requirements accounted for only 6 % of the total number of companies that continued operations in Finland, however they did account for 70 % of employment. (TEM, 2012b)

The contribution of growth companies to a modern economy is significant. In Finland, growth companies employ approximately 10 % of the workforce, varying from 12 % in 2007 to 8,5 % in 2010. (TEM, 2012a) Their proportion of the population of firms varies depending on the situation of the economy. At the lowest point, in 1993, growth companies accounted for only 2 % of all companies, while in the turn of the millennium they represented 8 % of the population. (TEM, 2012b)

Although growth companies come in many different forms, certain generalizations can be made about them. They tend to be:

- Young; over 50 % of growth companies are under 10 years of age.
- Small; 60 % of them employ 10-19 people.
- Service companies; approximately 70 % of growth companies operate in the services sector. Growth companies are most common in knowledge-intensive services and most rare in the high-tech industry business sectors.
- Spread out across Finland; 46 % of growth companies and one third of all companies are located in the region of Uusimaa's Centre for Economic Development. In relation to the population of companies, also Pirkanmaa, Central Finland and Southern Savonia are growth-company-intensive.
- Less international; 14 % of growth companies and 23 % practice export operations.
- Know-how –intensive; the personnel of growth companies tend to be highly educated. Non-technical innovations are common and formal R&D is practiced less than in other companies.

(TEM, 2012b)

Following TEM's (2012b) definition, there were approximately 670 growth companies in Finland in 2010 that employed at least 10 people and maintained an annual employee growth rate of 20 %. This accounted for 4,4 % of all companies employing a minimum of 10 people. The *Confederation of Finnish Industries* (EK) defines a growth company as a company that has been able to increase its turnover by 10 % in three consecutive years (EK, 2008). According to EK's definition, the amount of growth companies in 2008 was 12 000, account-

ing for 4,5 % of all companies excluding extractive industries. Furthermore, 2 100 companies achieved an annual turnover growth of 30 %, accounting for 0,8 % of all companies (excl. extractive industries). EK defines these companies as high-growth companies. (EK, 2010) In 2009, the effects of the global financial crisis could be seen as the stable growth experienced in 2003-2008 turned to a decline. In 2009, there were only 7 646 growth companies and 1 258 high-growth companies accounting for 2,9 % and 0,48 % of all companies (excl. extractive industries). (EK, 2011)

2.6 Growth firm definitions

For the purpose of this study, the growth of a firm is measured as the relative growth of net sales. This is due to many reasons. Firstly, as mentioned, previous research has proven that net sales growth is the most common growth measure (Shepherd & Wiklund, 2009; Delmar, 1997), thus its use will improve the comparability of this study with other studies of the field. Secondly, although employee growth is also a commonly used measure, used e.g. by *OECD/Eurostat* in its growth company definition, it could not be effectively utilized since the data set received from *Balance Consulting* included employee information for only 22 % of the companies for all of the observed years. It is worth noting that the data for this study did not include information regarding the international operations of companies and therefore that aspect could not be covered in this study.

Firms are also often categorized further into growth groups based on the dataset at hand. E.g. Delmar et al. (2003), for the purpose of their study, define a high-growth firm as a company that was in the top 10 % of all firms included in their study in terms of annual average in one or more out of six categories: (1) absolute total employment growth, (2) absolute organic employment growth, (3) absolute sales growth, (4) relative (i.e., percentage) total employment growth, (5) relative organic employment growth, and (6) relative sales growth. Out of a population of 11 748 firms, 1 501 fulfilled the criteria.

One of the most popular definitions of a high-growth firm is that of a "gazelle" company. The term was introduced by Birch (1979) in his report *The Job Generation Process* and it is used to describe a company that effectively doubles its net sales within a four-year period. This leads to an average annual growth rate minimum of 20 % in net sales for each of the observed years.

As noted by the *Committee for Corporate Analysis* (2005, 80), inflation should be taken into account when interpreting the net sales growth -% of a company. The average inflation in Finland for the observation period, years 2008-2011, was 2,18 % (Statistics Finland, 2013c). For the purpose of this study, in order to qualify as a growing firm, a company had to be able to grow its net sales at a higher rate than inflation. Following the lines of presented definitions, growth groups were formed in order to categorize sample firms.

TABLE 2 Growth groups of companies

Growth speed	Group name	Net sales growth
High growth	Gazelles	> 20 %
Moderate growth	Humdrums	2,19–19,99 %
Diminishing growth	Slackers	< 2,18 %

The formed growth groups are presented in table 2 above. Three separate growth groups were formed and named according to their growth performance in net sales growth. Companies exhibiting diminishing growth (2,18 % or less growth annually), were seen to neglect their growth potential and were thus named "Slackers". Companies that achieved moderate growth (2,19-19,99 % annual growth) were named "Humdrums" due to their mediocrity in terms of growth rates. Companies exhibiting high growth (20,0 % or higher growth) rates were named "Gazelles" according to Birch's (1979) definition of a Gazelle company.

Chapter 2 has explained the connection of growth to entrepreneurship and entrepreneurship research. Entrepreneurial opportunities are at the root of entrepreneurial activity and growth is an essential measure in evaluating performance in entrepreneurial activities (Shane, 2003, 5-6). While growth can be measured in various ways, sales growth is the most commonly used measure in growth research (Shepherd & Wiklund, 2009; Delmar et al., 2003), thus providing the main research measure for this study, and increasing its comparability to others. A brief look into the growth models and strategies was also provided. Growth models for high-tech ventures, INVs and software ventures were presented. Software companies are often regarded as a part of the high-tech industry and therefore models for both high-tech and software ventures represent growth models common to software companies. INVs are common in SMOPEC countries (Fan & Phan, 2007), such as Finland, and in the high tech industry (Autioet al., 2011), thus increasing the relevance of INV growth models for this study. Even though the financial statement data used in this study does not reveal the models or strategies implemented in order to achieve growth, they are essential in order to understand the concept of firm growth. The current state of growth companies in Finland was then discussed in a brief review. Finally, definitions were presented for growth and high-growth firms. Based on the provided definitions, company growth groups were formed for the use of this study. The next chapter, Chapter 3, gives an introduction into the financial statements of a company, financial statement analysis, and provides detailed descriptions into the financial statement ratios used in this study.

3 FINANCIAL STATEMENT ANALYSIS

3.1 The financial statement

In Finland, the financial statement is consists of three items: the balance sheet, income statement and the accompanying notes to the financial statement. In addition, for publicly listed or large companies, attaching an annual report and cash flow statement is required. (Ikäheimo, Lounasmeri & Walden, 2005, 63) The requirements are fairly similar in many other countries too. In the United States, the three main required financial statements are the balance sheet, the income statement and the cash flow statement. In addition to the main documents, a company is also required to reconcile the beginning and ending shareholder's equity for the period, which is usually reported in the statement of shareholder's equity. (Penman, 2013: 34) Even though the main contents of financial statements are more or less the same across country borders, the presentation and structure may vary. The following explanations of financial statement items are based on the regulations of the Finnish Accounting Act (Finlex, 2013). Official models of the income statement based on expense categories (appendix 1) and balance sheet (appendix 2) are provided in the appendixes section of this paper.

The balance sheet

The balance sheet is divided into assets, liabilities and shareholders' equity (Penman, 2013: 34-36). Assets are displayed on the debit and liabilities and shareholders' equity on the credit side of the balance sheet, thus representing the applications and sources of funds in the company's operations (Niskanen & Niskanen, 2007: 45). Assets are displayed in the order of their liquidity; the higher the item's location on the balance sheet, the harder it is to transform it into cash (Ikäheimo et al., 2005: 65). E.g. manufacturing equipment is located higher on the balance sheet than accounts receivable, while R&D costs are located even higher.

The three parts of the balance sheet can be illustrated by the so called accounting or balance sheet equation below:

> Shareholders' equity = assets - liabilities
> (Penman, 2013: 36)

The balance sheet equation states that the difference between assets and liabilities equals shareholders' equity. This illustrates the amount of assets that shareholders would have claim to after deducting the claims of creditors. The difference between assets and liabilities is often referred to also as net assets. (Penman, 2013: 36)

Assets can further be divided into *non-current assets* and *current assets*. Non-current assets are assets that are expected to produce revenue on a longer term than only the current accounting period. Non-current assets can further be divided into intangible, tangible and investment assets, and include items such as patents, machinery and shares of affiliated companies. Current assets are assets that are planned to be consumed or traded during the upcoming accounting period and include the company's tradable goods, such as inventories, as well as financial assets, such as accounts receivable and cash. (Ikäheimo et al., 2005: 65-67)

Where shareholders' equity represents the claim to the payoff by the owners, liabilities represent the claim by others (Penman, 2013:34). The credit side of the balance sheet is constructed in a manner that represents the amount of claim that a creditor has towards withdrawing his or her capital from the company. The lower the creditor's position is on the balance sheet, the higher his or her claim is to the company's assets. As shareholders' equity is located on top of the credit side, the owners are last in line to receive their invested funds out of the company in case of liquidation of assets. The credit side of the balance sheet can be divided into four main sections: *capital and reserves* (i.e. shareholders' equity), *appropriations*, *provisions* and *creditors*. Capital and reserves illustrate the capital invested in the company by the owners. Part of the capital and reserves are eligible for profit distribution. Appropriations stand for the accumulated difference between taxable income and income according to accounting. In Finland, companies are allowed to practice income taxation planning within certain legal limits. As a company practices income planning through accounting, this is where the effects will be recorded in form of a debt payable to the state in the following years. International Financial Reporting Standards (IFRS) do not recognize appropriations. Provisions represent expenses and fall upon the previous accounting period, but have not been paid yet. The expenses need to be required by law and expected to be paid during the upcoming years. Common items include provisions for pension payments or taxation. The last group, creditors, stands for the investments into the company that have been made in form of a credit by a creditor. They can be divided into long-term liabilities, referring to debts payable on a longer term, and current liabilities, which refer to debts payable during the next accounting period. (Ikäheimo et al., 2005: 68-70)

The income statement

The income statement reveals the amount of income and expenses of the accounting period. The remainder, after deducting expenses from income, displays the profit or loss for the accounting period. (Ikäheimo et al., 2005: 63) For the owners, the income statement explains how the shareholders' equity has changed due to business activities. The value added to shareholders' equity is net income, which can be calculated in the following manner (Penman, 2013: 36-38):

Net income = revenues - expenses
(Penman, 2013: 38)

Net income can also be referred to as earnings or net profit. Revenue stands for the value coming in from selling the company's products and expenses for value going out in earning revenue (Penman, 2013: 36-38). The income statement can be structured either by function or by expense origins. If the income statement is structured by function, the expenses are divided by functions such as purchasing, manufacturing, sales, marketing and other operational expenses. The expenses based structuring is more commonly used in Finland. In it, the income statement is dived into four main sections (Ikäheimo et al., 2005: 70-71):

1. Operating income and expenses
2. Financial income and expenses
3. Extraordinary income and expenses
4. Changes in appropriations and taxes

(Ikäheimo et al., 2005: 70)

The main ingredients of *operating income and expenses* are the company's net sales, other operating income, raw materials and services, staff expenses, depreciation and amortization payments and other operating expenses. Earnings before interests and taxes (EBIT), is the difference between operational income and expenses. This figure indicates the capability of the company's operations to create a profit. *Financial income and expenses* indicate the effects the financing operations have on the profitability of a company. Financial expenses relate to the expenses generated by the borrowing of their capital. Financial income in turn relates to the returns generated by possible investments of the company's capital. The effect of financial income and expenses is highly dependable on the financial structure of the company; to what proportion is the company's operation funded by external sources of funding and on what terms has the funding been acquired. *Extraordinary income and expenses* refer to income and expenses that are nonrecurring, that differ distinctly form the normal operations of the company and that are significant in relation to other items such as the company's profit. These can be items such as group contributions or nonrecurring insurance claims. *Changes in appropriations and taxes* describe the decisions made by the company in terms of taxes. As mentioned previously, Finnish companies have the opportunity to practice planning of their taxable income within certain legal limits. In double-entry bookkeeping, the recording of these procedures is done to both the balance sheet under appropriations and to the income statement. The function of appropriations is to affect the total taxable income of a company. (Ikäheimo et al., 2005: 71-75)

After each of the above four sections have been accounted for, the income statement's bottom line indicates the company's net income. The figure describes the profit or loss that has been generated by the company's operations

during the accounting period. Profit increases the shareholders' equity, while recording a loss decreases it. (Ikäheimo et al., 2005: 75).

The accompanying notes to the financial statement

As a general rule, the accompanying notes to the financial statement should include all information that is needed to form a true and fair view of the company. Regulations govern the minimum requirements of the accompanying notes; however it falls under the responsibility of the accountable to evaluate the need for presenting additional information (Ikäheimo et al., 2005: 75-76). The minimum requirements for information that should be presented include the following:

- deviations from common accounting principles
- notes regarding the balancing of the books
- notes regarding the income statement and balance sheet
- notes regarding income taxes
- collaterals and responsibilities
- key personnel and members of the legally proscribed organs
- ownership in other companies
- conglomerate ties

(Ikäheimo et al., 2005: 76)

The accompanying notes to the financial statement do not play an essential role in ratio analysis; however they are an essential ingredient of the financial statement in order for it to provide a realistic view of the company.

The cash flow statement

The cash flow statement describes the volume and structure of cash that is flowing through the company. It can be used to evaluate how the company can accumulate funds as well as what those funds are used for. (Ikäheimo et al., 2005: 76) The cash flow statement examines the sufficiency of funds to cover expenses in the order of priority. The net sales proceeds are used firstly to cover the running business operations, secondly financial expenses, then taxes, profit sharing items and finally investments and loan amortizations. The cash flow statement is presented in the form of a subtraction calculation and it indicates if the company's funding is sufficient to cover expenses. It also reveals to what extent the company relies on internal and, on the contrary, external capital in its financing. (Committee for Corporate Analysis, 2005, 52) The cash flow statement is not examined here more thoroughly, since the financial statement analysis ratios used in this study are based on balance sheet and income statement items.

3.2 Financial statement analysis

A company's financial statement information can be examined through financial statement analysis. Financial statement analysis can be conducted through *common size*, *trend* or *ratio analysis*. In common size analysis, income statement figures are compared to net sales and presented as percentages. Balance sheet figures in turn are presented as a percentage of total assets. This type of presentation of the figures reveals the relations of different balance sheet and income statement items to each other. Trend analysis can only be executed on a time frame of two or more points in time, since it aims to identify the changes in income statement or balance sheet items. The reference values used in trend analysis are usually the first year's figures, thus revealing the changes within a time period. In ratio analysis the income statement and balance sheet are used to calculate different ratios that illustrate the performance of the company such as the profitability, financing structure or liquidity. (Niskanen & Niskanen, 2007, 49-52) Ratio analysis will be discussed in detail in the following chapters.

Most forms of financial statement analysis can be conducted both as cross section analysis, focusing only on one year, or alternatively as time series analysis, focusing on multiple years of operation. In cross section analysis, the company at hand is often compared to other companies, usually from its own industry. In time series analysis, the company's financials are observed on a wide time scale in order to make conclusions on the development of the company's financial position. (Niskanen & Niskanen, 2007, 50)

Financial statements need to be reformulated in order for them to be suitable for financial statement analysis. The main reason for modifying financial statements before analysis is to guarantee that they are in a form that suits the analysis as well as comparable with each other. Even though the principles for preparing a financial statement are generally governed by law, certain discretionary items are left to the consideration of company management in order for the financial statement to fully describe the nature of the company and to guarantee that the information provided by the statement is as accurate as possible. These points susceptible for management judgment have to be examined with care when preparing a financial statement for analysis because different companies, although similar by nature, may choose to treat even similar situations in a different manner when reporting them to the financial statement. Differences in handling discretionary items may be e.g. due to management's own interests to present steady sales growth instead of highs and lows in order to depict the company as a safe investment opportunity. (Ikäheimo et al., 2005, 111-112)

Although the need for reformulating a financial statement is lesser than before (Niskanen & Niskanen, 2007, 49; Ikäheimo et al, 2005; 112), there are certain items that need to be examined closely when preparing for financial statement analysis. These include items such as the recording of profit or loss of sold assets, the treatment of subsidies in regards with investment costs, the treat-

ment of exchange rate losses, possible fixed costs included in stock valuation and possible increases in asset valuations. It is also essential to confirm that the length of the accounting period is similar across all of the companies facing analysis. (Ikäheimo et al, 2005, 112) The information regarding this study has been reformulated by *Balance Consulting* to ensure that the data is comparable and that the accounting periods of all included companies agree with each other.

3.3 Ratio analysis

Financial ratios are designed to indicate the economic performance of a company and they are calculated based on financial statement items. Economic performance is commonly divided into three categories: *profitability*, *solvency*, and *cash position and liquidity*. This division serves also as a general rule for classifying calculated ratios into main groups. In addition to these three groups, a fourth group of *turnover ratios*, that focuses on the efficiency of the company's operations, is often separated. (Niskanen & Niskanen, 2007, 55-56; Ikäheimo et al, 2005, 116) The turnover ratios section in this chapter is not strictly limited to turnover ratios, but also includes other ratios describing the efficiency of a company's operations such as the working capital -%. Furthermore, a group of indicators regarding the *scope and development* of the company's operations is often included in financial statement analysis (Ikäheimo et al, 2005, 116). The indicators are often presented in the form of ratios, since most are the result of division calculations between different financial statement items. Some commonly used ratios can be derived directly from common size analysis, in which different financial statement items are presented as a percentage of net sales or balance sheet total. However, these indicators form only a small portion of ratios, since calculations can be made between items originating both from the income statement and balance sheet. This enables a more diverse set of indicators to represent the economic performance of a firm. (Niskanen & Niskanen, 2007, 56) The financial ratios and indicators used in this study are categorized and listed in table 3 and explained in the following subchapters.

TABLE 3 Financial ratios and indicators

SCOPE AND DEVELOPMENT OF OPERATIONS
Net sales
Net sales growth -%
Avg. no. of personnel
PROFITABILITY RATIOS
Operating result (EBIT)
Operating result -%, EBIT -%
Operating margin (EBITDA)
Operating margin -%, EBITDA -%
Net result
Net result -%
Return on investment -% (ROI)
Return on assets -% (ROA)
Return on equity -% (ROE)
SOLVENCY RATIOS
Equity ratio, %
Net gearing ratio
Debt to net sales ratio, %
CASH POSITION AND LIQUIDITY RATIOS
Quick ratio
Current ratio
TURNOVER RATIOS
Working capital -%
Inventory to net sales, %
Collection period of trade receivables
Payment period of trade payables
Net sales per employee
Operating result (EBIT) per employee
Personnel costs per net sales -%

Scope and development of operations

The scope of the company's operations refers to the size of a company. The size of a company can be measured in various ways, such as net sales, balance sheet total, the market value of share capital, or number of employees. Other measures include indicators such as production capacity, market share, and number of operating locations, markets or countries. The scope indicators should be chosen case-by-case based on what type of information is needed. The development of a company's operations is often examined through growth measures. Growth is commonly measured by net sales growth, balance sheet development, difference in market value of share capital, and changes in number of employees. (Ikäheimo et al, 2005, 117) The scope and development of op-

erations indicators used in this study and the formulas used to calculate them are the following:

> Net sales = the net sales of the accounting period (12 mo.)
> (Balance Consulting, 2013a)

Net sales, also referred to as turnover, is a measure of the volume of the company's business operations. Changes in net sales are usually the result of growth or reduction in the operations of the company. (Committee for Corporate Analysis, 2005, 80) It is worth noting that although net sales enables the volume comparison of companies, comparability between companies differs due to different operating structures or accounting practices between companies or industries. (Balance Consulting, 2013a)

> Net sales growth -% = 100 * [net sales (12 mo.) – previous net sales (12 mo.)] /previous net sales (12 mo.)
> (Balance Consulting, 2013a)

Net sales growth -% measures the annual change in net sales. Changes in inflation or booking sales should be taken into account when interpreting this figure. Changes in booking sales can include e.g. adopting the percentage of completion booking method. (Committee for Corporate Analysis, 2005, 80) There are no common reference values for net sales growth -%; in addition to inflation, it should be interpreted in relation to industry growth. Within conglomerate companies, net sales changes can also be due to group support payments (Balance Consulting, 2013a).

> Avg. no. of personnel

The number of personnel is also a common measure of company size and volume of operations. In ratio analysis, the number of personnel is presented in the form of average number of personnel (employees) per year, indicating the number of full time employees. Two half-day employees contribute into one full-time employee. (Balance Consulting, 2013a)

Profitability ratios

Profitability calculations can generally be done only on a company-wide level. Information regarding specific business units is usually not sufficient to enable reliable calculations. (Niskanen & Niskanen, 2007, 57) There are certain key ratios that are commonly used to describe the profitability of a company. These ratios can further be divided into ratios describing the structure of profit, or the return on capital. Structure of profit ratios include ratios such as gross margin, operating margin, operating result, net result and financing result. Return on capital ratios include ratios such as return on assets (ROA), return on invest-

ment (ROI) and return on equity (ROE). (Committee for Corporate Analysis, 2005, 63-68) The profitability ratios used in this study and the formulas used to calculate them are the following:

> Operating result = net sales + other operating income – operating expenses – depreciations and amortization payments
>
> Operating result -% = 100 * operating result / net sales
> (Balance Consulting, 2013a; Committee for Corporate Analysis, 2005, 64)

The operating result, also known as the operating profit (loss) or internationally as EBIT, is the first subtotal included in the official financial statement. It stands for earnings before interests and taxes, and can be calculated by adding other operating income to net sales and deducting operating expenses and depreciation and amortization payments. It indicates the level of profit that the company creates with its operations and that it can use to cover financial and tax expenses. (Committee for Corporate Analysis, 2005, 13, 64) According to the *Committee for Corporate Analysis* (2013, 64), operating profit -% is calculated as a ratio between operating profit and total operating income. However, *Balance Consulting* (2013a) calculates it as a ratio between operating profit and net sales. *Balance Consulting's* formula is used in the calculations of this study. The ratio can be used to indicate a company's performance either individually or within an industry (Balance Consulting, 2013a). The benchmark values, listed in table 4 below, can be used when assessing the sufficiency of the operating result -%:

TABLE 4 Operating result -%benchmark levels (Committee for Corporate Analysis, 2005, 65)

Benchmark level	**Operating result -%**
Good	> 10 %
Satisfactory	5 - 10 %
Poor	> 5 %

An operating result of over 10 % can be regarded as a good level of profit before interests and taxes. A level of 5-10 % is usually seen as satisfactory, and less than 5 % is commonly regarded as a poor level of performance. As mentioned before, business sector, depreciation and financial expenses need to be taken into consideration when analyzing these figures.

> Operating margin = operating result + depreciations and amortization payments
>
> Operating margin -% = 100 * operating margin / net sales
> (Balance Consulting, 2013a; Committee for Corporate Analysis, 2005, 63)

Operating margin, EBITDA, can be calculated by adding depreciation and amortization payments to operating profit. It is not included in the official income statement as a subtotal. (Committee for Corporate Analysis, 2005, 63) The

Committee for Corporate Analysis (2013, 63), calculates the operating margin -% as a ratio between operating margin and total operating income. *Balance Consulting* (2013a) uses operating margin and net sales to calculate the ratio. *Balance Consulting's* formula is used in this study. The operating margin describes a company's operating result prior to depreciation and financial items and is best used in comparisons of companies within the same business sector. However, comparability between companies operating in the same industry may be affected by ownership of production facilities. If a company rents, fully or partially, its production facilities, the subsequent costs are included under operating expenses, thus taken into account in the operating margin. However, if a company owns its production facilities, the related costs appear on the income statement after the operating margin as depreciation and financial costs. There is no generally applicable acceptance level for operating margin -% - the business sector, depreciation requirements of fixed assets and financial expenses relating to external capital need to be taken into account when conducting analysis. (Committee for Corporate Analysis, 2005, 63-64) The following benchmarks are general guidelines for different business sectors:

TABLE 5 Business sector operating margin -% benchmarks (Committee for Corporate Analysis, 2005, 64)

Business sector	**Operating margin -%**
Industry	10 – 25 %
Trade	2 – 10 %
Services	5 – 15 %

As can be seen in table 5 above, different business sectors generally operate at different levels of operating margins. While companies operating in the industrial sector tend maintain an operating margin level of 10 -25 %, the trade sector operates at a level of 2-10 % and services at a level of 5-15 %. As mentioned previously, these benchmark levels serve only as general guidelines.

Net result = operating result + financial income – financial expenses - taxes

Net result -% = net result / net sales
(Balance Consulting, 2013a; Committee for Corporate Analysis, 2005, 65)

The net result of a company is used to determine a company's profitability. The net result should be positive in order for the company to be regarded as profitable. It is calculated from the operating result by adding financial income, deducting financial expenses and deducting taxes. (Committee for Corporate Analysis, 2005, 63-64) *Balance Consulting* (2013a) calculates the net result -% by dividing the net result by the net sales of the company, while the *Committee for Corporate Analysis* (2013, 65) uses net result and total operating income. *Balance Consulting's* formula is used in this study. The required minimum level of net profit is dependent on the company's aims for improving the capital structure and profit distribution (Committee for Corporate Analysis, 2005, 65). No gener-

ally applicable benchmark levels for net profit -% exist, but as profit distribution aims affect strongly the desired level of net profit, return on investment (ROI) stands in as a good indicator of net profit sufficiency. A ROI level of 10 % or more is usually satisfactory from the owners' point of view and indicates a more than sufficient level of net result. As net profit does not include extraordinary items or closing items, it may not represent the final profit or loss for the accounting period stated on the final row of the income statement. (Balance Consulting, 2013a)

Return on investment -% = 100*[net result + financial expenses + taxes (12 mo.)] / average invested capital of the fiscal period

, where

Invested capital = adjusted shareholders' equity + invested interest-bearing external capital
(Balance Consulting, 2013a; Committee for Corporate Analysis, 2005, 67)

, in which

Capital loans
+ Loans from financial institutions
+ Loans from pension institutions
+ Loans and liabilities from group companies (long-term)
+ Other long-term liabilities
+ Short-term interest-bearing liabilities
+ Other short-term interest-bearing loans and liabilities from group companies
Invested interest-bearing external capital
(Committee for Corporate Analysis, 2005, 67)

The return on investment -% (ROI) reflects how well the capital invested in the company has managed to produce returns (Ikäheimo et al., 2005, 118). It is calculated by dividing the sum of the net result, financial expenses and taxes by the invested capital. Invested capital is the sum of adjusted shareholders' equity and interest-bearing liabilities for the fiscal period and it is calculated as the average opening and closing balances of the period. If a company's fiscal period differs from 12 months, the numerator should be divided by the number of months in the period and multiplied by 12. In the case of a company's adjusted shareholders' equity being negative, invested capital will amount to the sum of the invested external capital at the minimum. (Committee for Corporate Analysis, 2005, 67-68) The ratio can be compared to the company's own previous track record as well as other companies. The company's economic development and competitiveness can be evaluated based on the observations. (Ikäheimo et al, 2005, 118) Company comparison may be difficult if information regarding the separation of interest-bearing and other liabilities is lacking. A company can be regarded to have a fairly good ROI -%, when it, at the minimum, amounts to

the average financial expense -% of its interest bearing liabilities. (Committee for Corporate Analysis, 2005, 68)

> Return on assets -% = 100* [net result + financial expenses + taxes (12 mo.)] / average adjusted balance sheet total
> (Balance Consulting, 2013a; Committee for Corporate Analysis, 2005, 66)

, where

> Financial expenses = interest and other financial expenses + foreign exchange losses
> (Committee for Corporate Analysis, 2005, 66)

The return on assets (ROA) compares the operating result to the total capital tied to the business operations. ROA is a profitability measure that is not affected by the company's tax policy or tax practices dependent on the company's corporate from. The used balance sheet items are calculated as averages of their opening and closing balances. If the reporting period differs from 12 months, a comparable yield percentage is calculated by dividing the numerator by the number of months and multiplying the result by 12. If the adjusted shareholders' equity is negative, total capital will amount to the sum of adjusted external capital at the minimum. (Committee for Corporate Analysis, 2005, 66-67) The adjusted balance sheet total is calculated in the following manner:

> Adjusted balance sheet total = adjusted shareholders' equity + adjusted external capital

, where

> Shareholders' equity from the balance sheet
> \+ Depreciation difference
> \+ Voluntary provisions
> \- Adjustments to shareholders' equity
> = Adjusted shareholders' equity

, and

> Long-term external capital
> \+ Deferred taxes
> \+ Compulsory provisions
> \+ Leasing commitments
> \+ Short-term liabilities
> = Adjusted external capital
> (Committee for Corporate Analysis, 2005, 66)

The calculated ratio reflects the company's capability to generate profits in relation to the total capital tied to its operations. In cases where a clear distinction between interest and non-interest bearing external capital cannot be done, the

ROA is more useful than ROI. (Committee for Corporate Analysis, 2005, 67) The following benchmark values can be used to evaluate the level of ROA-%:

TABLE 6 ROA -% benchmark levels (Committee for Corporate Analysis, 2005, 67)

Benchmark level	**ROA -%**
Good	> 10 %
Satisfactory	5 – 10 %
Poor	> 5 %

Although the benchmark levels listed above in table 6 can be used as general guidelines, there are certain issues that impair ratio comparisons. Companies are not consistent with asset revaluation. Other companies tend to make revaluations, while others use asset acquisition costs as basis in asset valuation. Companies that make revaluations tend to produce lower yield percentages. Also, when examining an individual company's ROA -% development, the figures will become distorted during a year when revaluations are made. (Committee for Corporate Analysis, 2005, 67)

> Return on equity -% = 100 * net result (12mo.) / adjusted shareholders' equity for the fiscal period
> (Balance Consulting, 2013a; Committee for Corporate Analysis, 2005, 68)

Return on equity (ROE) measures the company's ability to service the owners' capital investment. As in the case of ROI and ROA, the balance sheet items in the ratio are averages for the opening and closing balance sheet values. In the case of a fiscal period that differs from 12 months, the result should be annualized to represent 12 months. ROE is calculated by dividing the net result by the adjusted shareholders' equity for the period. The required ROE level depends on the return requirements of owners, which are dictated by the risks involved. Out of all the return on capital ratios, ROE is most affected by revaluations. (Committee for Corporate Analysis, 2005, 68)

Solvency ratios

Solvency ratios describe the capital structure of a company and are most often calculated based on balance sheet items. Capital structure refers to the ratio between shareholders' equity and liabilities. It can be calculated in various ways. A company with good financial standing can manage its interest payments on the long term even in times of low profitability. (Niskanen & Niskanen, 2007, 59)

The measures used in this study are equity ratio, debt to net sales ratio and the gearing ratio. All of the ratios include a step in which advances received is deducted from adjusted balance sheet total. In all of these three cases, the deducted advances received consist of short- and long-term advances received for work or project in progress. These types of advantages do not com-

monly involve liability for repayment, since they disappear from the balance sheet when the work has been completed. (Committee for Corporate Analysis, 2005, 69) The formulas and explanations for the ratios are listed below.

> Equity ratio, % = 100* adjusted shareholders' equity / (adjusted balance sheet total – advances received)
> (Balance Consulting, 2013a; Committee for Corporate Analysis, 2005, 69)

The equity ratio describes the company's solidity, its ability to cope with losses and its capability to fulfill its long-term commitments. The Equity ratio is calculated by dividing adjusted shareholders' equity by the remainder of the adjusted balance sheet total after deducting advances received. A company's depreciation policy and the impact of inflation can affect the balance sheet asset values considerably. If the changes in value can be verified, increasing or decreasing adjustments can be made to the shareholders' equity used in the equation. The comparability of ratios between different years is affected by any upward revaluation made to non-current assets as well as the consistency of the treatment of capital loans. In cases where the owners of a small enterprise are, to a large extent, liable for the company's operations and interest-bearing liabilities, the analysis should also take into account the personal assets and liabilities of the owner. (Committee for Corporate Analysis, 2005, 69)

TABLE 7 Equity ratio benchmark levels (Committee for Corporate Analysis, 2005, 70)

Benchmark level	**Equity ratio**
Good	> 40 %
Satisfactory	20 – 40 %
Poor	> 20 %

As can be seen in table 7 above, an equity ratio of above 40 % reflects good solidity, 20 – 40 % satisfactory and a ratio below 20 % poor solidity of a company.

> Net gearing ratio = 100 * (total interest-bearing liabilities - cash and marketable securities) / adjusted shareholders' equity
> (Balance Consulting, 2013a; Committee for Corporate Analysis, 2005, 71)

, where

> Long-term liabilities excl. advance payments received
> \+ Short-term interest-bearing liabilities
> \+ other interest-bearing loans from and liabilities to group companies
> = Total interest bearing liabilities
> (Committee for Corporate Analysis, 2005, 71)

The net gearing ratio describes the level of debt that the company has in relation to shareholder's equity – the higher the net gearing ratio is, the more in debt the company is (Niskanen & Niskanen, 2013, 59-60). The net gearing ratio

is calculated by deducting the company's cash and marketable securities from its total interest-bearing liabilities and dividing the remainder with adjusted shareholders' equity. The *Committee for Corporate Analysis* (2005, 71) considers a ratio giving a value less than 1 financially sound. However, *Balance Consulting's* (2013a) benchmark values, which can be seen in table 8 below, regard a wider range of values as excellent (below 10 %), as well as give guidelines to evaluating larger values:

TABLE 8 Net gearing benchmark levels (Balance Consulting, 2013a)

Benchmark level	**Net gearing ratio**
Excellent	< 10 %
Good	10 - 60 %
Satisfactory	60 - 120 %
Tolerable	120 - 200 %
Poor	> 200 %

A negative ratio indicates that the company has zero net debt; the company either has no interest-bearing liabilities or they can be paid in full with the company's cash reserves (Balance Consulting, 2013a). However, if a negative value is caused by negative shareholders' equity, the value is considered poor (Committee for Corporate Analysis, 2005, 71).

> Debt to net sales ratio, % = 100 * (liabilities of the adjusted balance sheet - advances received) /net sales (12 mo.)
> (Balance Consulting, 2013a; Committee for Corporate Analysis, 2005, 70)

The debt to net sales ratio is calculated by deducting advances received from the liabilities of the adjusted balance sheet and dividing the remainder by net sales. A high debt to net sales ratio requires that the company also is able to generate a good operating result in order to cope with the obligations of debt financing (Committee for Corporate Analysis, 2005, 70; *Balance Consulting*, 2013a). The ratio is highly dependent on the business sector, thus no general benchmark values can be used (Committee for Corporate Analysis, 2005, 70).

Cash position and liquidity ratios

Cash position and liquidity refer to a company's capability to manage its payments on a daily basis. Ratios such as sales receivable turnover and accounts payable turnover are traditionally considered cash position and liquidity ratios, but they will be explained in the next subchapter under turnover ratios. (Niskanen & Niskanen, 2007, 59)

Quick ratio = (short-term receivables + cash and marketable securities - receivables booked according to percentage of completion method) / (short-term liabilities - advances received)
(Balance Consulting, 2013a; Committee for Corporate Analysis, 2005, 75)

Quick ratio is calculated essentially as a ratio between a company's current assets and short-term liabilities. It is used to evaluate a company's capability to meet its short-term liabilities only with its current financial assets. Advances included in the equation are short-term advances relating to work or projects-in-progress. In the case that short-term receivables include deferred tax assets based on confirmed losses, that amount is excluded from the calculations. (Committee for Corporate Analysis, 2005, 75) The following benchmark values in table 9 can be used as guidelines in quick ratio analysis:

TABLE 9 Quick ratio benchmark levels (Balance Consulting, 2013a)

Benchmark level	**Quick ratio**
Excellent	> 1,5
Good	1 - 1,5
Satisfactory	0,5 - 1
Tolerable	0,3 - 0,5
Poor	< 0,3

Balance Consulting divides quick ratio values into five different performance levels (table 9). The *Committee for Corporate Analysis* (2005, 75) uses only three categories good (above 1), satisfactory (0,5 - 1) and poor (below 0,5).

Current ratio = (inventories and work-in-progress + receivables + financial assets) / short-term liabilities
(Committee for Corporate Analysis, 2005, 76)

The current ratio is similar to the quick ratio, except for the fact that it takes into account also the inventories of a company. Both of the ratios are calculated based on the values at the time of closing of the books. Hence, they are both considered measures of static liquidity. The items included are treated the same in both ratios (e.g. deferred tax assets). (Committee for Corporate Analysis, 2005, 75-76) Benchmarks for the current ratio are the following:

TABLE 10 Current ratio benchmark levels (Balance Consulting, 2013a)

Benchmark level	**Current ratio**
Excellent	> 2,5
Good	2 - 2,5
Satisfactory	1,5 - 2
Tolerable	1 - 1,5
Poor	< 1

While *Balance Consulting* separates five categories as benchmark guidelines (table 10), The *Committee for Corporate Analysis* (2005, 76) divides the values into only three categories: good (> 2), satisfactory (1 - 2) and poor (< 1).

Turnover ratios

This section of ratios is not strictly limited to include only turnover ratios. It includes ratios that describe the efficiency of a company's operations, many of which are calculated in relation to the company's net sales (turnover).

Working capital -% = 100 * working capital / net sales (12 mo.)

, where

Inventories
\+ Trade receivables
\+ Trade receivables from group and associated companies
\+ Receivables booked according to percentage of completion method
\- Trade payables
\- Trade payables to group and associated companies
\- Advances received
= Working capital
(Committee for Corporate Analysis, 2005, 71-72; Balance Consulting, 2013a)

Working capital describes the level of cash that is tied up to the company's ongoing operations. All working capital items are dependent on the amount of net sales, thus working capital -% is calculated by comparing working capital with net sales. The working capital -% can be used to estimate how much financing possible expansion of a business will cause. A more thorough understanding can be achieved by calculating the efficiency ratios of the components of working capital. (Committee for Corporate Analysis, 2005, 71-72)

Collection period of trade receivables = 365 * trade receivables / net sales
(Committee for Corporate Analysis, 2005, 72; Balance Consulting, 2013a)

The collection period of trade receivables indicates how long it takes for the company to receive funds from sales booked as trade receivables. Trade receivables include also items that are not part of the actual net sales, such as value added tax; therefore the actual collection period is slightly shorter than the value received from the above equation. Also, if net sales include items booked according to the percentage of completion method, the collection period will seem to be shorter than it actually is. (Committee for Corporate Analysis, 2005, 72)

Inventory to net sales -% = inventories / net sales
(Committee for Corporate Analysis, 2005, 73; Balance Consulting, 2013a)

There are various ways to calculate inventory turnover ratios. *Balance Consulting* uses the inventories in relation to net sales, % -method, which describes the amount of cash that is tied up to inventories. Other methods focus on calculating the number of days inventory calculated by either the variable expenses or materials and supplies stay in the inventory (Committee for Corporate Analysis, 2005, 72-73).

> Payment period of trade payables = 365 * trade payables / net sales
> (Committee for Corporate Analysis, 2005, 74; Balance Consulting, 2013a)

The payment period of trade payables shows to what extent the company has used the payment times offered by its suppliers (Committee for Corporate Analysis, 2005, 72-73). The figure stands for the average payment time for trade payables in days. There are no generally applicable reference values for the payment period of trade payables. In analysis, the industry's common payment periods should be taken into account and the company's value should be compared to them. An increase in the average payment period often indicates a weakened situation in the company's cash position. Significantly long payment periods indicate trouble, since they cause increases in costs and loss of reputation. As a general rule, a company should aim to have a slightly higher trade payables period than its trade receivables collection period. This enables the firm to fund part of its operations through the credit received from suppliers (Balance Consulting, 2013a). The weakness of all working capital related ratios is that they are a reflection of the situation at the time of the closing of the books. The values may differ considerably throughout the fiscal period. (Committee for Corporate Analysis, 2005, 74)

> Net sales per employee = net sales (12 mo.) / average number of personnel
> (Committee for Corporate Analysis, 2005, 80; Balance Consulting, 2013a)

This ratio measures the relative effectiveness of the company's employees. It is worth noting that many companies outsource work input, thus affecting the ratio's comparability between companies. The comparability of the ratio is also affected by different calculation practices of the number of employees between companies. The number of personnel might also include e.g. workers that are temporarily laid off., thus affecting the figure's comparability. (Committee for Corporate Analysis, 2005, 80; Balance Consulting, 2013a)

> Operating result (EBIT) per person = operating result / average number of personnel
> (Balance Consulting, 2013a)

The operating result per person indicates the level of operating profit that a company can produce per person. The ratio is comparable between companies operating within the same business sector. The same comparability problems

related to the net sales per employee ratio apply to operating result per person as well.

Personnel costs per net sales -% = personnel costs / net sales

The personnel costs per net sales ratio is not as commonly used as net sales per employee ratio. However, since the data set provided for this study had a considerable amount of number of personnel figures missing, this ratio was included in the analysis. It describes the level of personnel costs in relation to net sales i.e. the efficiency of the company in creating net sales.

Chapter 3 has provided an introduction to the items that form a company's financial statement. The structure of the balance sheet and income statement were explained and the main functions of the accompanying notes to the financial statement as well as the cash flow statement were briefly presented. Different forms of financial statement analysis were presented with the focus on ratio analysis, which forms the basis for this study. The different financial ratios and indicators used in this study were explained and the formulas used to calculate them were presented.

Performance measurement is in the core of this study. Following Shane's (2003, 6) measures of entrepreneurial performance presented in Chapter 2, growth represents the main indicator of performance in this study. The chosen measure for growth for the purposes of this study is net sales growth, which, due to its common use as a growth measure (Shepherd & Wiklund, 2009; Delmar et al. 2003; Delmar, 1997), increases the comparability of this study to others. Most of the other ratios used in this study are also often used to measure the performance of a company. Shane (2003, 5-6) includes also profitability as a measure of entrepreneurial performance. The connections between net sales growth and profitability ratios will be further examined in following chapters, but one can assume that a positive correlation exists between the two. Other financial ratios presented in this chapter provide insight into the financial position and efficiency of a company's operations. The impact of growth on these indicators and vice versa will be examined in the following chapters. As this study's aim is to find possible connections between different financial ratios and indicators in relation to growth, all of the available ratios were chosen for further analysis, with the exception of number of personnel related ratios that were excluded due to insufficient data. The next chapter will provide a brief introduction of the software marketplace on a global and Finnish level. Then the used data, its characteristics and used research methodology will be presented before moving on to the results of the study.

4 RESEARCH DESIGN AND METHODOLOGY

4.1 The software industry

The software business differs from other businesses in many ways. The key differentiator is the digital "soft" good that software companies provide. Companies can offer products varying from products customized for individual users to standardized products for many users or anything in between. The distinction between a product and service company within the software industry is blurred. Many firms that start out offering a software product eventually become purely service companies or hybrid companies that offer customization and support functions to the products they sell. The nature of the products sold enable high scalability, since the production costs between delivering one product or a million products can be nearly the same. Not many traditional manufacturing or services industry companies can achieve 99 percent gross profit margins on their product sales such as in the software industry. There are also challenges that arise from the nature of the business. Huge productivity differences between employees, long product development periods and volatility to changes in the economy are only a few of the challenges that software companies face. (Cusumano, 2004, 2-3)

Cusumano (2004, 4) divides software companies into three main categories based on their business models (figure 7):

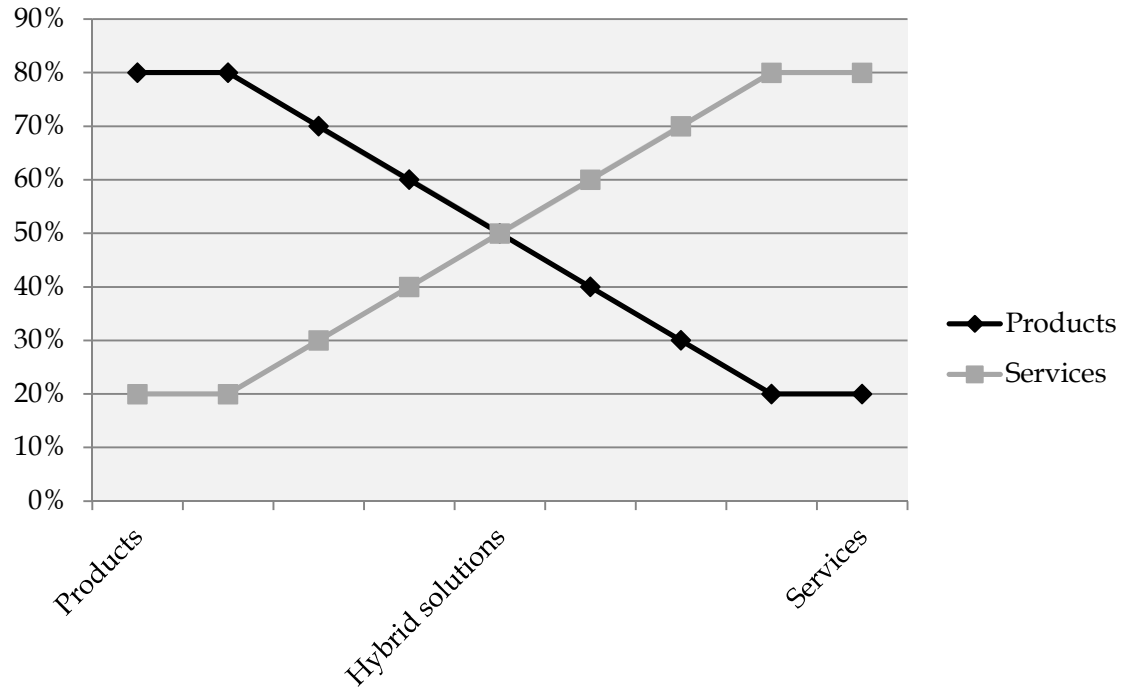

FIGURE 7 Three Business and life-cycle models for software companies (Cusumano 2004, 26)

Software products companies get all or most of their revenues from new product sales, i.e. software license fees. On the opposite end of the spectrum are *software services companies*, which derive most of their revenues from IT consulting, custom software development, integration work, technical support, systems maintenance, and similar activities. In the middle are *the hybrid solutions companies*, which have some new product sales but gather up to 80 percent of their revenues through services and maintenance. These service and maintenance functions often include product updates or enhancements that are sold through long-term contracts to the initial customers. (Cusumano 2004, 4, 24-29)

The highest profit margins in the industry can be achieved in the products end of the spectrum when the scalability of an individual product is at its highest. However, many companies shift towards the service end, customizing their products heavily, which also increases the labor-intensity of their operations. The balancing of the company's business model is essential for long term success because while product orientation may produce the highest profit margins, it is also highly volatile to economic downturns. In bad times, the customers, being individuals or enterprises, may choose not to invest in new versions of their products, placing products oriented software companies at risk. It is therefore essential that healthy software companies have a balance of products and services revenues in order to survive the bad times and grow rapidly in the good. (Cusumano 2004, 26-27)

Due to the nature of software products, defining the boundaries of the software industry can be problematic. Peltonen, Rönkkö and Mutanen (2013), for the purposes of their study, distinguish between five types of economic activities related to software:

1. The software product business
2. Software development services
3. IT services
4. Embedded software
5. Web portals

Peltonen et al. (2013)

The software product business refers to selling a software based product to the customer usually in the form of a license or other access to the sold software product. *Software development services* include delivering custom software systems to a customer, selling software development services or services directly related to them. *IT services* include the remaining activities in the software and IT services sector, such as pure IT consulting or maintenance of computer hardware. *Embedded software* includes software that is integrated into hardware products such as industrial machinery. *Web portals* are software systems whose business logic is driven by something other than the software. The first two classes are commonly considered to be part of the software industry, while the first three form the boundaries of the broader software and IT services industry.

Categories four and five are commonly not included in industry statistics regarding the software industry. (Peltonen et al., 2013)

International Data Corporation (IDC) aims to define the worldwide software marketplace by the companies that are relevant for market research purposes and defines its scope of the software market to "commercial software". *IDC* uses the term commercial software to distinguish commercially available software from custom software. (IDC, 2013a)

> Commercial software is programs or codesets of any type commercially available through sale, lease, or rental, or as a service. Commercial software revenue typically includes fees for initial and continued right-to use commercial software licenses. These fees may include, as part of the license contract, access to product support and/or other services that are inseparable from the right-to-use license fee structure, or this support may be priced separately. Upgrades may be included in the continuing right of use or may be priced separately. All of the aforementioned are counted by IDC as commercial software revenue. (IDC, 2013a) (page 3)

IDC further divides the worldwide software marketplace into three primary markets of commercial software: applications, application development and deployment software, and system infrastructure software. Total commercial software revenue is formed as the sum of license revenue, maintenance revenue, subscription and other software revenue (figure 8). In addition, companies can generate revenue through other means such as non-recurring IT service fees, hardware and business process services. The sum of total commercial software revenue and other revenue form company revenue. (IDC, 2013a)

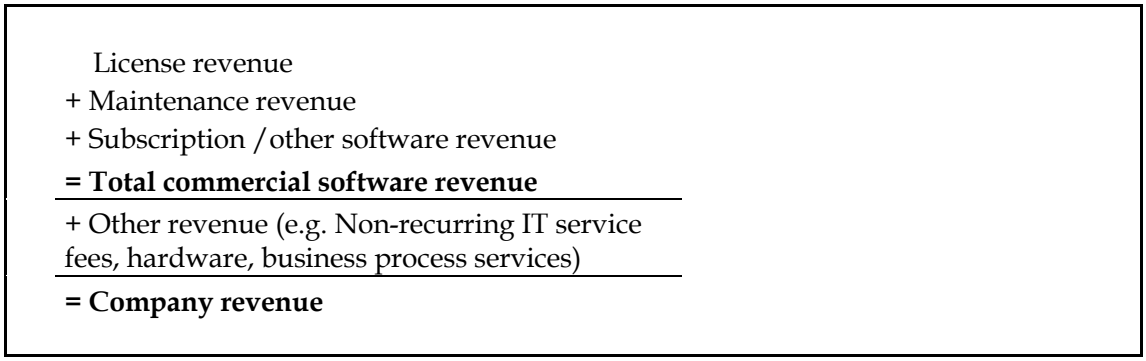

FIGURE 8 Commercial Software Revenue Data Model (IDC 2013a)

According to *IDC's* (2013b) report, the worldwide revenue of the commercial software market reached $342,6 billion (€266,6 billion, exchange rate 1 USD = 0,7781 EUR [Oanda, 2014]) in 2012, growing 3,6 % from $330,7 billion (€237,7 billion, exchange rate 1 USD = 0,7188 EUR [Oanda, 2014]) in 2011.

Table 11 shows the distribution of revenue across geographical regions and primary markets in 2012. The Americas (North America and Latin America) accounted for over half (52,0 %) of the global revenue of the commercial software market, while EMEA accounted for nearly one-third, and Asia/Pacific (including Japan) for the remaining 16,7 %. In terms of primary markets, applications captured nearly half (48,9 %), systems infrastructure software more than

a quarter (27,2 %) and application development and deployment slightly less than a quarter (23,9 %) of the revenue.

TABLE 11 Worldwide commercial software revenue by region and primary market 2012 (IDC, 2013b)

	Revenue ($M)	Share of Primary Market (%)
Americas		
Application development and deployment	42 163,60	51,5
Applications	88 701,80	52,9
System infrastructure software	47 379,60	50,8
Subtotal	178 245,00	52,0
EMEA		
Application development and deployment	26 448,80	32,3
Applications	53 140,90	31,7
System infrastructure software	27 458,50	29,5
Subtotal	107 048,20	31,3
APJ		
Application development and deployment	13 220,80	16,2
Applications	25 774,40	15,4
System infrastructure software	18 349,50	19,7
Subtotal	57 344,70	16,7
Worldwide		
Application development and deployment	81 833,30	100,0
Applications	167 617,10	100,0
System infrastructure software	93 187,50	100,0
Total	342 637,90	100,0

IDC (2013b) points out that the 2012 growth rate (3,6 %) is less than half of the previous two years and estimates that 2012 marks the beginning of a conservative growing period after the post crisis recovery years of 2010 and 2011. It predicts that the software marketplace will continue single-digit growth in 2013-2017. In its projections, *IDC* estimates annual average growth figures ranging from 5,1 % to 8,3 % depending on the primary market and geographical region.

As mentioned previously, the software industry is a subset of the IT services industry. Most software companies, that recognize software as their main business are listed under the industrial classification code 62, Computer programming, consultancy and related activities (Statistics Finland, 2013a), which will be discussed further in the next chapter. However, the size of the IT services industry is often mistakenly used to describe the size of the software industry. This is due to official statistics not differentiating between the two. IT service statistics are easily available, updated annually and internationally standardized. The distinction between the two should be made because all IT services companies are not software firms and not all software is produced within the IT services industry. When examining Finnish software companies,

this distinction becomes increasingly important. The Finnish economy relies highly on exporting, which is more common within software companies than IT services companies that serve mainly domestic customers. In 2012 The Finnish IT services industry produced €6,6 billion of revenue and the Growth Forum 2013 report estimates that the Finnish software industry generated €4,8 billion of revenue including the software business performed by all Finnish firms excluding embedded software and in-house development. When only taking into account firms included in the IT services industry, this figure is €3,4 billion or 54 % of the industry's total revenue. (Peltonen et al., 2013) Despite the previous discussion regarding the boundaries of the sotware industry, for the purposes of this study, the industrial classification category 62 was chosen to represent the Finnish software industry. The reasoning behind this lies in the availability of the statistics. The lack of more specific classifications leads to category 62 providing the most appropriate means of defining the convenience sample to represent software companies. The industrial classification category will be explained in more detail in the following chapter.

4.2 Data sampling

The data for this study have been provided by *Balance Consulting*, which is the data analysis company of the Finnish financial newspaper *Kauppalehti*. The company specializes in financial statement analysis and research. *Balance Consulting's* company database covers approximately 90 % of the net sales of all Finnish companies in the form of their financial statements. The database is updated through the Finnish Trade Register as well as companies supplying their financial statements to the company themselves. (Balance Consulting, 2013b) The companies in the database have been categorized according to the industrial classification category, TOL 2008, of *Statistics Finland*. TOL 2008 (TOL) is a five-digit categorization system in which the digits represent the industry that the company operates in. It is based on the *European Union's* classification of economic activities in a manner that the four first digits represent the same industries across countries and the fifth digit consists of national categories (Statistics Finland, 2013a). Whereas in most databases, the TOL classification is automatically created based on the information registered to the Finnish Trade Register, *Balance Consulting* updates the category of each company manually based on the actual industry the company is operating in.

The *population* of data in this research consists of all Finnish companies under TOL category 62, Computer programming, consultancy and related activities, and that are active and legally obliged to register their financial statements to the Finnish Trade register. All limited liability companies fall under this scope. Companies operating as limited partnerships and partnerships are very rarely required to register theirs by law, because their size and form of operations most often deem them legally exempt. The *sample* of the data consists of companies that actually have registered their financial statement with the

Trade Register. While it is possible that a company which has not delivered its financial statement to the Trade register would supply *Balance Consulting* with it, these cases are rare. Therefore this group is not mentioned separately in the definition of the sample of this study.

The *convenience sample* of the data is outlined by certain parameters that were provided to *Balance Consulting* when requesting for the data. The convenience sampling criteria were as follows:

- TOL: 62 Computer programming, consultancy and related activities
- 170 000 EUR net sales in 2007
- Company established before 2007

These criteria were chosen in order to receive a somewhat homogenous convenience sample that can be further refined with certain background variables. When conducting financial statement analysis, it is important to keep in mind that companies operating in different industries often have very different financial statement structures. E.g. a company operating in the industrial machinery industry often has a considerable amount of capital tied into its fixed assets in form of heavy machinery, while a consulting company often does not. Meanwhile, the consulting company's cost structure may be very heavy on the employee costs side. These types of variations cause notable differences when calculating ratios relating to fixed assets or employee costs and thus make it very difficult to conduct reliable and comparable analysis across industries. This is why only a single industrial classification category was chosen.

TABLE 12: SME thresholds (European Commission, 2005)

Enterprise category	**Head count**	**Annual turnover**	**Annual balance sheet total**
Medium-sized	< 250	≤ €50 Million	≤ €43 Million
Small	< 50	≤ €10 Million	≤ €10 Million
Micro	< 10	≤ €2 Million	≤ €2 Million

A net sales minimum of €170 000 for the year 2007 was chosen for various reasons. The size of a company is most often defined by head count, net sales or balance sheet total. This is the case also in the *European Commission's* (European Commission, 2005) definition of SME's that can be seen in the table 12. The same classification of SME's is used also by the *Confederation of Finnish Industries*. The aim of the study is to examine SME growth and it is therefore wise to use the same measurements to define the convenience sample. It has been argued that balance sheet total is not the best measurement for size in the modern economy, since many companies generate revenue through means that do not require heavy investment in assets. Also, many companies do not provide information on their head count along with their financial statements. Due to these reasons, net sales was selected to serve as the size criteria instead of headcount. The *European Commission's* definition of SME's includes three sub categories defined in the table 12.

Even though, according to the definition displayed in table 12, there is no minimum net sales (turnover) requirement for a SME, including companies with near zero net sales would not serve the purpose of the study for various reasons. While these companies might be active in a legal sense, they are often companies that are in a resting state or that are run only part time by the owners. This leads to their financial statements not being comparable with companies that actually have ongoing operations. Minimal net sales in 2007 can also lead to immense growth figures in 2008, so excluding companies with under €170 000 net sales guarantees that the included companies have had ongoing operations in the comparison year of 2007. A net sales of €170 000 also indicates that more people than one are employed in the company. Even though many companies that do not fulfill the net sales requirement may well be operational and may employ more than one person full time, excluding these from the convenience sample helps homogenize the convenience sample and leads to more reliable findings. According to the definition in table 12, companies producing net sales of over €50 M annually are not considered as SME's. However, a maximum net sales limit was not implemented at this point of data sampling.

The time frame of the study is four years, starting from 2008 ending in 2011. In order to get comparable growth figures for 2008, a full year's financial information for 2007 is needed; therefore the convenience sample companies need to have been established before 2007.

There are a few background variables that were utilized to refine the convenience sample. These variables include the company's ownership structure (i.e. part of a conglomerate company or independent), industrial classification category (TOL), domicile and age.

TABLE 13 Sample description: Age and group affiliation

Company age	**All**		**Cong.***		**Ind.****	
2-4 years old	16,9 %	100	10,5 %	21	20,3 %	79
5-7...	19,8 %	117	14,0 %	28	22,8 %	89
8-10...	18,0 %	106	19,5 %	39	17,2 %	67
11-13...	13,4 %	79	15,5 %	31	12,3 %	48
14-16...	8,0 %	47	7,0 %	14	8,5 %	33
17-19...	9,5 %	56	11,5 %	23	8,5 %	33
20 and over	14,4 %	85	22,0 %	44	10,5 %	41
TOTAL	100,0 %	590	33,9 %	200	66,1 %	390
Average age	10,3 years		12,5 years		9,3 years	

*Conglomerate companies.
** Individual companies – firms that do not belong to conglomerate groups.

Table 13 displays the age distribution and group affiliation of the convenience sample. Out of the sample data of 590 firms received from *Balance Consulting*, roughly a third (33,9 %) belong to a business consortium residing either in Finland or abroad. In the beginning of the examination period, in year 2008, 100 (16,9 %) firms were 2-4 years old and 323 (54,7 %) were 10 years old or younger.

The average age of the sample companies was 10,3 years, but a clear difference in average company age can be seen between conglomerate and individual companies. The average age of a conglomerate company in the beginning of the observation period was 12,5 years, while individual companies were 9,3 years old on average.

The TOL 2008 classification 62, Computer programming, consultancy and related activities, to which all of the firms included in the convenience sample belong to, can be further divided into four categories. The categories and number of companies (#) included can be seen in table 14 below:

TABLE 14 Sample description: Industrial classification

TOL	Description	Companies	
6201	Computer programming activities	77,6 %	458
6202	Computer consultancy activities	16,9 %	100
6203	Computer facilities management activities	4,4 %	26
6209	Other information technology and computer service activities	1,0 %	6
62	Computer programming, consultancy and related activities	100,0 %	590

Most of the companies (77,6 %) belong to classification 6201, computer programming activities. This classification includes the development, coding, customization, configuration, testing and support of programs or software. Classification 6202, computer consultancy activities, includes the development of computer systems, which combine hardware, software and communications technologies. The service can also include user training. This classification has 100 (16,9 %) representatives in the sample. TOL 6203, computer facilities management activities, includes services that relate to computer systems, data processing and usage services and support functions that occur in the premises of the customer. Out of the sample, 26 (4,4 %) Companies reside in this group. Only 6 (1,0 %) companies belong to the last group of classifications, 6209, other information technology and computer service activities, which includes teleinformatic and data processing services that do not fall under other classifications. (Statistics Finland, 2013b)

The convenience sample reveals a total of 68 different cities or municipalities in as the registered domiciles of companies. The largest concentrations of domiciles can be seen in figure 9. Helsinki dominates the convenience sample with a total of 227 (38,5 %) companies, adding up to over one third of the convenience sample. The second largest contributor, Espoo, is also located in the Capital Region of Finland and is home to 99 (16.,8 %) of the companies. Tampere (55 companies, 9,3 %), Oulu (37 companies, 6,3 %) and Jyväskylä (24 companies, 4,1 %) take third, fourth and fifth place. It is worth noting that if Espoo and Vantaa, both located in the Capital Region, are considered as a part of Helsinki, each one of the top seven cities house a university and/or polytechnic with an IT-faculty. Also, each one of the top seven cities has or has had an office of *Nokia* located in the city or in the near vicinity.

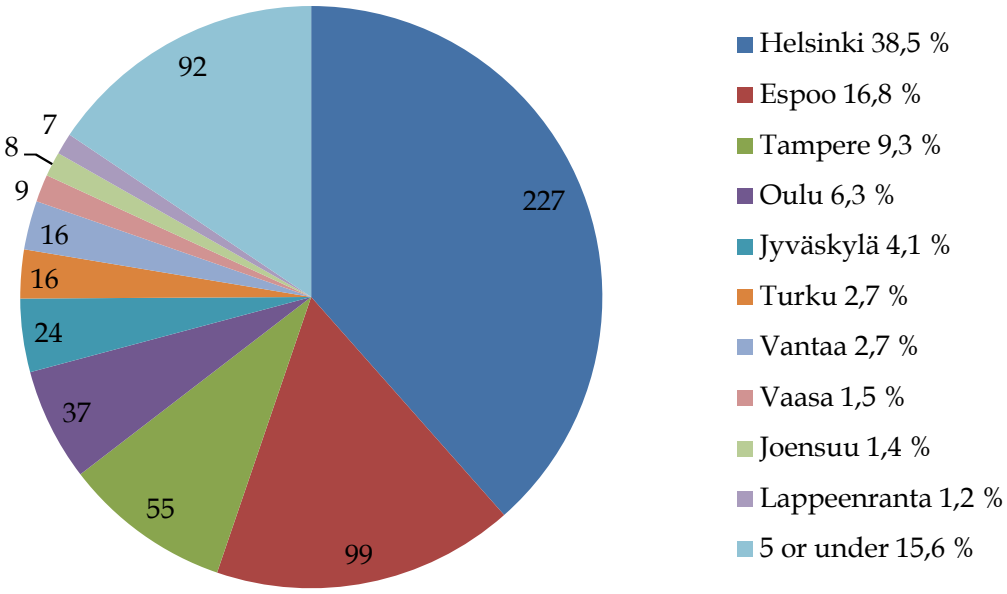

FIGURE 9 Company domiciles – convenience sample

In order to homogenize the convenience sample further, the group of companies was narrowed down by two criteria. Firstly, only non-conglomerate firms were included in the convenience sample. Conglomerate companies were ruled out due to the fact that their funding and cost structures tend to differ from independently operating firms. They may receive considerable funding from their mother companies, profits are often minimized through group support payments, and strategic decisions (e.g. concerning growth) are often dictated by owning companies. The other reason for excluding conglomerate companies is their average age, which can be seen in table 13. They tend to be, on average, over three years older than individual companies, which can be assumed to affect the growth stage that they are in. Secondly, only companies founded in 2001 or later were included. The software industry encountered a turbulent period during the years 2000 and 2001 as the dot-com bubble burst after inflating in the late 1990's. The reasoning for including only companies founded after the dot-com collapse was to ensure similar industry conditions. The assumption in this case was that prevalent industry conditions may highly influence e.g. the availability of seed funding and willingness to launch new startups as well as the risk taking and growth aspirations of existing companies. As the oldest companies included in the convenience sample were founded in 2001 and the youngest in 2006, the age of the companies in the beginning of the observation period varies between 2 and 7 years.

After taking into account both of the criteria explained above, the convenience sample included 168 companies. The sample was then tested for outliers in order to exclude distinctly different cases. Outliers are observations with a

unique combination of characteristics identifiable as distinctly different from the other observations (Hair, Black, Babin & Anderson, 1995, 57). A univariate detection method, using net sales growth -% mean as the dependent variable, was chosen. While the use of multiple outlier detection methods, such as bivariate and multivariate, is usually recommended to examine a group of observations (Hair et al., 1995, 58), only the univariate detection method was chosen due to the fact that net sales and net sales growth -% as variables are in the core of this study since the study focuses on company growth.

Tukey (1977, 43-44) uses sample fourths (F_L and F_U) in labeling observations as outliers. Observations below $F_L - k\ (F_U - F_L)$ or above $F_U + k(F_U - F_L)$, where k = 1,5, are labeled as outliers. However, later research in the topic has led researchers to recommend the use of 2,2 as the value of k, since lower values tend to exclude also observations that are part of the normal distribution (Hoaglin, Iglewicz & Tukey, 1986; Hoaglin & Iglewicz, 1987). Using the 25th (Q_1=5,0125) and 75th (Q_3= 35,3813) percentile values of net sales growth -% mean and applying them to the equations explained above, the following cut-off values were calculated:

Upper = 102,19

Lower = -61,80

Out of the convenience sample, six companies' net sales growth -% mean was found to exceed the upper cut-off value, while none posted values below the lower cut-off value. Although investigating the observations flagged as outliers is often assumed in outlier labeling (Hoaglin & Iglewicz, 1987), the scope and timeframe of this study did not facilitate further investigation to the cases at hand. The labeled outliers were excluded from the sample as a precaution to avoid potential problems. E.g. Hair et al. (1995, 58) warn that problematic outliers can seriously distort statistical tests. While deeper analysis will not be conducted in this study, a few quick observations can be made concerning the outliers. Firstly, the observations were not labeled outliers due to a procedural error, such as a problem in data entry or coding. The correctness of data was checked through verifying the corresponding companies' net sales from their financial statements after labeling observations as outliers. Secondly, the examined business sector, software industry, seems to facilitate extraordinary success and growth time-to-time. *Rovio Entertainment Oy*, one of the outliers, is one of these success stories. The company has had huge success in the recent years originating from the launch of the mobile game Angry Birds. Although this study will not focus on investigating the reasons behind the success of the outlier companies, it would be a suitable topic for future research in the form of a multiple-case study.

TABLE 15: Age and size distribution

Age	All		Micro (≤ €2 M)		Small (≤ €10 M)	
2 yrs.	16,7 %	28	16,4 %	23	17,9 %	5
3 yrs.	12,5 %	21	12,9 %	18	10,7 %	3
4 yrs.	17,9 %	30	17,1 %	24	21,4 %	6
5 yrs.	17,9 %	30	19,3 %	27	10,7 %	3
6 yrs.	19,6 %	33	20,0 %	28	17,9 %	5
7 yrs.	15,5 %	26	14,3 %	20	21,4 %	6
TOTAL	100,0 %	168	83,3 %	140	16,7 %	28
Average age	4,6 years		4,6 years		4,6 years	

After the exclusion of the six outlier observations, 162 companies remain in the final convenience sample. The companies' age and size distribution can be seen in table 15. The age distribution of the companies is fairly evenly spread across the convenience sample ranging from 21 (13,0 %) 3-year-old to 33 (20,4 %) 6-year-old companies. None of the convenience sample companies fulfilled the EU-commission's criteria for a medium sized enterprise (net sales between €10 M and €50 M) in the year 2008, thus that category has been left out of the table. The majority of companies, 135 (83,3 %), are micro companies with net sales of under €2 M, and 27 (16,7 %) companies are regarded small (net sales between €2 M and €10 M).

TABLE 16 Geographical distribution

City/Municipality	Companies	
Helsinki	37,4 %	61
Espoo	12,3 %	20
Oulu	7,4 %	12
Tampere	8,6 %	14
Turku	4,9 %	8
Vantaa	3,1 %	5
Jyväskylä	2,5 %	4
Lahti	2,5 %	4
OTHER *	21,5 %	35
TOTAL	100,0 %	163

* Riihimäki 3, Kaarina 2, Joensuu 2, Lappeenranta 2, Loimaa 2, Kirkkonummi 1, Uurainen 1, Kempele 1, Hämeenkyrö 1, Ikaalinen 1, Nokia 1, Ylöjärvi 1, Mynämäki 1, Järvenpää 1, Sipoo 1, Alajärvi 1, Haapajärvi 1, Hyvinkää 1, Hämeenlinna 1, Isokyrö 1, Kokkola 1, Kouvola 1, Kuopio 1, Mäntsälä 1, Seinäjoki 1, Sodankylä 1, Sonkajärvi 1, Suonenjoki 1

The domicile distribution of the final convenience sample companies is dominated by the Capital Region, as can be seen from table 16. Combined, Helsinki, 61 (37,4 %), Espoo 20, (12,3 %), and Vantaa, 5 (3,1 %), account for over half (53,1 %) of the companies. Following the Capital Region, are Tampere, 14 (8,6 %), Oulu, 12 (7,4 %), and Turku, 8 (4,9 %). As in the case of the larger convenience sample, the top seven cities are all in the near vicinity of a current or former *Nokia* office and university and/or polytechnic IT-faculty. Even though

the distribution of companies is wide across Finland, most of the other cities or municipalities, apart from the Capital Region, house only one convenience sample company.

The metric variables

In addition to the name, company identification code and the three remaining background variables (founding year, industrial classification code and domicile) described above, each observation was also described by a set of 24 metric variables (financial ratios) explained in chapter three and listed in table 3. Due to the fact that the number of employees figure was only available fully for 22 % of the final convenience sample companies, it and its derivatives (net sales per employee and operating result per employee) were excluded from the analysis. Even though in statistical analysis missing values are commonly replaced with mean values, in this case the proportion of missing data was deemed too significant. After the exclusion of the three variables mentioned above, the following 21 metric variables listed in table 17 remained.

TABLE 17 The metric variables chosen for analysis

SCOPE AND DEVELOPMENT OF OPERATIONS
Net sales
Net sales growth -%
PROFITABILITY RATIOS
Operating result (EBIT)
Operating result -%, EBIT -%
Operating margin (EBITDA)
Operating margin -%, EBITDA-%
Net Result
Net Result -%
Return on investment -% (ROI)
Return on assets -% (ROA)
Return on equity -% (ROE)
SOLVENCY RATIOS
Equity ratio, %
Net gearing ratio
Debt to net sales ratio, %
CASH POSITION AND LIQUIDITY RATIOS
Quick ratio
Current ratio
TURNOVER RATIOS
Working capital -%
Inventory to net sales, %
Collection period of trade receivables
Payment period of trade payables
Personnel costs per net sales -%

The metric variables were examined between the years 2008-2011, covering a timespan of four years. Even though the information was received separately for each year, a mean value for each variable was calculated based on the values of the four observed years. Using a mean value instead of each year's values separately disabled the possibility of examining the relations between separate years' ratios to each other. However, this was a deliberate decision as the set of variables and subsequent tests were vast even with the metric variables reduced to single mean values. Even though studying the associations between different years' ratios would be an intriguing opportunity and might produce interesting results, this study focused only on examining the relationships of the calculated means. In the following chapters, the use of a certain ratio's mean value will not be mentioned separately, i.e. if a certain ratio of a company is discussed, it will refer directly to the calculated mean value if not specified separately. In the case of absolute figures, such as net sales or operating result, the presented figures are in the form of thousands of euros unless mentioned otherwise.

4.3 Methodology and the research questions

The research design of this study is quantitative, combining descriptive and exploratory elements. The study can be regarded as quantitative due to the research data being in the form of financial ratios and the analysis relying on statistical methods. The main focus is on company growth and the two primary research questions were defined in the following manner:

1. How do companies differ from each other based on different levels of materialized growth?
2. Which financial ratios predict growth?

These research questions were aimed to be answered through research design methods that can be regarded as experimental. In order to describe the convenience sample and find out possible background variables that may have effect on companies' financial ratios, descriptive methods were also used. These methods were used in order to answer to the following secondary research question:

3. Do the convenience sample companies differ from each other in light of their key financial ratios based on their geographical location, industrial classification and age?

Various analysis methods were used in the study. Analysis of variance (ANOVA) methods were used to seek answers to the secondary research question and provide descriptive information of the convenience sample. ANOVA-methods are appropriate for testing the differences in the means of independent varia-

bles between groups defined by a single (Oneway ANOVA) or multiple (Multiway ANOVA) grouping (factor) variables (Metsämuuronen, 2008, 781). Oneway ANOVA-tests were conducted to compare the differences in financial ratios based on the location, industrial classification, age and growth group of convenience sample companies. No Multiway ANOVA-tests were conducted in this study, therefore upcoming discussion regarding ANOVA-tests will refer to Oneway ANOVA-tests.

The main analysis method chosen for answering the primary research questions was multiple regression analysis. The method is appropriate when the research problem involves a single metric dependent variable, the factor, presumed to be related to one or more metric independent variables, the predictors (Hair et al., 1995, 13). The predictors are referred to as independent variables and the factor as the dependent variable. Regression analysis can be divided in to three phases. In the first phase, the variables to be included in the analysis are chosen. One or more of the variables are dependent variables (DV) and the rest are independent variables (IV). In the second phase, the actual regression analysis is conducted. The third phase consists of performing diagnostic tests to the developed model. Regression modeling relies on various assumptions, such as that the residuals, i.e. the portion of the model that remains unexplained, are normally distributed and that their variance is homoscedastic, i.e. evenly distributed. The data is usually also checked at this point for significantly different observations known as outliers. Distinctly different observations tend to affect the correlation coefficient strongly. Regression analysis is also sensitive to multicollinearity, i.e. high correlation between the independent variables, as well as singularity, i.e. the situation that some independent variable or variables are the combination of or identical with other variables. These factors are tested in the third phase. (Metsämuuronen 2008, 85-87, 21-22)

The correlation coefficient (r) between a dependent and an independent variable describes the strength of the association between those variables. The value can range from -1 to +1, with +1 indicating a perfect positive relationship and -1 a perfect negative relationship (Hair et al. 1995, 80). As mentioned previously, there can be various independent variables used in regression analysis. In that case, the squared multiple correlation (R^2) describes the extent to which a group of independent variables can explain the dependent variable (Metsämuuronen 2008, 85).

The factor in this regression analysis is the net sales growth -% of companies and the predictors are key ratios chosen from the list of available independent variables. Due to the nature of the research problem, this study can be regarded as an explorative regression analysis. In explorative regression analysis, the aim is to sort out which predictors, out of a large set of independent variables, are significant relative to the examined phenomenon (Metsämuuronen, 2008, 86).

The results chapter will begin by analysis of variance testing of the background variables in order to find out if companies grouped by geographical location, industrial classification or age are distinctly different from each other

in light of their financial ratios. Next, companies will be compared based on the growth groups that they represent. Statistically significant differences between the mean values of the group's financial ratios will be discussed and analyzed. Then correlations between the net sales growth -% and independent variables will be tested in order to find which financial ratios are connected to growth. Finally, regression analysis will be conducted for each financial ratio group in order to find which ratios are significant to growth. Based on the findings, a model combining the most significant ratios will be introduced.

5 RESULTS

5.1 Background variables

Geographical location

One of the background variables for the examined companies was the domicile, i.e. the city or municipality in which the company has registered its office. One of the research questions presented in the previous chapter involved the examination of the effect of a company's location on its financial performance. As the sample sizes in most of the cities or municipalities did not enable statistical analysis between single domiciles, geographical grouping of the companies had to be done. Differences within and between the formed groups were then examined by ANOVA. The ANOVA-test results tables displayed in this chapter include the variables in which statistically significant ($F > 1$ and $p < 0,05$) differences were found. Most variables that exhibited no statistically significant variance have been left out. However, some variables that did not exhibit statistical significance have been included due to their informative value. These variables' backgrounds are greyed out in the tables in order to highlight that they are not statistically significant

An obvious concentration of companies can be derived from table 16. The "Capital Region", consisting of Espoo, Helsinki and Vantaa, houses a total of 86 (52,8 %) convenience sample companies. A Oneway ANOVA-test was conducted in order to verify if statistically significant differences exist based on domicile within the Capital Region.

Vantaa, even though housing only 5 companies, was also included in the analysis in order to give a rough estimation on whether differences exist. The test was conducted on all of the available 21 ratios listed in table 17. Significant differences were found for one ratio, net sales growth -% ($F = 4,585$, $p = 0,013$), which indicates that in terms of net sales growth -%, companies differ from each other depending if they come from Espoo, Helsinki or Vantaa. However, since 20 out of the 21 ratios tested did not indicate significant differences, it was found that companies within the capital region do not differ significantly from each other based on their domicile.

A similar test was conducted for companies located outside the Capital Region. Although the "Outside Region" consists of a wide variety of different domiciles, only the largest concentrations, Tampere (14), Oulu (12) and Turku (8), were chosen for the analysis. The reason for excluding other domiciles was the small number of companies per domicile. None of the 21 ratios tested indicated statistically significant differences between groups, thus indicating that significant differences between Outside Region companies do not exist based on their home city or municipality.

TABLE 18 Geographical groups

Geographical location	**N**	%
Capital Region	86	53,10 %
Outside Region	76	46,90 %
TOTAL	162	100,00 %

Finally, companies located within the Capital Region were tested against companies located in the Outside Region. The distribution of companies between the two regions can be seen in table 18 above.

TABLE 19 ANOVA: Geographical groups

			Means		
Variable	**F**	**Sig**	**Capital**	**Outside**	**Total**
Net sales	13,81	0,000	1 764,0	1 032,7	1 420,9
EBITDA -%	4,725	0,031	7,0	13,5	10,1
EBIT -%	2,104	0,149	3,7	9,0	6,1

Statistically significant differences were found in 2 out of the 21 tested variables (table 19). A strong statistical difference (F = 13,810, p < 0,000) was found in net sales, indicating that companies operating in the Capital Region tend to be larger than those operating outside of it. Another statistically significant difference was found in the operating margin -% (F = 4,725, p = 0,031) of companies. It indicates that companies operating outside of the Capital Region maintain a higher operating margin -% (13,5 %) than those operating within it (7,0 %). Comparing the margins of the regions to the services industry's benchmark range (5-15 %) presented in table 5, reveals that both regions reach a level common to the service industry. However, companies from the Capital Region seem to inhabit the lower end of the range, while Outside Region companies inhabit the higher end. When interpreting the EBITDA -% means of different geographical groups, if is worth observing also the EBIT -% means. Companies from the Outside region score higher average scores also in that variable, however the differences were not statistically significant (F = 2,104, p = 0,149) by the ANOVA-test. As the operating margin excludes depreciation and amortization payments, the results suggest that companies operating in the Capital region tend to rent their machinery or premises instead of owning them. This would explain the higher operating margins of Outside Region companies. High real estate prices in the Capital Region can explain the tendency to rent premises instead of buying them, while the presence of various competitors can explain the lower levels of profits in general. Furthermore, a high concentration of potential customers can, in its part, explain the larger size of companies operating in the Capital Region. Since only 2 variables, out of the 21 tested, exhibited statistically significant differences, the findings do not suggest major differences depending on the company's geographical location. However, some differences do exist. The results

did not indicate reasons for the convenience sample to be examined as separate geographical groups in subsequent analysis.

Age groups

In the beginning of the observation period in 2008, the convenience sample companies ranged from 2-7 years of age. The age of a company was calculated based on its founding year due to more precise information not being easily available. The median age of a company in the beginning of the observation period was 5,0 years, while the mean age settled at 4,6 years. The convenience sample was first divided into two groups based on the mean age. Companies included in the younger group were 2-4 years of age, while older companies were 5-7 years of age. The distribution of the companies can be seen in table 20 below:

TABLE 20 Convenience sample: Two age groups

Age group	**N**	%
2-4 yo.	75	46,3 %
5-7 yo.	87	53,7 %
TOTAL	162	100,0 %

The groups were then tested with the ANOVA-test to find statistically significant differences in financial ratios between the two groups. All 21 metric variables were tested and only one, net sales growth -%, exhibited statistically significant differences between the groups. The results, presented in table 21 below, suggest that companies belonging to the younger age group have higher net sales growth (23,6 %) on average than the older ones (15,6 %).

TABLE 21 ANOVA: Two age groups

			Means		
Variable	**F**	**Sig**	**2-4 yo.**	**5-7 yo.**	**Total**
Net sales growth -%	5,409	0,021	23,6	15,6	19,3

On average, the convenience sample was found to inhabit companies that are growing (average growth rate 19,3 %). In order to provide more proof of the age-growth –connection, the convenience sample was further divided into three groups (table 22) based on the age of the companies:

TABLE 22 Convenience sample: Three age groups

Age group	N	%
2-3 yo.	47	29,0 %
4-5 yo.	57	35,2 %
6-7 yo.	58	35,8 %
TOTAL	162	100,0 %

These age groups were then tested by an ANOVA-test to find possible differences between them. Out of the 21 metric variables tested, 4 exhibited statistically significant differences between the age groups (table 23):

TABLE 23 ANOVA: Three age groups

			Means			
Variable	**F**	**Sig**	**2-3 yo.**	**4-5 yo.**	**6-7 yo.**	**Total**
Net sales	0,015	0,985	1 443,0	1 425,2	1 398,9	1 420,9
Net sales growth -%	9,560	0,000	27,2	22,3	10,0	19,3
EBIT	3,639	0,029	201,5	66,9	56,3	102,2
EBIT -%	2,501	0,085	11,5	1,3	6,6	6,1
EBITDA	3,347	0,038	229,6	111,1	90,2	138,0
EBITDA -%	1,829	0,164	14,0	6,9	10,0	10,1
Net result	3,225	0,042	142,4	28,7	22,5	59,5
Net result -%	2,398	0,094	7,5	-2,0	3,5	2,7

The net sales growth -%, EBIT, EBITDA and net results of companies exhibited statistically significant differences between the age groups. As in the previous test of two separate age groups, the net sales growth -% of companies was found to be higher in younger companies averaging at 27,2 % in 2-3 year-old companies, 22,3 % in 4-5 year-olds, and 10,0 % in 6-7% year-olds. When reflecting these growth figures to the company life-cycle illustrated in figure 5 in chapter 2, the companies can be seen to follow the model and can be positioned roughly on the growth curve. As 2-3 year-old companies exhibited higher sales growth figures, their position on the growth curve can be estimated to lie somewhere between the Early Growth and Later Growth phases. The 4-5 year-old companies exhibited slightly lower growth rates, positioning them in the latter portion of the Later Growth phase or early in the Maturity phase. The 6-7 year-old companies exhibited lower growth rates and could therefore be assumed to be positioned in the Maturity phase, therefore facing the Renewal or Decline phase next. The other ratios, which were found to be significantly different between age groups, were all profitability ratios. Companies of 4-5 years of age and 6-7 years of age all exhibited lower absolute figures on average in EBIT, EBITDA and Net Result than 2-3 year-olds. Even though the relative figures did not exhibit statistically significant differences between the groups, some indication of lowered relative profitability can be seen from the general level of decline in the ratios. Especially the 4-5 year-old companies can be seen

to exhibit lower relative profitability ratios across all of the ratios. In relation to the company life-cycle, these may be interpreted as signs of the "Death Valley", which usually occurs near the third year of a company's operations. As 4 out of the 21 variables tested indicated statistically significant differences between the age groups, it was found that companies from different age groups differ from each other in terms of their growth and profitability. The examination of all age groups separately could provide an interesting setup for future research. However, for the purposes of this study all age groups were included in subsequent analysis.

Industrial classification

The convenience sample consisted of companies under the TOL 2008 category 62, Computer programming, consultancy and related activities. As explained in chapter 4.2, the industrial class is further divided into four subclasses. The distribution of the convenience sample companies into these subclasses can be seen in table 24 below:

TABLE 24 Convenience sample industrial classification

TOL	Description	Companies	
6201	Computer programming activities	69,8 %	113
6202	Computer consultancy activities	25,3 %	41
6203	Computer facilities management activities	4,3 %	7
6209	Other information technology and computer service activities	0,6 %	1
62	Computer programming, consultancy and related activities	100,00 %	162

Due to the low number of companies included in categories 6203 and 6209, ANOVA-tests were conducted only for categories 6201 and 6202. The test sample of 154 companies indicated statistically significant differences in 2 out of the 21 tested variables:

TABLE 25 ANOVA: Industrial classification

			Means		
Variable	F	Sig	TOL 6201	TOL 6202	Total
Net sales growth -%	4,304	0,040	21,5	13,3	19,3
Personnel costs per net sales -%	8,573	0,004	55,3	41,5	51,6

Companies listed under TOL category 6201, Computer programming activities, exhibited significantly higher net sales growth -% on average (21,5 %) than companies listed under category 6201, Computer consultancy activities, (13,3 %). Another significant difference was found in personnel costs per net sales -%, in which category 6201 averaged 55,3 % while category 6201 averaged 41,5 %. This result indicates that category 6201 companies are more effective in

creating net sales in relation to the personnel expenses than category 6202 companies. These differences can be partially explained by the characteristics of the market segments that these companies operate in. The activities that classification 6201 companies conduct may require more labor intensive work that cannot be directly billed from the customers. The fact that the profitability of different categories was not found to be significantly different between the two groups suggests that sales is generated in a different manner. As one company might be selling their services to the customer by the hour, the other may be selling a project or software product as a whole. Even though some differences were found between the different industrial classification subcategories, the focus on this study is on the complete industrial category 62. As statistically relevant observations could be made only between two out of the four subcategories - due to the limited amount of companies in categories 6203 and 6209 - the industrial classification of a company was not included in the tested background variables in subsequent tests performed in this study.

Even though some differences were found between the convenience sample companies based on their geographical location, industrial classification sub-category and age, the findings did not indicate pressing need for the groups to be analyzed separately. Therefore the subsequent analyses were conducted for the convenience sample as a whole. The background variables were included as individual variables in some of the subsequent analysis for their informative value.

5.2 Analysis of growth groups

The convenience sample was divided into growth groups according to the cut-off values listed in table 2. The growth groups were named according to their performance. Companies exhibiting diminishing growth were named “Slackers”, those exhibiting moderate growth “Humdrums” and companies of high growth “Gazelles”. The groups and number of members are listed below in table 26. Interestingly 67 (41,4 %) companies qualified as Gazelles and 64 (39,5 %) as Humdrums. Only 31 (19,1 %) of companies were found Slackers.

TABLE 26 Growth groups and distribution

Growth group	**Net sales growth**	**N**	**%**
Slackers	< 2,18 %	31	19,1 %
Humdrums	2,19-19,99 %	64	39,5 %
Gazelles	> 20 %	67	41,4 %
TOTAL		162	100,0 %

In order to provide information regarding the complete industry, the same division was applied also to the entire sample including also the conglomerate companies that were rejected from the convenience sample. Out of the 590 sample companies, over a quarter (28,6 %) qualified as Gazelles, nearly half (44,9 %) as Humdrums and approximately a quarter (26,4 %) as Slackers. Even though the definitions used to define growth companies in chapter 2.5 were different, these findings propose a strong contrast to the average growth rates in Finland. TEM (2012b) and EK (2010; 2011) found that the proportion of growth companies of the total amount of firms in 2008-2010 varied annually between 2,9–4,5 % depending on the chosen definition. Furthermore, as growth is commonly known to be rare (Shane 2003, 6), judging from the sample, it is safe to say that the software industry is a growth industry.

The convenience sample groups were then analyzed by a one-way ANOVA-test in order to find possible differences in variables between the groups. They were examined first by the two remaining background variables, age and geographical group, after which they were tested by the available 21 metric variables one financial ratio group at a time.

TABLE 27 Background variables and company growth groups

			Means			
Background variable	**F**	**Sig.**	**Slackers**	**Humdrums**	**Gazelles**	**Total**
Age	6,267	0,002	5,4	4,7	4,1	4,6

One of the background variables, age, exhibited statistically significant (F = 6,267, p = 0,002) differences between the groups (table 27). Examining the means of different growth groups does not reveal major differences in the average ages of the groups, but still suggests that the faster growing companies tend to be slightly younger than those exhibiting lower growth. These results support the findings regarding the age group ANOVA-tests that were conducted earlier.

TABLE 28 Scope and development of operations ratios and company growth groups

Scope and development ratios			Means			
Variable	**F**	**Sig.**	**Slackers**	**Humdrums**	**Gazelles**	**Total**
Net sales	1,406	0,248	1070,4	1495	1512,4	1420,9
Net sales growth -%	193,378	0	-8,6	11,6	39,7	19,3

The first examined group of financial ratios was Scope and development of operations. Since the average number of employees -variable was previously removed from variables under examination, the group only consisted of two ratios: net sales and net sales growth -%. Net sales growth -%, was, as expected, found to have strong significant differences due to it being used as the grouping variable for the companies (table 28). It was included to provide descriptive information on the groups. Slackers exhibited a negative growth rate of -8,6 % on average, while Humdrums achieved an average growth rate of 11,6 % and Ga-

zelles a rate of 39,7 %. The average growth rate of Gazelles is astonishing, especially when taking into account that 41,4 % of the convenience sample companies belong to that group. In practice, an average growth rate of 40 % means that a company not only doubles, as according to the definition of a gazelle company (Birch, 1979), but nearly quadruples, its net sales on a four year period.

The mean net sales values suggest that companies with lower growth rates tend to be smaller than those exhibiting moderate or high growth. As can be seen from table 28, Gazelle and Humdrum net sales averages were approximately half higher than those of Slackers. However, these differences could not be verified at a sufficient level of statistical significance (p = 0,248). The results also seem to contradict the assumption stated by Witt (2007) as well as Delmar et al. (2003) that small companies tend to have higher relative growth rates than large ones. One has to keep in mind that the convenience sample consisted of a group of companies that were in fact all relatively small in size, and that companies exhibiting high growth rates throughout the four-year observation period effectively increase their net sales mean as they grow. Further investigation of the topic would therefore be welcome with a wider sample of companies that would not be so vulnerable to the influence of possible outliers in terms of company size.

TABLE 29 Profitability ratios and company growth group

Profitability ratios			**Means**			
Variable	**F**	**Sig**	**Slackers**	**Humdrums**	**Gazelles**	**Total**
ROI	3,193	0,044	14,6	27,4	36,7	28,8
EBITDA	3,096	0,048	34,6	131,8	191,8	138
EBITDA -%	0,639	0,529	11,3	8	11,5	10,1
EBIT	2,745	0,067	-0,4	98,6	153,1	102,2
EBIT -%	0,292	0,747	4,5	5,2	7,8	6,1

The second financial ratio category observed was Profitability ratios. Out of the 9 tested variables, 2 indicated differences between the groups (table 29). The p-values for both variables were under the cut-off value of $p < 0,05$, indicating statistical significance. However, neither of them exhibited high significance ($p < 0,01$). Examining the means reveal clear differences between the groups. Gazelles were found to produce nearly ten percent higher return on investment (36,7 %) than Humdrums (27,4 %). Slackers maintained a ROI of 14,6 %, which is nearly a half lower than that of Humdrums. In summary, higher growth rates were accompanied by higher returns on investment. In terms of the ROI-equation (see chapter 3.3), the growth of the numerator (net result + financial expenses + taxes) is by far sufficient enough to cover for the consequences of the growth of the denominator (invested capital). This indicates that either the investments made in growing companies enable growth that is sufficient enough to cover for the increase in invested capital, or growing companies are able to grow even with low levels of invested capital.

The EBITDA of companies was also found to differ between different growth groups. Gazelles and Humdrums were found to create higher operating margins than Slackers in absolute figures. However, none of the relative measures indicated statistically significant differences between the groups. The mean net sales, which were observed previously with the scope of development ratios, indicated that companies of higher growth were larger in size. This could explain the higher absolute EBITDA figures of faster growing companies as well as the fact that no significant differences were found in the relative EBITDA -% of companies. However, as the net sales differences among the groups could not be verified at a level of statistical significance, this conclusion has to be treated with caution.

The third group of financial ratios observed was solvency ratios. No statistically significant differences were found in the ratios. Since solvency ratios describe the capital structure of a company, the findings suggest that companies of higher growth do not consistently differ from those exhibiting lower growth in terms of capital structure.

TABLE 30 Cash position and liquidity ratios and company growth groups

Cash position and liquidity ratios			**Means**			
Variable	**F**	**Sig**	**Slackers**	**Humdrums**	**Gazelles**	**Total**
Quick ratio	7,002	0,001	5,1	2,3	2,2	2,8
Current ratio	7,579	0,001	9,2	2,2	2,3	3,6

The fourth financial ratio category observed was cash position and liquidity ratios. The analysis indicated that highly significant differences exist between groups in both quick ratio (F = 7,002, p = 0,001) and current ratio (F = 7,579, p = 0,001) (table 30). Comparing the mean values of quick ratio to the benchmark levels provided in table 9, reveals that all groups reach an excellent level of performance (quick ratio > 1,5). However, the means show clear differences especially in the case of companies of diminishing growth. Slackers scored significantly higher values in both quick ratio and current ratio figures than those of moderate or fast growth, suggesting that growth, at least to some extent, comes at the cost of liquidity. In light of the convenience sample companies, this common assumption seems to hold true in the case of software companies too. Since the current ratio takes into account also the inventories of the company, the difference between quick and current ratio figures suggest that companies exhibiting diminishing growth have also high levels of inventory, which increase their performance in terms of current ratio. While this indicates a higher level of stability, it may also indicate inefficient inventory management. Only minimal differences were found in quick and current ratio figures between Gazelles and Humdrums.

TABLE 31 Turnover ratios and company growth groups

Turnover ratios			Means			
Variable	**F**	**Sig**	**Slackers**	**Humdrums**	**Gazelles**	**Total**
CPoTR*	5,839	0,004	46,0	53,7	65,6	57,2
PPoTP**	0,483	0,618	201,9	203,8	232,9	217,2
Working capital -%	4,822	0,009	15,9	7,8	15,5	12,5

* Collection period of trade receivables
** Payment period of trade payables

The fifth and final financial ratio category observed was Turnover ratios. Out of the 5 tested variables, 2 were found to have highly significant differences between the growth groups (table 31). Slackers exhibited the shortest collection period of trade receivables with 46,0 days on average, while Humdrums allowed 53,7 days and Gazelles 65,6. The findings suggest that companies with higher growth rates allow longer payment periods to their customers or alternatively do not manage their debt collection as effectively as companies with lower growth. Regardless, longer collection periods translate into higher levels of capital being tied to a company's processes, which impair a company's ability to utilize cash flow financing. However, as Collection periods of trade receivables should commonly be examined in relation to payment periods of trade payables, all company groups exhibited lower collection than payment periods, which indicates effective cash flow management throughout the convenience sample.

The working capital -% of the companies also indicated differences between the groups. As the figure describes the level of cash that is tied up to the company's operations, it is interesting to note that Slackers (15,9 %) and Gazelles (15,5 %) exhibited similar levels, while Humdrums (7,8 %) exhibited a lower level. The differences can indicate that an especially slow or fast rate of growth challenges the financial position of a company, which in turn causes a higher level of cash to be tied to the operations of a company. In the case of moderate growth, the growth might be more controllable and therefore the level of working capital can be planned more efficiently. As expenses occur before income is generated, companies, especially ones experiencing fast growth, struggle with the sufficiency and availability of funding. The increased level of working capital -% of Gazelles compared to Humdrums illustrates the heightened need of capital in order to maintain fast growth. When observed along with the previous findings of the ANOVA-tests of profitability ratios, specifically the ROI, the results indicate that companies experiencing fast growth do need higher levels of investments, but they are also able to create higher returns for the invested capital. More detailed analysis of the components of working capital could provide better insight to the cause of differences between the groups. However, the scope and timeframe of this study does not facilitate deeper analysis into the causes and therefore this area would be a suitable area for future research.

Out of all 21 financial ratios tested, 7 exhibited statistically significant differences between the growth groups. In addition one of the two tested background variables, age, was found to separate the groups from each other. These results indicate that companies exhibiting different levels of growth differ from each other in terms of their financial ratios and age.

5.3 Correlations and regression analysis

Correlations

The correlation between net sales growth -% and independent variables was examined through Pearson's product-moment correlation coefficient, *r*. The significance of the correlation coefficient is dependent on two factors: the correlation and sample size. If the sample size is small, even a strong correlation might not be regarded as significant. If the sample size is large, even a low correlation may be significant. (Metsämuuronen 2000, 43-44) As a general rule, a correlation coefficient value between 0,8-1,0 is considered very high, between 0,60-0,80 high, and between 0,40-0,60 relatively high or average. At a sample size of 30, the correlation should be at a level of 0,36 for it to statistically significantly differ from zero. (Metsämuuronen 2009, 371) The strongest correlations found are listed in table 32 below:

TABLE 32 Correlations between net sales growth -% and independent variables

Variable	**Pearson's correlation**	**Sig. (2-tailed)**
Age	-0,268	0,001
Quick ratio	-0,258	0,001
EBITDA	0,236	0,002
EBIT	0,220	0,005
Current ratio	-0,212	0,007
Net result	0,195	0,013
Net sales	0,187	0,017

The results reveal that a statistically highly significant ($p < 0,01$) positive correlations exists between net sales growth -%, and the founding year, EBITDA, EBIT and current ratio of a firm. A statistically highly significant negative correlation was found between net sales growth -% and quick ratio. Statistically significant ($p < 0,05$) positive correlations were in addition found for net result and net sales. However, it is worth noting that, although statistically significant, all of the found correlations were weak since none of them exhibited r values exceeding 0,4 (or under -0,4).

Regression analysis

In order to develop a model with the highest possible explanatory power, a backward elimination method was chosen for the regression analysis. The backward elimination method starts with the inclusion of all independent variables in the model, after which variables that do not make a significant contribution to prediction are eliminated (Hair et al., 1995, 80). As the backward elimination method suggests, all 20 independent variables were included in the analysis. A model of ten variables emerged as the most suitable (table 33):

TABLE 33 Regression results of antecedents of net sales growth -%

Independent Variables	Standardized Coefficients	t-Value	Sig.
Net sales	-0,102	-1,107	0,271
EBITDA	0,473	3,722	0,000
EBITDA -%	-0,707	-3,767	0,000
ROE	-0,151	-1,436	0,154
Net gearing	-0,160	-1,586	0,116
Quick ratio	0,212	1,141	0,257
Current ratio	-0,556	-3,017	0,003
Working capital -%	0,276	2,430	0,017
Payment period of trade payables	0,250	2,663	0,009
Personnel costs per net sales -%	-0,619	-4,415	0,000

The adjusted coefficient of determination, adjusted R^2, of a model indicates how much of the variance of the dependent variable about its mean is explained by the set of independent variables (Hair et al., 1995, 79-80). The adjusted R^2 of the proposed model was 0,234, which indicates that the financial ratios included can predict 23,4 % of the net sales growth -% of a company. An ANOVA-test found the model appropriate for the examination of the data at a $p < 0,001$ level of significance.

The regression results displayed in table 33 show that 5 out of the 10 predictor variables were found to have a highly significant effect ($p < 0,01$, and $t > 2$) on the net sales growth -% of a company, and one variable had a significant effect ($p = 0,017$, $t = 2,430$) approaching high significance. A positive dependence was found for the operating margin, EBITDA, indicating that higher absolute EBITDA figures contribute to higher net sales growth. However, a negative dependence was found for the operating margin -%, which is calculated as a ratio based on net sales. The finding indicates that the higher the relative EBITDA -% of a company, the less likely it is to grow its net sales. These two findings seem to contradict each other, which can be due to multicollinearity between the predictor variables. The independent variables were not tested for multicollinearity, which poses a risk for the reliability of the findings of the regression analysis. The results should therefore be interpreted with caution. The findings could however indicate that if a company focuses on creating short term profits at a

high level in relation to its net sales, it is unlikely to have invested in the internal development of the company and therefore is unlikely to grow its net sales on the long term. The positive dependence of EBITDA can be explained by the fact that even though high relative operating margins may indicate low ambition in reinvestments and therefore low growth, a company that cannot maintain a positive absolute operating margin, despite of it being on a low level relative to net sales, is less likely to grow.

Another negative dependence of high statistical significance was found with the current ratio of the company. The finding indicates that the higher the current ratio of a firm, the less likely it is to grow. This finding is in line with the common assumption that growth puts short term liquidity at risk. A positive dependence was found with the payment period of trade payables. This finding seems logical in the light of two different explanations. On one hand companies that manage to extend the payment times of their trade payables can more effectively finance their daily operations through the credit received from the suppliers. On the other hand increased payment periods can indicate a weakened situation in the cash position of a company, which, as noted previously, is common within companies experiencing high growth.

The last ratio indicating a statistically highly significant dependence was personnel costs per net sales -%. The ratio exhibited a negative dependence, suggesting that the higher the portion of personnel costs in relation to net sales, the lower the expected net sales growth of a company. This indicates that companies that can effectively create sales in relation to their employee costs tend to grow at a higher rate.

A statistically significant (p = 0,017, t = 2,430) regression was found also with working capital -%. The significant model indicates positive dependence working capital -% and net sales growth -% of a company. As working capital -% describes the level of cash tied up to the operations of a company, and can be used to estimate how much financing possible expansion of a business will cause, it seems counterintuitive that higher levels of working capital are accompanied with higher growth rates. However, the software industry is characterized by long R&D periods and long customer projects, which commonly extend over accounting periods. Therefore, companies increasing their project portfolio face higher levels of cash tied up into their operations. Long projects' receivables are often booked according to percentage of completion method, which increase the working capital -% of a company. This phenomenon can explain the increased working capital -% levels depicted in the model. However, the results of prior ANOVA-tests between different growth groups indicated that companies exhibiting low or diminishing growth also exhibited higher levels of working capital. These findings suggest that the regression captured by the model is not linear. The net sales, ROE, net gearing and quick ratio, which were also included in the proposed model, did not exhibit statistical significance.

5.4 The reliability of the results

There are various aspects that contribute to the reliability of this study. The convenience sample was chosen based on certain parameters in order to homogenize it. Since the financial information that has been used in order to calculate the financial ratios used in this study are based on the official financial statements of companies, there is no reason to doubt the reliability of the used data. Furthermore, the convenience sample was scanned for outliers based on the net sales growth -% of convenience sample companies. This increases the generalizability of the study. However multiple variables could have been used to screen the data for possible outliers. The generalizability of the findings suffers also from the fact that the convenience sample represents only companies that fulfill criteria regarding their group affiliation, size and industrial classification.

The difficulties in defining the boundaries of the software industry pose a problem of the generalizability of the study. As mentioned in chapter 4.1, TOL-category 62 does not include merely software companies and it also does not include all companies that operate in software business. Therefore, it can be argued that the convenience sample, consisting of TOL 62 companies, does not provide an inclusive view of the software industry. However, in lack of another practical means of defining the software industry, TOL 62 provides the best alternative for defining it.

The choice of the measure of growth is essential for the reliability of the results. Net sales growth -% was chosen as the measure of growth for a company due to it being recognized as one of the most common measures (Shane 2003, 6; Witt, 2007; Delmar et al., 2003) used to measure growth. Using also other measures, such as number of employees, would have provided more reliable results as well as enabled the comparison of different growth measures. However, the data and timeframe of the study did not facilitate this option. The decision to use the mean values of the financial ratios for a four year period was also made based on the timeframe available for the study. A more thorough understanding of the causes and effects of growth could have been achieved if each observation years' financial ratios would have been observed individually and in relation to each other.

The analysis methods were chosen based on their suitability to answer the research questions. ANOVA-tests were conducted in order to provide descriptive information on the examined companies and correlation and regression tests were conducted to explore the dependencies between net sales growth -% and individual variables. Analysis was conducted mainly on results that indicated a level of statistical significance at the minimum. Some results of lower levels of significance were also included due to their informative value, yet no major conclusions were based on these findings. The convenience sample size of 162 companies provided relatively reliable values for the analysis, but a larg-

er convenience sample would have enabled a more diverse analysis based on more variables indicating statistical significance.

The findings regarding the correlations of individual variables with net sales growth -% provided results indicating only weak correlations. The low strength of the correlations does not enable reliable conclusions to be made.

The backward regression analysis method was chosen due to it suitability to explorative analysis situations. The resulting model of 10 independent variables was found to be appropriate for the predicting net sales growth -% at a statistically highly significant level. The model's coefficient of determination indicated that the model could predict 23,4 % of the variance of net sales growth -%, which can be regarded as a relatively high explanatory power in human sciences. However, the reliability of the results is lowered by the fact that the independent variables in the model were not tested for multicollinearity. In addition, all of the 10 independent variables did not indicate a statistically significant dependence with net sales growth -%. Therefore, in order to verify the generalizability of the model, further tests should be conducted.

6 CONCLUSIONS, IMPLICATIONS AND FUTURE RESEARCH

6.1 Summary of the findings

In this chapter, the key findings are summarized and discussed in regard to the three research questions. The main findings of the study are drawn together in table 34 below.

TABLE 34 Synthesis of the main findings

The portion of growth companies is considerably higher in the software business than in Finland in general.
Companies operating in the Capital Region tend to be larger, but companies operating elsewhere maintain a higher operating margin.
Companies differ in their net sales growth -% and personnel costs per net sales -% based on their industrial classification subcategory.
Younger companies tend to exhibit higher growth rates and absolute profitability.
A heightened level of cash is tied to the operations of companies exhibiting an especially slow or fast rate of growth.
Companies of exhibiting high growth maintain higher levels of ROI.
Companies exhibiting higher growth rates allow longer payment periods to their customers.
Only weak correlations exist between the net sales growth -% and financial ratios of companies.
Growth puts a company's relative short-term profitability and liquidity at risk.
A regression model combining 10 financial ratios (net sales, EBITDA, EBITDA -%, ROE, net gearing, quick ratio, current ratio, working capital -%, payment period of trade payables, personnel costs per net sales -%) can be used to predict the net sales growth -% of a company.

In the first analyses, the convenience sample companies were divided into groups based on background variables. The groups were then compared to each other based on their financial ratio means using the ANOVA-method. First, the geographical location of companies was examined in order to determine if companies originating from the Capital Region differ from companies originating from the Outside Region. In light of the third research question "*Do the convenience sample companies differ from each other in light of their key financial ratios based on their geographical location, industrial classification and age?*" the findings indicate that even though major differences were not found, some differences do exist between companies located in the Capital Region and elsewhere. The main results indicated that while companies operating in the Capital Region tend to be larger, Outside Region companies manage to maintain a higher operating margin. The findings may, on one hand be explained by a higher concentration of customer companies within the Capital Region, and on the other hand,

heightened levels of competition may decrease the operation margin of companies. The tendency to rent premises instead of owning them may also cause differences in the operating margin between the different geographical groups. In relation to net sales growth -%, the geographical location of a company was not found statistically significant.

The second background variable to be observed was the age of a company. The convenience sample was initially divided into two groups based on the mean age of the convenience sample. The analysis of the two groups suggested differences only in the net sales growth -% of companies. Younger companies were found to exhibit higher growth rates than older ones. Further division into three age groups confirmed the finding regarding net sales growth -%, and also revealed additional differences in the operating results, operating margins and net results of different age groups. Based on their net sales growth -%, the companies were found to follow the company life-cycle curve (Kelley & Marram, 2010) indicating that traditional growth models (such as Quinn & Cameron, 1983, and Kazanjian, 1988), which the life-cycle model follows, may be applicable to software companies. The findings were further supported by the lower profitability ratios that older companies exhibited. According to Kelley and Marram (2010), younger companies have an advantage against established ones as they are able to recognize innovative opportunities and bring them to market rapidly. These findings provide answers to the third research question of the study. The findings indicate that companies do differ in light of their growth rates, operating results, operating margins and net results based on their age.

The third background variable, industrial classification, was only analyzed in the light of two subclasses due to the other two subclasses lacking sufficient number of members in order to provide statistically reliable results. The ANOVA-test revealed that TOL category 6201, Computer programming activities, companies exhibited higher net sales growth -% than category 6201, Computer consultancy activities, companies. However, category 6202 indicated more efficient net sales generation in terms of personnel costs per net sales -%. The findings indicated differences in the cost structure and business models of the two subclasses. The findings provide additional information regarding the third research question of the study. Companies were found to differ in their net sales growth -% and personnel costs per net sales -% based on their industrial classification subcategory.

Next, the convenience sample was divided into three growth groups according to their net sales growth rates. The findings provide answers to the first research question "*How do companies differ from each other based on different levels of materialized growth?*" The criteria for a high growth company were adapted from Birch's (1979) definition of a gazelle company. Other groups were formed along the guidelines of the *Committee for Corporate Analysis* (2005, 80). The three groups were labeled according to their net sales growth -% performance: Gazelles (>20 %), Humdrums (2,19-19,99 %), and Slackers (<2,18 %). The initial grouping revealed that a large portion (41,4 %) of the convenience sample companies were found to have exhibited high growth and almost equally as many

exhibited moderate growth (39,5 %). Only a fifth (19,1 %) of companies exhibited diminishing growth. These findings, accompanied by tests conducted for the entire sample, indicate that the software industry represents an industry of high growth. The findings are especially remarkable when considering the findings of TEM (2012b) and EK (2010; 2011) that the proportion of growth companies of the total amount of firms in 2008-2010 varied annually between 2,9–4,5 % depending on the chosen definition.

The growth groups were then analyzed by ANOVA-tests to find possible differences between the groups. Testing of the background variables supported the findings made previously regarding the age of a company; the average age of a company was found to decrease from Slackers (5,4 years) to Humdrums (4,7 years) and eventually Gazelles (4,1 years). These findings are in line with TEM's (2012b) findings that growth companies tend to be younger than others. The geographical location did not differ significantly between different groups, indicating that growth companies are not more common in the Capital Region than elsewhere. The *Ministry of Employment and the Economy's* Growth Company Survey (TEM, 2012b) found that nearly half (46 %) of growth companies were located in the Uusimaa region. These two findings are in line due to approximately half (53,1 %) of the convenience sample companies being located in the Capital Region. Due to no statistically significant differences between growth groups being found based on their geographical location, it can assumed that the relative portion of growth companies in both regions is more or less in line with the distribution of companies.

ANOVA-tests of financial ratios indicated that companies exhibiting different levels of growth differ from each other in terms of their financial ratios. Out of the 20 ratios tested, 7 indicated statistically significant differences. Financial ratios were tested one financial ratio group at a time. The testing of Scope and development of operations ratios revealed no statistically significant differences between the groups. The mean net sales of companies seemed to rise along with net sales growth -%, but this finding was not verified at a level of statistical significance. These findings also contradict the findings of TEM (2012b), according to which growth companies tend to be smaller than others. However, TEM uses the number of employees to determine the size of a company instead of net sales. The use of four-year-averages in this study has to be also taken into account. Companies exhibiting high growth rates throughout the observation period increase their net sales means as they grow and are thus regarded as larger than their starting size.

Profitability ratios revealed that companies of higher growth exhibited also higher levels of ROI. The findings indicated that if and when considerable investments are made in companies of high growth, they enable growth that is sufficient enough to cover for the increase in invested capital and thus lead to higher levels of ROI. Furthermore, differences found in the working capital -% of different growth groups indicated that a heightened level of cash is tied to the operations of fast growing companies, suggesting that also the invested cap-

ital increases. However, the analysis of Solvency ratios indicated no significant differences in the capital structure of different groups.

Cash position and liquidity ratios revealed differences in the quick and current ratios of different growth groups. All groups of companies scored well in reference to the service industry benchmark values. However, Slackers scored significantly higher values in both ratios, suggesting that growth, at least to some extent, comes at the cost of liquidity. The findings also indicated that Slackers have higher levels of inventory than other groups, suggesting higher stability but indicating also possible inefficiencies in inventory management.

Finally, the last ANOVA-tests were conducted for Turnover ratios. All companies were found to exhibit lower collection than payment periods for their receivables and payables, indicating efficient cash-flow financing. Companies exhibiting higher growth rates were found to allow longer payment periods to their customers, indicating that they may not manage their debt collection as efficiently as companies exhibiting lower growth. This phenomenon can be explained by long project delivery times, which translate into longer collection periods especially as a company is growing and has to focus its resources on a wide set of projects. As mentioned previously, the working capital -% was also found to differ between the groups. Interestingly, Slackers and Gazelles exhibited higher working capital -% than Humdrums. The findings suggest that an especially slow or fast rate of growth challenges the financial position of a company, which in turn causes a higher level of cash to be tied to the operations of a company. EK's (2008) report on the financing situation of growth companies in 2006 found that the financing need of companies differs along the lifecycle of a firm as they face different turning points. Many companies struggle with financing especially when they enter the "Death Valley" of the growth curve, which usually occurs near the third year of a company's operations. Another turning point specified in the report can be caused by accelerated growth, which causes a need for internationalization and organizational development (EK, 2008). The findings of this study support EK's (2008) findings on the increased need for financing in times high growth.

In order to pursue the second research question "*Which financial ratios can predict growth?*" the financial ratios and background variables were tested for correlations with net sales growth -%. Even though the ratios exhibited statistical significance, only weak correlations were found. Weak negative correlations were found for the age, quick ratio and current ratio. Weak positive correlations were found for EBITDA, EBIT, net result, and net sales. The positive correlation of net sales is especially interesting, since it seems to contradict the findings of Witt (2007) and Delmar et al. (2003), that small companies exhibit higher relative growth rates than larger ones. However, the finding has to be treated with certain skepticism, since the found correlation is very weak. In addition, since the observation period of the study was 4 years, companies exhibiting higher growth rates (means) increase in during the observation period and therefore increase their net sales mean for the period.

Finally, net sales growth -%'s dependency of all 20 other financial ratios was tested by regression analysis. A backward elimination method produced a statistically highly significant ($p < 0{,}001$) model combining 10 different financial ratios (table 33). The proposed model's explanatory power was found to be relatively high (adjusted $R^2 = 0{,}234$), however the multicollinearity of independent variables was not tested for, which lowers the reliability of the model. The negative dependencies found with EBITDA -% and current ratio suggest that growth puts a company's relative short-term profitability and liquidity at risk. Net sales growth -% was also found to be positively dependent on working capital -%, which indicates that growth increases the amount of cash that is tied up to the operations of a company and therefore the availability and sufficiency of funding is essential for surviving fast growth. However, judging from the previous ANOVA-tests, the regression is not linear. In summary, the findings suggest that a model combining the net sales, EBITDA, EBITDA -%, ROE, net gearing, quick ratio, current ratio, working capital -%, payment period of trade payables and personnel costs per net sales -% can be used to predict the net sales growth -% of a company.

6.2 Implications and future research

The findings provide various implications for different interest groups. From a company management perspective, the study has proven that valuable information can be produced regarding the industry as well as an individual company. This information can be utilized by company management, financial administration and investors. From an educational perspective, the study has provided characteristics of the software industry that can be utilized in education. From a research perspective, the study has provided an industry analysis that can be used in further investigation of the software industry as well as in cross-industry analyses. Although a model for predicting the net sales growth -% of companies was presented in the findings of this study, one has to keep in mind that the financial statement of a company reflects the financial situation of a company only at a certain point in time. In addition, the causes of growth lie in the managerial and strategic decisions that entrepreneurs and company management make in order to facilitate growth.

Various topics for future research emerged during the research process of this study. A more refined method for selecting the convenience sample companies could enable analysis of strictly software companies. In this study, all companies included in the TOL-category 62 were assumed to be software companies even though Peltonen et al. (2013) point out that not all companies included in that category are truly software companies nor are all software companies listed under it. Preliminary scanning of a wider set of companies could provide a more distinct category of software companies to be used in the research. The outlier companies that were excluded from this study would also garner a potential area of research. Six companies were found to exceed the up-

per cut-off value of the outlier test and were therefore excluded from the final convenience sample. The examination of these companies and the reasons behind their exceptional growth would serve as a good multiple-case study.

The analysis of financial ratios in this study was conducted based on the 4-year means of different ratios of companies. A longitudinal research in which each year's figures were examined individually could provide more detailed information on the predictors of growth as well as on the effects of growth across accounting periods. Introducing qualitative research methods could also provide interesting insight into the managerial decision making processes that are connected to growth. A quantitative research design does not enable the capturing of that type of information.

The findings of the analysis of the background variables indicated that differences existed especially between companies of different age. Further research to each separate age group could provide interesting information on the predictors of growth in different age groups. The age groups could also serve as a good basis for research on the connection of the growth models and the age of software firms.

A level of statistical significance was not achieved in many of the ANOVA tests even though the mean values indicated occasionally considerable differences between different comparison groups. E.g. the net sales means of different growth groups indicated clear differences in absolute figures that were not confirmed at a level of statistical significance. A wider sample size could help confirm the findings. Studying the software industry in a country with a larger market could serve the purpose. Alternatively, the convenience sample could be refined further in order to homogenize it and produce more specific results. However, this would cause the generalizability of the study to suffer.

The proposed model for predicting net sales growth could also be tested in different markets and even different industries. The model could be tested on an updated sample of the Finnish software market or even the markets of other countries. Testing of other industries, especially service industries could prove if the model works merely on software companies or if it is generalizable on a wider scale.

This study provides insight into how companies are affected by growth in light of their financial ratios. Even though the findings are based on the materialized growth of companies, the study enables discussion on the predictors of growth and its effects. The findings can encourage entrepreneurs in software business to analyze their company's financial ratios and help them evaluate the financial situation of the company in relation to the industry. For investors, the benefits are similar. Independent investors are rare in Finnish growth companies and financing is most often obtained through traditional institutions such as banks (EK, 2008). Judging from the convenience sample, growth companies are able to generate high levels of return on investment. Additional research to the dynamics and risks of investing in the field can hopefully fuel further discussion and encourage higher levels of private investments in growth firms.

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APPENDIXES

APPENDIX 1 Income statement based on expense categories

NET SALES (TURNOVER)
Change in Finished Goods and Work-in Progress Inventories
Production for Own Use
Other Operating Income
Materials and Services
- Materials, Supplies and Goods
  - Purchases during the Fiscal Period
  - Change in Raw Material Inventories
- Outsourced Services

Personnel Expenses
- Salaries and Wages
- Social Security Expenses
  - Pension Expenses
  - Other Social Security Expenses

Depreciation and Reductions in Value
- Depreciations According to Plan
- Reductions in Value of Fixed and other Non-Current Assets
- Exceptional Reductions in Value of Current Assets

Other Operating Expenses
OPERATING PROFIT (LOSS)
Financial Income and Expenses
- Income on Investments in Group Companies
- Income on Investments in Associated Companies
- Income on Investments in Other Fixed Assets
- Other Interest and Financial Income
- Reductions in Value of Investments Held as Fixed and Other Non-Current Assets
- Reductions in Value of Investments Held as Current Assets
- Interest and Other Financial Expenses

PROFIT (LOSS) BEFORE EXTRAORDINARY ITEMS
Extraordinary Items
- Extraordinary Income
- Extraordinary Expenses

PROFIT (LOSS) BEFORE CLOSING ENTRIES AND TAXES
Closing Entries
- Change in Depreciation Difference
- Change in Voluntary Provisions

Income Taxes
Other Direct Taxes
PROFIT (LOSS) FOR THE FISCAL PERIOD

APPENDIX 2 Official Balance Sheet

ASSETS

FIXED AND OTHER NON-CURRENT
Intangible Assets
- Development Expenses
- Intangible Rights
- Goodwill
- Other Capitalized Expenses
- Advances Paid

Tangible Assets
- Land and Water Areas
- Buildings and Constructions
- Machinery and Equipment
- Other Tangible Assets
- Advances Paid and Fixed Assets under Construction

Investments
- Shares/Similar Rights of Ownership in Group Companies
- Receivables from Group Companies
- Shares/Similar Rights of Ownership in Associated Companies
- Receivables from Associated Companies
- Shares/Similar Rights of Ownership in Other Companies
- Other Receivables

CURRENT ASSETS
Inventories and Work-in-Progress
- Materials and Supplies
- Finished Goods
- Other Inventories
- Advances Paid

Receivables
- **Long-Term Receivables**
- Trade Receivables
- Receivables from Group Companies
- Receivables from Associated Companies
- Loan Receivables
- Other Receivables
- Unpaid Shares/Similar Rights of Ownership
- Prepaid Expenses and Accrued Income
- **Short-Term Receivables**
- Trade Receivables
- Receivables from Group Companies
- Receivables from Associated Companies
- Loan Receivables
- Other Receivables
- Unpaid Shares/Similar Rights of Ownership
- Prepaid Expenses and Accrued Income

Financial Assets
- Shares/Similar Rights of Ownership in Group Companies
- Other Shares/Similar Rights of Ownership
- Other Securities

Cash in Hand and at Banks
Total Assets

SHAREHOLDERS* EQUITY AND LIABILITIES

SHAREHOLDERS* EQUITY
Share capital, Subscribed Capital of a Co-Operative or Other Capital
Share Premium
Revaluation Reserve
Fair Value Reserve
Other Reserves
- Contigency Reserve
- Reserves According to the Articles of Association or Bylaws
- Other Reserves

Retained Earnings (losses)
Net Profit (Loss) for the Fiscal Period
ACCUMULATED CLOSING ENTRIES
- Depreciation Difference
- Voluntary Provisions

COMPULSORY PROVISIONS
- Pension Provision
- Tax Provision
- Other Compulsory Provisions

LIABILITIES
Long-Term
- Bonds and Notes
- Convertible Bonds
- Capital Loans
- Loans from Financial Institutions
- Loans from Pension Institutions
- Advances Received
- Trade Payables
- Bills of Exchange Payable
- Loans from and Other Liabilities to Group Companies
- Loans from and Other Liabilities to Associated Companies
- Other Loans and Liabilities
- Deferred Income and Accrued Expenses

Short-Term
- Bonds and Notes
- Convertible Bonds
- Capital Loans
- Loans from Financial Institutions
- Loans from Pension Institutions
- Advances Received
- Trade Payables
- Bills of Exchange Payable
- Loans from and Other Liabilities to Group Companies
- Loans from and Other Liabilities to Associated Companies
- Other Loans and Liabilities
- Deferred Income and Accrued Expenses

Total Shareholders' Equity and Liabilities