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INFORMATION TECHNOLOGY INDUSTRY BUYERS' STOCK PERFORMANCE IN THE NORDICS: EVIDENCE FROM 1995-2006

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ABSTRACT

In the end of 20th century the merger wave swept across the technological industry. Tens of thousands of mergers and acquisitions (M&A) were executed through the information technology industry and the technology companies' stock prices were reaching all-time records. In many occasions the acquisition's premiums were miserably overvalued and the acquirer paid significant overcompensation for the takeover target. The bubble was burst, and the information technology stocks became crashing down.

The research problem of this thesis is to focus on identifying the explanatory factors that explain the performance differences between mergers executed during the Information technology pre-bubble and post-bubble situations. The empirical part is conducted in form of event study in which the acquirer merger performance is measured on short-and long-term time frame on Nordic data. Data period covers the time frame of 1995 up to until 2006 and the sample consists of 132 deals conducted by Nordic Technology firms. The merger performance is mirrored against the benchmark of other Nordic Technology firms which were not involved with transactions in the specified time period. The merger performance is measured with market model and buy-and hold abnormal returns.

The review of previous literature indicates that the market structure and the unique quality of the products of information technology industry affect the strategic motives behind the merger strategy and to the valuation methods of the intangible assets. In the contrast with the findings of previous literature the acquisitions have the tendency to underperform the markets and the empirical results of the thesis are in line with previous research.

KEYWORDS: Mergers, Acquisitions, Information Technology, Markets, Strategy, Intangible Assets, Valuation, Long-term performance, Short-term performance

1. INTRODUCTION

As a result of depression in Finland and Sweden in the beginning of 1990s, the interest rates increased heavily due to the declining asset prices and the following depreciation of debtors' collaterals. The rapid economic boom in the 1980s and the financial deregulation across the European financial markets lead to a bubble which went bust in the Nordics in the beginning of 1990s. This caused the severe economic meltdown in the Nordics in the beginning of 90s. The economy recovered due to the governmental interventions and the interest rates started to decrease again after 1992. In Finland the knowledge led information technology industry led by Nokia contributed heavily on economic expansion of the rest of the 1990s and the lower interest rates encouraged companies to seek out un-organic growth through acquisitions and mergers. This development lead to a new tech bubble which burst in 2001.[1]

This thesis will examine the Nordic merger and acquisition market through three different time periods, which cover the whole inspection period of 1995-2006, pre-crises period of 1995-1999 and post-crises period of 2001-2006. The empirical part studies the acquirer's stock price performance after acquisition date and compares the profitability between short- and long-term financial performance of the acquirer during pre-crises and after dot-com crises periods. The crises period during August 1999 until August 2001 itself is excluded from the study to increase result reliability. The information technology industry market structure and the intangible nature of products and services are included as part of the study. The data is gathered from the Nordic markets, Finland, Sweden, Norway and Denmark, on the time periods specified above. The chosen industry concentrates on information technology & telecommunication markets and companies.

1.1. The Purpose of the Thesis and Intended Contribution

The purpose of this thesis is to investigate the short- and long-term financial performance of acquirer companies in Nordic Markets. The acquirer companies are divided into two groups. First acquirer group consists of companies that are classified as telecommunication or high technology industry enterprises. The second acquirer group includes companies from other industries that have bought a telecommunication or high technology target company. All the companies are publicly traded in Nordic stock exchanges to solve data availability problem

[1] Kiander 2004 p. 1-15.

concerning private companies. The information technology company valuation, nature of products and industry as well as merger and acquisition theory are presented as theoretical framework for the thesis.

Previous merger related literature and studies indicate that mergers tend to cluster up in to certain trend driven waves that are clearly identifiable by looking back in the historical merger activity. In the US, there are six longer periods since 1890s, when merger activity has clustered and increased above its' normal levels. The studies offer two opposite explanations to explicate this phenomenon. First explanation argues that the waves occur in certain periods, because unexpected shock forces companies to adapt fast for changes in their operating environment. These sudden environmental changes can be caused by new technological innovations, unexpected fluctuations of commodity prices or the rise of substitute products. The industry structure defines the length and impacts of these shocks. Some industries could be affected more deeply from these shocks than other industries. One way to survive these shocks is to acquire competitor companies and seek out competitive advantage over the industry through external growth. Second, rival explanation theory, suggests that merger trends are driven by misevaluations, where buyers use overvalued stocks to buy the stocks of lower valued firms. The second theory is linked to the availability of cheap capital, which increases the investment opportunities of buyers. The second theory has stronger scientific support, because the operating environmental shocks by themselves do not tend to start increased merger activity, whereas low cost of investment capital tends to form merger waves. (DePamphilis 2012: 13-15)

Usually the merger activity increases in the times of merger waves. This means that, when the interest rate levels are low and money is offered to the market operators in a form of cheap loans. The market operators take these cheap loans to finance their investment activities and one of these investment opportunities are mergers. The low interest rates and cheap loans encourage companies to merge and acquire lucrative companies to boost up their existing shareholder value, but when the interest rates for loans are low, the risk of negligently executed acquisition process could increase due the increased supply of money. When companies have vast amount of cheap loan money available, the decision-making process could be biased or the due diligence of the acquisition is not throughout forethought and this will have direct or indirect effect on the acquirer's stock performance. The focus of this study is to compare the acquirer's stock performance in short-term after the acquisition announcement day with the long-term stock performance and benchmark the returns against

the industry returns. The time frame of the inspection window is divided into two parts and it follows the bubble period. First time window starts at l of January 1995 and ends at August 1999, just before the global escalation of Dot-com crises, and the second time period includes the post-crises period starting at August 2001 and ending at December 2006.The whole inspection window covers both previously mentioned periods and the bubble period itself. The internet bubble period is usually included in the fifth merger wave in the US financial history. The fifth wave covers the time period from 1992 up to 2000 and it is called the age of strategic mega mergers (Depamphilis 2012: 15).

The intended contribution of this study is to provide results concerning the mergers performance on the Nordic markets on short-and long-term time frame. There are several research papers concerning the U.S merger market during the Dot-com crises providing results that lights up the interest to study, if the Nordic markets have similar effects than U.S markets. Even though there are some papers concerning the Nordic merger performance during the financial crises of 2007, the number of papers studying the Dotcom period is very limited. The scientific ambition to study this specific subject is to observe if Nordic technology markets behave in accordance with their American counterpart and how the acquiring companies performed in comparison with their industry. Interesting study concerning one part of the Nordics, was drafted by Jakobsen and Voetmann (2003). They studied Danish publicly listed acquirer performance on short-and long-term during 1993-1997 in Danish markets. They found out that the acquirers underperform the Danish markets 9.4 percent after three years, but still the long-term abnormal return was not far from zero and thus acquirers did not significantly underperform the market. They explain the finding with volatility effect, which may distort long term returns due to the right skewness of log returns. Their results are attained from time period that overlaps partly with the first time period of this thesis, so it will be interesting to compare, if Nordic markets and other Nordic countries provide similar kind of results.

1.2. The Research Hypotheses

The merger performance can be measured with different methods varying from long-time- and short-time profitability, accounting based ratios, integration process performance, innovation performance and as well as many other measurement tools. The most commonly used methods of measuring the merger performance by scholars are short-and long-term financial performance, accounting-based performance and key individuals' assessments of

overall merger performance. For this thesis the selected methods are short-and long-term financial performance, because the access to data is not restricted by confidentiality agreements or trade agreements. The previous research papers that use short-term financial performance method usually examine the short time window around the acquisition announcement date and compare the expected returns of the acquisition with average acquisition expected returns of the industry that are not affected by the event. Researchers using the accounting-based approach usually compare the post-merger returns of the acquiring company with the pre-merger returns of the acquiring company. The Scholars using the long-term financial performance extend the examination time window to several months or years instead of days or weeks and they measure realized returns instead of expected returns. (Faulkner, Teerikangas & Joseph 2012: 118-121).

The previous research literature regarding the merger returns for acquirer's short-term performance is somehow contradictory. For example, Schoenberg's findings (2006) concluded that 50 percent of cross-border acquisitions made by British acquirers between years 1988-90 created negative abnormal returns for acquirers. Also, Papadakis & Thanos (2010) found in their study that 52 percent of domestic acquisitions in Greece provided negative abnormal returns for acquirers. According to the studies of Carper (1990), Martynova, Oosting & Renneboog (2006) and Shantanu & Vijay (2009) the mergers did not provide excess returns for the acquiring companies. Interesting finding concerning the excess returns was concluded by Limmack (1991). His result underlined that the mergers and acquisitions provide abnormal returns for the stockholders of the target company, but not for the acquiring company. In fact, the mergers and acquisitions tend to have value decreasing effect for the stockholders of acquirer. The results also indicate that the wealth gains for target companies are made at the expense of acquirer. By observing findings of previous studies, the first hypothesis is formed.

Hypothesis 1: *Mergers and acquisitions did not provide abnormal returns for acquirer's stockholders in Nordic-markets neither in short-term or long-term time frame.*

Jensen & Ruback (1983) obtained different results than previously mentioned papers. They concluded that takeovers provide positive returns for the shareholders of target company, but do not decrease the shareholder value of acquiring company. The positive returns are not caused at the expense of acquirer's shareholder wealth. Healy, Palepu & Ruback (1992) found out that there is positive correlation between improved operational cash flow measures

and long-term abnormal returns and acquirer's merger activity. The mergers increase the acquirers' profitability. Loughran and Vijh (1997) summarized their findings with interesting fact concerning tender offers. The buyers with cash based tender offers tend to receive abnormal long-term returns from mergers, where as buyers with stock change-based tender offers long-term returns tend to be negative. This implies that market participants could not react to merger announcement information efficiently. The economic turmoil periods also affect the merger performance through managerial decision making. Campello, Graham & Harvey (2010) interviewed over one thousand Chief financial officers (CFO) around the world regarding their investing activity during the financial crisis. Almost 90 percent of the financially troubled companies had to cut their investment activity due to the financial crisis. Their findings indicate that economics crisis periods may cause difference in merger returns between different time periods through managerial decision making and this effect may last longer than the actual crises period. These studies form the base of the second and third hypothesis.

Hypothesis 2: *Acquisitions did not provide positive buy-and hold abnormal returns on the long term.*

Hypothesis 3: *There is a difference between pre-crises buy-and hold abnormal returns and post-crises buy-and hold abnormal returns created by mergers and acquisitions.*

1.3 Research Problem and Limitations

Previous research has criticized the method of using the short-term performance as measurement methodology, when investigating the merger performance. Montgomery & Wilson (1986) criticize the fact that short-term performance is not describing the actual performance of acquirer, but rather the investor expectations. The event-based studies are underlined by the expectations of investors and these expectations are priced accordingly as part of prices, the actual post-merger performance is not properly taken into account. To minimize this limitation, the study extends the methodology to long-term performance as well.

Larsson & Finkelstein (1999) address the limitations caused by the financial approach. The short-term performance measures only financial impact ignoring other important success factors such as employee reactions and integration problems. They also criticize that short-

term performance methodology can be used only to measure performance of publicly traded acquirers. Whereas their critique has to be taken into consideration, this thesis will only focus financial performance and publicly traded firms due to the data availability and access. To cope with the problems of time window length, five different time windows are used for the short-term performance. First event window investigates the price reactions around the merger announcement on -1/+1 day period and the second time window concentrates on -7/+7 day periods before and after the announcement. The remaining time windows are +1 month, +3 three months and +12 months after announcement date. To ensure sufficient coverage for results, the data is collected from time period between 1995-2006. The crisis period of highest volatility of August 1999 to August 2001 is excluded to avoid biased results caused by the crisis. For the long-term performance, event windows of 6 months and 12 months is used in order to avoid the right-skewness problem of long event windows.

1.4. The Structure of the Thesis

The thesis is divided into nine chapters. The second chapter contains the literature review and the frame background for the thesis. The third chapter introduces the information technology markets, the specific features of software and information based products and the market structure. The fourth chapter examines the valuation methods and techniques used to evaluate the economic value of the companies. The special elements of information technology based valuation are taken in to consideration in this chapter. The fifth chapter examines the strategic aspect behind M&A at the viewpoint of seller and buyer. The classification of M&A is also included in the chapter five. The sixth chapter specifies the different motives for mergers and acquisitions as well as typical acquisition process. The seventh chapter introduces the data and methodology used in the thesis and chapter eight presents the findings of the study. The last chapter concludes the results and summarizes the main findings, which are vital for hypothesis analysis.

2. LITERATURE REVIEW & MEASURING MERGER PERFORMANCE

2.1. Merger Waves

2.1.1. Background

Throughout the economic history of the known capitalism era, there have been certain specified time periods, when the merger and acquisition activity has increased heavily compared to its' long time average. The earlier merger waves have focused on industry sectors which were essential part of industrialization, such as oil, coal and steel industry, and the later merger waves concentrate more on more focused and specialized industry sectors, such as software, computer electronics or insurance services. On the financial literature five different merger waves have been identified and classified as merger wave. The first merger wave occurred during the change of 19th and 20th century and the mergers lead to vast problems with market structure and competition. Simplified trend of this "Great Merger Wave" was that the large corporations bought their smaller rivals out of markets and collected so much market power, that they could affect the consumer behavior and market structure. The rapid economic development and the lack of antitrust laws caused vastly increased merger rate, which usually lead to monopolistic or oligopolistic market competition. Mainly due to this development the Congress of U.S passed its first antitrust laws. The second major merger wave was just before the Great Depression in 1930s and was fueled by the strong economic growth after the First World War. The merger activity was built mainly around oil and steel industry, thus not as wide sense than with the first merger wave. The second merger wave ended with stock market crash in 1929 and lead to worldwide recession. (Faulkner, Teerikangas & Joseph 2012:21-22)

Third merger wave occurred in the 1960s and it was the first merger wave, where the merger activity increased on global scale and not only in U.S markets. The economic interaction increased between Europe and U.S and the mergers were on more frequent bases cross-border transactions with global effect. The wave ended with the global oil crises in year 1973. The fourth wave started in early 80s in U.S, Europe and Asia and it lasted until the end of the decade. Typical features of this wave were the use of cash as form of merger price payment, big target company size and hostile takeovers. Also, the deregulation of antitrust laws and

lowered willingness antitrust officials to sue mergers encouraged and strengthened the wave. (Faulkner & etc. 2012:22-23)

The fifth merger wave took place in 1990s and it focused around highly technological innovations and intellectual property. Typically, the target companies held more intangible assets in their balance sheet than tangible assets, which distorted the proper valuation. The wave peaked in end of 1990s and the high-technology bubble burst just after the turn of new millennia. The fifth wave went hand by hand with globalization development on the global scale, which ensured that the fall had global impact (Faulkner & etc. 2012: 23-25). The research topic of this thesis is dated in the end of fifth merger wave and for research purposes the impact area is restricted to Nordic markets. The companies are classified as high technology operators, which have merged or acquired publicly traded Information Technology companies during the examination period.

2.1.2. Merger Wave Drivers

Mirroring against the five known merger waves stated earlier, a conclusion can be drawn that the drivers behind merger activity and the market trends have varied heavily during different merger waves. In the earlier merger waves the driver motivation was built around the concept of industry consolidation and market power and the fifth merger wave focused on high technology innovation and vast amounts of intellectual property. There has been extensive amount of research concerning the merger drivers during the merger waves and next the thesis will cover the essential studies covering the fifth merger wave and its drivers.

Jarrad Harford examined in his paper (2005) the merger drivers and his findings are consistent with the neoclassical theory's assumptions, which explain the increased merger activity by industry related shocks in their operating environment. Usually these shocks are drastic changes in regulatory-, economic- or technological environment. Hartford adds the requirement of capital re-allocation and sufficient capital liquidity to execute capital re-allocation. According to Harford's findings merger waves need strong economic reasons and adequately low transaction costs to make mergers lucrative options. Sufficiently low transaction cost levels will mirror to transaction activity by increasing their number (Harford 2005: 530-533, 558-559).

Shleifer & Vishny (2003) study the behavioral approach as merger driver. According to their findings they underline the importance and amount of target companies' stock valuations as merger driver and that fore the main cause for increased merger activity. Their application model takes mispricing as given and specifies the rationality of acquiring overvalued stock valuation. This enables companies to use stock as payment method of their acquisitions, instead of cash, and ensure growth. The companies with undervalued or more realistic stock valuation were more likely to be more probable take-over targets than the companies with overvalued stock price. This encourages aggressive behavior of buying undervalued companies and growing through mergers (Shleifer & Vishny 2003: 309). Richard Roll presents in his research paper (1986) supporting evidence upon the behavioristic approach. He summarizes his discovery around the concept of managerial hubris. Managerial hubris mixed with bidding offers may cause managers to pay extra price for take-over target and this leads to valuation errors. (Roll 1986: 212-214). On the other hand, Gorton, Kahl & Rosen combine the offered merger wave explanations provided by behavioral approach and neoclassical theory in their paper (2009).

They studied the fifth merger wave of 1990s and found out that the firm size has serious impact on merger activity on industry sectors, whereas the economy of scale is important competition factor. They build their findings around the two unquestionable assumptions concerning the merger waves. First fact is derived from neo-classical theory and it states that the buyer's stock value decreases on the date, when the merger is announced to public. The second fact presents that merger activity tend to increase on industry sectors, where the target companies has experienced radical board or management changes due to acquisitions. The value maximization is the main goal for managers in mergers and the board management changes are necessary to replace the old management with new managers to maximize the merger value. According to their findings they underline the survival instincts of managers to keep their position in companies and to ensure their positions, the management is ready conduct mergers as defensive maneuver. This will increase the firm size and the bigger the firm size will get, the more unlikely it is to be targeted as merger target. They rationalize their conclusions with defensive mergers that occur to prevent the take-over possibility from competing firms and as the firm size increases the less profitable the merger returns will become. The outcome can be identified especially in industry sectors, where the companies have major economies of scale. (Gorton, Kahl & Rosen 2009: 1292-1296, 1328-1329)

Following the main explanation of neo-classical theory that increased merger wave activity is consequence of regulatory-, economic-, or technologic shocks in companies' operational environment, Ovtchinnikov investigated in his paper (2013) the effect of industry deregulation as a cause for increased merger activity. Regarding his findings the merger waves are preceded by industry related deregulation of laws and acts, which indicate the decreased level of control over the deregulated industry. Loosened control encourages companies to take bigger risks and execute practices that might have been forbidden before the deregulation took effect. Usually the deregulated industry is performing poorly, and certain interest groups are lobbying the lawmakers to intervene this development by easing the legal frame regulating the industry. (Ovtchinnikov 2013: 73)

2.2. Short-term Financial Performance

The merger performance has been a well-researched topic among the strategy and finance literature and performance metrics vary according to the research interests of the researchers. Generally, several studies indicate that the target companies have higher short-term returns than the markets without the merger event. Sudarsanam & Mahete (2006) and Arnold & Parker (2007) found out that target companies provide higher returns due to the bidding premiums paid by the acquiring companies. These premiums are usually paid at the expense of the acquirer company's stockholders. The results concerning the acquirers' short-term performance are more or less contradictory. Some studies (Martynova et.al 2006; Shantanu 2009; Carper 1990) state that mergers did not produce significant abnormal returns for the acquiring companies and some studies (Padakis & Thanos 2010; Schoenberg 2006) indicate that almost half or majority of mergers did provide positive significant abnormal returns for the acquirer as well as significant negative abnormal returns. The contradiction might be caused by the critic brought against the way of measuring short-term performance. Montgomery & Wilson (1986) criticize the measurement methodology of short term performance, which focuses on investor expectations and not the actual acquirer post-merger performance. Their criticism is justified in contrast with the contradiction of results. To conclude the trend of short-term merger performance is to acknowledge the tendency of acquisitions to destroy the acquirers' shareholder value.

2.3. Long-term Financial Performance

Several researchers have studied the long-term performance of acquirer companies in addition to short-term performance to bring robustness to the results. The long-term performance does not suffer the need of longitudinal data and it measures the actual returns instead of investor expectations, which is under criticism and brought up in Montgomery's and Wilson's paper (1986). The event window is usually extended to several months or even years. The previous research results are also somehow contradictory, but overall trend shows that mergers do not generate significant positive abnormal returns. Tuch & O'Sullivan (2007) found out that acquisitions in U.S and U.K markets provided negative abnormal returns on the long-run for the acquiring firms and their stockholders. Sudarsanam & Mahate (2006) concluded in their paper that almost half of the acquisitions measured produced significant negative abnormal returns on the long-term. Surprisingly, the other half of the acquisitions returned significant positive abnormal returns.

They underline the methodological problems of extended time windows, because the right skewness of log returns over time may distort the results considerably. The problem is underlined also in Jakobsen's and Voetmann's paper (2003), which was conducted on Danish data. They offer the wealth relative approach to answer the right-skewness problem of long-time periods, but it does not erase the rebalancing- or new listing bias presented by Barber & Lyon (1997). The best way to control these methodological challenges is to keep the time window relatively short. In this thesis, the longest event time window is set to 12 months in order to control the right skewness problem.

3. INFORMATION TECHNOLOGY INDUSTRY & MARKETS

3.1. Products and Services

The Information technology (IT) markets differ from markets, where normal products are produced and consumed. This difference can be explained by the nature of the information technology market's products and services, which are mainly intangible. The information technology markets include Internet-, email- and mobile services, computer hardware and software services, music related services, video and movie services and many other important branches of intangible services. There are certain special features that separate IT-markets from normal markets according to Oz. The features can be classified as followed:

1) Complementarity, compatibility & standards. The products of information technology markets are complements, which mean that the consumers do not buy an individual product but an entirety of products instead and this entirety will form a functioning system. For example, computer hardware needs the software system to operate and together they form a functioning entity. The successful production of these complementarity products requires that products must be compatible. This means that software must have similar specifications with computer hardware to operate properly. Otherwise the system does not work. The producers use standards to define the compatibility between products. In practice this means that these complementary products must be produced on the same standard to operate together.

2) Externalities of production. This means the utility that consumers get when they consume the product and how this utility is affected by the number of other consumers' consumption of similar or compatible products. The pace and method how consumers adopt new standard have an effect on market firms' behavior and production decisions. A new product or service must have adequate consumer base to become widely consumed product.

3) Switching costs and lock-in situations. Usually consumers have familiarized themselves with a certain operating system and find difficult to change it to another alternative system. The switch to a new system forces consumers to learn new interface and this takes time and effort. This spent time and effort are called switching costs. Consumers, who are trapped in the old system or services, are in lock-in situations, where they find it hard to change into

new service. The degree of lock-in situations can be calculated from switching costs caused by exchange of service producer or product. Varian and Shapiro (2004) classify lock-in situations to contract-, training & learning-, data conversion-, search cost- and loyalty cost based lock-ins. In the contract based lock-in situation the customers are bind by the terms of long term contract and the violations of the contract cause compensation penalty. This penalty is considered as a switching cost. Training and learning of how to use new system can cause lock-in situation, when the user base of the old product is vast. It will take a lot of time and money to train all consumers to use the new system, and this time is away from production. The lost production causes switching costs. Lock-in caused by data conversion means that huge number of older data must be converted to fit into new format and expenses from this operation are considered as switching costs. Search costs are costs that are caused, when consumers buy new systems and try to find a suitable system to replace the antiquated system. To avoid this consumer might hang on the old system longer than necessary. Switching older system to new one may result switching cost in a form of losing benefits offered by the old system provider. Consumers might prefer to stay with the old system if they don't want to lose those perks. These costs are called loyalty costs.

4) Significant economies of scale. In the information technology markets new technological innovations and products are expensive to develop and to test. So, the new products and software have big sunken costs compared to the later copies of the product or software. For instance, the first software prototype takes several millions to develop and to test before the commodity is ready for market launch, but the second copy of the original commodity cost only fraction of the expenses compared with money invested in the prototype creation. The later copies are usually sold for couple of dollars to the consumers. Internet offers the infrastructure to spread new copies almost free, so these low marginal costs compared to high sunken costs inflicts vast decline of cost function after next generation copies are sold to the consumers. (Oz 2001:1-7).

The nature of the products in information technology based markets is that the most of the products are used in different systems, networks or through Internet. These systems are compiled from many components and they are able to function only if components fit together and they are integrated to operate. This hardware needs software to be functional and even the best hardware is useless without proper applications. This means that information technology products are considered as complement products, which leads to that value of one component will be increased substantially by the existence of another

component. For example, when more software is available for the hardware and more flexible operating base of the hardware exists, the value of the components will increase (Varian 2006: 650). In the information technology markets manufacturers selling complementary products are equally meaningful, which leads into a situation that company cannot compete unless their component is compatible with the rest of the system and all its components. So, the information technology component manufacturers have to concentrate on their competitors and also the manufacturers, who produce complementary products (Shapiro & Varian 1999: 10).

3.2. Production and Manufacturing

The information technology markets are considered as quite concentrated markets due to the significance of the economies of scale. This concentration causes reduced competition between the market parties and usually dominant firms capture most of the markets. New information technology is expensive to develop and to test, and these costs must be paid before the product or service start to pay back the investment. There is no guarantee that the new technology will bring back the invested funds and the risk to lose the original investment is probable. The research and development costs are sunken costs, because those costs cannot be recovered. The high fixed costs lower the willingness to invest into new technology, the simplicity to copy developed products and the low variable costs of copies make product development pretty unfavorable option (Varian 2006: 651-656).

The companies need legal protection for their products that have been developed through expensive research & development process to prevent the competitors of stealing their innovations. The companies can apply patent protection for their new products and get an exclusive right of commercial exploitation for the product. A patent is defined as a legal document that provides the holder sole right to benefit from product for certain number of years[2] and it's issued by government agency. Patents are the method of encouraging companies to practice research & development and create new inventions. The patent system provides patent holders temporarily monopoly status and can distort market competition. In the information technology industry patents are widely used method of protecting new inventions and products (Oz 1996:233-235).

[2] In Finland patents are granted by government agency Patentti-ja rekisterihallitus and the protection period of sole exploit right is 20 years. In US the protection period is 17 years.

3.3. IT-market Structure

The network industries are exposed to similar market forces than any other markets, but the nature of the products and services makes IT-markets very different than ordinary tangible product markets. The information technology is mainly used to process and exploit data and information. Some of this information technology may be considered as intellectual property. Many innovations are protected by patents and research & development costs are high. In addition to these features, the intangible nature of product and services, unlimited amounts of information, high fixed costs and low marginal costs lead to price discrimination. The sole right to exploit new technological innovations gives companies significant competitive advantage and the patent protection is one of the major reasons, why IT-markets are pretty concentrated with only few market operators. The high switching costs cause lock-in situations and this makes the competition for customers tough (Varian, Farrell & Shapiro 2011: 4-30).

There are only two sustainable structures for information technology based markets. First structure is the dominant firm model. In this model the dominant firm has cost advantage over its smaller competitors due to its size, market power and economies of scale. The second model is the differentiated product model, where certain numbers of firms are producing same kind of product or service, but they offer this product in many different varieties. There are two different strategies to compete depending on the markets that the firm operates. If the firm is operating in differentiated markets, it must add extra value to the information and this way try to differentiate itself from its competitors. This strategy is called product differentiation strategy. The cost leadership strategy is suitable for dominant firm markets, where the dominant firm acquires competitive advantage through economies of scope and scale. As a summary, the information technology markets consist of firms that are either dominant agents with huge market power and market share or smaller firms that differentiate themselves from competitors (Shapiro, Varian 1999:24-29).

The nature of the information technology goods leads usually to concentrated markets and examination of the M&A process indicate that the market power and share is an important factor, when the antitrust officials monitor the effects of the merger on the market competition and consumer welfare. The Herfindahl-Hirschman index (HHI) is method of measuring the market concentration and it is also the figure that antitrust officials calculate before accepting the merger. HHI is calculated by squaring market share of each firm that

operates in the markets and summing the resulted numbers together. The HHI can range from 0 into 10 000 and it's formally expressed as followed:

(1) $\mathrm{HHI}=\sum_{i=1}^{N}(si)^2$

where,

S= market share of the firm

The closer the firm is to achieve full monopoly status, the more near the HHI value is to 10 000. The zero value of HHI will indicate perfect market competition.
(Oz 1996: 173)

4. VALUATION METHODS OF M&A

The modern financial theory uses valuation models to define corporation's value. This value varies depending on which model is used at the valuation process. Asset based valuation models specify the value of a company from the assets of its balance sheet. This model adds all property items together and company's value is the sum of these items. Market based valuation determinates the company's value by comparing it with other companies in similar circumstances (Nilson & Öhlin 1984: 13-18). The valuation process can be executed by looking at the future development aspects of the company and analyzing financial statements and other public financial data. This approach is called Going-Concern and its focus is strongly future orientated. The second approach is liquidation, which concentrates on to accredit company's assets in the moment of termination (Chiu & Siegel 1989: 175-183).

4.1. Valuation Models

4.1.1. Income and cashflow based models

The incorporated companies can be divided to limited liability companies and to public companies. Public companies' shares can be traded publicly in stock exchange, where the public companies have listed their shares. Limited liability companies' stocks are not traded in stock exchange, but the private partners own the share capital of the company instead. The valuation method is different depending which kind company is under the valuation process. The limited liability company's valuation determination is more likely to be asset based, because publicly traded stock price indicator does not exist. Public corporations are easier to value, because stocks market price offers determinant to build up the valuation process. Also, other valuation methods can be used to define public corporation's value, such as market based approach and income based approach. In this thesis the focus is in the public corporation's valuation process (Immonen 2008: 6-36).

The Income approach takes future cash flows and expected returns into account when defining the corporations' value. The future cash flows and expected returns must be discounted to their Present Value by adding up the various cash flows:

(2) $PV = \frac{C1}{(1+r)} + \frac{C2}{(1+r)^2} + \frac{CT}{(1+r)^T}$

where,
PV= present Value
r = discount rate
C = cash flow
T = time of the cash flow

This is called discounted cash flow (DCF) formula. When defining the net present value (NPV) any immediate cash flows must added to present value.

(3) NPV $= C_0 + PV$

where,
PV = present value
C_0 = initial cash flow

The cash flows must be discounted for two reasons. First money is worth more today than tomorrow and second safe money is more valuable than risky money (Brealey, Myers & Allen 2011: 49-67).

The discount rate can be determined with Capital Asset Pricing Model (CAPM) or calculating Weighted Average Cost of Capital (WACC).

(4) CAPM $= E(r_m) - r_f = \beta_i [E(r_m) - r_f]$

where,
$E(r_m)$ = expected return of the market
r_f = risk free interest rate
β_i = sensitivity of the excess asset returns to the expected excess market returns
(Bodie, Kane & Marcus 2005: 281-316)
Certain assumptions must be taken into consideration, when using the CAPM.

(5) $\text{After-tax WACC} = r_D(1 - T_c)\frac{D}{V} + r_E\frac{E}{V}$

where,
r_D = cost of debt
T_c = corporate tax rate
D = total amount of debt
E = shareholder's equity
r_E = cost of equity
V = value of the firm
(Brealey 2011: 452-456)

The free cash flow model (FCF) is used to value the enterprise value. The discretionary actions of financial statements do not affect the cash flows and this is why it is good measure of value. The free cash flow model can be calculated as followed:

(6) $\text{FCF}_t = \text{NOPAT}_t - \text{capital expenditures} \pm \Delta\text{net working capital}$

where,
NOPAT_t = net operating profit after taxes in time t
capital expenditures = funds used to upgrade or acquire new physical assets
change in net working capital = current assets-current liabilities

The FCF can be used to define the free cash flow to equity (FCFE) or the whole value of the firm (FCFF). The choice, which valuation method to use, depends on the situation at hand. (Arzac 2011: 15-16)

4.1.2. Market and asset based models

Public corporation's value can be specified by multiplying the number of its shares with the stock's market price. This value is based on the conception what investors have on the company's' future potential. Market values' information content depends considerably from

the financial market efficiency. So, the market value does not perceive the vital other factors that are intrinsic in business valuation process. There are several methods to amplify market based value and this amplified value take intrinsic factors into account. The methods to measure these intrinsic values are company's market valued potential, Firm's value ratio to yields and value ratio to dividend returns (Laitinen 2002: 66-69).

Market based value can also be defined by using valuation by comparables. In this valuation process similar firms are identified and then compared with the firm under the valuation process. Then examination is focused on how much these comparable firms' investors are willing to pay for every dollar of assets or earnings. In the asset based approach the market value based equity is compared with book value of the equity. The second approach compares the stock price with the earnings of the company. This value is put to comparison with competitors' similar values. Usually the market value is higher than company's book value, but exceptions occur in two situations. At first the book value can be exactly the same as the market value or second it can be less appreciated. Another way to measure company's value is to appreciate its' property from the balance sheet (Brealey 2011: 105-106).

4.1.3. Estimation models

Business valuation can be put into practice by using estimates. Estimation models are based on return on investments (ROI) requirement, which states that profits must be larger than the actual invested capital. The ROI-figure lacks capability to estimate long–term economic value creation and even with shorter time periods problems may occur. For example, when division makes new investment that provides lower return percentage than original profit. In this situation the divisions' combined ROI is reduced and the good investment opportunity is not utilized. Economic value added (EVA) model offers a solution to ROI-models' deficiency. EVA brings additional variable, which includes divisions' risk-adjusted capital costs and then are multiplied net investment base of the division. This calculation provides the divisions' capital charge, which is subtracted from income before taxes to attain EVA. EVA is also known as residual income (Kaplan & Atkinson 1998: 505-509).

(7) $\mathrm{ROI} = \frac{\mathrm{NIBT}}{\mathrm{Assets}}$

where,
NIBT = net income before taxes
Assets = division's asset base
(Kaplan:1998:505)

(8) EVA = NOPAT-(c*K)

where,
c = capital charge
K=capital employed
NOPAT= net operating profit after taxes
(Kaplan:1998:507)

In the EVA model the value of the stock is the book value of the stock added with the future financial values. Part of the value of the stock comes from the book value of the equity acquired from financial statements and that is why the estimation errors of future profits do not have decisive impact on the results that model gives. This is because discounted cash flow is result of subtraction of net operating profit and capital charge.
(Silverman 2010: 10-14).

4.2. Valuation of IT-companies

To evaluate the values of the companies that operate in the IT-industry is more challenging, because the specific nature of the markets and the amount of intangible assets. Next this thesis presents the typical valuation methods used in IT-company valuation and some specific features that affect the valuation.

4.2.1. Deciding the valuation drivers

Determining the valuation method for IT-companies, it is essential to be familiar with the unique features of IT-companies. The asset-based models give fairly truthful values to

tangible and physical assets and income-based models can be used to determine the value of future cash flows. Still the valuation of intangible assets; goodwill, innovation based intellectual property, brand and know-how, is much harder task. To understand the valuation process in a more detailed level, it is important to focus on the growth rate of a company and in which cycle of growth the company is going. Typically, the information technology companies grow fast and they are relatively young when they merge or somebody buys them. There are two general features that can be identified when valuing an IT-company, the fast growth rate and the invested capital that runs through the income statements. This invested capital is poured into the company to finance the customer pool expansion, instead of acquiring fixed assets to the balance sheet. This abnormal development of IT-companies makes the use of traditional short-term valuation methods, such as price-to-earnings or income multiple analyses, very difficult. In the valuation, the examining period should be longer, rather 5 to 10 years, and the focus should be on the economic fundamentals, which concentrate on future cash flows instead of poured capital investments. (Copeland, Koller & Murrin 2000: 315-317).

The valuation of fast growing IT-company should be started on the long-term performance of the company, instead of examining the present performance. The Industry environment, where the young IT-startups operate, will be unstable for the next years, because of the rapid growth and large capital investments. After the growing stage of this industry, the markets will eventually mature and achieve sustainable market balance and structure. The proper valuation must be based on educated assumptions made from the market data. These forecasts have to be realistically drawn and there should be several forecast outcome options available. These scenarios should be given their probability weight factor and calculate the average performance figures for the company. The valuation drivers are very different depending on the source of the competition advantage. If the advantage is based on Intellectual property rights or customer satisfaction and loyalty, then the impact factor of these drivers should be larger than other impact factors in the valuation process. (Copeland, Koller & Murrin 2000: 317-320).

4.2.2. The Valuation intangible assets

The IT-companies differ from firms, which operate in more traditional industries, what comes to the quality of assets. Whereas the traditional business field firms have mostly tangible assets, the majority of assets of IT-firms are regarded as intangible assets. The

unique feature of this asset type needs its own valuation methods. The successful execution of IT-merger requires the throughout and proper valuation of this asset type, otherwise there is a risk of paying too large acquisition premium. The leading valuation professor, Aswath Damodaran, lists the main characteristics of the firm with intangible assets. First feature is incoherent accounting concerning the investments in intangible assets. The first basic rule of accounting states that capital expenses and operating expenses have to be separated from each other, but IT-firms treat for example research & development expenses as operating expenses, instead of capital expenses. This leads to smaller capital expenditures, which may indicate smaller growth potential and size. The second feature in the behavior of IT-companies is that they tend to take less credit than traditional firms, but these firms operate in the early growth stage and are venture financed. The third feature is the compensation system of the IT-based firms. Because these firms rely on their human resource capital, the compensation, in a form of management options and equity-based options, is larger than other sectors of industries. (Damodaran 2010: 477-478).

So, in the valuation process of a company with intangible assets, these features have to be taken into account and the valuation methods must be adjusted to meet these requirements. In addition of using market-, cash flow- or estimation based models, the analyst should analyze exogenous growth, make sector comparison and draft careful simplistic adjustments. The exogenous growth analysis should concentrate more on future growth estimates, instead of observing data from the past or financial fundamentals. The treatment of capital expenses as operating expenditures skews the fundamentals. In the sector comparison, analysis should concentrate on similar kind of technology firms. Not just the operational similarities, but also the life cycle of the firms. The incoherent accounting information skews the accounting quality, so it is recommendable to keep valuation adjustment simple to narrow the error margin. (Damodaran 2010: 479)

The accounting consistency must be reclaimed, and this is possible, when the effects of intangible asset characteristics are minimized. The Characteristic elimination needs the capitalization of R&D expenses. This process starts with an assumption of time that it takes to convert the R&D asset into a commercial product. The time this process takes is called amortizable life of the R&D asset. This step is followed data collection of the expenses that the asset has caused during the last years extending back to the amortization life of the asset. Every of these expense items had to be amortized over its amortizable life. This operation produces an estimate of value of the asset today.

(9) Value of the Research Asset = $\sum_{t=-(n-1)}^{t=o} R\&D\,\frac{(n+t)}{n}$

This adjusted value gives the analyst an opportunity to define adjusted book of equity and adjusted income:

(10) Adjusted Value of Equity = Book Value of Equity + Value of Research Asset

(11) Adjusted Net Income = Net Income + R&D expenses – Amortization of Research Asset (Damodaran 2010: 480- 484).

4.2.3. Valuing customer base

In the high growth related information technology industries the customer base forms a major value potential, when examining the current and future performance. Assessing the value of the customer base is executed through customer value analysis. This analysis consists of five elements:

1) The average profit per customer in a year from the customer purchases.

2) The total number of customers

3) The contribution costs of customers

4) The acquiring costs of a customer

5) The customer number lost each year

This information helps the analyst to structure realistic future performance forecasts and determine the value of current cash flows.
(Copeland, Koller & Murrin 2000: 321-325).

4.3. The Impact of Financial Structure

In their research paper Mackay & Philips (2005) examined how the industry affects the financial structures of firms. This paper provides two significant contributions. Firstly, the results indicate that the financial structure is defined by industry related variables rather than the fixed effects of the industry. Secondly, the results identify certain interactions between financial structure and risk factor. They conclude their study into results that industry factors have effect on individual firm decisions, but also joint financial characteristic of the firms, which operate in the same industry sector. Their multivariate regression analysis indicates that company's position in the industry compared with its competitors is significant, both economically and statistically. The companies adjust their financial structures according the actions of their industry rivals. Another significant observation was that, in the highly competitive industry sectors, the firms with labor capital cost close to the industry median, use smaller amount of debt leverage than the firms, which are positioned farther away from the median. (Mackay & Phillips 2005: 1435-1465).

Maksimovic & Zechner studied the role of debt, agency costs and industry equilibrium. In their study, they assume that industry sector firms have possibility to choose between safe technology with low lower marginal costs and risky technology with higher or more uncertain marginal costs. All firms have an incentive to choose the risky technology and debt based financing since it provides higher expected profits than safe technology. The paper concludes their research into conclusion, where they found out that, in the industry equilibrium, the risky level of project's cash flow is defined with endogenous approach and this approach is dependable on the investments decisions of all firms, which operate in the particular industry. The lack of the use of tax advantage in a form of debt money affect the investments decisions of all firms in the industries, but this absence does not have effect on the whole value of the firms. The firms compensate the losses caused by the failed risky investments with the cash flows from the lower risk projects. The absence of tax shield affects the use of debt leverage what comes to financing risky projects with debt money. The risk level of the project affects the financial structure of companies and the absence of tax advantage of debt money reduces risky investments. As Maksimovic & Zechner concluded in their paper, the existence of tax shield encourages the firms to make more risky investments, because the losses can be

stabilized with cash flows from lower risk profits and the interest rates of debt money can be deducted in the taxation. (Maksimovic & Zechner 1991: 1620-1635).

5. STRATEGY BEHIND MERGERS & ACQUISITIONS

Several different motives and goals affect the way how mergers & acquisitions are executed. The operational environment and competition regulation set certain procedures that must be followed to perform these transactions successfully. The executing practices also differ depending on the viewpoint of the acquiring firm or the merging firm. The size, capital structure, geographical location and strategic choices have certain impact on the process and it is almost impossible to forecast these impacts in advance. The judicial environment changes from stable constitutional country into unstable third world country and hence global M&A legislation do not exist. M&As can be categorized into national transactions and cross-border transactions. National transaction take place in a certain country and both merge-treaty parties operate in this particular country. Cross-border transactions whereas are carried out usually in a country, where the merge-treaty parties do not operate or only the other party operates. In addition to the previous classification methods are behavioral, economic and political motives. Even though it is challenging to classify M&As, some general features can be identified from all transactions (Cooke & Young 1988: 5-15).

In this thesis, the acquisition is defined as a procedure where corporations' shares are assigned to new legal entity or corporation's whole business, including all assets, are sold to acquiring firm. Merger is a narrower concept than acquisition and usually corporations merge as part of acquisition. Mergers are one method of executing acquisitions. As a result of acquisitions business recourses are concentrated under the same rulership. In merger process purchased firm merge to acquiring firm and they create a new legal entity. Purchased firm can also cease to exist or it can continue business as a subsidiary company of the acquiring firm. Acquisitions can be carried out through diversification, where business operation units are diversified and they continue their operations as individual corporations. The business function transformations and business dismantling processes are considered as acquisitions as well (Immonen 2008: 2-5). Acquisitions that thrive to expanse business volume can be divided into horizontal-and vertical acquisitions. Whereas acquisitions that are based on diversifying business operations can be divided into conglomerate-and concentric acquisitions (Niemi 1991: 11-14).

5.1. M&A as Part of the Corporation's Strategy

5.1.1 Buyer

When examining the agents that execute M&A, we have to separate industrial agents from capital investment agents. There is a vast difference what comes to goals, methods and reasons of M&As between the two agents. Industrial agent is usually an operator, which goals, methods and reasons are linked into the scope of business, growth, economies of scale, improving profitability and achieving more market share and power. The main advantages for industrial agent in M&A; are deletations of overlap operations, economies of scale, improved resource management and overall improved efficiency of operations. The most important factor behind successful M&A, for industrial agent, is integration of procedure. The goals, methods and reasons for capital investment agent are usually linked into expansion of business operations though organic growth, increase of profitability and successful use of debt leverage. (Katramo, Lauriala, Matinlauri, Niemelä, Svennas & Wilkman 2011: 20-21)

The skills and resources between industrial agents have huge differences. Some of them have done several M&As and they have a department that main function is to execute M&As and for some industrial agents the M&As might be the first one. The reaction capability of industrial agent is slower than capital investment agent. This is mainly due the decision-making processes, because industrial agent is not planned to exclusively to execute M&As. For industrial agent, M&As can be considered as an investments with a long investment period and the expectation of returns is based risk premium of industry. This risk premium is formed by the subjective concept of the buyer. Where industrial agent focuses on synergism advantages, the capital investment agent concentrates on overall returns on investment after the presumed investment period. The capital investment agent is not willing to keep the investment forever but want to sell the company and make profit. The profit margins consist from dividends, capital debt rate returns and increased value of company, when they are selling it. (Katramo & et. al. 2011: 21-22)

The capital investment agent can exploit the use of debt money. Their overall expectation of returns is built on the expectation return of their own capital equity and to the price of debt money. They can adjust their capital structure in a way that their capital equity is considered

as debt instrument and this rate expense is tax deductible from operational cash flow. In addition to exploitation of debt money, the capital investment agent has the benefit of capital reserves. These reserves form a buffer that capital providers consider as a risk eliminating factor and their willingness to offer credit to capital investment agent with a reasonable rate increases. The situation is completely different what comes to industrial agent. The more debt based financing industrial agent acquires, the bigger risk premium is needed to meet the expectations of capital providers. In the end, the threat of bankruptcy will stop the debt based financing. The value creation for capital investment agent is based on the debt free enterprise value, when they sell the target company.

As a conclusion, the value creation for capital investment agent is formed in three ways. 1) The enterprise value is increased through improved profitability 2) The free cash flow of the target company is used to pay back the capital equity based investment loan and this increases the value of the target company's equity 3) The target company is sold to industrial agent with a market premium. Even though capital investment agent has many advantages over industrial agent, they usually do not possess the industry related expertise that industrial agent has. (Katramo & et. al. 2011: 22-24)

5.1.2. Seller

The Seller's reasons to sell their business also include many strategic factors. These factors depend on the legal form and ownership structure of the firm. So, it is obvious that the reasons for selling the business for private entrepreneur and multinational enterprise are quite different. When the seller is a small business entrepreneur, the reasons to sell the business can be retirement, lack of development & research resources, taking advantage of good selling opportunity, the offspring is taking over the business or an external threat. The external threat can, for instance, be the change in market conditions or in competition position. In the case of global enterprise, the reason for selling the business is usually the concentration on core business function and as a part of updated strategy is to sell unsuitable business functions. Regardless the features of the seller, the selling process include certain goals that can be identified in every selling case.

1) The seller thrives to maximize the selling price and to be successful in this goal, the seller has to find suitable buyer for the business.

2) The business must retain its daily capability of functioning and produce products and services for customers.

3) To minimize the time and resources used for the selling process.

4) To maintain the control over the selling process.
(Katramo & et. al. 2011: 37-38)

5.1.3. Questionable managerial motives for M&A

M & As are a good option to enter new markets when an enterprise is already operating in new markets and this enterprise is undervalued. Katramo and his co-writers underline the importance of managerial competency as a part of successful M&A. The motive theory identifies three negative synergism impacts that can ruin the process.

1) Arrogance of executive management: The executive management suffers from over confidence and believes that they are able to execute the M&A better than their rivals. This may lead to bad acquisitions and the acquiring price might be highly overvalued.

2) Biased valuation process: The internal compensation system might encourage the executive management to take big risks when they are increasing the value of the company through mergers & acquisitions. There is a risk to exaggerate the benefits of mergers to gain bonuses.

3) The lack of strategic planning: The process is executed without proper integration plan or without proper expertise.
(Katramo & et. al. 2011: 36-37)

5.2 Theories that Decrease Merger Value

As the motive theory stated in previous chapter, the theory identified three forms of negative synergism, arrogance of executive management, biasedness in valuation and insufficient

strategic planning. In addition to the motive theory, the financial research has presented other reason for decreasing merger value. The research paper from Nguyen, Yang & Sung (2012) collect the main value decreasing motives for mergers that appear regularly in the financial literature. These value decreasing motives are Hubris, Agency problems and Market timing.

Hubris was presented in Roll's (1986) paper meaning a state of mind of key decision-making individuals in the organization whom rationality is blinded by their personal or corporate hubris. This makes the acquirer to pay too high premiums for the target company's shareholders. The hubris even drives the corporate executives to close deals in which the acquirer cannot attain synergy benefits from the target. The Agency problems is wide concept of various principal and agent interest conflicts. Traditional agency problem is the shareholders' interests against the executive management's own interests in publicly traded company. Interestingly Jensen (1986) mentions that agency problems are caused by the interest conflict of firm's cash flows between the executive management and firm's owners. The interest conflict arises, according to Jensen, in the view difference in the firm's payout policy of firm's excess cash reserves. The shareholders call for the excess cash to be paid as a form of larger dividends, when as the executive management see the inorganic growth through acquisitions to be the proper way to use excess cash. The agency conflict arises from the control issue of cashflows.

The third value decreasing motive is market timing. Shleifer & Vishny (2003) studied in their paper the relation of merger transaction activity and stock market trends. In their model, the mispricing of acquisitions is assumed and thus it is justified for bidder companies to overvalue their stocks to get better deals, in which the trade is conducted through stock change. The overvaluation of equity is a desirable state to have better purchase deals and it is also used prevent the company to become a target of acquisition itself. Companies with undervalued equity are under threat to be targeted for acquisitions or takeovers. According to their results the overvaluation tends to become an industry trend that affects bidder premiums of the whole industry. This forms a problem, when the buyer with overvalued equity buys a target company with undervalued equity, even though they both might be mispriced upwards due to the overvaluation trend of the stock markets. These motivational reasons may also occur simultaneously. Berkovitch & Narayanan (1993) found out that some acquisitions were involved with two or all the three previously mentioned motives.

5.2.1. Horizontal M&A

Horizontal mergers involve corporations in the same field of business and the majority of completed mergers are classified as horizontal. In this case purchased and acquiring firm produces similar products and competes for same customers (Cowling, Stoneman, Cubbin & et. al. 1980: 16-17). The main gains from horizontal mergers are; increased production efficiency through economics of scale and reduced competition inside the particular field of business. These gains can increase the market share of the acquiring firm and expand its' product portfolio. The reduced competition boosts the acquiring firms' buying-and negotiation power and growing market power leads to more centralized markets. Too large market power and fully centralized markets are harmful to consumers and national economy as a whole. To avoid this progress, mergers with such impacts require license of execution from the antitrust officials. In U.S, Federal Trade Commission approves mergers with such impacts (Fee & Shawn 2004: 424-426).

5.2.2. Vertical M&A

Vertical merger take place between corporations at different stages of production. The purchased corporation and acquiring corporation participate in the products' manufacturing process, but this participation happens at different stages of this manufacturing process. The acquiring firm can implement this integration towards the ultimate consumers or backwards to suppliers (Niemi 1991:14). The main objectives in vertical mergers are to improve efficiency of the supply chain through decision power consolidation and secure the supply of raw materials and channels in the production chain. These objectives can be achieved by dismantling operation clashes, warehouse re-organization and cut offs of profits from previous subcontractors. In the earlier studies Kedia, Ravid & Pons finds evidence that vertical mergers generate greatest gains when dominant firms merge. The co-operation of these dominant corporations leads to more concentrated markets and growing market power cause abnormal returns (Kedia, Ravid & Pons 2011: 846-848).

5.2.3. Conglomerate mergers

In conglomerate merger the purchased corporation and the acquiring corporation do not have functional similarity. The acquiring firm tries to pursue new markets with new products and customers. The purchased firm offers the infrastructure to enforce this aim. Conglomerate mergers can be considered as part of acquiring firm's strategy to obtain new competition advantages, but conglomerate mergers also include many financial-and taxation benefits. The business operation related risks can be divided between different business units and if the risks materialize the damages are divided between these units. So, the risk management approach is similar with portfolio management. The acquiring firm can achieve financial benefits, when it is buying a company from new business field, and there is uncertainty in the purchasing price. In the best case acquiring firm can buy the company for undervalued price and benefit from this valuation error. The acquiring firm's stockholders will benefit from this bargain deal, but unfortunately the process can go on the opposite direction as well and the selling price can be overvalued. In the situation, where the merger is funded mainly with debt liabilities, taxation benefits can be exploited. The interest rates for current liabilities can be deducted from corporation's returns before taxes (Lewellen 1971: 521-526).

5.2.4. Concentric mergers

In a concentric merger the acquiring firm's business field is not directly related to the purchased firm's business field and they do not offer same products. Still some similarities do occur and corporations may share same type of distribution channel, product development or research activities. The merger offers positive synergy gains for acquiring company. A textbook example from concentric merger is a car manufacturer who decides to start produce industrial machinery (Niemi 1991: 15).

5.2.5. Going-private

Boot, Gobalan & Thakor studied the reasons why publicly traded corporations go private. Going private is a process, where corporations sell functions what are unsuitable to their core business. Usually the support division's management purchases the stock capital (management buy-out) and due these operations the stocks are no longer traded in public

stock exchange. If the ownership in this established private company is divided with a third party and the transaction is funded mainly with liability funds, the procedure is called leverage-buy-out. Boot, Gobalan & Tharkor find in their studies that going private will decrease the level of corporations' stock price but also increase the volatility of stock price. The privatization will also increase the corporations' overall value. Their studies also indicate that the autonomy of the management increases and going private procedure requires premium above the pre-transaction stock prices. The reduction in participation of public market investors encourages younger firms to go private. The gains, from going private procedure for this new private entity, are reduced listing-and transactions cost, decision power autonomy is concentrated to the management and corporations overall value is increased due to the transactions (Boot, Gobalan & Tharkor 2008: 2014-2024).

The going private procedure can be executed by using tender offers. Tender offer is public offer or invitation to all stockholders to sell their shares for a bidding price. The tender offer is issued by acquiring company and does not need approval from acquiring company's stockholders, so it is flexible alternative to arrange takeover. Tender offer does not violate minority stockholders' rights and they are free to decide will they sell their shares (Niemi 1991: 17). Earlier studies show results that, tender offer bid prices and the method of payments, have effects on stock prices after the public offer announcement. In his paper Travlos (1987) studied methods of payment and how they explain common stock returns in bidding firms at the time of announcement bids. His research hypothesis assume that cash based finance as payment method has positive effect on the bidding firm's stock returns and common stock based financing as for has negative effect. Travlos' research concludes that pure stock exchange transaction causes losses for the stockholders at the time of offer announcement. The research also concludes that cash financed payment methods causes normal earnings to the stockholders and the abnormal returns are explained with other factors; such as type of the acquisition or the bid premium margin (Travlos 1987: 944-962).

5.2.6. Takeovers

Takeover is an acquisition, where acquirer makes a bid to the acquiree for its stocks. Takeover is friendly transaction when collaboration between parties' works and the process goes smoothly. Hostile takeover is completed without mutual agreement of the parties and the takeover is carried through without the approval of the target's management. Usually

hostile takeover is executed in form of a tender offer or a proxy fight[3]. Takeover can be also executed in a form of a merger. In this procedure the usually the old legal entity ceases to exist and its funds and liabilities are transferred to the acquiring company (Schwert 2000: 2599-2601).

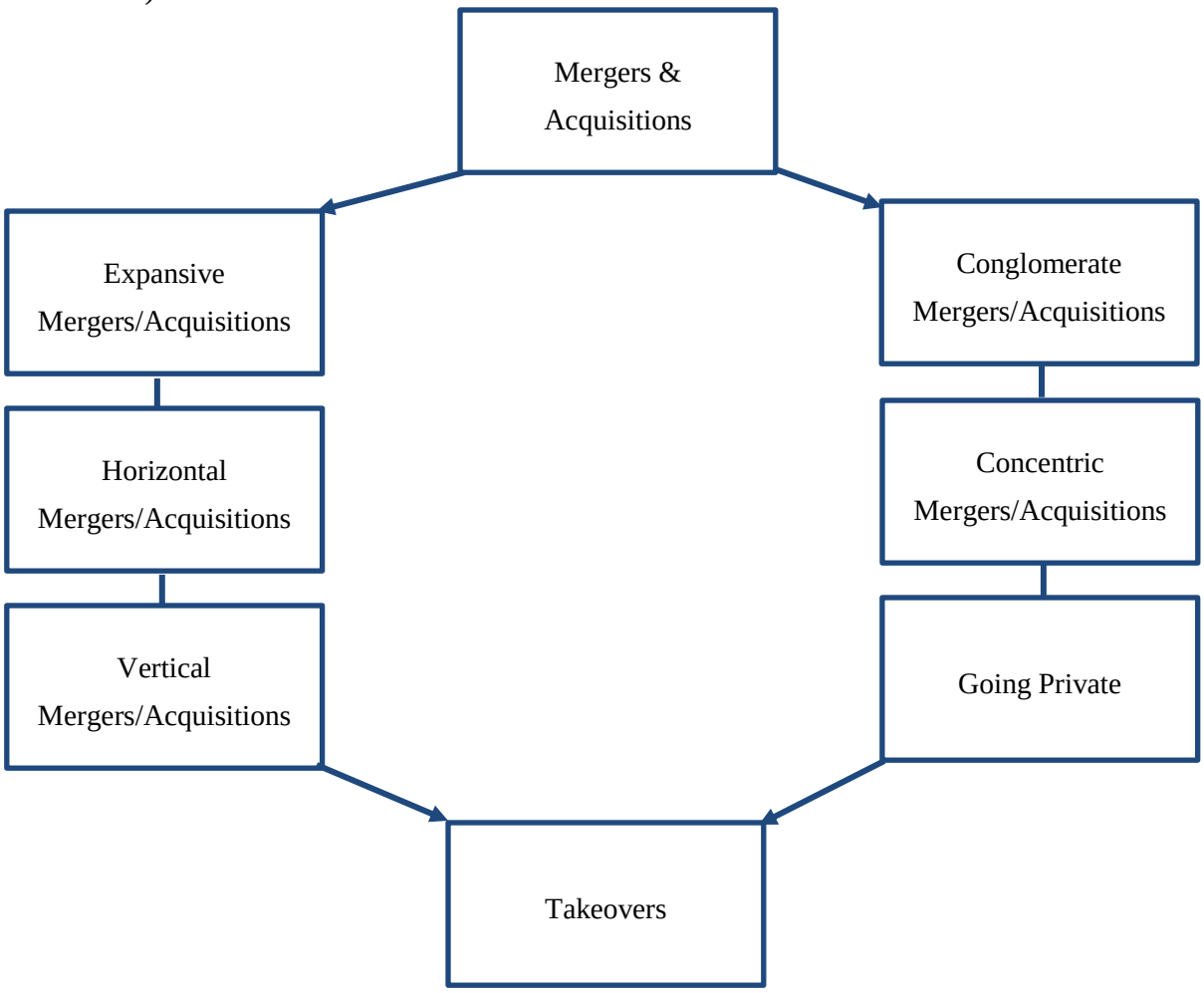


Figure 1: (classification of mergers as they are classified in this thesis)

[3]A situation, where the acquirer will persuade shareholders to vote out the target's management to get rid of takeover obstacle.

6. M&A AND IT-INDUSTRY

6.1. Motives for M&A

Competition in the business world is strict and corporations have to update their goals on the regular basis, if they want to maintain their operational functionality. Corporations must adapt to fast changing environments and seek out the competition advantage where ever they can find it. The corporations make strategic decisions to maintain or to improve its compatibility with the changing environment. To achieve this reconciliation with environment, corporation can alter itself or try to influence the environment itself (Niemi 1991: 19-21).

Mergers and acquisitions are one way of executing corporation's strategy, the changes in the business environment, forces management to switch old strategic guidelines. M&A can promote strategy process, when management wants to sell unsuitable divisions and focus on its' core business areas or attain new knowledge, resources or technology to boost its' already existing competence (Niemi 1991: 20-21). Company can form strategic alliances with other companies to develop expensive technology or to improve its standing in the markets, but in this thesis strategic co-operation is not studied. There are several motives that can be identified behind of M&A. These motives have been categorized differently in financial literature and usually the categorizing method depends from writer's own personal approach to the topic.

6.1.1. Synergism

Synergistic benefits are created when the combined post-merger performance will be greater than the pre-merger performance of the separate merging companies together. The basic idea behind synergistic gains is that the post-merger corporation is more capable than either one of the merging parties alone. Due to these synergistic gains the performance increases: 2+2=5. The synergism consist of many factors and their precise classification are challenging task but still there are some major variables that can be identified almost in every M&A. These synergistic features are shared tangible resources, improved management, shared know-how and pooled negotiation power (Mukherjee, Kiymaz & Baker 2004: 8-10).

The merging companies both benefit from the situation, where they share their key know-how and expand their competence through co-operation. The acquiring company can improve the target company's management qualities by replacing the old board of executives. This scenario is probable, when the target company has underperformed in its area of business and the cause for this underachievement lies in the managerial decisions or choices. The deteriorated state makes the target company a tempting object for purchase and due to these problems bidding price level can be set lower than normally. Sometimes combined market-and negotiation power of the acquiring-and the target company grows so large that the transaction need approval from the competition officials. In these cases, the outcome of the transaction depends from the permit, the parties either get it or do not get it. The merging companies can still achieve same kind effects through merger but without the permit proceedings. In this scenario the combined effects on markets and general competition are not so significant that separated permit for transaction is required. Despite the fact that merger is possible to execute without permit, the gains from transaction still exists. The impacts of these gains are materialized in smaller scale, but they could enable market price manipulation or restrictions to production volumes. Based on the competition official's discretion a merger with harmful impact on the market competition could require a merger license[4] (Krishna & et. al. 2007:435-437).

In the information technology markets the synergy gain is additional value to the economic value created by the acquisition. The successful execution of due diligence process enables the identification of synergy value sources and enables their proper exploitation. The proper due diligence execution also identifies the value destroyers of synergy or minimizes their impact. The higher the net synergy value is, the more sensible motive for acquisition exists. (DePhamphilis 2012: 339-341). The synergy value can be separated into two types: operational synergy and financial synergy. The operational synergy consists of economies of scale and economies of scope. The economies of scale consist of the spread of fixed costs over the production steps. The fixed costs include the depreciation of tangible assets, amortization of intangible assets, maintenance expenditures and obligations. The fixes cost cannot be changed in short time window. The variable costs are costs that have impact on out-put levels. The economies of scope are defined as certain pool of skills or assets that are used to produce products or services. The financial synergy is the cost of capital for the

[4]In the US the merging companies need the approval from the Federal Trade Commission, if the market share excel 40 percent and this have effects on the national competition. In the EU the approach for permit requirement is based on the overall effects on the markets. The main objective is to prevent the merging companies to accomplish dominant market position.

acquiring firm meaning the minimum return that the investors expect to receive from the invested capital used in the acquisition.
(DePhamphilis 2012: 5-7)

The operational synergy is examined in more detailed level in the next section. The financial synergy gained through the acquisition can be measured through the cost of capital for the acquirers. Maksimovic & Zechner concluded in their paper (1991) that the existence of tax shield encourages the firms to make more risky investments, because the losses can be stabilized with cash flows from lower risk projects and Mackay & Philips (2005) concluded in their research that industry factors have effect on individual firm decisions, but also joint financial characteristic of the firms, which operate in the same industry sector. The important factor that affects the cost of capital is the Tobin's Q ratio. Tobin's Q is defined as the market value of the buying firm's stock to the replacement costs of its assets. For example, the firm, which is considering of making an investment to equipment, can measure the option of acquiring a firm with acquiring price less than the costs of replacing the asset by buying it by themselves. Tobin's Q ratio helps the firms to identify the undervalued take-over targets and exploit the undervaluation. If the Tobin's Q ratio is less than one the acquisition would be profitable option to execute. Servaes finds in his paper (1991) that the abnormal returns are higher when the takeover target has low q-ratio and the acquirers have high Q-ratio. Tobin's Q formula is drafted as followed:

(12) Tobin's Q = $\frac{Market\ Value\ of\ the\ Firm}{Total\ Assets\ of\ the\ Firm}$

The Q-ratio is measured between zero and one. If the ratio equals to one or higher, the market price is overvalued. If the ratio is under one, the price is undervalued.
(Servaes 1991: 409-417)

In the information technology markets the use of Tobin's Q is challenging due to the large amount of intangible assets. The problems with valuation are the research & development expenses and their treatment as operating expenses instead of capital expenses. So, it is important to capitalize the research & development expenses as capitalization expenses using the formula introduced previously (formula 9). By doing so the amortization expense can be defined and the value for intangible assets reliably measured. The financial synergy is achieved, when the previous operation is properly executed, and the Tobin's Q provides ratio

under one. In this situation the financial synergy is achieved through acquisitions and mergers.

6.1.2. Economies of scale and scope

When firms merge, their ability to produce goods and services, will most likely increase. Individual firm can perform tasks more efficiently than several firms separately by eliminating duplicate operations. Operational synergy enables the reduction of research-, general- and administrative costs and expands the production capacity. The trimming of duplicate business operations can save billions of dollars of merging corporations' money, but the transactions causes negative effects in a form of losing jobs (Krishna, Healy, Bernard & Peek 2007: 435).

Moeller, Schlingemann & Stulz studied in their paper the effect of the acquiring firm's size with the returns attained from the transaction. Their research data contained material from over 12 000 executed M&As. The acquiring companies were categorized into small and large firms by capitalization volume and these transactions took place during the time period of 1980-2001. The sample firms spent 3.4 trillion dollars for these transactions and the large firms lost 312 billion dollars of the acquiring companies' stockholders' money. The small firms returned over 9 billion dollar yield from the same time period. The model used to calculate the earnings and loses is equity-weighted, but still even the value-weighted model offers similar results. Moeller's and his colleagues' research indicate that large firms destroy the acquirers' wealth and the small ones return profit instead. This study does not observe other indicators than returns for the acquirer so the rational explanations for the larger mergers lie in other factors such as economies of scale (Moeller, Schlingemann & Stulz 2004: 201-204).

In the information technology industry, the complementary products lead to that the producers have to offer the whole portfolio of products to the customers and this requires suppliers, distributors and operational corporate value chain. This value chain can be integrated to be more efficient through acquisitions. The value chain consists of logistics, production, marketing, distribution/sales and customer support. The effectiveness of this corporate value chain can be improved with proper integration process at the time, when the acquisitions are conducted. The forward integration starts from logistics and it extends

through the whole value chain into the customer support. The integration can also be done in reversed manner. This is called backward integration. (DePhamphilis 2012: 21). The information technology producers have to follow certain standards to make the products compatible with each other. This causes competition between market operators and forces the companies to seek competitive advantage through the value chain. The source of effectiveness for the value chain can be acquired through successful merger strategy. The mergers prevent transaction costs and terminate duplicate operations. The right acquisitions compile all the skills and functions that are needed to gain competitive advantage through economies of scope.

Economies of scale as a motive for acquisitions in the information technology industry are caused by the structure and features of the markets. The high research and development costs make the companies to acquire legal protection in form of patents and other Intellectual property rights, externalities of production, switching costs for customers make the acquisition favorable option, when seeking the competitive advantage. Especially the patent protection of specific time period gives the owner the exclusive right to benefit from the innovation financially. The benefits of adjusted fixed costs, intangible assets with amortization possibility and long period of patent protection provide the acquiring company vast amount of operation synergy value. These factors distort the market structure and cause this distortion the information technology markets cannot be examined in the traditional manner (Campello & Graham 2013: 89-92).

These features typically lead into concentration measures executed by market participants. Mergers and acquisitions reduce market competitions and raise the profit margin for market operators. In the monopoly situation the market operator is responsible for selling hundred percent of the market output. Monopoly markets are extremely rare and are usually formed with protective legislation. More accurate approach to measure market concentration is to identify the number of the firms that operate in the markets and the distribution of output among the market operators. The concentration of industry can be presented as followed:

(13) $\sum_{i=1}^{N} si = \frac{100\sum_{i-1}^{N} qi}{Q} = 100$

where:
si = the market share of the firm i
N = the number of the firms in the industry
Q = aggregate industry-output level
qi = the output of the firm i
si= $\frac{100qi}{Q}$ = the percentage of the industry total output sold by firm i

Note that $0 \leq si \leq 100$
(Oz 1996: 171-174)

The mergers and acquisitions that lead into concentrated markets or provide too much market power and percentage for the acquiring company the competition official will prohibit the execution of the transaction. This is called the freeze-out mechanism.
(Amihud, Kahan & Sundaram 2004: 1325-1328)

6.1.3. Taxation gains

The tax gains are achieved in a situation, where merger compensation is completed in form of stock exchange. The realization principle in taxation defines that only realized profits are taxable. So according to this principle, if the transaction involves cash payment or compensation, profits are counted as taxable funds. Certain countries have tax policies that allow the use cash payments as part of the transactions without obligation to pay capital gain tax. For instance, Finnish corporate taxation law allows ten percent of the combined nominal value of the stocks to be cash. The rest ninety percent of the merger price must be based on stock exchange or other arrangements as long as profit does not realize. Another important principle in corporate taxation is continuity. This principle requires that the companies continue to perform business after the merger. Otherwise the procedure is considered to be tax evasion (Järvenoja 2003: 62-63).

In the U.S the basic taxation principle is built around citizenship. This principle allows the federal government to carry taxes from its citizens and corporations regardless their whereabouts. This principle enables many forms of tax planning. The U.S tax policy has its advantages and disadvantages, and they can be exploited in tax planning. One goal in the

international taxation is to avoid the double taxation of income. This means that the income of multinational consolidated corporations is taxed in its country of origin and the same income is taxed again in country, where the income is created. International tax deduction treaties are signed to eliminate double taxation (Huizinga & Voget 2009: 1222-1240).

Taxation procedures are different between cross-border mergers and national mergers. At the national level the method of the arrangement influences the transaction taxability. As a rule, for cash payments are that they usually taxable and the tax-percent depend from the taxation state. If profits realize during the merger the capital gain tax must be paid. The tax-free treatment requires continuity of business after merger (Moden: 1993: 30-31). The comparison between finish and American taxation procedures indicate that the basic principles are similar. U.S taxation laws affect cross-border acquisitions in a way or another and the effect depends from the home country of the acquirer. The domestic acquisitions are taxed by the U.S tax laws and foreign acquisitions are taxed as per foreign-and U.S tax legislation. Taxes paid to foreign countries can be utilized in the domestic taxation. The foreign tax credit (FTC) can be from deducted marginal tax rate, but deduction cannot be greater than the amount of payable taxes in U.S from foreign income source (Manzon, Sharp & Travlos 1994: 1894-1895).

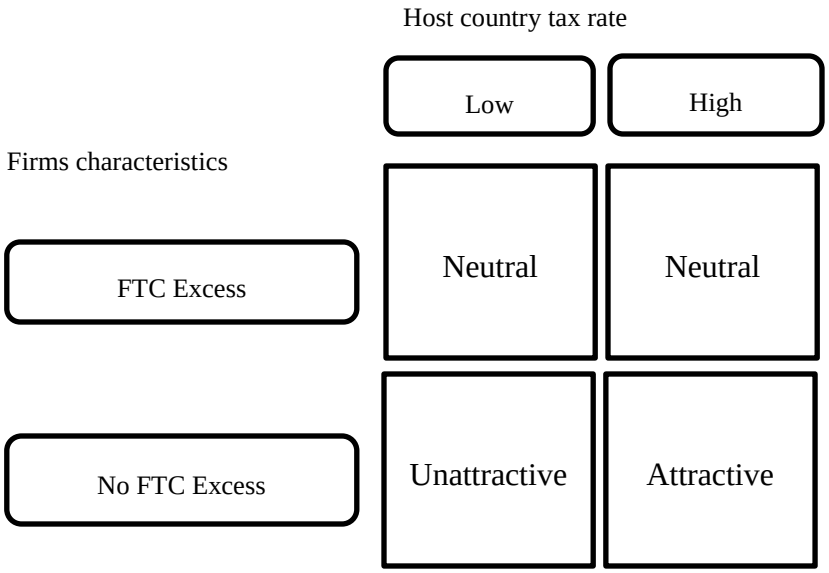
The foreign tax credit limitation (FCTL) can expressed as followed:

(14) FTCL= US marginal tax rate*foreign source income
(Manzon & etc 1994: 1895)

If the foreign tax rate is higher than the U.S marginal tax rate, the difference is compared to FTCL. In the case, where FTC exceeds the FTCL, the remaining FTC can be used within next five years or refund paid taxes from last two years. The tax gains are achieved through the tax rates of U.S and the foreign country, and availability to use excess foreign tax credit. The repatriated profits from low tax rate countries can cause additional taxes in U.S, if the company doesn't have any usable FTC left to balance tax installment. So, in this situation, tax gains are reached if the company has a lot of unused FTC excess. The FTC excess will become unusable in five years. In the circumstance, where the foreign tax rate is higher than U.S tax rate, the gains come through in form of FTC excess. This FTC excess can be used as described above (Manzon & etc 1994: 1896-97). As a conclusion M&A have tax gains, when the transaction is executed in form of stock exchange or only certain portion of merger price

is cash. Also, the use of FTC excess can bring tax gains in form of cross-border M&As. Still tax gains are seldom the major motive for M&As, because big tax gains are easily considered to be tax evasion.

Figure 2. Figure indicates the relations of firms characteristic and host country tax rate in the eyes tax payer. (Mazon1993:189)



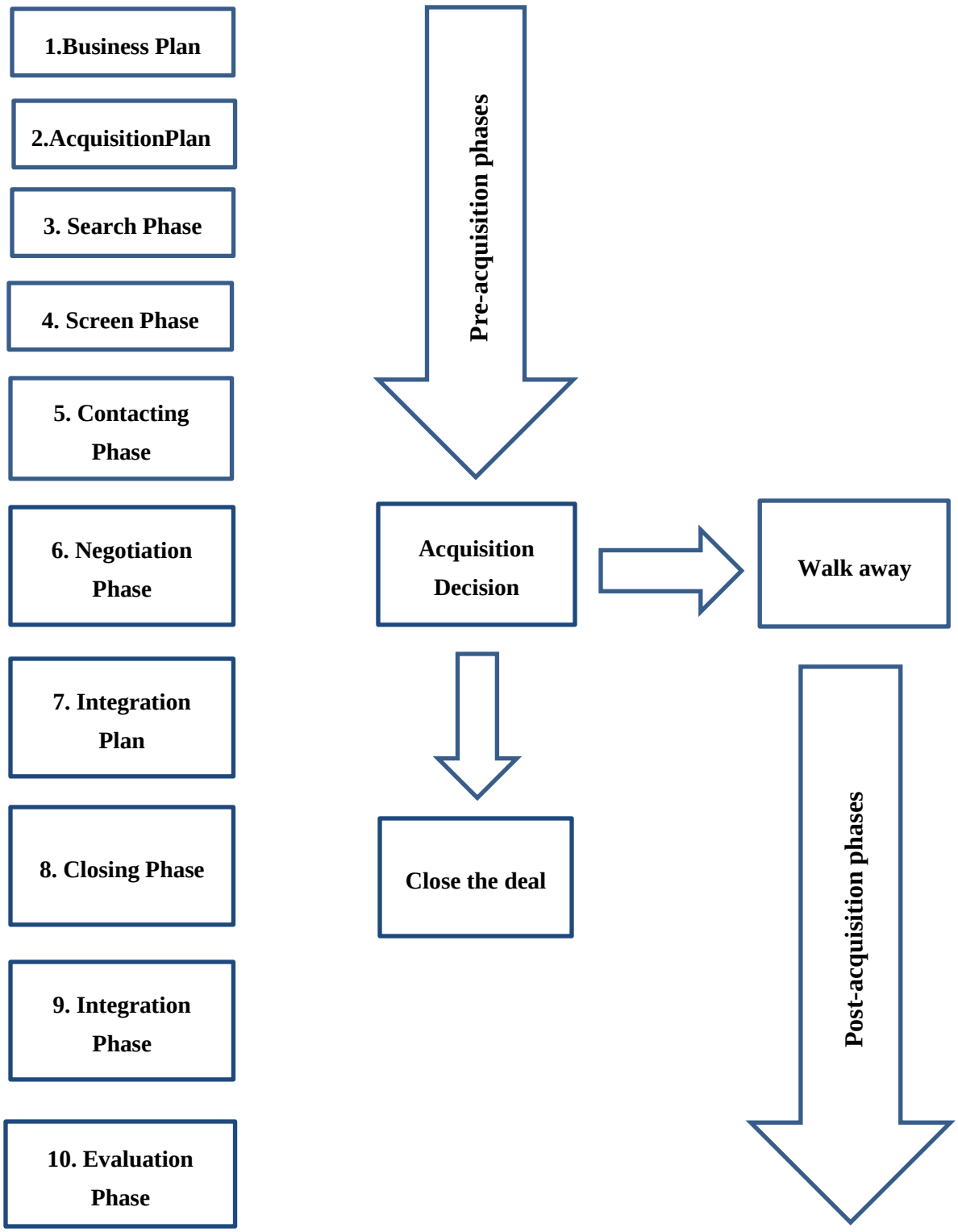
As mentioned earlier in the conclusions of Maksimovic's and Zechner's paper (1991) the tax shield encourages firms to make more risky investments and the deductibility of debt interest in the company's taxation increases the use of debt leverage and affects the cost structure. The taxation benefit enables the tax planning in the consolidated enterprises and is potential explanatory factor for mergers and acquisition.

6.2 Acquisition Process

6.2.1. Pre-merger phase

The planned merger or acquisition is a complicated process that involves many steps before and after the announcement date, when the deal is announced to the general public. DePhamphilis has divided the acquisition process into a comprehensive ten phase process diagram. The diagram is presented as followed:

Figure 3. The Ten steps of Merger process (Dephamphilis 2012: p. 139)



As can be seen from Figure 3, the first five of the ten phases are carried out prior to the actual deal negotiation with the counter party. The first phase of drafting a business plan is a wider

concept of the acquirer's general business management. Typically, the merger policy is part of the general operational plans of the company as an important source of likeable growth potential. The business plan acts as statement of purpose for the company's business and includes internal analysis and external analysis of company's business functions and position in the markets. Business plan provides an executable strategy for the company on how to compete on the markets and gain a competitive advantage in relation to the competitors. The second phase of the process is called acquisition plan and it is also an essential part of the business plan as well. Acquisition plan supports the execution of business plan and its primary purpose is to identify potential acquiring targets. Through these acquisitions the company can attain growth and know-how to its business by adding the bought business functions as part of its own enterprise. Usually the companies have their own acquisition function, which are responsible for drafting the acquisition plans and actively search and screen potential acquisition candidates.

The phases three and four require acquisition function's active effort and capability of identifying potential acquisition targets and proper prioritization of the candidates in order to achieve sustainable competitive advantage through their acquisition activities. The firm's strategic goals and weight factors will vary through time, so it is important that the acquisition function collects and updates the potential candidate list to match up the firm's current strategic situation. The screening phase focuses on prioritizing the potential targets of acquisitions in accordance with the acquirer's current strategic requirements set for the specific acquisition. In the fifth phase the acquirer will start to contact the potential target companies based on priority order set in screening phase. The negotiation phase is complex process involving stakeholders in the acquiring company as well as the target company. Additional stakeholders may vary from external consultants such as investment bankers or the employees of the target company. (Dephamphilis 2012: 136-177)

6.2.2 Negotiation phase

The negotiation phase is often described as the most time consuming and complex phase of the acquisition process. It involves the representatives of the acquiring company and target company as well as several external stakeholders. The terms and details of the deal are structured and put together during this phase. It is impossible to name all the sub-phases of negotiation phase, thus each negotiation is different depending on the features of the deal,

but Dephamphilis has listed certain phases that can be found in the vast majority of the deal negotiations. The different negotiation phases can be listed as followed:

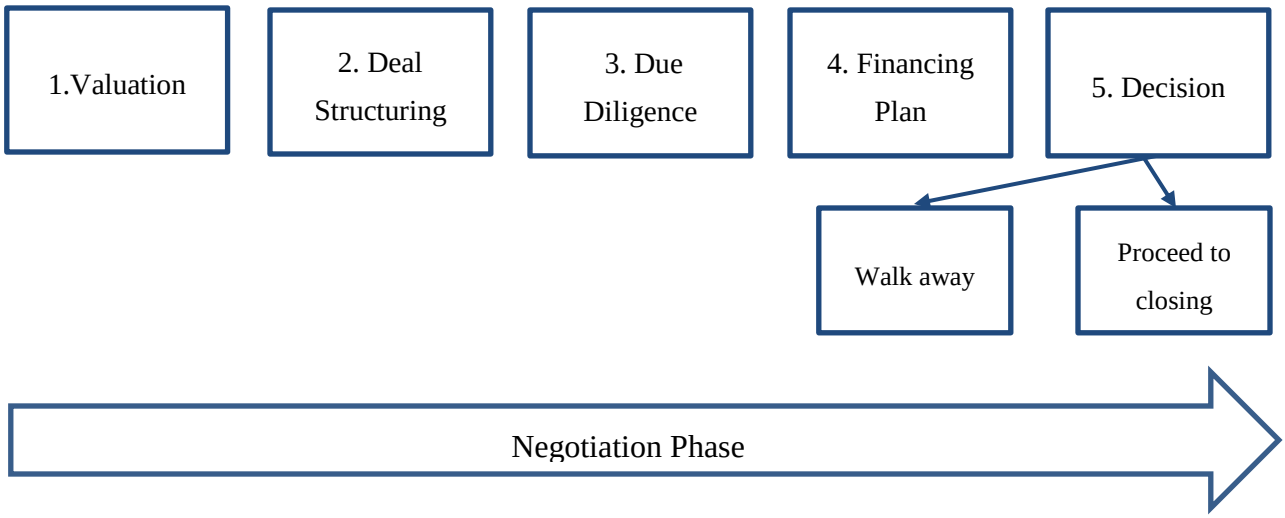


Figure 4: Negotiation phases according to Dephamphilis (2012: 179).

The deal negotiation process starts by calculating the value of the target company. This calculation offers some orientation angle to the final deal price and financing plan. Both parties usually present their own perception of the value of the target company and the final deal price sets between these two perceptions as a result of a compromise. The valuation is based on historical financial data of target company's performance and probable future performance forecasts. Typically, the final deal price is specified on more detailed level, when the negotiation process proceeds. The second sub-phase of the negotiation phase is the deal structuring, which is an encompassing stage, in which parties agree on deal execution specifics and possible sources of disagreements. Deal structuring requires firm specific information and data on target company's condition and strategic fit on acquirer's viewpoint. The required information is acquired through due diligence processes, which are a necessary procedure of information gathering in the acquirer's perspective. The due diligence process guarantees that the target company records are investigated throughout, and possible hidden risks are brought to buyer's attention. The due diligence process overlaps other negotiation phase sub-phases and may last through the whole negotiation phase. After, the data provided by the due diligence process is analyzed, the acquirer and its advisors compose a financial plan how to finance the deal. The deal can be financed with cash, stocks of the acquiring company or the mix of previously mentioned. The final sub-phase of the negotiation is the decision-making, in which the acquirer either decides to buy the target company or walk

away from the deal. Depending on, if the acquirer decides to continue the deal, the process either dries out or continues to seventh phase of the Dephamphilis's acquisition phase diagram. (Dephamphilis 2012: 178-185)

6.2.3. Post-merger phase

The acquirer and the target company usually have their own business practices, organizational culture, management style and operating functions and they do not necessary fit with each other without proper integration procedures and steps. To enable smooth transition period in the acquiring and the target company, an integration plan is usually drafted. Integration plan contains clear steps and phases on how different processes and assets are bind together cost effectively. The integration plan operates as a groundwork for the integration phase. The integration phase is one of the most important phases of the acquisition process due though integration the acquirer may achieve considerable synergy benefits. The proceeding order of the post-acquisition phases is not necessarily clear, and the phases can overlap with each other or change places with each other. The closing phase ends the actual acquisition negotiations and the parties sign the purchase agreement. After the closing phase the pre-drafted integration plan is activated, and integration processes begin. The final phase measures the success of the acquisition and the benefits achieved through the deal. Typically, the merger success is measured with pre-set indicators that measure the performance on different levels of corporation. It is important not to overlook the meaning of the integration phase as it will define in large extent the quality of the newly formed corporate culture and practices. (Dephamphilis 2012: 186-194)

7. DATA & METHODOLOGY

7.1 Data description

The sample consists of 132 mergers and acquisitions in which the buyer is always a publicly listed company in Finland, Sweden, Norway and Denmark. The selected time window covers a time period of 1995-2006 and it is separated in three different periods. The pre-bubble period covers time frame of 1995-1999, bubble-period of 2000-01 and post-bubble period of 2002-2006. The actual crises period is only to be examined as part of the whole-time period of 1995-2006, because the number of crises period acquisition deals is simple just too low to attain robust results. The crises period is described more detailed in the descriptive results. The data is constructed as a combination of two different portfolios. The first portfolio includes publicly listed acquirers from all other industries than high technology and information communication, which have acquired high technology or information technology target companies. The second portfolio consists of publicly listed acquirers operating in high technology or information communication technology industries and which have acquired target companies from other industries than high technology and information communication. The selection criterion for this structure is to measure the performance for all companies involved with high technology and information communications and compare this performance with average performance of technology industry. The technology industry is formed as a proxy and it contains all publicly listed technology companies in the specified country. Data is collected from Datastream provided by Thompson Reuters. All the prices are daily closing prices for the specified companies and the sample includes also companies that have been delisted, if their stock has been imposed for public securities trading 12 months after the merger announcement. The currency rates and their conversion rates are obtained from OFX.
The mergers must fill the following conditions to be included in the portfolios.

1) The acquirer has acquired at least 50 percent of the target company's stocks or increased its ownership below 50 percent over the 50 percent threshold.

2) The later deals are omitted from the sample, if the acquirer is involved in many acquisitions during the time period.

3) The mergers have to be classified as completed deals to ensure the fact that the transactions really were executed.

4) The deal value has to exceed one million euros in order to limit the effect of small transaction deals of biasing the results.

5) Acquirer has to be publicly listed company and its stock has to be traded publicly at least one day before the deal was announced.

The event study methodology assumes the market efficiency to capture the event effects to test the research hypotheses. According to Fama's and Malkiel's (1970) paper the efficient market hypothesis is divided to three different forms of efficiency, weak-, semi-strong and strong forms of efficiency. Weak-form of efficiency states that the historical prices cannot be used to acquire abnormal returns. In semi-strong efficiency the prices include all available public information and in the strong-form efficiency the prices contain all public and privately available data. Brown and Warner (1980) underline the event study method as straightforward test of market efficiency. This is mainly due to the fact all the market information is reflected quickly on prices and the event, merger in this case, can be captured.

7.2 Methodology

The chosen methodology for the empirical part of the thesis follows event study method, where the stock performance of the acquirer is considered on -1/+1 day around the merger announcement date. The event window is also extended to cover different event periods of -7/+7 days, 1-month, three months, six months and twelve months to guarantee reliable results of acquirer performance also on the longer time scale. The data observations are spread on three different time periods of pre-bubble period, bubble period and post-bubble period. The benchmark portfolio is formed as a proxy to measure the post-merger performance of acquiring firms and compare this performance against the average performance of technology industry. The technology industry portfolio is constructed by bundling all the technology related companies together and calculating them technology industry average returns. Four different benchmark portfolios are created to cover each Nordic country and the general technology mean average returns are formed based on the returns of technology companies

listed in that country. Previous studies have used Book-to Market or Firm Size as reference portfolio proxies, but in this thesis technology industry is chosen as proxy. The formed four portfolios covering the four Nordic countries are then combined as single Nordic technology benchmark portfolio providing the daily mean average returns for Nordic technology companies.

Individual company's weight on the formed benchmark index is achieved by using weight factors. The weight factor is calculated by comparing the company's market value to the combined market value of the technology companies included in the benchmark index. The weight factors are calculated and updated on quarterly basis and all the prices are transformed to U.S dollars to guarantee the comparability of the companies included the Nordic Technology index. This selection is rational considering the unique features of technology companies and the vast amount of intangible assets employed in the high technology business. This may distort the comparability with general indices traditionally used as benchmarks in financial sciences. Usually general indices consist of companies operating in very different industries and possessing features that are not so common in technology industry or the number of technology companies is too low to represent their unique effect sufficiently as part of the general index. As so, it will increase the reliability of the performance comparison, when the actual benchmark index consists purely on companies that operate in the same field as the acquirer companies, which are involved with technology related mergers. Even though several technology based general indices exist on global scale, the Nordic markets are too marginal to have their own general technology index at the time of the Dotcom crises[5]. In this thesis, a separate technology index is built to serve as a benchmark index for companies that have conducted technology related mergers or acquisitions. In addition, the purpose of this thesis is to examine the acquirer stock performance in pre-Dotcom crises time period and post-Dotcom crises period. The length of the estimation window is 12 months prior the merger announcement date, in which the security related alphas and betas are calculated in order to calculate the abnormal returns.

[5] It is important to notice that modern Nordic Technology index N9000EURGI was established at the beginning of 2000, while the inspection window of this study covers time period of 1995-2006. Due to this a separate and earlier benchmark index is required in order to capture the industry returns for earlier years.

7.2.1 Short-term financial performance

According to Mckinlay's paper (1997) the event study is a useful method for capturing short-term impacts around certain events. In this thesis event study method is selected to capture short-term acquirer stock price fluctuations around the merger announcement date. The typical one factor-model used to measure short-term performance is the market model.

(15) $E(R_{it}) = \alpha_i + \beta_i * R_{mt} + \epsilon_{it}$

where $E(R_{it})$ is the expected normal return for specific security *i* on time period-*t*, the acquirer company in this thesis, α_i and β_i are parameters of market model, R_{mt} is the reference market return (the benchmark index) and ϵ_{it} is the error term. Market model is used to calculate the expected normal returns for acquiring company. So, the next logical step is to define abnormal returns. The methodology part follows the methods presented by Mackinlay's paper (1997) of calculating short term profitability for the acquiring firm. The abnormal returns are defined by using the following model.

(16) $AR_{i,t} = R_{i,t} - (\alpha_i + \beta_i * R_{m,t})$

where $AR_{i,t}$ is the abnormal return from the acquisition event, $R_{i,t}$ is the return of the acquiring firms stock and the rest of the equation is the expected return presented in the previous formula (15). The short-term event windows used in this thesis are 1 days, 7 days, 30 days, 90 days and one year.

When the abnormal returns for every executed merger events are defined, they will be included in the portfolios. The average abnormal returns are calculated for the portfolios for specified time periods are acquired with following formula.

(17) $AAR = \frac{1}{N} \sum_{i=1}^{N} A\,R_{i,t}$

where, *AAR* is the average abnormal return for acquiring companies after the merger, *N* is the total number of the companies that have executed merger transactions and $AR_{i,t}$ is the abnormal return for specific stock included in the stock portfolio. When the average abnormal

returns are calculated for the different time periods, their cumulated abnormal returns can be obtained with following formula.

(18) $CAR_{(t1,t2)} = \sum_{t=t1}^{t2} A\,R_{i,t}$

where, the abnormal returns are summed up from the whole event window between *t1-t2*. This is cumulative return for single event type among multiple observations of merger events. Usually the merger and acquisition research, which exploit event study methodology, contains many individual merger observations. These individual observation events' cumulative abnormal returns can be extended to cover the whole portfolio by defining the average cumulative abnormal returns with following formula.

(19) $CAAR_{(t1,t2)} = \frac{1}{n} \sum_{i=1}^{n} CAR(t1, t2)$

where, the $CAAR_{(t1,t2)}$ is the cumulative average abnormal returns for the time periods *t1-t2* for all individual events and the $CAR(t1, t2)$ is the cumulative abnormal returns for individual merger observation events. This enables the identification of merger impacts on short-term.

The simple t-statistics are used in this thesis to test statistical significance of abnormal returns caused by the merger events on 5 percent significance level. The significance of abnormal returns is tested on pre-crises period, whole time period and post-crises period. The parametric simple t-test requires that the abnormal returns follow the normal distribution. The t-test follows the following formula.

(20) $t = \frac{\bar{X} - u_0}{S/\sqrt{n}}$

where, t is the statistical significance weighted against the 5 percent significance level, $\bar{X}$ is the average mean of cumulated abnormal returns for the sample, u_0 is the zero hypothesis, *S* is the standard deviation of the error in the sample and *n* is the overall number of the observations included in the sample. The zero hypothesis in this case is that merger events did not generate abnormal returns. In other words, u_0 equals zero.

The reason for selection of one-factor based model of measuring the short-term market performance is that the usage of multifactor models in event studies are restricted. According to McKinley's paper explanatory power of additional factors used in multifactor models possess only limited capability to explain the market performance. This is due to the variance related issue of the additional factors capability to reduce the variance of abnormal factors. The variance reduction of abnormal returns can be achieved through market benchmark portfolio formation by selecting firms with similar attributes or similar operating industries. In this thesis the variance reduction is attained through the formed benchmark index, which consists of publicly traded companies operating in the technology industry in the Nordics. The short-term performance methodology is needed to test the first hypothesis.

7.2.2 Long term financial performance

The previous merger research has presented two different ways to measure long-term financial performance. First method is called calendar-time portfolio approach and the second one is buy-and hold return approach. Both methods require the building of stock portfolios. Usually the time window extends to months and even years, when measuring the long-term performance and this causes several problems to the reliability of the results. Lyon, Barber & Tsai (1999) underline the problems in their paper by stating that cross sectional dependency between the sample observations may distort the t-statistics and investor experience in post situations is not properly measured. The investor experience may be not measured correctly, because the skewness bias, rebalancing bias and survivor bias. Skewness bias means that the long run abnormal return distribution is positively skewed, and this distorts the t-statistics. Rebalancing bias are caused by the periodic calculation of benchmark portfolio returns, that are rebalanced every time the periodic calculation is made, compared to not rebalanced sample merger firm returns. Survivor bias arise, when the merger sample firms are followed in the long-term event window, but the benchmark portfolio firms start their trading in the following month to the event month. The buy-and hold return approach can be used to avoid most of these problems by constructing the benchmark portfolios in a way that survivor- and rebalancing bias are excluded from the portfolios. The skewness bias can be controlled by using the standard statistical skewness corrected version of t-statistics and by keeping the estimation window sufficiently short.

The calendar-time portfolio method eliminates the cross-sectional dependency between the sample observations. Loughran and Ritter (1995) and Brav and Gompers (1997) used this method in practice in their research and were able eliminate most of the cross-sectional dependency, but unlike buy-and hold approach, the calendar-time portfolio method does not take investor experience into account. In this thesis the buy-and hold return approach is used to measure the long-term performance. This is mainly for the reasons of data availability and investor experience measurement, but also topic sets certain requirements. Lyon & et.al. (1999) mention in their paper that in the construction of benchmark portfolios and sample companies it is not necessarily sufficient to use book-to-market and firm ratios, when determining the reference companies for portfolios. They recommend of using other variables. In this thesis the used variable for benchmark portfolio constructing is the industry, where the acquirers and target companies operate. The chosen industries are high technology, technology and telecommunications. These industries were mostly affected by the Dotcom bubble and the company characteristic similarities in the Nordic markets encourage measuring the acquirer performance in the specified time-periods. The survivor- and rebalancing bias are controlled by selecting the benchmark companies from the same operational industry and by calculating the industry return based on these companies. The skewness bias and cross-sectional dependency problem is controlled by keeping the long-term estimation window short. In this thesis the maximum long-term period is 12-months. Other term used is 6-month period. The intended contribution of this thesis is to investigate merger returns on short-and long-term time window in the Nordic markets before, during and after the Dotcom bubble. There is very limited selection of research papers available concerning information technology mergers in the Nordic markets. The buy-and hold returns are calculated by using the following formula:

(20) Buy-and hold return = $\prod_{t=1}^{12}(1 + r_{i,t})$ - 1

in where,

$r_{i,t}$ = raw return of the acquirer stock *i* in the event month *t.*

In order to calculate the buy-and hold abnormal returns the buy-and hold returns of the acquired firms are subtracted with the buy-and hold returns of the Nordic Technology benchmark index. The buy-and hold abnormal returns (BHAR) are formulated with the following formula:

(21) Buy-and hold abnormal return = $\prod_{t=1}^{H}(1 + r_{i,t}) - \prod_{t=1}^{H}(1 + r_{B,t})$

In which,
$r_{i,t}$ = raw return of the acquirer of the stock i in the event month t.
$r_{B,t}$ = the return on benchmark index companies.

To test the second hypothesis the two-sided conventional t-test is conducted with a following formula:

(22) $t_{BHAR} = \frac{BHAR_{mean}}{\sigma(BHAR_H)/\sqrt{n}}$

In where,
$BHAR_{mean}$ = mean buy − and hold returns of the acquirers.
$\sigma(BHAR_H)/\sqrt{n}$ = standard deviation of buy-and hold abnormal returns included in the sample consisting of n firms.

The long-term methodology follows the Ritter's paper (1991) and Barber's & Lyon's paper (1997), in which separate matching firm portfolios are formed as a benchmark for acquirers' average buy-and hold returns for specified time periods. The matching firms are selected based on their similar attributes with the acquirer companies. In this thesis, the matching companies are selected according their operating industry, which is the Nordic technology. The acquirers form five different portfolios, one for each Nordic country and fifth is the Nordics as a whole. Then buy-and hold returns are counted for each of them for 6 months and 12 months event periods and the results are compared against Nordic Technology index benchmark buy-and hold returns. This will indicate, if the acquirers have performed more poorly than their Nordic technology industry.

Jakobsen and Sorensen have studied IPOs long term stock performance in the Danish markets in their paper (2001) and this study is one of the few available papers in the Nordic markets measuring the long-term stock performance with buy-and hold returns. They used data derived between the years 1984-1997 of the listing companies noted in the Copenhagen Stock Exchange. They concluded in their study that the listing firms' long-term performance

underperforms the Total Danish Stock Index. This cannot be used as a direct comparison to mergers, but still earlier studies of IPOs and mergers indicate underperformance to their benchmark indices, so certain indication of buyer's underperformance on the long run can be drawn from their findings. Another significant paper from the Nordics is also published by Jakobsen et. al. (2000) and it focuses on long-term merger performance of the buyer. Their major finding underlined is that the acquiring firms underperformed the market index by 10.4 percent after three years, respectively. In contrast with the Nordic literature, the implication is to expect underperformance of acquirers to be present in the short-term as well as long-term time periods.

The third hypothesis, which states; *There is a difference between pre-crises buy-and hold abnormal returns and post-crises buy-and hold abnormal returns created by mergers and acquisitions,* is tested with conventional t-statistics for samples with unequal variances and sample sizes by using following formulas.

(23) $SE_S = \sqrt{\frac{s_1^2}{n_1}} + \sqrt{\frac{s_2^2}{n_2}}$

As both unequal variances and unequal sample sizes can be taken into consideration at the same time through weighted average of standard errors, the t-statistics can be then calculated as followed:

(24) $t_{stat} = \frac{\bar{Y}_1 - \bar{Y}_2}{se_p}$

8. EMPIRICAL RESULTS

8.1. Descriptive Statistics

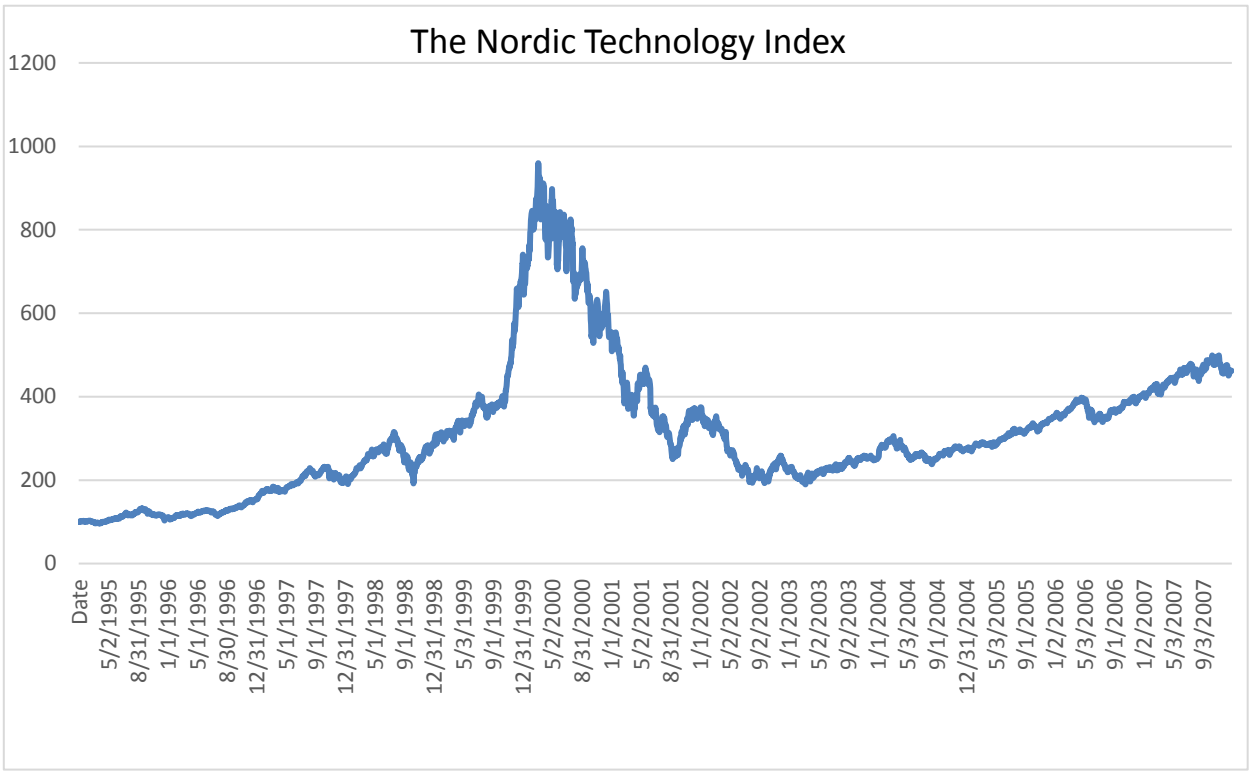
The results of short-term and long-term profitability are presented on this part of the study. The Benchmark Index used in this thesis is called the Nordic Technology Index and it is composed of the companies, which were publicly listed in any Nordic stock exchanges and were not involved in acquisitions in the specified time period. The Nordic Technology index consists of 455 companies that have operated technology industry in the Nordic markets between 1995-2006. Some of the companies have gone bankrupt, bought out or delisted for some other reason. In these cases, their weight is removed from the index during the quartile update check in which the company related weights are recalculated and updated, if necessary. The Table 1 describes the descriptive statistics related to the daily returns and performance of the Nordic Technology Index during the whole investigation period of the 1995 to 2006. The descriptive statistics for the benchmark index are stated in the table 1.

Table 1: Descriptive Statistics for the Nordic Technology Index.

Mean Average Daily Return	Standard Deviation	Minimum Return	Maximum Return	Kurtosis	Skewness	Variance
0.00061	0.0169	-0.119	0.1167	5.021	-0.179	0.00029

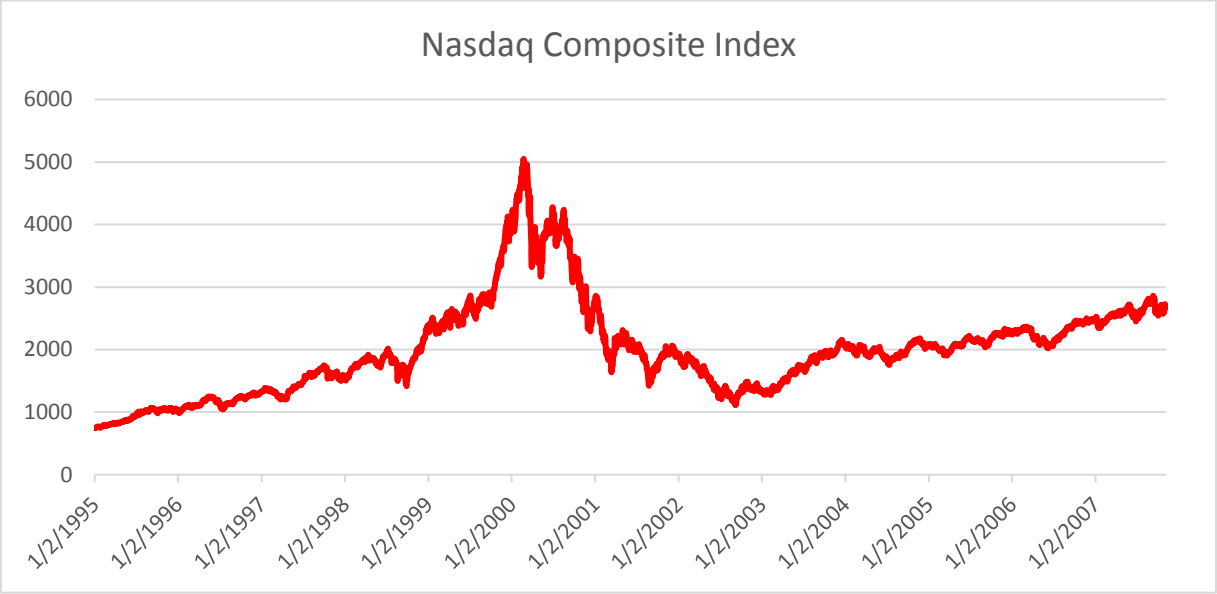
The average daily returns of the benchmark index do not provide as clear indication on the overall development of the benchmark index than the daily prices. The better perception can be attained from the Figure 5.

Figure 5: Development of the Nordic Technology Index between 1995-2006.



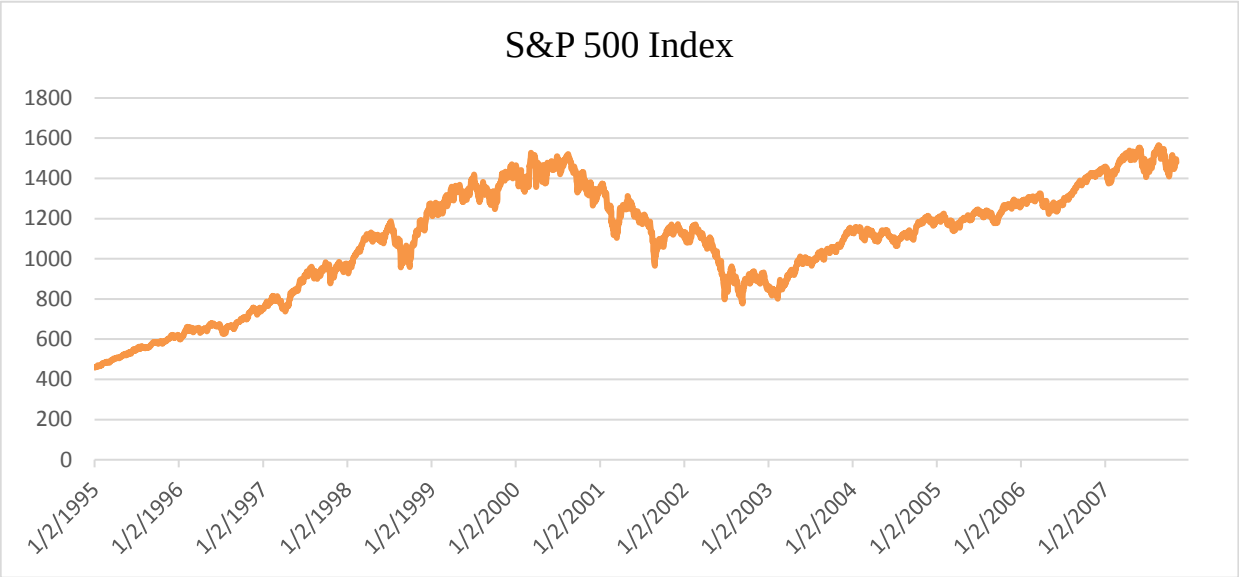
The Figure 5 indicates the daily prices of the Nordic Technology Index and the effect of the Dotcom crises can been seen clearly as sudden rise of prices between 1999-2000 and 2001, when the technology stock prices collapsed nearly 60 percent less than eight months. Ofek and Richardson (2003) studied in their paper the reasons for the sudden technology stock rise, which started in early 1998 and lasted until February of 2000. During that time the Nasdaq Composite Technology Index rose nearly 150 percent. After the February 2000, the index fell staggering 40 percent in less than three months. It is interesting to observe that the Nordic Technology Industry stock pricing follow similar rising and declining pattern that can be observed in the U.S technology stocks between the years 1998-2001. In the Nordics the drop, in the beginning of crises, was not steep as in U.S markets and the price decline started earlier than in the Nordics. The development of the Nasdaq Composite Index can be found in the Figure 6.

Figure 6: Development of the U.S Nasdaq Composite Index between 1995-2006



The most interesting observation that Ofek and Richardson brought up in their paper was comparison between Nasdaq Composite Index and S&P 500 index performance and their reaction to Dotcom crises. As Nasdaq Composite Index consists mainly on technology stocks, it is more sensitive to react on industry related shocks than S&P 500, which comprises of stocks from various industries, technology, being only one industry among them. The S&P 500 index rose 40 percent from early 1998 into February 2000, which is considerably less than the Nasdaq Composite or Nordic Technology index did rise in the same time period. Also, the decline was not as steep as than with Nasdaq Composite index or Nordic Technology index, which fell 40-60 percent less than eight months. S&P 500 fell less than ten percent in the same period. The S&P 500 development is described in Figure 7. The sensitivity factor, which depends on index stock composition, can have large effect on index fluctuations, so it is justifiable to use Nordic Technology index as a benchmark proxy for the companies involved with technology mergers and acquisitions to increase the comparability of the results and improve the robustness of the results.

Figure 7: Development of the S&P 500 Index between 1995-2006



8.2. Short-term Performance Results

This sub-chapter presents the short-term abnormal returns attained through methodology presented in the previous chapter. The time periods under inspection are pre-crises period covering the acquisition conducted from 1995 until August 1999, post-crises period covering the transaction executed after August 2001 and the whole period of 1995 to 2006. Each time periods consists of five event windows around the actual acquisition announcement date. These event windows are 1-day, 7 days, 30-days, 90-days and one year after the merger announcement. The usage of five different windows enable to investigate the short-term profitability also semi long-time frame. If any of the event window dates are banking holidays or other non-trading days, the event date is transferred to next trading day. The mean abnormal returns are derived with market model for each Nordic country and Nordics as a whole. The whole-time period of 1995-2006 included 132 technology related mergers, in which 69 were conducted in Sweden. The table 2 indicates the cumulative mean abnormal returns for each Nordic country.

Table 2, Cumulative average abnormal returns of acquirers between 1995-2006.

The short abnormal returns for the whole event period of 1995-2006.										
	1 day		7 days		1 month		3 month		12 month	
Sweden										
CAAR	0.006		0.000		-0.007		-0.053		-0.185	
T-stat	(1.1)		(.03)		-(.46)		-(1.24)		**-(2.29)**	**
S.dev	0.044		0.074		0.127		0.356		0.667	
S.Error	0.005		0.009		0.015		0.043		0.081	
Observations	69		69		69		69		69	
D.f	68		68		68		68		68	
Finland										
CAAR	0.003		0.004		0.044		0.085		-0.006	
T-stat	(.75)		(.72)		(1.75)	*	(1.92)	*	-(.06)	
S.dev	0.017		0.027		0.116		0.203		0.441	
S.Error	0.004		0.006		0.025		0.044		0.096	
Observations	21		21		21		21		21	
D.f	20		20		20		20		20	
Denmark										
CAAR	0.001		0.000		-0.018		-0.007		-0.011	
T-stat	(.22)		(.)		-(.53)		-(.14)		-(.08)	
S.dev	0.021		0.048		0.163		0.259		0.680	
S.Error	0.004		0.010		0.034		0.054		0.142	
Observations	23		23		23		23		23	
D.f	22		22		22		22		22	
Norway										
CAAR	-0.006		-0.028		-0.021		-0.104		-0.435	
T-stat	-(.82)		-(1.94)	*	-(.86)		**-(2.4)**	**	-(1.92)	*
S.dev	0.034		0.064		0.106		0.189		0.989	
S.Error	0.008		0.015		0.024		0.043		0.227	
Observations	19		19		19		19		19	
D.f	18		18		18		18		18	
Nordics										
CAAR	0.003		-0.003		-0.003		-0.031		-0.162	
T-stat	(.87)		-(.58)		-(.24)		-(1.16)		**-(2.63)**	***
S.dev	0.036		0.064		0.131		0.305		0.710	
S.Error	0.003		0.006		0.011		0.027		0.062	
Observations	132		132		132		132		132	
D.f	131		131		131		131		131	

*/**/***, statistically significant at 10%, 5% and 1% level.

The acquiring companies provide zero abnormal returns or insignificant abnormal returns on 1-day or 7-days event windows. The abnormal returns tend to turn negative as longer the event window is extended. Finland was an exception with positive abnormal returns of 4.4% and 8.5% in one-month and three months event windows after the event date, respectively. The 12-month event window provides slight negative abnormal return in Finland. Sweden, Norway, Denmark and the Nordics as a whole, provided mainly negative abnormal returns and magnitude of negative abnormal returns seem to grow larger with the extension of the event window. The two-way t-statistics test was then conducted to indicate, if the abnormal returns were significantly different from the return provided Nordic Technology Index, which is used as proxy for average market return. The t-statistics indicated no statistical significance at 5% level for positive abnormal returns for the whole period. Finland attained some (4.4% and 8.5%) positive abnormal returns on 10% significance level, but the significance was not sufficient to fulfill the required significance level of 5%.

More interestingly, t-statistics test revealed that the negative abnormal returns were statistically significant in Sweden, Norway and Nordic markets. The significance is stronger the longer the event window is extended. Norway and Sweden provided negative abnormal returns, which were statistically significant at 5% level at 3-and 12-month event windows. The most interesting find was the statistical significance of negative abnormal returns for Nordic markets at 1% significance level at 12-month event window. This indicates that the Nordic acquirers performed much worse than the Nordic technology industry in general did. The findings support the hypothesis 1, which stated: *Mergers and acquisitions did not provide abnormal returns for acquirer's stockholders in Nordic-markets neither in short-term or long-term time frame.* On the contrary, the findings support completely opposite that the acquisitions made the acquirers to perform more poorly than the Nordic technology industry in general on short- and long-time frame. Next step is to examine, if the same result applies into pre-crises and post-crises periods. The time window from August 1999 into August 2001 is excluded to investigate the performance without period of highest volatility of the crises. The tables 3 and 4 present the results for pre-crises and post-crises periods.

Table 3, The pre-crises cumulative average abnormal returns

The short abnormal returns in pre-crises period of 1995 until August 1999									
	1 day		7 days	1 month		3 months		12 months	
Sweden									
CAAR	-0.001		-0.006	-0.003		0.012		0.043	
T-stat	-(.11)		-(.27)	-(.11)		(.3)		(.56)	
S.dev	0.030		0.090	0.125		0.164		0.327	
S.Error	0.007		0.021	0.030		0.039		0.077	
Observations	18		18	18		18		18	
D.f	17		17	17		17		17	
Finland									
CAAR	0.004		0.007	0.045		0.112		-0.062	
T-stat	(.45)		(.9)	(1.13)		(2.74)	*	-(.62)	
S.dev	0.018		0.016	0.089		0.091		0.221	
S.Error	0.008		0.007	0.040		0.041		0.099	
Observations	5		5	5		5		5	
D.f	4		4	4		4		4	
Denmark									
CAAR	0.000		0.013	0.045		0.073		0.118	
T-stat	(.03)		(.94)	(2.17)	*	(2.07)	*	(.91)	
S.dev	0.023		0.049	0.075		0.127		0.463	
S.Error	0.006		0.014	0.021		0.035		0.128	
Observations	13		13	13		13		13	
D.f	12		12	12		12		12	
Norway									
CAAR	-0.017		-0.050	0.018		-0.082		-0.477	
T-stat	-(1.2)		-(1.79)	(.51)		-(1.21)		-(1.75)	
S.dev	0.031		0.062	0.079		0.151		0.609	
S.Error	0.014		0.028	0.035		0.068		0.273	
Observations	5		5	5		5		5	
D.f	4		4	4		4		4	
Nordics									
CAAR	-0.002		-0.004	0.021		0.032		-0.009	
T-stat	-(.43)		-(.33)	(1.25)		(1.3)		-(.13)	
S.dev	0.027		0.072	0.105		0.155		0.447	
S.Error	0.004		0.011	0.017		0.024		0.071	
Observations	41		41	41		41		41	
D.f	40		40	40		40		40	

*/**/***, statistically significant at 10%, 5% and 1% level.

Table 4, The post-crises cumulative average abnormal returns

The short abnormal returns in post-crises period of September 2001 until 2006					
	1 day	7 days	1 months	3 months	12 months
Sweden					
CAAR	0.002	0.007	0.021	0.049	0.023
T-stat	(.27)	(.6)	(1.07)	(1.16)	(.3)
S.dev	0.035	0.061	0.111	0.241	0.438
S.Error	0.006	0.011	0.020	0.043	0.077
Observations	32	32	32	32	32
D.f	31	31	31	31	31
Finland					
CAAR	-0.002	0.005	0.047	0.088	0.037
T-stat	-(.37)	(.68)	(1.55)	(1.55)	(.3)
S.dev	0.015	0.025	0.106	0.197	0.429
S.Error	0.004	0.007	0.031	0.057	0.124
Observations	12	12	12	12	12
D.f	11	11	11	11	11
Denmark					
CAAR	0.006	-0.009	0.007	0.040	0.030
T-stat	(.97)	-(.46)	(.23)	(.69)	(.17)
S.dev	0.016	0.049	0.072	0.144	0.433
S.Error	0.007	0.007	0.014	0.029	0.058
Observations	6	6	6	6	6
D.f	5	5	5	5	5
Norway					
CAAR	0.019	0.014	0.033	0.005	-0.121
T-stat	(1.43)	(.6)	(.98)	(.07)	-(.78)
S.dev	0.035	0.061	0.090	0.166	0.413
S.Error	0.013	0.023	0.034	0.063	0.156
Observations	7	7	7	7	7
D.f	6	6	6	6	6
Nordics					
CAAR	0.004	0.005	0.027	0.051	0.009
T-stat	(.87)	(.74)	(1.9) *	(1.76) *	(.15)
S.dev	0.031	0.055	0.106	0.219	0.439
S.Error	0.004	0.007	0.014	0.029	0.058
Observations	57	57	57	57	57
D.f	56	56	56	56	56

*/**/***, statistically significant at 10%, 5% and 1% level.

The table 3 indicate that abnormal returns have the tendency to turn positive and larger, when the event window covers the pre-crises period. The 12-month event window provided negative abnormal returns in Finland and Norway and slight negative return in Nordics as a whole. Despite of the positive abnormal returns none of the event windows were not statistically significant on 5% level. Danish acquirers attained positive abnormal returns at 10% significance level at one-month and 3-months event windows and Finland at 3-months event window. The results reveal that the pre-crises abnormal returns were not statistically significant in any Nordic country or the markets as a whole. The results support the first hypothesis that the mergers and acquisitions would not provide abnormal returns for the acquirers. Findings are in line with results attained from the whole period, with the difference that the whole inspection period indicated that the acquisitions made by acquirers performed more poorly than the Nordic technology industry in general did.

The table 4 provides results for the post-crises period. The trend of appearance of positive abnormal returns and their larger magnitude can be identified also in post-crises period. The post-crises period did not neither provide statistically significant results at 5% level or reveal significant negative abnormal returns on 5% level unlike the whole inspection period did. Nordic markets were significant at 10% level at one-month and three-months event windows and hence provided slightly higher positive returns than the Nordic technology industry as a whole. Any of the selected study periods (pre-crises, post-crises or whole period) did not produce statistically significant positive abnormal returns on short-term or semi long-term time period. Therefore, the first hypothesis holds true pointing out the mergers did not produce positive abnormal returns for acquirers on short-or semi long-term time frame. On the other hand, the whole-time period provided statistically negative abnormal returns in Nordics, Norway and Sweden, but in the pre-crises and in the post-crises periods this trend was absent. It seems likely that the crises peak period between August 1999 and August 2001 have affected the results of the whole inspection period causing significant negative abnormal returns for the whole-period. The findings were in line with the findings of Jakobsen’s and Voetmann’s results (2003) concerning the overlapping time period of pre-crises. Neither did not provide significant abnormal returns for acquirers.

8.3 Long-term Performance Results

Table 5, Buy-and hold returns for the whole time period

Buy-and hold returns for the whole time period of 1995-2006			
		6 months	12 months
Sweden	Average BHR of Acquirers	0.057	0.007
	The Nordic Technology Index Average BHR	0.108	0.138
	BHR abnormal returns	-0.051	-0.131
	S. dev	0.402	0.485
	T-stat	-1.06	-2.25 **
	Observations	69	69
Finland	Average BHR of Acquirers	0.124	0.150
	The Nordic Technology Index Average BHR	0.058	0.135
	BHR abnormal returns	0.066	0.015
	S. dev	0.312	0.525
	T-stat	0.97	0.129
	Observations	21	21
Denmark	Average BHR of Acquirers	0.098	0.320
	The Nordic Technology Index Average BHR	0.238	0.410
	BHR abnormal returns	-0.140	-0.089
	S. dev	0.405	0.864
	T-stat	-1.66	-0.50
	Observations	23	23
Norway	Average BHR of Acquirers	-0.108	-0.131
	The Nordic Technology Index Average BHR	0.176	0.229
	BHR abnormal returns	-0.284	-0.360
	S. dev	0.443	0.673
	T-stat	-2.80 **	-2.33 **
	Observations	19	19
Nordics	Average BHR of Acquirers	0.051	0.065
	The Nordic Technology Index Average BHR	0.132	0.198
	BHR abnormal returns	-0.082	-0.134
	S. dev	0.409	0.611
	T-stat	-2.29 **	-2.51 **
	Observations	132	132
*/**/***, statistically significant at 10%, 5% and 1% level.			

In contrast with the second hypothesis, *Acquisitions did not provide positive buy-and hold abnormal returns on the long term*, the whole event period provided, as described in the table 5, positive buy-and hold returns for the acquirers with the exception of Norwegian acquirers, which returned negative buy-and hold returns. The Nordic Technology Index (which consists of firms operating in High Technology, Technology or Information Technology in the Nordics and were not involved in acquisitions) provided higher buy-and hold returns for the stockholders than the technology firms involved in acquisitions. Due to this, even though the buy-and hold returns were positive for the acquirers, the buy-and hold abnormal returns formed to be heavily negative for the acquirers. The only exception was Finland in which the buy-and hold abnormal returns were higher than the benchmark index provided, and Finland returned positive 6.6 percent at 6-month time period and positive 1.5 percent at 12-month time period, respectively. The acquirers underperformed their benchmark matching companies (The Nordic Technology Index) in Sweden, Denmark, Norway as well Nordics as a whole in the event window covering the whole time period. The findings validate the second hypothesis, which stated that acquisitions did not provide positive buy-and hold abnormal returns for the acquirer. Norway, Sweden and Nordics as a whole, provided statistically significant underperformance for the acquirers at 5% significance level in time period. In Sweden the statistical significance was present only at 12-month time frame.

In Sweden the acquirers underperformed the benchmark index by 5.1 percent in six-month time frame and 13.1 percent on 12-month time period. In Denmark the abnormal buy-and hold returns were negative by 14.0 percent at 6-month time frame and negative 8.9 percent at 12-month time period. Norway acquirers underperformed the benchmark index by staggering negative 28.4 percent at 6-month time frame and negative 36.0 percent at 12-month time period. Nordics abnormal buy-and hold returns formed to be negative as well with 8.2 percent negative return at 6-month time frame and negative 13.4 percent at 12-month time period. Even though the underperformance was statistically significant in Norway, Sweden and Nordics as whole at 5% significance level, the results may be distorted as the crises period of 2000-2001 is included in the sample. Finland was the only Nordic country, which provided positive buy-and hold abnormal returns, but they were not statistically significant. The second hypothesis is validated for the whole time period in contrast with the results and Nordics as a whole returned statistically significant underperformance at 5% significance level. Still to minimize the distortion caused by the crises period the buy-and hold abnormal returns are scrutinized through two sub-periods (pre-crises and post-crises

periods) to minimize the effects of the crises period of 2000-2001. The tables 6 and 7 presents the results for these sub-time periods.

Table 6, Buy-and hold returns for pre-crises period

Buy-and hold returns for the pre-crises period of 1995 until August 1999			
		6 months	12 months
Sweden	Average BHR of Acquirers	0.198	0.300
	The Nordic Technology Index Average BHR	0.207	0.372
	BHR abnormal returns	-0.010	-0.072
	S. dev	0.472	0.561
	T-stat	-0.09	-1.06
	Observations	18	18
Finland	Average BHR of Acquirers	0.174	0.076
	The Nordic Technology Index Average BHR	0.274	0.369
	BHR abnormal returns	-0.100	-0.293
	S. dev	0.121	0.167
	T-stat	-1.80	-3.81 **
	Observations	5	5
Denmark	Average BHR of Acquirers	0.222	0.494
	The Nordic Technology Index Average BHR	0.283	0.638
	BHR abnormal returns	-0.061	-0.144
	S. dev	0.490	0.983
	T-stat	-0.45	-0.53
	Observations	13	13
Norway	Average BHR of Acquirers	-0.356	-0.372
	The Nordic Technology Index Average BHR	0.191	0.644
	BHR abnormal returns	-0.547	-1.016
	S. dev	0.283	0.469
	T-stat	-3.86 **	-4.33 **
	Observations	5	5
Nordics	Average BHR of Acquirers	0.139	0.262
	The Nordic Technology Index Average BHR	0.255	0.551
	BHR abnormal returns	-0.116	-0.289
	S. dev	0.454	0.754
	T-stat	-1.64	-2.45 **
	Observations	41	41

*/**/***, statistically significant at 10%, 5% and 1% level.

Table 7, Buy-and hold return for the post-crises period

Buy-and hold returns for the post-crises period of September 2001 until 2006			
		6 months	12 months
Sweden	Average BHR of Acquirers	0.145	0.148
	The Nordic Technology Index Average BHR	0.099	0.199
	BHR abnormal returns	0.046	-0.051
	S. dev	0.361	0.401
	T-stat	0.72	-0.72
	Observations	32	32
Finland	Average BHR of Acquirers	0.099	0.207
	The Nordic Technology Index Average BHR	-0.009	0.087
	BHR abnormal returns	0.108	0.120
	S. dev	0.360	0.607
	T-stat	1.37	0.68
	Observations	12	12
Denmark	Average BHR of Acquirers	0.032	0.130
	The Nordic Technology Index Average BHR	0.106	0.166
	BHR abnormal returns	-0.075	-0.036
	S. dev	0.190	0.483
	T-stat	-0.96	-0.17
	Observations	6	6
Norway	Average BHR of Acquirers	0.011	-0.017
	The Nordic Technology Index Average BHR	0.039	0.105
	BHR abnormal returns	-0.028	-0.122
	S. dev	0.251	0.339
	T-stat	-0.30	-0.95
	Observations	7	7
Nordics	Average BHR of Acquirers	0.117	0.141
	The Nordic Technology Index Average BHR	0.073	0.164
	BHR abnormal returns	0.044	-0.023
	S. dev	0.341	0.461
	T-stat	0.98	-0.38
	Observations	57	57
*/**/***, statistically significant at 10%, 5% and 1% level.			

The table 6 indicates the buy-and hold abnormal returns for the pre-crises period of 1995-1999. The acquirers returned higher buy-and hold returns than they returned during the whole time period (with exception of Norway), but so did the Nordic Technology Index as well. This inflicted that acquirers' buy-and hold abnormal returns turned out to be negative for each Nordic country as well as Nordic markets. The 12-month period returned slight negative buy-and hold abnormal returns in Sweden and Denmark. Finland returned staggering 29.3 negative buy-and hold abnormal return and underperformance was significant at 5% significance level. Norway and Nordics performed considerably worse than their benchmark index and their underperformance were statistically significant at 5% significance level. The 6-month time frame provided slight negative buy-and hold abnormal returns in Sweden, Finland and Denmark. Norway and Nordics caused statistically significant underperformance and were significant at 5% significance level. The pre-crises period results validate the second hypothesis as the whole Nordic markets underperformed its benchmark index at 5% significance level.

The table 7 indicates the results for post-crises period and it did provide some positive buy-and hold abnormal returns for acquirers. Sweden, Finland and Nordics as a whole returned some positive buy-and hold abnormal returns for the acquirers and actually managed to perform better than their benchmark index at 6-month time frame. Norway and Denmark lost to their benchmark index slightly at 6-month time period. The 12-month period returned positive abnormal buy-and hold returns in Finland as the rest of the Nordic countries and whole Nordic market returned negative abnormal buy-and hold returns. None of the countries or Nordic markets as a whole did not provide statistically significant results. So, the second hypothesis could not be invalidated or validated for the post-crises period. The results concluded in regard of the second hypothesis indicate that the acquirers underperformed in Norway, Sweden (12-months and whole time period), Finland (12-months and pre-crises period) and Nordics as a whole at 5% significance level for the whole period of 1995-2006 and the pre-crises period of 1995-99. The post-crises period did not provide any statistically significant results considering the performance, but the abnormal returns were more positive and higher compared to the whole- or pre-crises periods. The second hypothesis could be validated for the pre-crises period as well as the whole period, but not for the post-crises period and so the second hypothesis could not be validated completely.

Majority of the countries produced positive average buy-and hold returns through all time periods (whole-time period, pre-crises period and post-crises period), but the acquirers did

underperform compared to their benchmark matching companies of similar industries that were not involved with acquisitions. Generally, the acquirers underperformed their benchmark index. Interestingly the post-crises period did not provide any statistically significant results as other periods did and this raises the third hypothesis under scrutiny.

Table 8, Results for the sub-period difference

Buy-and hold return results for the sub-period difference					
		6 months		12 months	
Sweden		*Pre-crises*	*Post-crises*	*Pre-crises*	*Post-crises*
	BHAR	-0.010	0.046	-0.072	-0.051
	Var	0.236	0.134	0.334	0.166
	t-stat	-0.42		-0.58	
Finland					
	BHAR	-0.100	0.108	-0.293	0.120
	Var	0.018	0.142	0.035	0.402
	t-stat	-1.93 *		-1.99 *	
Denmark					
	BHAR	-0.061	-0.075	-0.144	-0.036
	Var	0.260	0.043	1.047	0.280
	t-stat	-0.36		-0.41	
Norway					
	BHAR	-0.547	-1.016	-0.028	-0.122
	Var	0.100	0.073	0.275	0.134
	t-stat	-2.55 **		-3.60 ***	
Nordics					
	BHAR	-0.116	0.044	-0.289	-0.023
	Var	0.211	0.118	0.583	0.216
	t-stat	-1.89 *		-1.98 *	

*/**/***, statistically significant at 10%, 5% and 1% level.

As the results in the table 8 indicate nearly all the countries returned negative abnormal buy-and hold returns. Only Finland (6 and 12-month periods and post-crises period) and Sweden (6-month period and post-crises period) provided positive abnormal buy-and hold returns. Nordics returned a modest abnormal return of 4.4 percent on 6-month time period. In the contrast of the third hypothesis; *There is a difference between pre-crises buy-and hold abnormal returns and post-crises buy-and hold abnormal returns created by mergers and*

acquisitions, the results show statistically significant results for Norway, Finland and Nordics as a whole. In Finland and Nordics as a whole the post-crises period performed better than the pre-crises period and were statistically significant at 10% significance level. Even though the significance is not sufficient to validate the third hypothesis at 5% level, the 10% significance indicate that there is a solid difference in abnormal returns provided by pre-crises and post-crises time periods. In this case the post-crises period returned higher returns than the pre-crises period did. This is in line with the findings of Campello, Graham & Harvey (2010) in which they concluded that financial turmoil influences merger performance and activity. The higher returns of post-crises period may also be explained with managerial hubris and risk aversion of business decision makers. As a result of depression, the risk aversion of decision makers tends to increase as the managerial hubris tend to decrease due to the losses caused by the crises.

In Norway the results were contrary, and the pre-crises period performed less worse than the post crises time frame. Interestingly the results were statistically significant at 5% and 1% significance level. Still small sample sizes of 5 and 7 are too few to draw a widening conclusion. In the next section the findings of the study are concluded and summarized.

9. CONCLUSIONS

In this thesis the data sample consists of 132 Nordic acquirers that were involved with M&As in the high technology or information communication technology industries during the time period of 1995-2006. Timing-wise the time frame is placed in the the fifth merger wave, which was mainly driven by knowledge-based industries and high intangible asset valuation. The wave ended as the Dotcom bubble went bust in 2001 and the rapid decline in merger activity followed the crises. In the light of previous financial literature, the mergers and acquisitions are driven by various motives and strategic economic reasons, but the main consensus dominating the narrative underlines the positive synergy benefits for main reason for executing mergers and acquisitions. Due to the transaction the company is more valuable than the sum of its parts or the former companies separately. Still the results of previous research are more or less contradictory covering the business rationality or positive post acquisition performance of M&A's.

In this thesis the focus is to study the M&A performance in the Nordic markets over decade of time covering the Dotcom crises period of early 2000. The selected industries were chosen to be high technology and information communication technology as they were most likely to be affected by the fifth merger wave, which was driven by the rise of knowledge-based industry trend. The measurement method is short-term and long-term performance of the acquiring firm and the level of its' performance compared to the industry benchmark, which is Nordic technology in this thesis. The intended contribution of this thesis is to examine the Nordic technology merger market during the fifth merger wave and find out if the mergers will underperform in the Nordics as they do in the majority research papers in which the data is derived from other markets such as U.S or U.K. There is only very limited supply of research papers available covering the Nordic markets in the time of Dotcom era, which underlines the ambition to study the topic in more detailed level. Other major contribution point of this thesis compared to previous literature is the build up of the separate benchmark index (Nordic Technology Index) in order to capture suitable matching benchmark as industry proxy for measurement of merger performance of acquirers. The current technology index, N9000EURGI, was established in the beginning of 2000 and covers only part of the whole inspection window used in this thesis.

The measurement methods for merger performance in this thesis are short-term and long-term financial performance and the research hypotheses are formed based on the previous literature. First the previous literature behind the first hypothesis is summarized to set up the expected results for the short-term financial performance. The first hypothesis stated:

Hypothesis 1: *Mergers and acquisitions did not provide abnormal returns for acquirer's stockholders in Nordic-markets neither in short-term or long-term time frame.*

The hypothesis is based on the findings of previous literature, which indicate significant underperformance for the acquiring firms. Schoenberg (2006) concluded that over 50 percent of British acquirers suffered from negative abnormal returns between the years of 1988-90. Some other studies (Martynova et.al 2006; Shantanu 2009; Carper 1990) state that mergers did not produce significant abnormal returns for the acquiring companies. The results of previous studies indicate a tendency of underperformance for the acquirers. The short-term financial performance is measured with market model in this thesis and the results show statistical significance of underperformance for the acquirers, when the time window covers the whole time period of 1995-2006.

The empirical results revealed that the negative cumulative abnormal returns were statistically significant in Sweden, Norway and Nordic markets. The significance is stronger the longer the event window is extended. Norway and Sweden provided negative cumulative abnormal returns, which were statistically significant at 5% level at 3-and 12-month event windows. The most interesting find was the statistical significance of negative cumulative abnormal returns for Nordic markets at 1% significance level at 12-month event window. This indicates that the Nordic acquirers performed much worse than the Nordic technology industry in general did. So, the hypothesis could be validated concerning the positive cumulative abnormal returns, because the statistical significance of positive abnormal returns was absent. The hypothesis is invalidated for the negative abnormal returns as the underperformance of the acquirers returned statistically significant negative abnormal returns. Finland was the only country which returned positive abnormal returns, but they were only significant at 10% significance level, which is not sufficient to invalidate the hypothesis for the case of positive abnormal returns.

The results for the sub-periods of pre-crises and post crises did not show statistical significance at 5% significance level. Some positive cumulative abnormal returns were

significant at 10% significance level in Denmark, Finland and Nordics as a whole. Still the results were not sufficient to invalidate the first hypothesis. Therefore, the first hypothesis holds true pointing out that the mergers did not produce positive cumulative abnormal returns for acquirers on short-or semi long-term time frame. On the other hand, the whole-time period provided statistically significant negative cumulative abnormal returns in Nordics, Norway and Sweden, but in the pre-crises and in the post-crises periods this trend was absent. It seems likely that the crises peak period between August 1999 and August 2001 have affected the results of the whole inspection period causing significant negative cumulative abnormal returns for the whole-period. The previous literature indicated a tendency of underperformance for the acquirers and as light of empirical result this seem to hold true in the Nordics also.

The long-term performance is measured with buy-and hold returns in this thesis for time periods of 6 and 12-monthts after the merger announcement date. The method was selected in order to include the investor experience as part of the results. The cross-sectional dependency may cause skewness bias on longer time periods and to control this issue the time frame of long-term performance has been set to maximum of twelve months. This should prevent distortion of the distributions. The rebalancing and survivorship bias brought up by Lyon, Barber & Tsai (1999), are controlled through the construction and update of benchmark portfolios. Based on the previous merger literature covering the long-term merger performance, the acquisitions did not return positive abnormal buy-and hold returns for the acquiring companies (Jensen & Ruback 1983) and the times of economic turmoil have an effect on acquirers' merger activity (Campello, Graham & Harvey 2010). These findings form the base for the second and third research hypotheses of the thesis.

Hypothesis 2: *Acquisitions did not provide positive buy-and hold abnormal returns on the long term.*

Hypothesis 3: *There is a difference between pre-crises buy-and hold abnormal returns and post-crises buy-and hold abnormal returns created by mergers and acquisitions.*

The empirical results conducted on the Nordic data support partially the earlier findings. Sweden, Norway and Nordics underperformed their benchmark index at 5% significance level. Norway and Nordics were significant at both periods of 6-months and 12-months and Sweden at 12-month period. As the results indicate the second hypothesis is supported by the

Nordic data and thus it can be validated for the whole time period of 1995-2006. The results for pre-crises period of 1995-1999 provide similar results than the whole time period. During the pre-crises period Finland, Norway and Nordics underperformed the markets at 5% significance level at 12-month time period. In Norway the underperformance was also statistically significant at 5% level at 6-month period. Interestingly the post-crises period of 2001-2006 did not provide any statistically significant results, but the returns were higher compared to pre-crises and to the whole time-period. The results support the validation of the second hypothesis at pre-crises time period and whole time period due to the underperformance of acquirers. The results do not support the validation or invalidation of the hypothesis for the post-crises period. The Nordic data is in line with the findings of Jakobsen & Voetman (2003), which indicated slight underperformance for the Danish acquirers and with the results of Tuch & O'Sullivan (2007), which indicated acquirer underperformance in U.S and U.K.

The results for buy-and hold abnormal returns were different between pre-crises period and post-crises period as the pre-crises period showed statistical significance of underperformance for the acquirers and as for the post-crises this feature was absent. As the earlier literature suggest the depressions influence the merger activity of the acquirers and the sub-period results show difference in the pre-crises and post-crises results, thus the third hypothesis becomes under scrutiny. In contrast with the empirical results Finland and Nordics performed better during post-crises period than in the pre-crises period and the difference was significant at 10% significance level. This is an indication of difference in returns between the sub-periods, but the results were not significant at 5% level meaning that the third hypothesis could not be validated. In Norway the pre-crises period returned smaller negative returns than post-crises period and the difference was statistically significant at 5% and 1% significance level at 6-month and 12-month time periods, respectively. In the light of the results the third hypothesis could not be validated as the results provide only few statistically significant results with small sample sizes. Still the significance of 10% level in the Nordics as a whole on both time periods show that certain tendency of sub-period difference does exists.

The empirical results indicate that the Nordic technology mergers are not so different from other industries as the findings are in line with older studies. The tendency of sub-period difference between the pre-crises and post-crises provided by the Nordic data and earlier research can be explained by behavioral approach introduced by Roll (1986) and Sleifer &

Vishny (2003). During the pre-crises period the managerial hubris tend to increase due to the vast amount of available loan money and increased merger activity. This leads often to biased merger premiums and underperformance of acquirer firms. After an economic turmoil the risk aversion of business managers increase and managerial hubris decrease. This leads to better merger performance due to the better decision-making. Economic results indicate that tendency for sub-period difference could be identified even though it was not statistically significant at 5% level.

The empirical results of this thesis are partially in line with the findings of previous studies. The M&As tend to underperform their benchmark industry in the Nordics as well and the managerial hubris of behavioral approach introduced by Roll may have caused at least some difference between the subperiods of pre-crises and post-crises even though it was not statistically significant at 5% level. In the future it would be interesting to extend the data to cover other industries as well such as logistics and financial services, in which the amount of tangible assets can be considered low and see if underperformance do occur on the other industries as well.

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