



Open your mind. LUT.  
Lappeenranta University of Technology

LAPPEENRANTA UNIVERSITY OF TECHNOLOGY

School of Business

A250A5000 Bachelor's thesis

Finance

THE IMPACT OF COMPANIES' DEMERGERS TO THE STOCK PRICES: A FINNISH  
PERSPECTIVE  
YRITYSTEN JAKAUTUMISTEN VAIKUTUS NIIDEN OSAKEKURSSEIHIN:  
SUOMALAINEN NÄKÖKULMA

20.12.2013

Author: Timo Hyttinen  
Opponent: Petri Gostowski  
Supervisor: Elena Fedorova

## TABLE OF CONTENTS

1	INTRODUCTION.....	4
1.1	Background of the research and research gap .....	4
1.2	Objectives of the research and research problem .....	5
1.3	Delimitations .....	6
1.4	Research methodology .....	6
1.5	Structure of the research .....	7
2	FACTORS AFFECTING STOCK PRICES .....	7
2.1	Efficient markets.....	7
2.2	Market psychology .....	8
2.3	Internal value .....	9
2.4	Corporate actions.....	9
2.5	Emission and under pricing .....	10
2.6	Future prospects and other factors.....	11
3	SPIN-OFF COMPANIES.....	12
3.1	Definition of a spin-off.....	12
3.2	Spin-offs' motives .....	13
3.3	Challenges and possible consequences.....	15
3.4	Studies of stock price reactions on spinoffs .....	16
4	DATA AND RESEARCH METHODOLOGY .....	18
4.1	Data.....	18
4.2	Event study .....	19
4.3	Process of event study .....	20
4.4	Linear regression .....	22
5	RESULTS.....	22
5.1	Total return index and Nasdaq OMXH -index .....	22
5.2	Descriptive statistics .....	25
5.3	Linear regression results.....	29

6	CONCLUSIONS AND RECOMMENDATIONS .....	32
6.1	Summary and main findings.....	32
6.2	Suggestions for further research .....	33
	REFERENCES.....	34
	APPENDICES	
	Appendix 1. Market psychology theories	
	Appendix 2. Table of demerger events	
	Appendix 3. Heteroskedasticity and autocorrelation tests from $t - 30$ to $t + 30$	
	Appendix 4. Heteroskedasticity and autocorrelation tests from $t - 30$ to $t - 1$	
	Appendix 5. Heteroskedasticity and autocorrelation tests from $t$ to $t + 30$	

# 1 INTRODUCTION

## 1.1 Background of the research and research gap

Stock markets are an interesting and a complicated research environment. There has been done a lot of research in the past and there will be probably made even more research in the fields of finance in the future. Strong interest towards worldwide stock markets, stock prices' dramatic changes and excessive stock returns have become more and more subjects of study. The globalization has enabled the possibility for almost anyone to buy or sell stocks with just a couple of mouse clicks with the computer. When considering the use of various financial instruments and their generality in terms of liquidity, is investing in equities definitely one of the most widely used instruments, as Table 1 shows. In ten years, the change has been radical, when comparing the years 1995 and 2005 with each other: the growth of the stock market has been more than 30 percentage points. As one key factor for this, there can be mentioned the rise in share prices during this period of time.

**Table 1.** Allocation of various financial instruments (million EUR) 1995-2005.

Investment funds	31.12.2005		31.12.1995	
Deposits	81 680	22 %	49 008	33 %
Money Market Instruments	34 354	9 %	31 490	21 %
Bonds	56 445	15 %	34 037	23 %
Stocks	203 121	54 %	31 969	22 %
<b>In total</b>	<b>375 600</b>	<b>100 %</b>	<b>146 504</b>	<b>100 %</b>

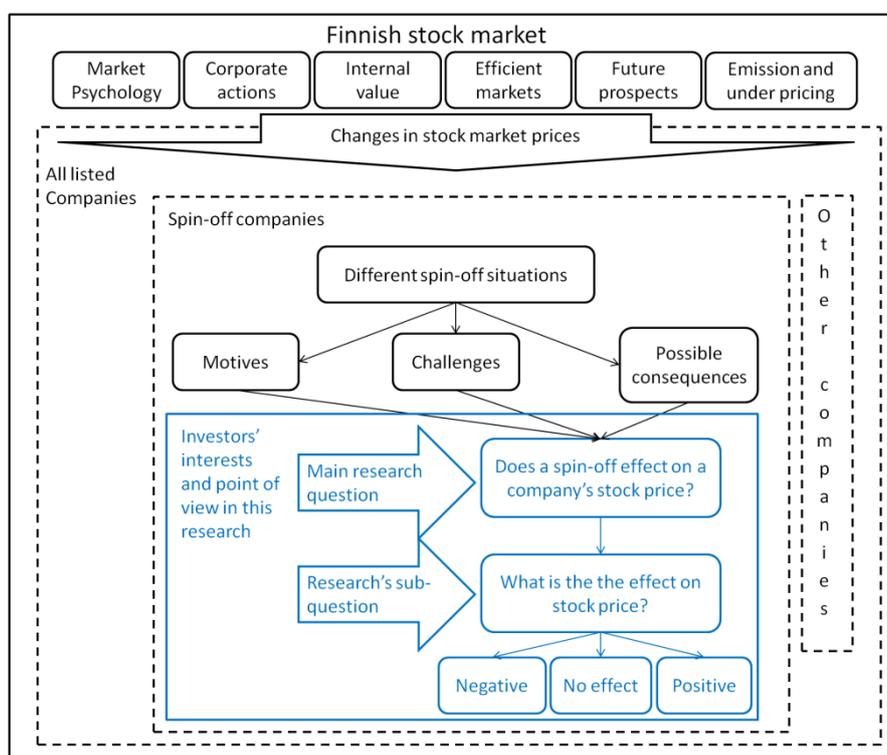
Source: Niskanen & Niskanen (2009)

In recent years, the number of corporate spin-offs has accelerated. However, there is somewhat known about the precise source of any benefits from a demerger. Chemmanur & Yan (2004) have noticed that there has been repeatedly documented that parent-company stockholders gain excess returns by spin-off announcements. Even though the precise source of such value gains is still a matter of considerable debate. Cusatis et al. (2001) show in their research that on the announcement date of a spinoff, both spin-offs and their parents experience significantly positive abnormal returns for up to three years beyond the spin-offs' announcement date. The spin-offs have been a recent subject of conversations in Finland because of a big demerger of YIT in 2013 and an upcoming spinoff of Metso in 2014 which raised an interest and a question whether the spin-offs have any effects in the demerging firms' stock prices in the market and if

they actually do to what extent? In Finland there has been only a little research done close to none on spinoffs. Therefore, this field of finance provides a very interesting subject of study.

## 1.2 Objectives of the research and research problem

The objective of this study is to research what kind of effect a company's demerger has on its divided companies' stock price. If there is any effect, what kind of difference is there in the stock market? In the research there are examined Nasdaq OMX Helsinki -stock markets' spin offs. The study focuses on total return index, what causes the stock prices to change and why does a firm demerge, what are the reasons for it, what challenges does it make for the firm's operations, what advantages it will get from a spinoff. The main research questions and the research's sub-questions can be seen in Figure 1.



**Figure 1.** Research's theoretical framework with main research question and research's sub-question.

As seen from Figure 1, in this research the investor's point of view is taken into account because this way the effects of a demerger on a spin-off company's stock price can be examined the best way. The most interesting thing is to find out, whether there can be found some excess profits or is there going to be losses when investing in shares in some specific moment.

### **1.3 Delimitations**

There were some limitations that had to be acknowledged when writing this bachelor's thesis. There will be left outside other types of company actions such as mergers, acquisitions and selling situations. This research focuses mainly in publicly listed companies because it is easier to obtain information from such firms. Geographically this work is limited to Finland's stock market companies and the reason for this is that this kind of information turned out to be extremely difficult to gather from other stock markets. Also, the bachelor's thesis sets some limits for the size of this research and therefore there has only been chosen a couple of theories, parameters and data that are seen fit and useful for this topic from tremendous amounts of theories, parameters and calculation forms.

In this work there were identified publicly listed companies and their upcoming and newborn companies from year 1994 to 2013 that had made some sort of spin-off in this time period with sufficient data for analysis besides for one exception where both the parent and the daughter company were listed and demerged on the same date. Also, there is one case where the company split into four companies in total. The companies have a large scale of turnover from small to large and total personnel vary a lot depending on the company.

### **1.4 Research methodology**

This research's focus is on a business point of view to interpretivism. As Saunders et al. (2009) acknowledge, it's typical for a business and management-related research, in which objects of a study are often challenging and unique as well as multi-dimensional practical situations. Interpretivism and positivism are often seen as each other's counter parts when researching trends in the philosophy of science. The aim of this thesis is to provide information and hopefully new knowledge for researchers, analysts, teachers, students, companies, management and for investors of course. The work differs from the so-called basic research due to the fixed link to the practice and that's why it can be described as an applied research.

The research is conducted as a quantitative research. The main objective of this study is, however, to get results and give directions for further research in the fields of stock price research, finance and econometrics. The conclusions and proposals for actions of the thesis are based on the researcher's own interpretation and analysis from the collected data and external

environment in the empirical section. (Gill and Johnson, 2010, 120) The data for this research was collected by using triangulation, which can be referred as using various methods at the same time (Saunders et al., 2009, 146; Gill and Johnson, 2010, 221). This allows obtaining a more accurate overall picture of the object of the study and this way increases the validity of the study at the same time. The research data was gathered by exploiting stock market reports, press releases, annual reports, e-mail interviews, research articles and domestic and foreign literature as well as from Bloomberg and Datastream databases. Regression analyses are made with EViews for estimating the specified relationships among variables.

## **1.5 Structure of the research**

This bachelor's thesis includes six chapters in total. Chapter 1 analyses the research gap and the background of the study, states the research question and its sub-question as well as presents the problems and objectives of the work. In addition, Chapter 1 describes delimitations, methodology and structure of the research. Chapters 2 and 3 illustrate the theories that are implemented in this study. Chapter 2 starts with elucidating largely on factors that influence a publicly listed company's share price to change as well as presents chosen parameters for this study which allow researchers to study and examine excess returns on stock market. Chapter 3 as being the second part of the theory section explores the theory of demerging companies including for example motives for a spin-off, challenges and possible consequences for it. Chapter 4 concentrates on research methodology, the process of the event study and linear regression. Chapter 5 introduces the various results of the study. The last and most significant part is Chapter 6, which states the conclusions and recommendations of the thesis by including summary, main findings and suggestions for further research.

## **2 FACTORS AFFECTING STOCK PRICES**

### **2.1 Efficient markets**

Knüpfner & Puttonen (2009) point out that the financial market is populated by a great variety of investors, who are trying their best to be successful and better than their competitors. The key question is: what are the implications of this for the financial markets? For example, in informatively effective markets, the prices respond to new information quickly and accurately.

When talking about share prices, there can be said that market price development reflects information that is available at that moment. As Markus (2002) states, random walk is a term that is commonly used in economics and in finance industry and it relates to the efficient market hypothesis. Fama (1970) divided the market's efficiency degrees as following: Weak form includes all the past data. According to this term, historical data-based strategies, such as technical analysis, are inefficient and there is no possibility to get abnormal returns with it. Medium form says that the stock prices include all the public information about shares and companies. There is no possibility to get excess returns by analyzing corporate balance sheets, profit and loss accounts or dividends. Strong form is expected to include the above-mentioned public and historical data as well as insider information.

In the effective markets, the competition with many rational actors creates a situation in which the value of the security describes all of the currently existing data, as well as what are the future market expectations for the security. Markus (2002) also finds that in the efficient markets, the value of the security reflects consistently a good estimate of the natural value of the security. However, the actual value of the security in the uncertain and factual markets is not possible to determine accurately. The natural value of the securities and their market value may be in conflict.

## **2.2 Market psychology**

The psychology of the market has a big influence in the variation of share prices. It often aims to explain how stock prices behave in the short run. One of the most well-known market psychology theories is the maximum expected value theory. According to it a person behaves always for their own good so that the person ends up choosing always the best solution in line with the best expected value figure. Thus, the stock market investor makes decisions that have the maximum expected value to maximize the return on their investments. However, the problem is that some of the investors do not always act rationally and this can lead to overreactions on the stock market. Shiller (1999) lists seven market psychology theories that can affect the stock market and share prices: prospect theory, regret and cognitive dissonance, cognitive dissonance, anchoring, overconfidence, disjunction effect, gambling behavior and speculation. The theories are introduced and explained more closely in Appendix 1.

Moisio (2008) discovers that the stock market is also affected by all kinds of rumors that are on the move. For example, investors' silent information and all kinds of corner table discussions are not necessarily official information and may be in the worst cases fabricated information. These, however, affect share prices when the general public makes decisions based on rumors. In 2008, rumors circulated about how Toshiba was going to abandon the HD DVD -format and this rumor was awarded with a 5.7 percent price increase.

### **2.3 Internal value**

The internal value is based on a company's price valuation. The company's market value is the number of shares multiplied by the market rate (Kauppalehti, 2012). The company's valuation has been traditionally used to support investment decisions. This way it is possible to estimate the firm's profitability and growth opportunities. After calculating the valuation, the investor compares the calculated share price to the price in stock market. If the stock value is lower than the actual value calculated, the situation is favorable for buying. As Kallunki & Niemelä (2004) state, this situation is good for the long run since stock prices reflect the actual state of a company. The value of the share is likely to rise, because the share is undervalued in the market. Ikäheimo et al. (2011) mention that if the return on equity expectations does not meet the yield requirements of investors, the market price of the share will ultimately drop to a level where the expected return rises to the required level.

### **2.4 Corporate actions**

Interim reports that firms publish four times per year have a significant effect on stock prices. After the interim report, the stock price moves up and down before it stabilizes to a new level (Parviainen & Järvinen, 2012, 50). When releasing the interim report there is always shown the company's financial report as well and if it shows a better financial situation than is generally thought, the stock price increases. Of course, if the economic situation is worse than expected, the effect is the opposite. Publicly listed companies are obligated to release stock newsletters because of the announcement. There must be informed about subjects such as events that substantially affect the company's share price. (Leppiniemi & Puttonen, 2002, 216-217) Hyttinen (2002) points out that the allocation of shares to enterprise's owners causes stock price fluctuations. In Finland, for example, dividend will be paid once a year from the firm's net

earnings and as a result of this, the stock prices often drop. This is due to the fact that the share is worth more to the investors with a dividend than without it. In Finland, the share price drops approximately the same amount as the dividend is, because the company does not pay taxes from this anymore.

Kari-Matti Markus (2009) researched in his Master's thesis about how share prices react to profit warnings in rising and descending markets. The study results do not explicitly draw conclusions that under certain market conditions the stock shares would overreact or under react to profit warnings. However, the study shows that there is a certain common behavior for positive and negative profit warnings in the rising and descending markets. For example, if an investor wants to make excessive profits, at least in theory it would be possible to do so by buying shares on rising market at the end of the day on the release day of a profit warning, or correspondingly on descending market by selling shares short at the end of the day on a profit warning day. In turn, if such a trade would be closed on the second day after a profit warning, it would be possible to receive on average excess returns, assuming that there would be no transaction costs, or they would be lower than the average abnormal return during these two days.

## **2.5 Emission and under pricing**

Ikäheimo et al. (2011) point out that in the early stages when a company needs financing, an emission is often arranged when the company goes publicly listed. After this, the exchange with the company's shares may commence and anyone can buy or sell these shares. Typically companies list themselves publicly in the business cycle at times when demand for the shares is high. This way, the stock share is awarded with a good value in the market, and after the listing the demand is high and the price may start to rise. Kallunki & Niemelä (2004) note that defining a correct and fair exchange rate in the long term after listing is useful for, both, the company and the investors.

For many countries, studies have shown that the share price after the listing is significantly higher than the price at which investors have bought the subscription of shares. The results show that under pricings have been approximately 10 to 15 per cent in total. Martikainen & Martikainen (2009) take note that one key factor in under pricing is the asymmetric information

problem, as there are always a lot of uncertainties associated with a new listing company, which is why an investor should also receive high yield from the high-risk investment. It is alleged that under pricing can also be caused by the share issue organizers because it may be advantageous for them to ensure that the share trading is on a reasonable price level. Under pricing may also give a more positive image of the company. Also, under pricing may be a reasonable way to avoid an undesired situation i.e., nobody would want to buy the shares. The winner's curse is an essential part of under pricing because when an investor is able to participate in the under priced issue of shares, his number of shares received may remain small. When the share issue proves to be a failure, the investor receives a greater share of the stock units, sometimes even all of the subscribed shares.

## **2.6 Future prospects and other factors**

Soininen (2008) researched in his thesis work about the stock market changes when credit ratings change. Based on the results, especially downgrading in the Nordic countries and France, were followed by negative abnormal reactions. Nordic stock markets were although expecting for downgrading in ratings, because there were seen negative abnormal reactions even before the downgrade was published. In turn, in the Nordic countries, both before and after the credit ratings, there occurred positive abnormal returns, so therefore the results regarding ratings are very inconsistent with previous studies. Market anticipation can be seen as a sign that the credit rating companies are at least partially dependent on public information, with a slight delay when making credit rating decisions and, therefore, the markets have the ability to predict and act to the credit rating events. There should be taken into account that the credit rating is an own business. Companies that want well-known rating from credit rating companies such as Standard & Poor 's and Moody's pay from rating. The company's future can be interpreted in many different types of valuation models, but it can never be fully predicted. Future's calculations will always involve uncertainties, factors and so -called "what if" calculations. In the investment decision-making, a successful investment may exponentially increase the value and share value of the firm, but on the other hand, poorly executed investment may drive the company into bankruptcy.

The objective of an informative annual report is to complete and clarify the financial statements. The report also describes the features, risks, uncertainties and development plans, which are important for the company's various investors. Also, analysts make their own assumptions for

the company's future prospects. Publications by various reputable analysts also affect the company's share price indirectly through investors. When the professional analysts publish the company's predictions for the future in prestigious journals that investors venerate, many investors make buying and selling decisions on the basis of these publications, therefore the weight of the words of analysts are implemented indirectly in share rates. Analysts' publications consist mainly of, however, from their own conclusions and opinions. There may start to spread various rumors about the status of the company through these publications. These rumors are dangerous in terms of the company's share price and may affect it in a negative way. Many of the buy and sell decisions are made by numerous computer programs. These computer programs that pick up specific words and phrases from magazines and online publications provide buy and sell signals to investors. For example, improper release or rumor can influence investors' decisions in many ways and this reflects to the company's share price, as for example what has happened many times in Nokia's case.

Knüppfer & Puttonen (2009) state that the company's capital structure affects the firm's future uncertainty. A company should always have equity to the extent that it can handle its running costs, such as salaries and short-term debts. The optimal capital structure of a company is such that the weighted average cost of capital (WACC) is minimized. Meaning that the return on capital employed percent (ROCE) is greater than the WACC. Because investors understand the company's increasing risks of debt money, the company's equity ratio plays an important role when evaluating the company's value. In practice, 25 percent of a debt equity ratio is typical covenant for a loan, and when falling below that, the cost of money usually goes up. Sometimes, too, the company's debt is economically sensible through debt leverage. It works well when the company's return on assets exceeds the cost of liabilities.

### **3 SPIN-OFF COMPANIES**

#### **3.1 Definition of a spin-off**

Brealey & Myers (2006, 910) have defined demergers or in other words, spin-offs as new, independent companies, which are created by removing certain items from the parent company's balance sheet and operations to the new company. After this, the new company's shares are distributed to the parent company's shareholders. Another same kind of situation is

called carve-out, where all or a specified amount of the new shares are sold to new investors through emission. Slovin et al. (1995) determine that spin-offs can be said to be tax free pro rata stock dividends that distribute subsidiary ownership to shareholders of the parent firm. The consolidated company is divided into at least two firms with an identical set of shareholders. A demerger creates a stand-alone public entity that is administratively and financially independent of the parent firm.

As Daley et al. (1997, 258) mention, spin-offs differ from other forms of divestments so that money does not change any hands. A spin-off occurs when a company creates a subsidiary to hold a part of its assets, and then deals the shares of the subsidiary to its shareholders to create a maverick company. Copeland (2004, 786) states that often carve-outs are followed by either immediately or soon with spin-offs, where unsold usually 80 percent of the parent company's shares are divided between the parent company's shareholders. The 80 percent comes from the fact that often in the US, approximately 80 % of a carve-out firm's shares are left to the parent company because of taxation reasons.

### **3.2 Spin-offs' motives**

In financial literature, there have been proposed many reasons for demergers (see, Slovin et al. (1995), Habib et al. (1997), Nanda and Narayanan (1999), Ahn & Denis (2004), Schipper & Smith (1983), Krishnaswami & Subramaniam (1999)):

- reduction of negative synergies, tax and regulatory benefits,
- focus on core business and elimination of low-productivity businesses,
- benefits from restructuring asset management as well as better incentive opportunities,
- improve parent firm value by transferring the ownership and control of a subsidiary to an acquiring firm that can better utilize the assets,
- improving the quality of the information managers and uninformed investors can infer from the prices of the firm's traded securities which may lead to an increase in the expected price of the firm's equity,
- firm may be undervalued if the market cannot observe the cash flows of each individual division in a company, therefore its needs for external financing could resort to divestures such as spin-offs in order to raise capital at a fair market price after the divestiture,

- improved efficiency of capital allocation subsequent to the spinoff, improved contracting,
- decreased information asymmetry, depreciation of uncertainty among investors, growth of transparency and flow of information in the market.

According to Cusatis et al. (2001, 592) and Stewart & Glassman (2001, 529-530) number of studies show that after releasing information about an upcoming spin-off, it generally leads to positive reaction on the stock price reaction. As a result of this, investors often expect the spin-offs to induce improvement in operating profit in the future. Demergers expand opportunities for investors to be involved only in a part of businesses. At the same time the new situation will also improve the company's management and employees' incentive opportunities, since the stock options or share-based system can be deployed for each unbundled and separated listed businesses. Brealey & Myers (2006) conclude that separate stock prices encourage corporate governance to perform better on the long term. The unbundling of non-core activities provides a better opportunity for company's management to focus and develop its main functions.

Krishnaswami & Subramaniam (1999, 74) point out that in the past two decades, mergers, acquisitions and other forms of investments have substantially reduced. The conglomerates are focused on their core competencies and are getting rid of additional activities with spinoffs, disposals and purchases. They studied in total of 1305 companies on a time period of 1990-1999 and their conclusion was that almost half of the companies had made some sort of investment or divestment at that time. Cusatis et al. (2001, 593) state that company executives tend to remark as the background of a positive share price reaction that it is difficult for the investors to appreciate the conglomerates as a whole because of the poor visibility in different activities. Krishnaswami & Subramaniam (1999, 74-75) add to this that company executives and the media in general present an information-aspect as a motive for the spin-offs. In general, the CEOs of the spin-off companies put forth that the spin-offs raise the company's market value as investors are able to evaluate the company's various activities and parts better separately. This is due to the fact that the information asymmetry in the market reduces and the enterprise's earning capability and profitability improves because of the different parts of the company are more transparent than before. Cusatis et al. (2001) acknowledge that the spin-off may reduce the information asymmetry between shareholders, allowing investors to receive greater valuation opportunities from more public knowledge. The investors are able to set price

on at least one unit properly and benefit from a spin-off even though they might not have that much information of all of the firm's units altogether.

Chemmanur & Yan (2004) researched in their article "A theory of corporate spin-offs" about motives for spinoffs and their results imply that spin-offs are more likely if a firm operates in an industry with a high degree of takeover activity. The benefits of a spin-off arise from the increase in takeover pressure on incumbent management following the spin-off. Their results also imply that divisions of a firm which underperform other divisions in the same firm or other firms in the same industry are more likely to be spun off. It is more likely that a takeover by another firm in the same industry can improve performance. Chemmanur & Yan's (2004) discoveries are consistent with the evidence of Krishnaswami & Subramaniam (1999) that parts of a company which are more distantly related to the core business of the firm are more likely to be spun off, because:

1. incumbent management is likely to have lower management ability for these divisions,
2. the synergy between such a division and the rest of the firm is likely to be low,
3. incumbent management's control benefits from such a division will be lower than to a division related to the firm's core business,
4. firms operating in industries characterized by rapid technological change and high growth are more likely to spin off divisions.

### **3.3 Challenges and possible consequences**

Cusatis et al. (2001) discover that the spin-offs had five times the probability to be bought compared to normal companies because they may increase radically the interest in a takeover bid of making a new subsidiary or parent company. Insurance company Phoenix announced in February 2008 of its intention to remove the asset management operations into a separate company. An UBS bank analyst, Andrew Kligerman, recognized that the spin-off of Phoenix would make both of the remaining operations an interesting new target for purchasing for competitors. A number of other analysts evaluated that Phoenix's market value would be a total of at least 16 dollars per share, which is considerably more than the Phoenix's price per share of approximately 11 dollars at that time.

Chemmanur & Yan (2004) mention that as the new spin-offs are born, these new companies are often attractive for acquisitions at which time their new management may end up in a

difficult situation if there has been made a hostile takeover bid of the demerging firm. The new independent management may also want to keep the company's lead to itself and therefore object to the bid. This may also be contrary to the interests of shareholders, because often the offer includes a good premium relative to the share's current market price. One of the fundamental responsibilities of the company's management is to increase the market value of the enterprise. In an implementation of a spin-off, the parent company's management loses control to the detached business, which decreases the power of the administration and also the possible future benefits may diminish. In such circumstances, management's interests may differ from the interests of the owners and therefore the new decisions made might not necessarily be in favor for the owners.

### **3.4 Studies of stock price reactions on spinoffs**

There are a number of studies that show a positive equity market reaction to spin-off announcements (Hite and Owers, 1983; Miles and Rosenfeld, 1983; Schipper and Smith, 1983). Krishnaswami and Subramaniam (1999) have tested that positive market reactions to spin-offs are due to a reduction in the information asymmetry existing in the market for the equity of the parent firm. Desai and Jain (1999) and Daley et al. (1997) mention that both the market reaction to spinoff announcements and the long-term excess returns and operating performance are significantly greater in unrelated spinoffs where subsidiary operates in an industry unrelated to the parent firm than in related spin-offs.

Chemmanur & Yan's (2004) model predicts that the announcement effect of spin-offs will be positive on average as the equity holders in the joint firm will receive a positive abnormal return on the day of the announcement of the spin-off. The scope of this announcement effect is increasing depending on the size of the subsidiary and also in the extent of takeover activity in the industry the joint firm is operating in. The announcement effect will be decreasing in the fraction of equity in the spun-off subsidiary if it is held by the incumbent management of the parent firm. Hite and Owers (1983), Miles and Rosenfeld (1983) and Schipper and Smith (1983) have all calculated significant positive abnormal stock returns of approximately 2 to 3 per cent during the two-day interval surrounding the announcements of spinoffs. Veld & Veld-Merkoulova (2009) used meta-analysis in their research to summarize findings of 26 event studies on spinoff announcements. Table 2 establishes that spinoffs are associated with positive abnormal returns. The total of these returns depends on the study as the researches use different

data sets and different methodologies. As the results show, the country where the studies have so far been emphasized is mainly the US with only a few in other countries and continents.

**Table 2.** Various studies with results of cumulative average abnormal returns (CAAR) around the spinoff announcement.

Study	Country	Research period	Observations	Event window	CAAR (%)
Schipper and Smith (1983)	US	1963-1981	93	-1, 0	2,84
Hite and Owers (1983)	US	1963-1981	123	-1,0	3,3
Miles and Rosenfeld (1983)	US	1963-1980	55	0,1	3,34
Rosenfeld (1984)	US	1963-1981	35	-1,0	5,56
Copeland et al. (1987)	US	1962-1982	188	-1,0	3,03
Denning (1988)	US	1970-1982	42	-6,6	2,58
Seifert and Rubin (1989)	US	1968-1983	51	-1,0	3,26
Ball et al. (1993)	US	1968-1990	39	-1,0	2,55
Vihj (1994)	US	1964-1990	113	-1,0	2,90
Allen et al. (1995)	US	1962-1991	94	-1,0	2,15
Michaely and Shaw	US	1981-1988	9	-1,1	3,19
Slovin et al. (1995)	US	1980-1991	37	0,1	1,32
Seward and Walsh (1996)	US	1972-1987	78	-1,0	2,6
Johnson et al. (1996)	US	1975-1988	104	-1,0	3,96
Daley et al. (1997)	US	1975-1991	85	-1,0	3,4
Desai and Jain (1999)	US	1975-1991	144	-1,1	3,84
Krishnaswami and Subramaniam (1999)	US	1978-1993	118	-1,1	3,28
Mulherin and Boone (2000)	US	1990-1999	106	-1,1	4,51
Maxwell and Rao (2003)	US	1976-1997	79	0,1	3,59
Veld and Veld-Merkoulova (2008)	US	1995-2002	91	-1,1	3,07
Kirchmaier (2003)	Western Europe	1989-1999	48	-1,1	5,4
Veld and Veld-Merkoulova (2004)	Western Europe	1987-2000	156	-1,1	2,62
Sudarsanam and Qian (2007)	Western Europe	1987-2005	157	-1,1	4,82
Murray (2000)	UK	1992-1998	25	-1,1	-0,19
Shauten et al. (2001)	UK	1989-1996	23	-1,1	2,13
Sin Ariff (2006)	Malaysia	1986-2002	85	-1,0	1,8

Source: Veld & Veld-Merkoulova (2009)

Nevertheless, the main conclusion is that spin-offs are associated with strongly significant excess returns that vary from 1,32 % to 5,56 %. As seen in Table 2, the only exception is the study by Murray in 2000 with a non-significant abnormal return of -0.19 percent. Depending on the study, the event window varies from six days before the spinoff announcement to six days after the announcement. An interesting question is whether the wealth effects of spin-offs are limited to the announcement returns, or do they persist in the longer run, after the spin-off is completed. These kinds of studies are summarized in Table 3. It presents the results of different studies on the long-run stock performance of subsidiaries, parents and pro-forma combined firms involved in spinoffs where  $mo.$  is a shortening from months. The long-run performance is measured as the buy-and-hold excess return after the spin-off completion and  $t_{sp}$  represents the spinoff completion date.

**Table 3.** Long-run stock market performance on spinoffs.

Study	Research period	Observations	$t_{sp} +$ 6 mo.	$t_{sp} +$ 12 mo.	$t_{sp} +$ 24 mo.	$t_{sp} +$ 36 mo.
<b>Pro-forma combined firms</b>						
Cusatis et al. (1993)	1965-1988	141		4,7	18,9	13,9
Desai and Jain (1999)	1975-1991	155		7,7	12,7	19,8
Veld and Veld-Merkoulova (2004)	1987-2000	45-61	-2,2	-2,3	4,2	2,0
Sudarsanam and Qian (2007)	1987-2002	129		-2,3	8,3	8,4
<b>Parents firms</b>						
Cusatis et al. (1993)	1965-1988	131	6,8	12,5	26,7	18,1
McConnell et al. (2001)	1989-1995	80	8,6	13,5	19,2	5,1
Desai and Jain (1999)	1975-1991	155		6,5	10,6	15,2
Veld and Veld-Merkoulova (2004)	1987-2000	68-106	3,9	-0,7	6,5	-0,4
Sudarsanam and Qian (2007)	1987-2002	129		-3,9	6,2	7,1
<b>Subsidiaries</b>						
Cusatis et al. (1993)	1965-1988	146	-1,0	4,5	25,5	33,6
McConnell et al. (2001)	1989-1995	96	8,9	7,2	5,8	-20,9
Desai and Jain (1999)	1975-1991	162		15,7	36,2	32,3
Veld and Veld-Merkoulova (2004)	1987-2000	53-70	12,0	12,6	13,7	15,2
Sudarsanam and Qian (2007)	1987-2002	142		7,2	17,5	23,0

Source: Veld & Veld-Merkoulova (2009)

As Table 3 shows, there can be noticed largely that  $t_{sp} + 6$  months excess returns vary from -2,2 per cents to 12, whereas  $t_{sp} + 12$  months returns differ from -3,9 to 15,7 percents. And from  $t_{sp} + 24$  to  $t_{sp} + 36$  there can be seen only two researches where the abnormal yield is negative. Desai & Jain's (1999) study establishes the highest returns with the most observations as well. In its entirety there can be summarized in total of 26 studies that report wealth effects associated with spin-off announcements. In total they show a significantly positive average abnormal return of 3,02 percent during the event window.

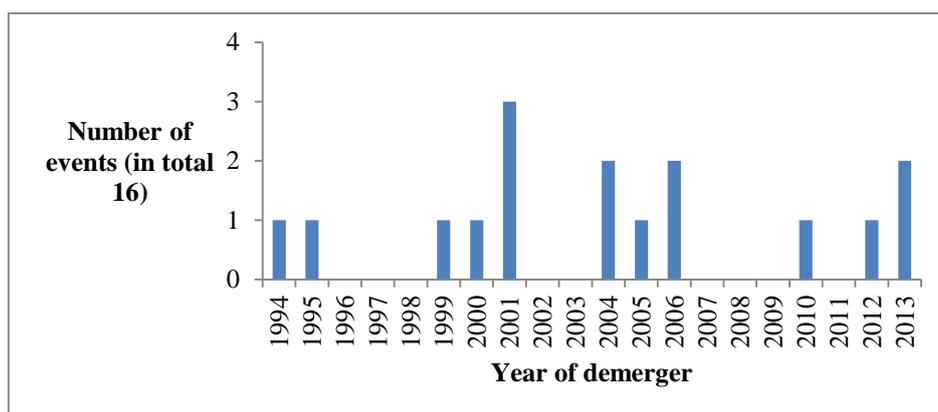
## 4 DATA AND RESEARCH METHODOLOGY

### 4.1 Data

The data used in this research consists of the Finnish stock market's publicly listed companies that have demerged. The analysis period covers the period from April 1994 to August 2013. The OMX Helsinki-index describes the reactions of the Finnish equity market and acts in this study as the stock market index. The daily three-month Helibor to the end of 1999 and after that the daily three-month Euribor present the risk-free returns. Data for the events was imported from Bloomberg and Datastream databases, table of demerger events can be found in Appendix 1. The selected events are chosen because the following criteria are filled:

1. the shares of the demerging firm and at least one established new firm that spinoffs had to publicly tradable,
2. the demerging firms had to be listed on the Finnish stock market.

After these exclusions, there was left 16 events. The events are divided for different time periods as seen in Figure 2. As the figure shows, most popular year for a spin-off has been 2001 with three demergers, following with 2004, 2006 and 2013 with all two demergers.



**Figure 2.** Number of events and year of the spinoff.

## 4.2 Event study

This study is converted on as an event study because it is one of the most common analytical tools especially in the world of finance (Peterson 1989, 36). An event study examines a specific external event of an impact to a selected variable. In this event study, the chosen variables are the demerging company's stock price as well as the newborn's company's stock price. As Vaihekoski (2004, 230) explains, the starting point of an event study is to identify the exact time of a specified event and explore the behavior of the price of the security around this time.

An event study can be used for many different purposes. In accounting and finance research, event studies are used among other things, to determine companies' securities' prices in mergers and acquisitions (MacKinlay 1997, 13). The researcher points out that the event study may also resolve macro-economic events' affect to the markets. Vaihekoski (2004) highlights that the event studies are related to the efficiency of the market in a way that when the market reacts to various events slowly or predictably the investor can benefit from this and then the markets are not efficient.

The validity of the study reflects how well the research methods are used to measure the phenomenon that is under investigation. This study contains data from two known databases, Bloomberg and Datastream, and thus can be considered as a reliable research environment and its validity as high. The data is largely in a numerical form, so therefore only the conclusions after the data has been handled and analyzed, there can be seen researchers' own opinions. The only risk may occur if the results of the data have been calculated incorrectly or as there is a significant amount of data that has to be dealt with manually, there may be some problems.

### 4.3 Process of event study

The first task of the event study is to determine the event of examination and identify the time period during which the values of shares of selected companies is examined. (MacKinlay 1997, 14) In this study, events are selected as the demerger days in the stock market. Share course data will be analyzed 30 stock days prior to the event, on spinoff date, and 30 stock days thereafter. The chosen length of the event window was seen as a good period of time for this type of research and it would also provide sufficient information for valid results. First there has to be calculated the excess returns. As MacKinlay (1997) describes, the excess returns is measured by subtracting the normal rate of return from realized Ex Post returns over the event window period. Abnormal return formula is presented as following (1):

$$(1) \quad AR_{it} = R_{it} - E(R_{it}|X_t) .$$

In the formula  $AR_{it}$  describes excess returns,  $R_{it}$  actual returns and  $E(R_{it}|X_t)$  normal return for time period  $t$ . In this case  $X_t$  is the market rate of return. Capital Asset Pricing Model or CAPM is a model for calculating portfolios' or securities' expected returns. It is based on modern portfolio theory, according to which markets are exposed to systematic and unsystematic risk. Unsystematic risk mirrors the share's company-specific risk. Systematic risk instead describes factors that affect the market as a whole. Non-systematic risk can be get rid of by diversifying the portfolio enough, but there will always be systematic risk, which cannot be decentralized. According to Elton et al. (2003) the expected return on a security depends on the risk-free rate, market return and beta coefficient that describes the systematic risk of a share. The basic model can be expressed in two ways as following (2) and (3):

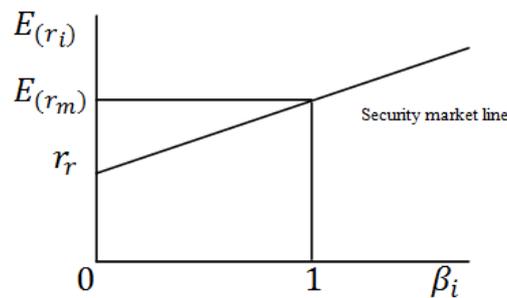
$$(2) \quad (E)R_{it} = R_f + \beta_i(E(R_m - R_f)) + e_{it} ,$$

$$(3) \quad (E)R_{it} = \alpha_i + \beta_i R_{mt} + e_{it} .$$

In the formula,  $(E)R_{it}$  represents the expected return for a share,  $R_f$  is risk-free interest rate, Jensen's alpha is known as  $\alpha_i$ ,  $\beta_i$  is a share's beta coefficient, also known as systematic risk. Both,  $\alpha_i$  and  $\beta_i$ , are calculated by using regression analysis. The symbol for random error term is  $e_{it}$ . The risk-free interest rate is considered generally as the government bonds' income, as they are considered an example of risk-free returns. The market, in turn, is described as the market portfolio, which consists of the target market's shares. The market risk premium  $R_{mt}$  is obtained by reducing risk-free rate  $R_f$  from the market portfolio's expected return  $R_m$ . Beta coefficient can be calculated as following (4):

$$(4) \quad \beta_i = \frac{Cov(R_i R_m)}{Var(R_m)} .$$

The beta coefficient consists of covariance between share returns and the market portfolio return as well as the variance of market portfolio. Bodie et al. (2009) have created a so-called security market line that can be seen in Figure 3.



**Figure 3.** Security market line (Brealey & Myers, 2006).

The security market line shows the connection between the expected return on a security and the beta, which are based on the CAP -model. The figure shows that shares that have a higher beta also have a higher expected yield. The line displays the investment targets that are in balance according to the CAP -model.

## 4.4 Linear regression

Linear regression analysis is used to model the CAP -market model. Since the objective of the study is to examine the spinoff companies' potential abnormal returns, it is essential to examine the estimated regression constants and parameters. When combining regression analysis to the CAP -model, describes the parameter, Jensen's alpha, abnormal returns. If the results indicate non-zero and significant alphas, there can be recognized that there is a possibility for over or under-returns. The risk level is set to 5 % in this study. Assuming the CAP -model to work and the market to be effective, the null hypotheses can be formed as following:

$$H_0: \alpha = 0 ,$$

$$H_1: \alpha \neq 0 .$$

If the null hypothesis will remain in effect, the market can be considered to be sufficiently efficient and abnormal returns are therefore unavailable. However, if the null hypothesis is necessary to reject according to the results, there is a possibility for excess returns.

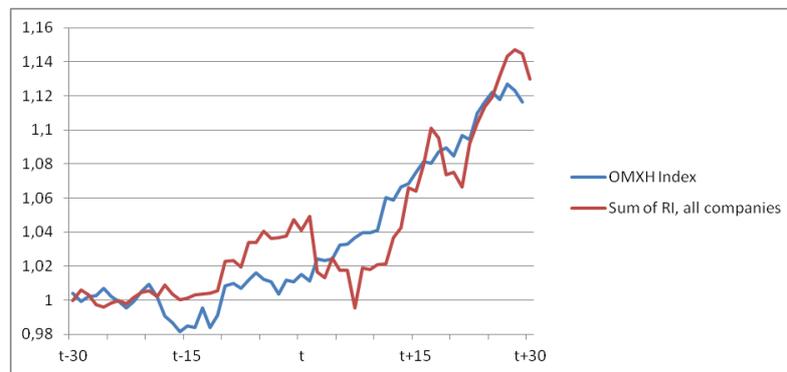
## 5 RESULTS

### 5.1 Total return index and Nasdaq OMXH -index

In this chapter is presented all the results that have been gathered from all used models and analyses. Figures below describe the logarithmic total return indexes (RI) for different companies. The OMXH -index in each figure is formed by gathering the index data from  $t_{-30}$  to  $t_{+30}$  from demergers' same time periods and is then summarized to a total value for each day. From  $t_{-30}$  to  $t_{-1}$  there are only the RI figures of the parent company. From  $t$  to  $t_{+30}$ , there are summarized the RI numbers from the parent and daughter firms altogether. Spinoff day is shown as  $t$ . There are two companies that have two different spinoffs: Kemira + Tikkurila and Kemira + Kemira GrowHow as well as Kone + Konecranes and Kone + Cargotec. The first one from the two shares is defined as the first share and the second one is described as the second share in the text from now on.

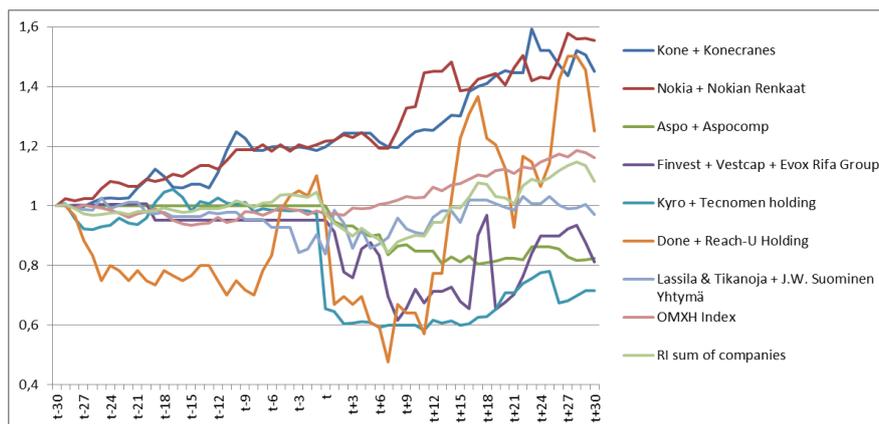
All the total return indexes have been standardized to start from the same point so that all the firms and the OMXH -index can be compared. What is interesting to notice is that there are no

demergers in periods of 1996-1998, 2002-2003 or 2007-2009. In 1996-1998 there might have still been left some negative leftovers from the deep depression of the beginning of 1990. In 2002-2004 the IT bubble burst resulting in setting all the companies on their toes and to check their solvency and financial situation. As for years 2007-2009, this time period was poisoned by the big recession affecting on many companies' ability to grow and prosper. Figure 4 shows the sum of RI for all demerger firms as well as the OMXH -index for comparison. As seen from the figure, both of the lines move close to each other, sum of RI line having more variation, with some higher peaks as well. What can be noticed is that the rise of RI is quite high from moment  $t$  to moment  $t_{+30}$ : over 12 percent.



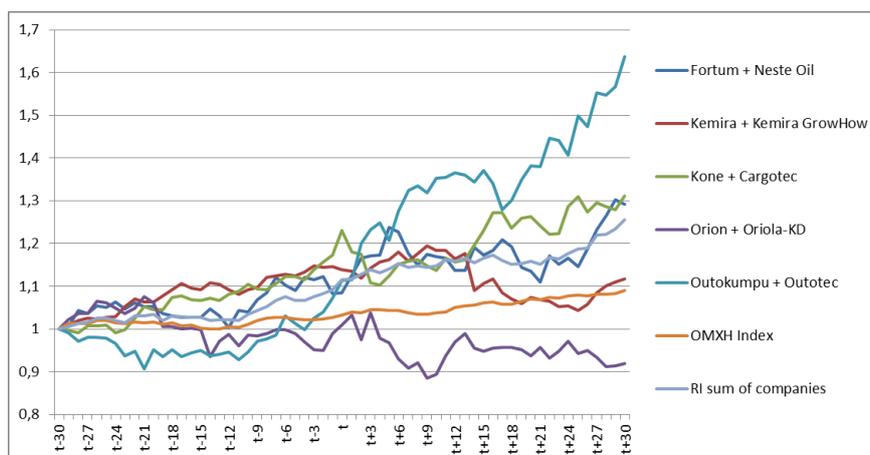
**Figure 4.** Compounded RI of all spinoff companies compared to compounded OMXH -index.

The 16 spinoffs have been divided into three figures to make to comparison and analyzing easier. The figures also include the OMXH -index as well as the sum of RI for the chosen companies just to show the possible differences more clearly. As seen from Figure 5, there is a lot of variety in the different lines. Kone's first share's and Nokia's RI lines show a tremendous growth compared to many other companies: the growth is almost 40 per cent from  $t$  to  $t_{+30}$ . Instead, Done's line has dramatic variance almost the whole event window. The spinoff day,  $t$ , shows a transparent drop in stock prices with Done, Finvest and Kyro in approximately six days after the demerger. There can be noticed that the sum of RI stays almost the whole event window under the OMXH -index.



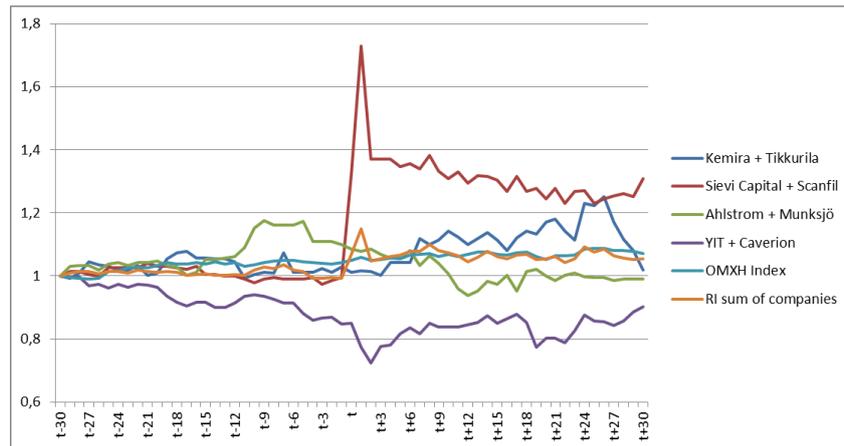
**Figure 5.** Spinoffs' RI, OMXH -index and sum of RI of companies.

Figure 6 differs substantially from Figure 5, since all demerger companies except for Orion are beneath the OMXH -index almost the whole event window. The sum of RI supports the situation as well. The skyrocket is Outokumpu by showing a vast increase in the RI after the spinoff. Kone's second share and Fortum go closely in the same line with the sum of RI line. From  $t_{-30}$  to  $t_{-1}$  the differences are very minimal and after  $t$  the changes start to vary more.



**Figure 6.** Spinoffs' RI, OMXH -index and sum of RI of companies.

Figure 7 establishes the last four companies from 16 spinoffs. The conspicuous company is Sievi Capital, with a huge ascent of almost 70 percent on the spinoff day. What is also noticeable is the direct decline on  $t_{+1}$  and after that the decrease is a lot smaller but still continuous to  $t_{+30}$ . Other companies' lines go quite close in the same way with the OMX -index's line. The sum of total return indexes' line stays also quite close to the index line with some 5-20 per cent changes in some time periods.



**Figure 7.** Spinoffs' RI, OMXH -index and sum of RI of companies.

What is interesting in Figure 7 is the YIT's RI line that stays under the average the whole research period because approximately six months after the demerger the total return index has almost doubled.

## 5.2 Descriptive statistics

Arithmetic mean, median, maximum value, minimum value, standard deviation, skewness, kurtosis and Jarque-Bera of annual return of the logarithmic returns are used as descriptive statistics in different event windows. In Table 4 are gathered results from the whole event window from  $t_{-30}$  to  $t_{+30}$  (61 observations) on every demerging company, OMXH -index as well as risk-free rate from the whole time period from 1994 to 2013. There was chosen to divide the event window for two separate periods for better and more accurate comparison. The first event window in Table 5 is from  $t_{-30}$  to  $t_{-1}$  (30 observations) and the second one is from  $t$  to  $t_{+30}$  (31 observations) and it can be seen in Table 6. The bold values describe the lowest and highest figures of every key figure. Also, there has to be noticed that even after all the calculations and their formulas have been checked and repeated twice, a couple of standard deviation values are still extremely high. The risk-free rate has in every case 4777 observations and the OMXH -index has 4776 observations in total.

**Table 4.** Descriptive statistics for companies' returns from  $t_{-30}$  to  $t_{+30}$ .

	Mean	Median	Max.	Min.	Std. Dev.	Skewness	Kurtosis	Jarque-Bera
Ahlstrom + Munksjo	10,23 %	-0,14 %	13,93 %	-14,35 %	<b>0,2669</b>	0,1717	5,72	19,07
Aspo + Aspocomp	<b>-81,55 %</b>	-1,88 %	12,96 %	-19,28 %	0,2908	<b>-1,1651</b>	8,05	78,63
Done + Reach-U Holding	67,71 %	<b>-36,72 %</b>	<b>60,43 %</b>	<b>-49,26 %</b>	<b>1,3998</b>	0,5438	3,66	4,11
Finvest + Vestcap + Evox Rifa Group	-1,41 %	<b>-3,50 %</b>	34,92 %	<b>-35,65 %</b>	0,4866	-0,1637	<b>15,34</b>	<b>387,40</b>
Fortum + Neste Oil	66,12 %	-1,49 %	<b>9,86 %</b>	<b>-9,15 %</b>	<b>0,2308</b>	0,2704	3,47	<b>1,30</b>
Kemira + Tikkurila	12,35 %	-0,46 %	21,47 %	-14,94 %	0,3707	0,5920	5,78	23,18
Kemira + Kemira GrowHow	50,85 %	<b>69,65 %</b>	<b>5,65 %</b>	<b>-9,22 %</b>	<b>0,1545</b>	-0,8660	5,62	25,05
Kone + Konecranes	105,79 %	18,14 %	18,13 %	-9,48 %	0,3310	<b>0,9937</b>	4,93	19,54
Kone + Cargotec	<b>114,84 %</b>	52,52 %	12,29 %	<b>-6,21 %</b>	<b>0,2280</b>	0,5943	<b>3,12</b>	3,63
Kyro + Tecnomen Holding	<b>-154,00 %</b>	23,26 %	20,93 %	<b>-99,66 %</b>	<b>0,9520</b>	<b>-4,7077</b>	<b>30,77</b>	<b>2184,86</b>
Lassila + Tikanoja + Suominen	17,36 %	-2,97 %	<b>37,83 %</b>	-24,38 %	0,4989	<b>1,3018</b>	11,53	201,99
Nokia + Nokian Renkaat	<b>220,35 %</b>	<b>141,30 %</b>	14,88 %	-10,70 %	0,3443	0,4718	<b>3,05</b>	2,27
Orion + Oriola-KD	<b>-30,79 %</b>	<b>-35,76 %</b>	12,98 %	-16,47 %	0,3429	-0,2323	3,72	<b>1,85</b>
Outokumpu + Outotec	95,33 %	<b>89,96 %</b>	11,80 %	-10,94 %	0,2983	0,0798	<b>2,87</b>	<b>0,11</b>
Sievi Capital + Scanfil	<b>145,05 %</b>	-1,03 %	<b>71,98 %</b>	-31,02 %	<b>0,8149</b>	<b>3,8525</b>	<b>21,94</b>	<b>1063,07</b>
YIT + Caverion	-28,90 %	-3,33 %	<b>7,86 %</b>	-21,81 %	0,2946	<b>-1,6426</b>	8,71	110,16
OMXH	6,96 %	7,59 %	36,70 %	-43,86 %	0,2959	-0,3591	9,75	9165,21
Risk-free rate	1,99 %	2,15 %	0,04 %	0,00 %	0,0006	-0,0587	2,27	107,60

The average annual return varies from 220 per cent to -150 per cent where Nokia scores the highest and Kyro the lowest. All except for five companies exceed the OMXH -index yield on annual mean return. Sievi Capital's maximum return value from the starting point is the highest being over 70 % on one day and Kemira's second share's same figure staying as low as a little bit over 5 %. Kemira's minimum annual return is yet one of the lowest ones, where the median is one of the highest ones. Only three companies exceed the maximum value of the OMXH -index's best day. Nevertheless, spinoffs' minimum values stay mainly under OMXH index's own value. The lowest minimum value, -99 %, is with Kyro, Kone's second stock having the highest minimum value of all. Done's returns have been received with the highest risk of all spinoffs.

Almost all spinoffs' returns are more risky than OMXH -index. Approximately half of the spinoffs have negative skew, indicating that the tail on the left side of the probability density function is longer or fatter than the right side. Positive skew indicates that the tail on the right side is longer or fatter than the left side. Kurtosis describes the peakedness of the probability distribution variable. There are only two spinoffs where the kurtosis is higher than the OMXH index's same character. Jarque-Bera test is a goodness-of-fit test of whether the data has the skewness and kurtosis matching a normal distribution. The values vary tremendously from 0,11 to 2184, whereas OMXH is over 9000. In Jarque-Bera a value that is a little bit over 5 is seen as normally distributed. Altogether there can be round up that by buying before the spinoff: an investor would receive from 12 spinoffs positive annual returns and from 4 spinoffs negative annual mean returns. The best shares that could be chosen for short time investing are Nokia,

Kone's both shares, Outokumpu and Kemira's second share. In Table 5 is presented the same characteristics as in Table 4 with the exception that the event window is from  $t_{-30}$  to  $t_{-1}$ . The annual mean return ranges from 201 per cent to -128 per cent where Nokia has the highest score and YIT has the lowest. Compared to these, OMXH -index has a very low annual mean return.

**Table 5.** Descriptive statistics for companies' returns from  $t_{-30}$  to  $t_{-1}$ .

	Mean	Median	Max.	Min.	Std. Dev.	Skewness	Kurtosis	Jarque-Bera
Ahlstrom + Munksjo	73,56 %	42,29 %	13,93 %	-14,35 %	0,3191	-0,0886	5,26	6,43
Aspo + Aspocomp	-1,89 %	-1,88 %	<b>-0,02 %</b>	<b>-0,02 %</b>	<b>0,0000</b>	<b>-5,1534</b>	<b>27,73</b>	<b>897,09</b>
Done + Reach-U Holding	77,57 %	<b>-210,24 %</b>	<b>41,77 %</b>	<b>-26,58 %</b>	<b>0,9744</b>	<b>0,5374</b>	3,07	1,45
Finvest + Vestcap + Evox Rifa Group	-44,15 %	-3,50 %	<b>0,16 %</b>	-14,24 %	<b>0,1643</b>	<b>-5,1897</b>	<b>27,97</b>	<b>914,02</b>
Fortum + Neste Oil	70,69 %	-1,50 %	9,86 %	-9,15 %	0,2911	0,1913	<b>2,58</b>	<b>0,40</b>
Kemira + Tikkurila	23,94 %	-0,45 %	<b>15,72 %</b>	-14,94 %	<b>0,3787</b>	-0,1332	4,66	3,54
Kemira + Kemira GrowHow	117,91 %	105,44 %	<b>5,65 %</b>	<b>-2,92 %</b>	<b>0,1441</b>	0,0382	<b>2,23</b>	0,74
Kone + Konecranes	<b>124,03 %</b>	-2,82 %	<b>16,42 %</b>	-8,38 %	0,3645	<b>0,7888</b>	3,51	3,44
Kone + Cargotec	<b>137,89 %</b>	<b>119,83 %</b>	6,82 %	<b>-4,28 %</b>	0,1863	0,2391	<b>2,21</b>	1,06
Kyro + Tecnomen Holding	<b>-49,42 %</b>	<b>-51,74 %</b>	13,77 %	-13,34 %	0,3789	-0,0193	3,06	<b>0,01</b>
Lassila & Tikanoja + Suominen	<b>-109,37 %</b>	-3,00 %	13,98 %	<b>-24,38 %</b>	<b>0,4072</b>	<b>-1,1426</b>	<b>7,63</b>	<b>33,34</b>
Nokia + Nokian Renkaat	<b>201,45 %</b>	<b>136,94 %</b>	14,45 %	-5,01 %	0,2745	<b>0,6201</b>	3,43	2,15
Orion + Oriola-KD	-41,71 %	-18,47 %	10,24 %	<b>-16,47 %</b>	0,3826	-0,5994	3,56	2,18
Outokumpu + Outotec	68,87 %	<b>132,40 %</b>	11,80 %	-10,94 %	0,3340	0,1065	2,74	<b>0,14</b>
Sievi Capital + Scanfil	-26,33 %	-1,03 %	6,28 %	-6,30 %	0,1791	-0,1532	3,24	<b>0,19</b>
YIT + Caverion	<b>-128,09 %</b>	<b>-66,25 %</b>	5,61 %	-9,03 %	0,2389	-0,2702	<b>2,23</b>	1,11
OMXH	6,96 %	7,59 %	36,70 %	-43,86 %	0,2959	-0,3591	9,75	9165,21
Risk-free rate	1,99 %	2,15 %	0,04 %	0,00 %	0,0006	-0,0587	2,27	107,60

The annual median value returns are much more negative than positive. Annual median return for Done is very low compared to other medians. Its maximum return value is the highest with over 40 %, being the only value higher than the OMXH -index's similar figure. Aspo has the only negative maximum value. Also, Aspo's standard deviation is very low, which indicates that there was not much risk in receiving the small returns from it. Dones's and Lassila & Tikanoja's minimum annual return values are extremely low, which indicate for high standard deviation and skew values. There are only two demergers that have a kurtosis that is over 20. Half of the spinoffs have negative skew, which means that their returns are negatively inclined and the ones that are left are positively inclined. Table 5 includes seven spinoffs with negative annual mean returns. This is two more than in the whole event window. The sensible securities for short time investing could be Nokia, Kone's both shares, Kemira's second stock and Outokumpu. Table 6 below includes the last event window with some significant changes compared to the previous time period from  $t_{-30}$  to  $t_{-1}$ .

**Table 6.** Descriptive statistics for companies' returns from  $t$  to  $t_{+30}$ .

	Mean	Median	Max.	Min.	Std. Dev.	Skewness	Kurtosis	Jarque-Bera
Ahlstrom + Munksjo	<b>-51,08 %</b>	<b>-31,20 %</b>	8,20 %	<b>-6,67 %</b>	<b>0,2024</b>	0,2666	3,45	<b>0,63</b>
Aspo + Aspocomp	<b>-158,61 %</b>	-2,44 %	12,96 %	-19,28 %	0,4052	-0,5031	4,01	2,62
Done + Reach-U Holding	58,19 %	<b>-36,72 %</b>	<b>60,43 %</b>	<b>-49,26 %</b>	<b>1,7323</b>	0,4933	2,88	1,28
Finvest + Vestcap + Evox Rifa Group	39,97 %	-3,50 %	34,92 %	<b>-35,65 %</b>	0,6679	-0,1649	8,69	42,00
Fortum + Neste Oil	61,71 %	20,24 %	<b>7,49 %</b>	<b>-4,12 %</b>	<b>0,1570</b>	0,4240	3,46	1,20
Kemira + Tikkurila	1,14 %	-28,98 %	21,47 %	-9,87 %	0,3690	1,3464	7,09	30,94
Kemira + Kemira GrowHow	-14,04 %	10,66 %	<b>2,80 %</b>	-9,22 %	<b>0,1555</b>	<b>-1,6293</b>	6,95	33,90
Kone + Konecranes	88,12 %	30,62 %	18,13 %	-9,48 %	0,3007	<b>1,2620</b>	7,36	32,75
Kone + Cargotec	92,51 %	-1,47 %	12,29 %	<b>-6,21 %</b>	0,2646	0,7680	<b>3,10</b>	3,06
Kyro + Tecnomen Holding	<b>-255,23 %</b>	<b>84,34 %</b>	20,93 %	<b>-99,66 %</b>	<b>1,2905</b>	<b>-3,6728</b>	<b>17,75</b>	<b>350,60</b>
Lassila & Tikanoja + Suominen	<b>139,99 %</b>	-2,55 %	<b>37,83 %</b>	-19,42 %	0,5701	<b>1,9590</b>	10,34	89,45
Nokia + Nokian Renkaat	<b>238,67 %</b>	<b>169,57 %</b>	14,88 %	-10,70 %	0,4050	0,3511	<b>2,52</b>	<b>0,94</b>
Orion + Oriola-KD	-20,26 %	<b>-69,43 %</b>	12,98 %	-8,79 %	0,3058	0,5116	3,37	1,52
Outokumpu + Outotec	120,93 %	11,19 %	9,68 %	-7,80 %	0,2637	0,1359	<b>2,71</b>	<b>0,20</b>
Sievi Capital + Scanfil	<b>310,92 %</b>	-0,91 %	<b>71,98 %</b>	-31,02 %	<b>1,1289</b>	<b>2,6480</b>	<b>11,06</b>	<b>120,20</b>
YIT + Caverion	67,06 %	<b>49,22 %</b>	<b>7,86 %</b>	-21,81 %	0,3327	<b>-2,4704</b>	<b>11,74</b>	<b>130,16</b>
OMXH	6,96 %	7,59 %	36,70 %	-43,86 %	0,2959	-0,3591	9,75	9165,21
Risk-free rate	1,99 %	2,15 %	0,04 %	0,00 %	0,0006	-0,0587	2,27	107,60

In Table 6, Sievi Capital has a huge growth on annual mean returns when comparing to the earlier event window. Nokia has once again a very strong mean, followed by Lassila & Tikanoja, Outokumpu and Kone's both shares. Ahlstrom's, Aspo's and Kyro's averages have dropped radically. Maximum and minimum values are a lot higher and lower compared to Table 5. Done's, Kyro's and Sievi Capital's standard deviation values are extremely high as noted earlier. A high standard deviation indicates that the data points are spread out over a large range of values and in this research it indicates for a high risk investment. Kurtosis values are lower than in  $t_{-30}$  to  $t_{-1}$ . As Jarque-Bera values refer, Kyro's, Sievi Capital's and YIT's kurtosis and skew figures are also very high compared to other companies. Fortum can be seen as a decent and stable investment with a good mean, median, standard deviation and a low minimum value. Table 7 acknowledges the average values from the research's results from each characteristic figure and event window.

**Table 7.** Summarized results from descriptive statistics characteristics.

	Mean	Median	Max.	Min.	Std. Dev.	Skewness	Kurtosis	Jarque-Bera
t-30 - t+30	34,35 %	17,63 %	22,48 %	-23,69 %	0,4223	-0,0180	8,3501	744,3906
t-30 - t-1	27,99 %	10,32 %	12,40 %	-12,45 %	0,30	-0,59	6,51	618,89
t - t+30	40,50 %	11,58 %	21,75 %	-21,82 %	0,4915	0,0727	6,5830	561,9032
OMXH	6,96 %	7,59 %	36,70 %	-43,86 %	0,2959	-0,3591	9,75	9165,21
Risk-free rate	1,99 %	2,15 %	0,04 %	0,00 %	0,0006	-0,0587	2,27	107,60

In all event windows the mean is quite high which means for good revenues when investing to the right companies at the right time before the spinoffs. The highest returns could be received when investing one day before the spinoff and then selling them at the latest 30 stock days after

the demergers. The risk in all time periods is a little bit higher than OMXH -index, but in  $t_{-30}$  to  $t_{-1}$  it is pretty close on average. The time frame,  $t_{-30}$  to  $t_{-1}$ , has the lowest mean, median, max, min and standard deviation values as Table 7 shows. The variation in maximum and minimum values are close to each other in the whole event window and in  $t$  to  $t_{+30}$ . The only positively skewed distribution is in  $t$  to  $t_{+30}$  but all the time periods are on average normally distributed. Kurtosis and Jarque-Bera are quite high compared to the risk-free rate. OMXH's Jarque-Bera is extremely high compared to studied time windows.

### 5.3 Linear regression results

Next are presented the results from regression models that are done with EViews 7. The results are gathered to Tables 8, 9 and 10. These three tables have same event windows as before: from  $t_{-30}$  to  $t_{+30}$  (61 observations), from  $t_{-30}$  to  $t_{-1}$  (30 observations), and from  $t$  to  $t_{+30}$  (31 observations). The tables include R-squares, adjusted R-squares as well as  $\alpha$ ,  $\beta$  and their P-values. There are highlighted with bold the three highest coefficients of determination figures. Also, there are bolded all  $\alpha$ ,  $\beta$  and their P-values that are statistically significant. In Appendixes 3-5 are shown the heteroskedasticity and autocorrelation tests from the different event windows' regression models. There had to be made only one modification to improve the statistical significance for the regression models. If the P-value is lower than the risk level, which is 0,05,  $H_0$  is rejected.

The  $R^2$  and the adjusted  $R^2$  are quite good only in Nokia's case where the market portfolio leaves only explained approximately 25 % of the share's variation. Next in line are YIT and Orion, with an R-squared value of 0,4. The worst coefficients of determinations are in Ahlstrom, Aspo and Kemira's second share. Since it is so low in many spinoffs, it reflects the fact that there are some other factors than changes in the stock market for abnormal returns. In Table 8, almost half of the models have a negative alpha and all the alphas are statistically insignificant and therefore the null hypothesis stays effective because the P-values are over the risk level. Alpha can be said to describe the excess return and in this event window the alphas are very low: varying from -0,01 to 0,40 percent. The statistical insignificance means that the market is sufficiently efficient and abnormal returns are unavailable with the spinoffs. Also, if the P-value is more than the risk level, it means that the model is not normally distributed. In turn, in five cases out of 16, the beta is also insignificant because the P-values are over 0,05. If the beta value is under one, this refers to the market portfolio with a smaller risk than in the market

itself. The beta's range is from 0,158 to 1,696. In Nokia, Done, Kemira's first share, Outokumpu and YIT, the risk is higher than the market risk.

**Table 8.** Regression models' results from  $t_{-30}$  to  $t_{+30}$ .

Company	R <sup>2</sup>	Adj. R <sup>2</sup>	$\alpha$	$\alpha$ P-value	$\beta$	$\beta$ P-value
Ahlstrom + Munksjo	0,0088	-0,0080	0,0004	0,8609	0,1590	0,4730
Aspo + Aspocomp	0,0168	0,0002	-0,0039	0,1160	0,1601	0,3188
Done + Reach-U Holding	0,1654	0,1512	-0,0004	0,9711	<b>1,2590</b>	<b>0,0011</b>
Finvest + Vestcap + Evox Rifa Group	0,0694	0,0536	-0,0002	0,9671	<b>0,2299</b>	<b>0,0403</b>
Fortum + Neste Oil	0,2228	0,2096	0,0022	0,1907	<b>0,8858</b>	<b>0,0001</b>
Kemira + Tikkurila	0,3180	0,3065	0,0011	0,6605	<b>1,0234</b>	<b>0,0000</b>
Kemira + Kemira GrowHow	0,0343	0,0180	0,0015	0,2571	0,2101	0,1529
Kone + Konecranes	0,0465	0,0304	0,0035	0,1891	0,5084	0,0949
Kone + Cargotec	0,1554	0,1411	0,0027	0,1352	<b>0,7546</b>	<b>0,0017</b>
Kyro + Tecnomen Holding	0,0544	0,0383	-0,0068	0,3695	0,4209	0,0706
Lassila & Tikanoja + Suominen	0,0829	0,0674	-0,0001	0,9826	<b>0,3178</b>	<b>0,0244</b>
Nokia + Nokian Renkaat	<b>0,7226</b>	<b>0,7179</b>	0,0029	0,0707	<b>1,6968</b>	<b>0,0000</b>
Orion + Oriola-KD	<b>0,4000</b>	<b>0,3898</b>	-0,0012	0,5908	<b>0,8557</b>	<b>0,0000</b>
Outokumpu + Outotec	0,2088	0,1954	0,0027	0,2122	<b>1,1787</b>	<b>0,0002</b>
Sievi Capital + Scanfil	0,1044	0,0893	0,0040	0,5261	<b>0,9849</b>	<b>0,0111</b>
YIT + Caverion	<b>0,4002</b>	<b>0,3901</b>	-0,0011	0,5698	<b>1,1799</b>	<b>0,0000</b>

As seen in Table 9, the  $R^2$  and the adjusted  $R^2$  are again the highest in Nokia, followed by Orion and YIT. This time in Nokia's case the market portfolio leaves explained about 35 % of the share's variation. The alpha values are still very low in total. In this event window there is however two companies, Aspo and Kemira's second share, where their alphas are statistically significant and therefore the null hypothesis are rejected. In Kemira's model the excess return could be 3,08 percent, when investing in the right time. In total there are eight statistically significant betas. The highest beta is in Kemira's first share's model, 1,919, and the lowest significant beta is in Kyro's model, being 0,339. Kemira's first share, Nokia, Fortum and Outokumpu have all a very high risk.

**Table 9.** Regression models' results from  $t_{-30}$  to  $t_{-1}$ .

Company	R <sup>2</sup>	Adj. R <sup>2</sup>	$\alpha$	$\alpha$ P-value	$\beta$	$\beta$ P-value
Ahlstrom + Munksjo	0,0006	-0,0351	0,0029	0,4478	-0,0542	0,9007
Aspo + Aspocomp	0,0345	0,0000	<b>-0,0001</b>	<b>0,0000</b>	0,0000	0,3258
Done + Reach-U Holding	0,1026	0,0705	0,0054	0,6240	0,7716	0,0844
Finvest + Vestcap + Evox Rifa Group	0,0001	-0,0356	-0,0018	0,3689	-0,0027	0,9571
Fortum + Neste Oil	0,3548	0,3318	0,0054	0,0650	<b>1,5276</b>	<b>0,0005</b>
Kemira + Tikkurila	0,4021	0,3808	-0,0072	0,0751	<b>1,9192</b>	<b>0,0002</b>
Kemira + Kemira GrowHow	0,0553	0,0216	<b>0,0039</b>	<b>0,0308</b>	0,2542	0,2110
Kone + Konecranes	0,0480	0,0140	0,0044	0,3017	0,6016	0,2447
Kone + Cargotec	0,0815	0,0487	0,0042	0,0704	0,4635	0,1262
Kyro + Tecnomen Holding	0,2712	0,2452	-0,0009	0,8149	<b>0,3390</b>	<b>0,0032</b>
Lassila & Tikanoja + Suominen	0,0358	0,0013	-0,0038	0,4308	0,1904	0,3169
Nokia + Nokian Renkaat	<b>0,6390</b>	0,6261	0,0030	0,1576	<b>1,7309</b>	<b>0,0000</b>
Orion + Oriola-KD	<b>0,5467</b>	0,5305	-0,0015	0,6322	<b>0,8867</b>	<b>0,0000</b>
Outokumpu + Outotec	0,2582	0,2317	0,0031	0,3680	<b>1,4094</b>	<b>0,0041</b>
Sievi Capital + Scanfil	0,3542	0,3312	-0,0009	0,5855	<b>0,3445</b>	<b>0,0005</b>
YIT + Caverion	<b>0,5309</b>	0,5141	-0,0023	0,2576	<b>0,9787</b>	<b>0,0000</b>

The last event window is from  $t$  to  $t_{+30}$  and the statistics are shown in Table 10. The R-square and the adjusted R-square are once again the highest in Nokia, being 76 %, and also the highest of all coefficient of determination compared to any model. There are no statistically significant alpha values in this time frame meaning that the market is sufficiently efficient and excess returns are unavailable for investors in Nasdaq OMX Helsinki when it comes to demerger companies.

**Table 10.** Regression models' results from  $t$  to  $t_{+30}$ .

Company	R <sup>2</sup>	Adj. R <sup>2</sup>	$\alpha$	$\alpha$ P-value	$\beta$	$\beta$ P-value
Ahlstrom + Munksjo	0,0796	0,0478	-0,0023	0,3052	0,3287	0,1242
Aspo + Aspocomp	0,0535	0,0209	-0,0089	0,0836	0,4005	0,2105
Done + Reach-U Holding	0,2189	0,1919	-0,0105	0,5669	<b>1,6682</b>	<b>0,0080</b>
Finvest + Vestcap + Evox Rifa Group	0,1902	0,1622	-0,0001	0,9896	<b>0,5980</b>	<b>0,0142</b>
Fortum + Neste Oil	0,1674	0,1386	0,0011	0,5307	<b>0,5169</b>	<b>0,0223</b>
Kemira + Tikkurila	<b>0,3961</b>	<b>0,3753</b>	0,0052	0,1477	<b>0,9759</b>	<b>0,0001</b>
Kemira + Kemira GrowHow	0,0192	-0,0146	-0,0009	0,6246	0,1526	0,4574
Kone + Konecranes	0,0493	0,0165	0,0027	0,4352	0,4468	0,2301
Kone + Cargotec	0,2166	0,1896	0,0015	0,5867	<b>0,9858</b>	<b>0,0083</b>
Kyro + Tecnomen Holding	0,0489	0,0161	-0,0140	0,3526	0,6119	0,2319
Lassila & Tikanoja + Suominen	0,0970	0,0658	0,0027	0,6732	0,3654	0,0882
Nokia + Nokian Renkaat	<b>0,7596</b>	<b>0,7513</b>	0,0027	0,2738	<b>1,6862</b>	<b>0,0000</b>
Orion + Oriola-KD	0,1822	0,1540	-0,0009	0,7864	<b>0,7535</b>	<b>0,0166</b>
Outokumpu + Outotec	0,1484	0,1191	0,0030	0,3167	<b>0,9243</b>	<b>0,0323</b>
Sievi Capital + Scanfil	0,1688	0,1401	0,0043	0,6401	<b>2,1107</b>	<b>0,0890</b>
YIT + Caverion	<b>0,3227</b>	<b>0,2993</b>	-0,0013	0,6946	<b>1,5195</b>	<b>0,0009</b>

As seen in Table 10, Sievi Capital has the highest beta of all models, 2,11, which indicates for a very risky investment and therefore the share has a lot higher risk than the market risk is. Nokia, Done and YIT have also very high and significant betas. The event window from  $t$  to  $t_{+30}$  has more significant betas than the time period from  $t_{-30}$  to  $t_{-1}$ , with a total of 10 spinoffs out of 16.

## 6 CONCLUSIONS AND RECOMMENDATIONS

### 6.1 Summary and main findings

This research was carried out with pure passion to stock markets and shares. The hardest part in this study was to gather the needed data for all the numerous analysis. In this bachelor's thesis there was examined what kind of effects a publicly listed company's stock price has when a company demerges from the parent company and both of the companies, the newborn and the parent, have then their securities available in the stock market for buying and selling. The earlier research on spinoffs, mainly in the US, implies that there are average abnormal returns in these situations. Veld & Veld-Merkoulova (2009) summarized their findings of 26 event studies on spinoff announcements ending in a result that the cumulative average abnormal returns around the spinoff announcement vary from -0,19 to 5,56 percents. There was established only one research with negative excess returns. All the other studies resulted in positive yields. In this research, the spinoffs were established between 1994 and 2013 in Finland and there were in total of 16 demergers. There was exploited quantitative analysis as well as CAP -model in this study to find answers for the following questions:

1. Does a spin-off effect on a company's stock price?
2. Is the effect positive, negative or is there any effect at all?

The results of this thesis provide new information and knowledge for future operations for researchers, analysts, teachers, students, companies, management and investors. According to the results, there can be seen many effects on the stock prices when a company demerges. The effect seems to be company-dependent. When investing on the right time, there are many spinoffs that give good returns on average, but as usual and typical for stock markets, there are also spinoffs that give negative or no returns. As seen from the compounded total return index of all spinoff companies it goes quite closely hand in hand with the compounded OMXH -index. The RI lines of Nokia and Kone's first share show a tremendous growth compared to many other companies: the growth is almost 40 per cent from  $t$  to  $t_{+30}$ . Outokumpu shows also a vast increase in the RI after the spinoff. The prominent firm is Sievi Capital, with a huge ascent of almost 70 percent on the spinoff day. What is also interesting about Sievi Capital is the huge decline on  $t_{+1}$ , which continues with a small decrease until  $t_{+27}$ .

The summarized findings on descriptive statistics' logarithmic average results show that there are annual positive returns on average. Depending on the event window, the annual logarithmic mean returns vary from 17,75 percent to 45 percent. If a broker would invest in the spinoff companies, let's say  $t_{-31}$  and sell them at the latest on  $t_{+30}$ , in an event window from  $t_{-30}$  to  $t_{+30}$ , the best firms to receive great returns would be Nokia, Kone's both shares, Outokumpu and Kemira's second share. In the time period from  $t_{-30}$  to  $t_{-1}$  the best demergers are again Nokia, Kone's shares, Ahlstrom and once again Kemira's second stock. The last event window from  $t$  to  $t_{+30}$  shows potential on Fortum, Nokia, Kone's both stocks, Lassila & Tikanoja and YIT. There are also good chances for returns with Sievi Capital but its risk is also one of the highest ones. These spinoffs are chosen according to their annual logarithmic mean returns, standard deviation and reasonable stability in other statistics.

The study's findings also indicate that since the coefficient of determination is low in many regression spinoff models, it reflects the fact that there are some other factors than changes in the stock market for abnormal returns in capital asset pricing model. There are however, two companies, Aspo and Kemira's second share, where their alphas are statistically significant and therefore the null hypothesis are rejected. In Aspo's case, the alpha is negative but in Kemira's model the excess return could be 3,08 percent. It is difficult to say why there are only two spinoffs with significant alphas. Unfortunately there was not enough time or resources to investigate this further at this time.

## 6.2 Suggestions for further research

While conducting this research, there arose some interesting questions concerning the demerger environment. Since most of the original research papers on spin-offs have been conducted inside the US borders it would be interesting to see what kind of results can be achieved outside the US. Another question that emerged was that what the factors are that really affect the securities to act like they act in a spinoff situations and is the effect positive negative or neutral. It would be interesting to investigate what kind of excess returns could be obtained from a portfolio that includes only demerged firms and then compare that portfolio to some other portfolios. Further research could take a lot longer event window than in this study. This might also help to increase the  $R^2$  -values a lot.

## REFERENCES

### Books

Bodie, Z., Kane, A. and Marcus, A. (2009) Investments. Boston: McGraw-Hill/Irwin.

Brealey, R. A. and Myers, S. C. (2006) Principles of Corporate Finance. Global Edition. Boston: McGraw-Hill/Irwin.

Cusatis, P., Miles, J. A. and Woolridge, J. R. (2001) Some new evidence that spinoffs create value. In: Chew, D. (2001) The New corporate finance. Boston: McGraw-Hill.

Copeland, T. (2004) Financial theory and corporate policy. Boston: Addison Wesley.

Elton, E., Gruber, M., Brown, S. and Goetzmann W. (2003) Modern Portfolio Theory and Investment Analysis. 6<sup>th</sup> edition. Hoboken: John Wiley & Sons Ltd.

Gill, J. and Johnson, P. (2010) Research Methods for Managers. 4<sup>th</sup> edition. London: Sage Publications.

Ikäheimo, S., Laitinen, E. K., Laitinen, T. and Puttonen, V. (2011) Laskentatoimi ja rahoitus. Vaasa: Vaasan yritysinformaatio Oy.

Kallunki, J.-P. and Niemelä, J. (2004) Uusi yrityksen arvonmääritys. Helsinki: Talentum.

Knüpfer, S. and Puttonen, V. (2009) Moderni rahoitus. Helsinki: WSOYpro.

Leppiniemi, J. and Puttonen, V. (2002) Yrityksen rahoitus. Helsinki: WS Bookwell Oy.

Niskanen, J. and Niskanen, M. (2009) Yritysrahoitus. Helsinki: Edita Publishing Oy.

Parviainen, A. and Järvinen, S. (2012) Sijoittamalla miljonääriksi. Helsinki: Talentum.

Saunders, M., Lewis, P. and Thornhill, A. (2009) *Research Methods for Business Students*. 5<sup>th</sup> edition. Harlow: Pearson Education.

Vaihekoski, M. (2004) *Rahoitusalan sovellutukset ja Excel*. Helsinki: WSOY.

## **Articles**

Ahn, S. and Denis, D. J. (2004) Internal capital markets and investment policy: evidence from corporate spinoffs. *Journal of Financial Economics*, Vol. 71, 489-516.

Chemmanur, T. J. and Yan, A. (2004) A theory of corporate spin-offs. *Journal of Financial Economics*, Vol. 72, 259-290.

Daley, L., Mehrotra, V. and Sivakumar, R. (1997) Corporate focus and value creation Evidence from spinoffs. *Journal of Financial Economics*, Vol. 45, 257-281.

Desai, H. and Jain, P. C. (1999) Firm performance and focus: long run stock market performance following spinoffs. *Journal of Financial Economics*, Vol. 54, 75-101.

Fama, E. (1970) Efficient Capital Markets - A Review of Theory and Empirical Work. *Journal of Finance*, Vol. 25, No. 2, 383-417.

Habib, M. A., Johnsen, B. D. and Naik, N. Y. (1997) Spin-offs and information. *Journal of Financial Intermediation*, Vol. 6, 153-177.

Hite, G. L. and Owers J. E. (1983) Security price reactions around corporate spin-off announcements. *Journal of Financial Economics*, Vol. 12, 409-436.

Hyttinen, M. (2002) *Osingon irtoamisen kurssivaikutus*. Master's Thesis. Faculty of political science. University of Helsinki.

Krishnaswami, S and Subramaniam, V. (1999) Information asymmetry, valuation, and the corporate spin-off decision. *Journal of Financial economics*, Vol. 53, 73-112.

MacKinlay, A. C. (1997) Event Studies in Economics and Finance. *Journal of Economic Literature*, Vol. 35, No. 1, 13-39.

Markus, K.-M. (2009) Osakekurssin reagointi tulosvaroitukseen nousu- ja laskumarkkinoilla. Master's Thesis. Faculty of Accounting. Lappeenranta University of Technology.

Martikainen, T. and Martikainen, M. (2009) Rahoituksen perusteet. 7<sup>th</sup> edition. Helsinki: WSOYpro Oy.

Maxwell, W. F. and Rao, R. P. (2003) Do Spin-offs Expropriate Wealth from Bondholders? *The Journal of Finance*, Vol. 58, No. 5.

Miles, J. A. and Rosenfeld, J.D. (1983) An empirical analysis of the effect of spinoff announcements on shareholder wealth. *Journal of Finance*, Vol. 38. 1597-1696.

Mulherin, H. J. and Boone, A.L. (2000) Comparing acquisitions and divestitures. *Journal of Corporate Finance*, Vol. 6, 117-139.

Nanda, V. and Narayanan, M. P. (1999) Disentangling value: financing needs, firm scope, and divestitures. *Journal of Financial Intermediation*, Vol. 8, 174-204.

Peterson, P. P. (1989) Event Studies: A Review of Issues and Methodology. *Quarterly Journal of Business and Economics*, Vol. 28, No. 3, 36-66.

Schipper, K. and Smith, A. (1983) Effects of recontracting on shareholder wealth: the case of voluntary spinoffs. *Journal of Financial Economics*, Vol. 12, 437-467.

Shiller, R. J. (1999) Human Behavior and the efficiency of the financial system. *Handbook of Macroeconomics*, Vol. 1, 1305-1340.

Slovin, M. B., Sushka, M. E. and Ferraro, S. R. (1995) A comparison of the information conveyed by equity carve-outs, spin-offs, and asset sell-offs. *Journal of Financial Economics*, Vol. 37, 89-104.

Soininen, J. (2008) Osakemarkkinoiden hintareaktiot luottoluokituksen muutokseen eri lainsäädäntöympäristössä. Master's Thesis. Faculty of Finance. Lappeenranta University of Technology.

Veld, C. and Veld-Merkoulova, Y. V. (2009). Value creation through spin-offs: A review of the empirical evidence. *International Journal of Management Reviews*. 407-420.

### **Online publications**

Kauppalehti. (2012) Taloussanakirja: markkina-arvo. [Online publications] [cited 10.11.2013] available: <http://www.taloussanommat.fi/porssi/sanakirja/termi/markkina-arvo/>.

Moisio, A. (2008) Toshiba osakekurssi nousi HD DVD -huhujen siivittämänä. [Online publications] [cited 12.10.2013] available: <http://www.digitoday.fi/bisnes/2008/02/18/toshiban-osakekurssi-nousi-hd-dvd--huhujen-siivittamana/20085027/66>.

## APPENDICES

### Appendix 1. Market psychology theories.

Name of the theory	Description of the theory
Prospect Theory	The theory describes human decisions when the choices are uncertain. It suggests that people tend to keep descendent shares for longer than rising shares.
Regret and cognitive dissonance	People have a natural tendency to feel remorse for making mistakes. This fear of contrition can cause the person not to behave rationally. The theory explains why individuals tend to delay the sale of the shares when they have gone downhill, and in turn speed up the sale when the value of the shares has risen. If the value of the investment falls, the investor may know that a wrong decision was made when purchasing shares, but still does not want to sell it, because then the mistake that was made in the past is realized and remorse strikes. The wish of course is that the stock would rise at least to the purchase price, in which case the error would not have to be liquidated and thus there would be no regret. In turn, if the share has risen immediately, people have a tendency to sell it quickly because the fear of the share's decline back to the purchase level may be high.
Cognitive dissonance	Studies have shown that individuals filter information based on what they believe in themselves. For example, if an investor believes that a certain share has good potential, the investor may completely leave the bad news unread.
Anchoring	The theory is based on the fact that, for example, if an investor hears that the S&P 500 index had a total of 1400 points a year ago and now it is at 1500 points, so the investor may therefore consider this as a high level of valuation. However, it is very difficult to say, what the actual and correct value of the index is. As a result of this, historical record is often used in assessing whether the indices are high or low.
Over-confidence	People sometimes have a tendency to be extremely confident in their own assessments. This theory has been shown to cause, among other things, that the investor overestimates the value of private information and underestimates the value of public information. Analysts and investors create private information for stock market by interviewing directors and economic leaders to research, inter alia, rumors and analysis of financial reports. If an investor overestimates his ability to produce private information, he will at the same time underestimate his own possibility of error in his forecasts.
Disjunction effect	The phenomenon describes the human tendency to wait for some event to happen or information to be given before making a decision, even if the new knowledge would not affect the decision's outcome. A company may for example take out a new loan from the bank to invest in a new factory, but still wait for the upcoming Central Bank interest rate decision. The final decision is awaited, even if the loan is taken up in any case, regardless of what the interest rate will be.
Gambling behavior and speculation	Gambling in the stock market means the act of taking unnecessary high risks compared to the outcome. Traditionally, people are seen as risk-avoiders. The stock market investors operate in various levels of risk and therefore there can be found unnecessary risk takers. This may lead to the fact that the stock market may be accompanied by investors who do not necessarily make rational

	investment decisions, but only to get a feeling of tension. Thus, there may appear irrational features in stock prices' fluctuations.
--	---

Source: Shiller (1999)

## Appendix 2. Table of demerger events.

N o.	Original company	Industry	Demerging date	Original company's new name after demerger	Demerging companies (name nowadays)
1	Kone Oyj	Metal	15.4.1994, (listed 1.4.1996)	Kone Oyj	KCI Konecranes International Oy (Konecranes Oyj)
2	Nokia Oyj	Electrical engineering	6.6.1995	Nokia Oyj	Nokian Renkaat Oyj
3	Aspo Oyj	Industrial logistics	1.10.1999	Aspo Oyj	Aspocomp Oyj
4	Finvest Oyj	Investments	1.11.2000	Finvest Oyj	Vestcap Oyj (Fusion with CapMan later on), Evox Rifa Group Oyj and eQ Holdings Oyj (no data available)
5	Kyro Oyj (Nowadays Glaston Oyj)	Technology	2.4.2001	Kyro Oyj Abp	Tecnomen Holding Oyj
6	Done Oyj (Nowadays Revenio Group Oyj)	Electrical business	1.10.2001	Done Solutions Oyj	Mgine Holding Oyj (Fusion with Reach-U holding Oyj on demerger)
7	Lassila & Tikanoja Oyj	Cleaning	1.10.2001	Lassila & Tikanoja Oyj	J. W. Suominen Yhtymä Oyj
8	Fortum Oyj	Energy	1.5.2004 (listed 18.4.2005)	Fortum Oy	Neste Oil Oyj
9	Kemira Oyj	Chemistry	14.10.2004	Kemira Oyj	Kemira GrowHow Oyj
10	Kone Oyj	Metal	1.6.2005	Kone Oyj	Cargotec Oyj
11	Orion Oyj	Pharmacy	3.7.2006	Orion Oyj	Oriola-KD Oyj
12	Outokumpu Oyj	Metal	10.10.2006	Outokumpu Oyj	Outotec Oyj
13	Kemira Oyj	Chemistry	26.3.2010	Kemira Oyj	Tikkurila Oyj

14	Sievi Capital Oyj	Investments	2.1.2012	Sievi Capital Oyj	Scanfil Oyj
15	Ahlstrom Oyj	Fiber-based materials	7.6.2013	Ahlstrom Oyj	Munksjö Oyj
16	YIT Oyj	Construction	1.7.2013	YIT Oyj	Caverion Oyj

### Appendix 3. Heteroskedasticity and autocorrelation tests from $t_{-30}$ to $t_{+30}$ .

Company	Heteroskedasticity Test: White	Breusch-Godfrey Serial Correlation LM Test
Ahlstrom + Munksjo	0.4468	0.4345
Aspo + Aspocomp	0.8459	0.4124
Done + Reach-U Holding	0.0596	0.3200
Finvest + Vestcap + Evox Rifa Group	0.8506	0.0851
Fortum + Neste Oil	0.9036	0.3854
Kemira + Tikkurila	0.5786	0.2615
Kemira + Kemira GrowHow	0.5375	0.4727
Kone + Konecranes	0.9046	0.0679
Kone + Cargotec	0.3562	0.9492
Kyro + Tecnomen Holding	0.7242	0.9957
Lassila & Tikanoja + Suominen	0.9778	<b>0.0480</b>
Nokia + Nokian Renkaat	0.4753	0.6510
Orion + Oriola-KD	0.4952	0.2228
Outokumpu + Outotec	0.5447	0.3356
Sievi Capital + Scanfil	0.2083	0.4594
YIT + Caverion	0.7292	0.7866

### Appendix 4. Heteroskedasticity and autocorrelation tests from $t_{-30}$ to $t_{-1}$ .

Company	Heteroskedasticity Test: White	Breusch-Godfrey Serial Correlation LM Test
Ahlstrom + Munksjo	0.7446	0.4439
Aspo + Aspocomp	0.6086	0.4071
Done + Reach-U Holding	0.3762	0.8678
Finvest + Vestcap + Evox Rifa Group	0.8557	0.9998
Fortum + Neste Oil	0.5103	0.4494
Kemira + Tikkurila	0.5893	0.6518
Kemira + Kemira GrowHow	0.6015	0.3247
Kone + Konecranes	0.9659	0.1011
Kone + Cargotec	0.3426	0.1448
Kyro + Tecnomen Holding	0.8164	0.8520
Lassila & Tikanoja + Suominen	0.8825	0.5262
Nokia + Nokian Renkaat	0.8576	0.5081
Orion + Oriola-KD	0.4260	0.2283
Outokumpu + Outotec	0.7840	0.5457
Sievi Capital + Scanfil	0.8341	0.1796
YIT + Caverion	0.4899	0.4333

### Appendix 5. Heteroskedasticity and autocorrelation tests from $t$ to $t_{+30}$ .

Company	Heteroskedasticity Test: White	Breusch-Godfrey Serial Correlation LM Test
Ahlstrom + Munksjo	0.5328	0.5705
Aspo + Aspocomp	0.7050	0.7804
Done + Reach-U Holding	0.1083	0.7253
Finvest + Vestcap + Evox Rifa Group	0.9039	0.3539
Fortum + Neste Oil	0.3787	0.4697
Kemira + Tikkurila	0.2187	0.2413
Kemira + Kemira GrowHow	0.7211	0.5443
Kone + Konecranes	0.6487	0.0887
Kone + Cargotec	0.3073	0.9955
Kyro + Tecnomen Holding	0.8333	0.9989
Lassila & Tikanoja + Suominen	0.9503	0.8361
Nokia + Nokian Renkaat	0.5581	0.5037
Orion + Oriola-KD	0.9056	0.3375
Outokumpu + Outotec	0.0527	0.2928
Sievi Capital + Scanfil	<b>0.0210</b>	0.9061
YIT + Caverion	0.5084	0.8218