WEALTH AND LIQUIDITY EFFECTS OF SHARE REPURCHASES – EVIDENCE FROM FINLAND 1998 - 2008

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Dennis Roikonen
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Department of Accounting and Finance
HELSINGIN KAUPPAKORKEAKOULU
HELSINKI SCHOOL OF ECONOMICS

HELSINKI SCHOOL OF ECONOMICS (HSE)
Department of Accounting and Finance

Wealth and Liquidity Effects of Share Repurchases

Evidence from Finland 1998 – 2008

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Abstract
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PURPOSE OF THE STUDY

The objective of the study is to measure the wealth effects surrounding share repurchase announcements and initial actual share repurchases. As the first research question state, I examine whether the events have increased shareholder value and how the returns have differed from each other. Also key drivers behind the observed returns are analyzed and compared to the findings of previous literature. Finally, liquidity effects are evaluated surrounding the same events. Since liquidity effects around the above-mentioned events have not been studied earlier with Finnish data, I investigate whether companies have been able to increase liquidity on the Helsinki Stock Exchange through the announcements as stated in the second research question.

DATA

The study focuses on all listed Finnish companies trading on the Helsinki Stock Exchange between 1998 – 2008. The announcements of share repurchase programs and initial actual repurchases are collected from Kauppalehti online and NASDAQ OMX database for corporate press releases. The final dataset includes 466 repurchase program announcements from 93 companies and 133 initial repurchases from 58 companies. Share information as well as accounting data is gathered from Thomson ONE Banker and information about foreign ownership from Euroclear Finland Oy.

RESULTS

The main findings of this study are that companies increase, on average, shareholder wealth around an announcement of a share repurchase program and around an initial actual repurchase and that small firms generate higher abnormal returns than large firms. The study also finds that signaling and free cash flow hypothesis have some power on explaining the observed cumulative abnormal returns. Finally, it is shown that the discussed events increase liquidity and trading volume in the Finnish stock market between 1998 – 2008.

KEYWORDS

Share repurchases, initial actual repurchases, liquidity, trading volume, turnover, bid-ask spread

HELSINKI SCHOOL OF ECONOMICS (HSE)
Department of Accounting and Finance

Helsingin kauppakorkeakoulu
Rahoituksen pro gradu -tutkielma
Dennis Roikonen

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TUTKIMUKSEN TAVOITE

Tutkimuksen tavoitteena on tarkastella varallisuusvaikutuksia omien osakkeiden takaisinostovaltuutuksien sekä ensimmäisten takaisinostojen yhteydessä. Ensimmäisenä tutkimuskysymyksenä tutkin, ovatko edellä mainitut ilmoitukset kasvattaneet osakkeenomistajien varallisuutta sekä miten tuotot eroavat tapahtumien välillä. Tutkimuksessa pyritään myös löytämään tukea aikaisemmassa kirjallisuudessa käytetyille hypoteeseille, joiden uskotaan selittävän havaittuja epänormaaleja tuottoja. Varallisuusvaikutuksien lisäksi myös likviditeettivaikutuksia on arvioitu samojen tapahtumien yhteydessä, koska aihetta ei ole tutkittu aiemmin suomalaisella aineistolla. Toisen tutkimuskysymyksen mukaan pyrin selvittämään, pystyvätkö yritykset vaikuttamaan likviditeettiin ilmoittamalla edellä mainituista tapahtumista.

AINEISTO

Tutkimus perustuu vaihtodataan kaikista suomalaisista yrityksistä, jotka ovat olleet julkisen kaupankäynnin kohteena Helsingin pörssissä vuosina 1998 – 2008. Ilmoitukset takaisinostovaltuutuksista sekä ensimmäisistä takaisinostoista on kerätty Kauppalehden sekä NASDAQ OMX:n pörssitiedotearkistoista. Lopullinen aineisto koostuu 93 yrityksen 466 takaisinostovaltuutuksesta sekä 58 yrityksen 133 ensimmäisestä takaisinostosta. Osakkeisiin liittyvä informaatio ja tilinpäätösinformaatio on kerätty Thomson ONE Banker -tietokannasta sekä ulkomaalaisomistusosuudet Euroclear Finland Oy:n palvelusta.

TULOKSET

Tutkimuksen empiirinen osa osoittaa, että yritykset luovat keskimäärin arvoa omistajilleen takaisinostovaltuutuksen ilmoituksen sekä ensimmäisen takaisinoston ilmoituksen yhteydessä. Lisäksi arvonluonti on voimakkaampaa pienten yritysten kohdalla verrattuna suurempiin yrityksiin. Epänormaalien tuottojen keskeisimpiä ajureita näyttävät olevan signalointihypoteesi sekä vapaan kassavirran hypoteesi. Tutkimus osoittaa myös, että likviditeetti ja osakkeiden vaihto kasvavat edellä mainittujen tapahtumien yhteydessä.

AVAINSANAT

Omien osakkeiden takaisinostovaltuutus, ensimmäinen takaisinosto, likviditeetti, osakkeiden vaihto, osto- ja myyntihinnan ero

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"When companies with outstanding businesses and comfortable financial positions find their shares selling far below intrinsic value in the marketplace, no alternative action can benefit shareholders as surely as repurchases." – Warren Buffet, 1984

1 INTRODUCTION

1.1 Background and Motivation of the Study

Companies are expected to use business resources efficiently and profitably. If these requirements are not fulfilled, the excess cash should be distributed to company's shareholders. Distribution of excess cash can be carried out in different ways, but the most common way is to pay dividend on company's shares. Other main alternative is share repurchases, the importance of which when distributing cash flows have increased substantially during the past 10 years.

This thesis concentrates on share repurchase program announcements and initial actual open-market share repurchases. Share repurchases were made possible in Finland in November 1997 but were still restricted quite heavily until 2005 when the new amendment doubled the amount of shares to be repurchased. The new legislation has increased interest in the subject as a whole in Finland.

Many international and a couple of studies in Finland have found abnormal returns at the announcement of a share repurchase program. The number of companies announcing their intention to start a share repurchase program has increased steadily. Abnormal returns have been material even though an announcement of open-market share repurchase program is not a commitment to execute the actual share repurchases. Actually, many companies never use their authorization and do not repurchase a single share.

Even though share repurchases are a more and more common way of distributing cash to share holders, only a few studies have been conducted about the issue in Finland. This thesis follows the logic applied in a study conducted by Karhunen (2002). The study made by Karhunen discusses the topic extensively and from different perspectives but the small sample size and relatively short time period limit the reliability of the empirical results of the study.

In addition to Karhunen's doctoral thesis, Örmä (2008), in her master's thesis, has tried to apply Karhunen's methods to study open market repurchases. Örmä's study discusses the

topic only relatively narrowly and e.g. the announcement period retuns around actual repurchases are completely left out. Moreover, her time period 2003 – 2006 is relatively short even though the data would have been available from 1998 onwards. Finally, the announcement dates in the thesis do not follow a consistent pattern, because some of the events occur when the announcement was initally made public and other events when the authorization was received although the information was already available and released earlier.

In this thesis, I will examine the announcement effects of open-market share repurchase programs and the effects of the first actual share repurchases in Finland from year 1998 to 2008. In addition to the above-mentioned research problem, I will also study the liquidity effects surrounding the same events. My sample is larger in terms of events and years compared to earlier studies. I will study whether the market reaction to share repurchase announcements between 1998 – 2008 are in line with previous studies internationally and in Finland. I also study how the market reactions have changed during the period under review and which factors could explain the abnormal returns.

The motivation of the study is that there is a lack of credible research on the wealth and liquidity effects regarding share repurchase programs in the Finnish stock market. At the time of the previous benchmark study made by Karhunen (2002), share repurchases were a new way to distribute cash to shareholders. The effect is expected to be substantially smaller with the new data, since repurchases have become more common. To the best of my knowledge, the liquidity effects have not yet studied with Finnish data. A strength of my study is also the long time scale 1998 – 2008 which includes various different economic cycles.

The study has also some limitations. In particular, the Finnish Stock Market is relatively small and illiquid. Even though the sample size in this study is substantially larger compared to Karhunen (2002), the number of observations is still much smaller compared to some international studies. When studying the wealth effects surrounding initial actual repurchases, the sample diminishes materially.

1.2 Research Questions and Hypotheses

The research question of this study is twofold. First, it is examined whether the announcements of share repurchase programs and the initial actual share repurchases have increased the shareholder value in the Finnish stock market during 1998 – 2008. In addition, the key determinants behind the observed returns are investigated. The second research question in this study examines whether the share repurchase program announcements and initial actual repurchases have increased the liquidity or trading volume in the Finnish stock market. The hypotheses I try to find support for are listed below.

H_1: An announcement of a share repurchase program has increased shareholder value in the Finnish stock market during 1998 – 2008.

H_1: An initial actual share repurchase has increased shareholder value in the Finnish stock market during 1998 – 2008.

H_3: An announcement of a share repurchase program does not have an effect on liquidity / trading volume in the Finnish stock market during 1998 – 2008.

H_4: An initial actual share repurchase does not have an effect on liquidity / trading volume in the Finnish stock market during 1998 – 2008.

1.3 Contribution to Literature

As mentioned earlier, only some studies about share repurchases have been conducted with a Finnish dataset and the time scale in these studies has been relatively short compared to international studies. This study measures the wealth effects around share repurchase events during the whole period when repurchases have been possible in Finland. In addition to wealth effects, this study contributes to the literature by increasing our understanding about liquidity effects surrounding the repurchase events. In general, liquidity effects have been studied relatively little and this study will find out the relation between share repurchases and some selected liquidity indicators such as trading volume, turnover and bid-ask spreads around repurchases. Managerial timing ability of actual share repurchases is also studied for the first time in Finnish markets.

1.4 Structure of the Study

This study proceeds as follows. The second chapter discusses the framework of share repurchases in Finland, since it is probable that the empirical results are not fully comparable to those acquired from other countries.

The third chapter goes through the literature and key theories as well as the previous evidence on the market reaction to share repurchase announcements and on the initial actual share repurchases. The third chapter also reviews the finance literature, which is related to the studied issue and which tries to explain the reasons behind the observed market reaction.

The fourth chapter describes the data and methodology used in this study whereas the fifth chapter develops and presents the hypotheses.

The sixth chapter is a central part in this study, since it reports the empirical findings of the event study and regressions. Sixth chapter also reports the analysis of liquidity effects under the same circumstances.

Finally, the seventh chapter summarizes and concludes the study.

2 BACKGROUND OF SHARE REPURCHASES IN FINLAND

Share repurchases and, in particular, open market share repurchases are an increasingly important corporate activity. Share repurchases have become an everyday event in the financial markets also in Finland, even though it is a relatively new way to distribute cash to shareholders. An important factor that affects companies' payout policy is the regulatory environment in which the company operates. In Finland, companies who repurchase their own shares are controlled both by the legislation and by the rules and regulations of the Helsinki Stock Exchange.

2.1 Share Repurchase Methods

Share repurchases may be carried out in four different ways. The methods are open-market share repurchase programs, Dutch auctions, fixed-price tender offers and privatively negotiated purchases. Basically all share repurchases in Finland are conducted as open-market share repurchase programs. Tender offers have not been used for repurchases due to the restrictions of the number of shares that can be acquired (Karhunen, 2002). Even the new amendment to the Companies Act has not increased the popularity of tender offers. This thesis focuses on open-market share repurchases and the method is thus presented more rigorously than other methods.

Open-market share repurchases are by far the most widely used and also the easiest method due to the fact that companies simply purchase their own shares in the open market as any other investors. In an open-market repurchase program, companies gradually buy back their shares in much smaller proportions compared to other methods. Brav et al. (2005) suggest that, although open-market repurchases have legal restrictions, this method offers the greatest degree of flexibility as it is not a commitment to buy any shares. Many managers favor repurchases compared to dividends because they can be used in an attempt to time the equity market or to increase EPS. According to the study made in Finland by Karhunen (2002), only 50% of companies that announced a share repurchase program also used the right for actual repurchases.

There are two different tender offer methods to buy back own shares: fixed-price tender offer and Dutch auction. In a fixed-priced tender offer, the company offers to repurchase a predetermined number of shares at a fixed price during a certain period of time. The price often has a significant premium to the market and companies generally tender for a fairly large percentage of shares outstanding. The generous premium for the shareholders increases the probability that they will accept the offer. Fixed-price tender offers, especially those financed by debt tend to be very powerful and convey a positive signal to the market.

In a Dutch auction, management defines the number of shares to be repurchased at some given price range (generally a premium to the market) and the expiration date. Shareholder may then tender their shares at any price within the price range. The pricing method removes the risk that a company would pay more than the price that shareholders are willing to sell. Starting at the bottom of the price range, the company sums the number of shares necessary to fulfill the program and all shareholders who tendered at or below the clearing price receive the clearing price for their shares. Dutch auctions usually convey strong signals to the market and management is able to execute them efficiently.

In privately negotiated repurchases, the company makes a deal with a single usually significant shareholder or a group of shareholders. As an example can be some investor or an investor group who has a large amount of company's shares in order to achieve the majority of company's shares and hereby the control of the company. In a case of this nature, a company can offer to buy the significant number of shares from an investor or a group who tries to make a takeover and thus get rid of the takeover attempt. This so called greenmail transaction has to be made deliberately and with an extremely fair price so that the target will sell its shares. This type of buyback remains relatively rare.

2.2 Regulatory Environment

2.2.1 Legislation related to share repurchases

The legislation on share repurchases is relatively new in Finland, since repurchases were not made possible until 1997. The initial law regarding share repurchases restricted companies to repurchase only 5% of the outstanding shares because legislators wanted to prevent the

manipulation of share prices on the thinly traded Helsinki Stock Exchange. The renewal of the Companies Act in 2005, which brought the legislation in Finland closer to EU standards, allowed companies to buy back 10 % of their outstanding shares. If the holding of own shares is less than the maximum 10%, the company can have them infinitely. Shares acquired in violation of the Companies Act must be transferred without undue delay, and in any event no later than one year after the acquisition. In some special occasions, the shares that exceed one tenth of all shares must be transferred within three years of acquisition.

Before the company can start the repurchase program and actual repurchases, it needs to get an authorization. The authorization to repurchase shares can be received either by the General Meeting or by the board's proposal to shareholders who accept it in the General Meeting. The board is required to present the proposal with all the details about the program, including the reason for the program and the maximum number of shares to be repurchased. The board's proposal for share repurchases must be announced publicly and in most cases it is done together with the board's other proposals for General Meeting. The decision to acquire own shares should contain, for example, the following information[1]:

(1) The quantity or maximum quantity of shares that the decision concerns, broken down by share class.
(2) The persons from whom the shares are to be acquired and, if necessary, the order in which the acquisition is to take place.
(3) The period during which the shares are to be acquired.
(4) The consideration to be paid for the shares.
(5) The effects of the procedure on the equity of the company.

The General Meeting makes the decision on repurchases and in a public company, the decision must be made by qualified majority, which means that a proposal must be supported by at least two thirds (⅔) of the votes cast and the shares represented at the meeting. The General Meeting may also authorize the Board of Directors to decide on repurchases in full or in part. In the new Companies Act the authorization may remain in effect for 18 months, and during this time the Board can use the authorization to buy back shares whenever it wants. In

[1] Limited Liability Companies Act, Unofficial Translation – Ministry of Justice, 2007

the previous Companies Act the authorization was valid for 12 months. One week before the actual repurchases start, the buying company must make a public announcement for using the shareholders' authorization. The public announcement before starting the acquisitions is made to prevent company to repurchase shares from only some shareholders. Own shares may be acquired according to the authorization only by using unrestricted equity for the purpose. Share acquisitions must be made in a way that they do not affect the share price materially and thus the company can acquire only a certain amount of shares per day.

In addition to Companies Act, OMX has its own rules and guidelines regarding share repurchases. When a company is acquiring its own shares it must operate in the market in the same way as other investors. A company may acquire at most a 10% share of its own shares and thus the company may momentarily be a significant player in the markets. The acquisition of own shares must be done in a way that no exceptional market movements result from the trading of the company and the equal treatment of the shareholders is taken into consideration in the acquisition as a whole. The maximum amount a company can acquire at each trading day is restricted to half of the average daily trading volume in four weeks preceding the actual repurchase. This higher percentage compared to many other countries, where the limit is 25%, is explained by the illiquidity and small size of the Helsinki Stock Exchange.

Acquisition of own shares must be notified on a daily basis to the Stock Exchange immediately after the transaction has been conducted and, at latest, before the beginning of the next trading day. In a normal share repurchase case, the repurchases must be notified to the Stock Exchange before the end of the post-trading session and in a minor case before the next trading day. Additionally, in an exceptionally large acquisition where the acquired amount exceeds the allowed 10%, the Stock Exchange must immediately be informed of the transaction in question. The disclosed information on a share acquisition should include the following details:

- The name of the company in question
- Transaction date
- Stock class
- Quantity of shares
- Price per share

- Total transaction price
- Date of notification
- Signature

To prevent insider trading and other exploitation related to acquisitions of own shares, a company should act in trading in its own shares so that such trading does not weaken confidence in the securities markets. It is not recommended e.g. that a commission is given during the 14 day period immediately preceding the release of the financial statements or the interim report or during such longer period of time that the company has prescribed for the insiders of the company.

2.2.2 Share repurchase regulation in Finland compared to other countries

Legislation about share repurchases is fairly strict in Finland compared to the legislation, e.g., in the USA. In Finland, companies are required to disclose nearly everything concerning share repurchases. Most of the studies regarding share repurchases are done in the US where the legislation and disclosure requirements differ significantly. As opposed to Finland were all companies are obligated to disclose all the information concerning actual share repurchases on a daily basis, the practice is completely different in the US where companies do not have to disclose any information if own shares are acquired. The lack of credible data is the most important reason why actual share repurchases have not been widely investigated in the US stock markets.

The key differences in the US and Finnish regulation on share repurchases are related to the length of authorization and maximum daily trading volumes. As in Finland the authorization has to be used within 18 months of the GM's approval, the legislation in the US does not make such restrictions. Stephens and Weisbach (1998) report that it is not unusual for US companies that repurchase programs are valid for several years and the amount of acquired shares is not limited. Another feature specific for share repurchases in Finland is that the maximum amount a company can acquire at each trading day is restricted to half of the average daily trading volume in four weeks preceding the actual repurchase. The corresponding trading limitation is 25 percent in many other countries.

2.3 Tax Considerations

In the latest tax reform at the beginning of 2005, the taxation for capital gains and dividends in Finland changed materially. Until 2005, Finland had a full imputation system of corporate tax which prevented double taxation. Tax rate for dividends as well as for corporations was 29 percent. In the old system, when dividends were paid to shareholders, corporate taxes were deductible and the effective tax rate, corporate taxes included, was only 29 percent. This system was removed in order to harmonize the legislation in EU countries and bring Finnish legislation closer to EU standards. After the renewal of the system, the tax rate for capital gains is 28% and for corporations 26%. Nowadays, the dividends received from publicly listed companies are partially tax-free, since 30% of the received dividends are not taxable. The remaining 70% is taxed at a tax rate of 28%. This means that the profit generated by a company is taxed two times as first the company pays 26% tax for its profits and after that shareholder pays tax for the capital gains. As a result, the taxation for dividends are lower than capital gains, since the effective tax rates are 19.6% and 28% respectively.

There is also another recent change in the Finnish legislation and tax treatment of dividends between Finland and USA that might affect the popularity of share acquisitions in the future. A central point in the tax convention between USA and Finland, which came into force on 28.12.2007, is that dividends received by pension institutions and pension funds will be exempt, subject to certain conditions, from the present 15 percent withholding tax (Ministry of Finance, 2006). The effect of this tax treaty can be seen e.g. in Nokia, which increased the amount of dividends distributed to shareholders and decreased the amount of shares to be repurchased.

3 PREVIOUS LITERATURE

At the time when Miller and Modigliani (1961) conducted their famous study about payout policy, share repurchases were not in use. According to their theory, different payout policies should not affect the firm value if markets are perfect and investors behave rationally. As a result, firm value is dependent only by the underlying cash-flows of the firm. If we ignore taxation and transaction costs, share repurchases are identical to a dividend payment when distributing cash to shareholders. In theoretical world of efficient and perfect markets the above-mentioned theory may hold, but in reality the markets are often far from perfect and thus, the payout policy may have an impact on firm value. The literature about share repurchases presents credible evidence that the payout method does matter, since share repurchase announcements have generated significant positive market reactions in the past decades.

In this chapter, I will go through the historical evidence of abnormal returns around share repurchase announcements as well as around the initial actual repurchases. Also the literature and evidence of liquidity effects around share repurchases announcements will be presented.

3.1 Evidence of Abnormal Returns of Share Repurchase Announcements

The announcement effects of share repurchase programs have been widely studied in the past decades. Historically, share repurchase announcements have generated a significant positive market reaction in share prices regardless of the repurchase method used. Most of the previous studies are made with US data but there are also a few studies made by McNally (2002 and 2006) with Canadian data and one by Karhunen (2002) with Finnish data. The summary of market reactions around share repurchase announcements found in different studies is presented in Table 1.

All in all, fixed-price tender offers have generated the largest positive market reactions around share repurchase announcements. The earliest studies made by Masulis (1980), Dann (1981), Vermaelen (1981) and Lakonishok and Vermaelen (1990) studied the market reaction of fixed-price tender offers with samples from the 1960's and 1970's and found market reactions around +15 per cent. The later studies by Comment and Jarrel (1991) and Lie and McConnell

(1998), applied data from 1980's and found substantially smaller, but still statistically significant, positive announcement returns of +8 per cent.

Dutch auction tender offers have increased the shareholders wealth by slightly less than 8 per cent. According to Comment and Jarrel (1991), who compare the three forms of common stock repurchases, Dutch-auction self-tender offers and open-market share repurchase programs seem to be weaker signals of stock undervaluation than fixed-price self-tender offers and thus result in smaller positive stock returns after the announcement.

The market reactions to open-market share repurchase program announcements are substantially smaller compared to the two other methods presented above. Typically, the average abnormal return around open-market share repurchase announcement has been around +3 per cent in the US. A similar positive share price reaction in Finland has been detected by Karhunen (2002). An interesting finding is that the market reaction is only around +1 per cent in Canada. Many studies have found proof that the announcements of repurchase programs are usually preceded by weak share price performance and followed by a good share price performance with an effect even up to four years (see e.g. Ikenberry et al., 1995).

At least two explanations have been proposed on why open-market share repurchase announcements generate notably smaller market reactions than the other methods. Firstly, Stephens and Weisbach (1998) propose that open-market repurchase programs do not provide a strong enough and credible signal that the share is undervalued, since an announcement and authorization for repurchases are not commitments for the firm. Comment and Jarrel (1991) argue that the proportion of shares repurchased explains the different market reaction. According to their study in the US, the average proportion of shares repurchased was 19 per cent in fixed-price tender offers, 15 per cent in Dutch auctions and only 5 per cent in open-market repurchase programs.

Table 1:
Summary of evidence on short-term abnormal returns around share repurchase announcements for the three most important share repurchase methods.

Method	Study	Sample period	Sample size	Event window	Announcement effect
Fixed-price tender offer					
	Masulis (1980)	1963-1978	199	[-1;+1]	16,90 %
	Dann (1981)	1962-1976	143	[-1;+1]	15,41 %
	Vermaelen (1981)	1970-1978	131	[-1;+1]	15,22 %
	Lakonishok and Vermaelen (1990)	1962-1986	221	[1]	12,54 %
	Comment and Jarrell (1991)	1984-1988	93	[-1;+1]	8,30 %
	Lie and McConnell (1998)	1981-1994	116	[-1;+1]	7,90 %
Dutch auction					
	Comment and Jarrell (1991)	1984-1988	72	[-1;+1]	7,50 %
	Bagwell (1992)	1981-1988	31	[0]	7,70 %
	Lie and McConnell (1998)	1981-1994	91	[-1;+1]	7,70 %
Open market					
	Vermaelen (1981)	1970-1978	243	[-1;+1]	3,67 %
	Ikenberry et. al. (1995)	1980-1990	1239	[-2;+2]	3,54 %
	Stephens and Weisbach (1998)	1981-1990	370	[-1;+1]	2,69 %
	Ikenberry et. al. (2000)	1989-1997	1060	[2]	0,93 %
	Kahle (2002)	1993-1996	712	[-1;+1]	1,60 %
	Karhunen (2002)	1998-2001	155	[-1;+1]	1,86 %
				[-2;+2]	2,78 %
	McNally (2002)	1989-1998	396	[-1;+2]	1,06 %
	Chan et. al. (2004)	1980-1996	5508	[-2;+2]	2,18 %
	Grullon and Michaely (2004)	1980-1997	4443	[-1;+1]	2,71 %
	Li and McNally (2006)	1987-2000	901	[-1;+2]	0,73 %

[1] The announcement effect is computed from five days before the announcement until ten days after the expiration. [2] The mean abnormal announcement return is the average total return for sample firms in the announcement month adjusted for the respective Toronto Stock Exchange index total return.

3.2 Evidence of Liquidity Effects to Share Repurchase Announcements

A number of studies have examined the effects of share repurchases on liquidity from various perspectives. Empirical studies of trading activities (such as trading volume and bid-ask spreads surrounding announcement of share repurchases) have been, however, rare and generally explained by the lack of data. In addition, the results of previous research on the liquidity impact of share repurchases are mixed. In some studies, share repurchases have been found to increase liquidity while other studies have come to the opposite conclusion. This

study, as well as most of the other studies, use daily closing bid-ask spreads to measure the changes in liquidity. In addition to measuring liquidity by bid-ask spread, I will also study the changes in trading volumes with different methods.

One obvious reason why liquidity could decrease due to share repurchases is that the number of shares outstanding decreases. In addition, changes in bid-ask spreads have been widely explained with information asymmetries because repurchase managers are better informed traders in the market and thus, increase the adverse-selection cost component of the bid-ask spread and hence decrease liquidity.

In the following section, I will divide studies about liquidity surrounding an announcement of a share repurchase program or an announcement of an initial actual share repurchase to three different categories. First, studies which are associated with liquidity decrease (bid-ask spread increases) and support *the liquidity decrease hypothesis*. Second, studies that find evidence of liquidity increases (bid-ask spread decreases) and support *the liquidity increase hypothesis*. And finally the third category, where scholars have not found any significant changes in liquidity.

Barclay and Smith (1988) were the first scholars to argue that after the share repurchase announcement the existence of asymmetric information increases and that the bid-ask spread widens and liquidity goes down. Their findings are in line with their hypothesis and the bid-ask spread for US firms widen after an announcement of a share repurchase. Findings by Brockman and Chung (2001), who analyze the liquidity effects on the Hong Kong Stock Exchange, are also in line with information asymmetry hypothesis and detect an increase in the bid-ask spreads and decrease in liquidity during repurchase periods. Also their evidence suggests that there are information asymmetries (i.e. repurchase managers trade on information advantage).

The first study that find increases in liquidity surrounding a share repurchase announcement was conducted by Franz, Rao and Tripathy (1995). They studied the bid-ask spread in the NASDAQ market and argue that share repurchases decrease information asymmetries and the adverse selection component of the spread and thus increase liquidity. Cook et al. (2004) studied the liquidity issue surrounding actual repurchase days and found that share repurchases, especially in NASDAQ shares, increase liquidity and bid-ask spread decreases surrounding the repurchase transactions.

There are also scholars who studied bid-ask spreads without finding any significant results whether the liquidity increases or decreases. Kim (2005) examined if a liquidity change in the U.S. market will be larger in a firm with higher degree of pre-announcement information asymmetry. According to his results, there is no significant change in liquidity across firms with differing degrees of information asymmetry. Singh et al. (1994) find out that bid-ask spread increases before the announcement but find no evidence that the spread would increase also after the announcement. Wiggins (1994), Miller and McConnell (1995) and De Ridder and Råsbrant (2004) have also studied the bid-ask spreads surrounding the announcement date but have not found evidence of a significant change in liquidity.

De Ridder and Råsbrant (2004) studied the liquidity effects of share repurchases in Sweden between 2000 and 2003. They found a 7 per cent increase in trading volume on the date of the announcement as well as on the the first day when actual repurchases take place. They found a higher trading volume in the period surrounding the actual repurchase date compared to the announcement day. In addition to this, they studied the relative change in the bid-ask spread on the first month after a repurchase but did not find a significant change.

3.3 Why Do Companies Repurchase Shares?

The financial literature has explored various motivations for share repurchases but it has focused on five hypotheses that may explain the abnormal returns observed on the time of an announcement of a share repurchase program. According to these hypotheses, companies buy back shares to: (1) signal to the market that their share is undervalued, (2) distribute excess cash flows to its shareholders, (3) change the capital structure, (4) take advantage of the different taxation on repurchases compared to dividends (5) increase the earnings per share (EPS) and struggle against the dilution effects when employee stock options are exercised. There are also some other motivations behind the repurchases which will be presented in this chapter. Depending on the circumstances of a company, it may have several motivations to repurchase its own shares and in Finland at least one reason has to be disclosed together with the announcement.

3.3.1 Signaling hypothesis

Signaling hypothesis has become the most important theory that explains the observed market reaction around the announcement of a repurchase program. According to Brau and Holmes (2006), the managerial signaling hypothesis[2] is based on asymmetric information between managers and shareholders. Managers have private information about the company and the value of the firm. If the management considers that the company's share is undervalued and see it as a good investment, they may communicate the information to the market by announcing share repurchases. On the other hand, firm's announcement to repurchase shares might also be a signal that the firm has no profitable investment targets.

There is substantial evidence supporting asymmetric information as a reason for share repurchases. According to Ikenberry et. al. (1995) signaling hypothesis holds in two ways. First, management have private information of future outlook and they try to communicate the information to the market through share repurchases or announcements. Second, the managers have noticed that the company is undervalued and they exploit this by announcing a share repurchase program. McNally et. al. (2006) find that companies making repurchases exhibit firm-specific timing ability, which supports the assumption that firms have asymmetric information. They find that abnormal returns are significantly negative over the five days before the repruchase trades and that companies tend to buy during short-run dips in share price.

Brav et al. (2005) found in a survey made to financial executives of repurchasing firms that payout policy is an effective method to convey information to the market. The most common answer by financial executives was that "payout decisions convey information about our company to investors". They also argue that managers use share repurchases as a consequence of undervaluation. Another survey made by Baker et al. (2003) found that undervaluation is the most important reason, why companies acquire their own shares. However, undervaluation motive for share repurchases is contradicted in a study made by Karhunen (2002) in Finland as only 10% of repurchases were motivated by undervaluation.

Many researches investigating the signaling effect of share repurchases concentrate on the firm-specific determinants that may affect the magnitude of the market reaction. The most

[2] Signaling hypothesis is also known as "the undervaluation" or "the asymmetric information" hypothesis.

important and often mentioned single factor in favor of signaling hypothesis is that share repurchases programs are very often preceded by share's negative abnormal performance (e.g. Vermaelen, 1981; Comment and Jarrel, 1991). Comment and Jarrel (1991) also suggest that negative share price performance is followed by share repurchases which are, again, followed by good earnings and share price performance. Multivariate analyses by Vermaelen (1981), Stephens and Weisbach (1998) as well as Chan et. al. (2004) show a negative relationship between the earlier share price performance and the announcement period abnormal return. This implies that the share price reaction is more positive after the announcement whereas the share price performance has been weak before the announcement.

Finally, it has been argued that small companies are less followed by financial analysts, their institutional ownership is lower and they are less visible in the financial media. Thus, they may find an announcement of share repurchase program the only way to reduce information asymmetries. When information asymmetries exist, the companies should be willing to convey information to the market that their share price is undervalued. Vermaelen (1981) finds that small firms are expected to signal more information to the market when they acquire their own shares. According to many studies (Stephens and Weisbach, 1998, Grullon and Michaely, 2004, Chan et. al. 2004), abnormal returns around the announcement day are negatively related to firm size which means that it is harder for small companies to communicate information to the market and more likely that there is information asymmetries but that these firms generate higher announcement period abnormal returns.

3.3.2 Free Cash Flow hypothesis

Free cash flow hypothesis is another important theory on share repurchases and suggests that cash flows in excess of what is required by the business, should be distributed to shareholders. According to Jensen (1986), the positive market reaction relating to share repurchases is due to reduced agency costs. Jensen (1986) suggests also that share repurchases are a good way to distribute excess cash to shareholders because managers' objectives differ from those of shareholders and that the presence of internally generated cash flow in excess of that required to maintain existing assets in place and to finance new positive NPV projects, creates potential for those funds to be misspent. Jensen also argues that share repurchases are an efficient way of alleviating agency problems when repurchases are financed by new debt.

A traditional way of distributing cash to owners is to pay dividends but open-market share repurchases have grown rapidly relative to dividends in the past decade (Fairchild, 2006). This can be explained by that repurchases are a more flexible way of distributing cash to shareholders because they do not have to be made on specific dates and open-market repurchase announcement is not a firm commitment of actual repurchases (Brav et al., 2005). Dividends are again more precise because they are, in Finland, dealt once a year and are fairly constant year after year. Dividend cuts are associated to negative market reactions because it is seen as a commitment to pay the same dividends in the coming years. In line with previous studies Stephens & Weisbach (1998), Jagannathan et al. (2000) and Brav et al. (2005) find that firms use share repurchases to pay out cash that have a low probability of being sustainable.

Jagannathan et al. (2000) suggest that companies with higher permanent operating cash flows prefer dividends, whereas companies with higher temporary non-operating cash flows prefer share repurhases. This means that companies using dividends when distributing cash to owners have less volatile cash flows. Guffey and Schneider (2004) examined the financial characteristics of US firms engaging in share repurchase activity compared with those not engaging in such activity. They found that most important explanation for repurchases comes from variables associated with free cash flow hypothesis.

Li and McNally (2007) and Kahle (2002) find that the amount of free cash flow is positively related to abnormal returns around repurchase announcements, whereas Grullon and Michaely (2004) find the same reaction to the overall level of cash in the firm. They find that the systematic risk and cost of capital declines in companies who repurchase own shares as well as stronger relationship between the amount of cash and market reaction for firms that are likely to overinvest.

3.3.3 Leverage hypothesis

Lane et al. (1989) suggest that managers frequently mention leverage as an important motive for share repurchases. According to the leverage hypotheses, companies increase, their debt-to-equity ratios by repurchasing shares and at the same time lower the total amount of shares outstanding. The desired outcome is to increase the firm value by exploiting tax deductability

of interest payments on new debt and pursue the optimal leverage ratio. According to the theory, tax savings are transferred to shareholders which explains the positive market reaction. The case in Finland is not that straightforward due to share repurchase restrictions which were 5% of share capital up to 2005 and 10% from 2005 onwards. This limits significantly the potential tax savings from new debt. In tender offers, where the acquired amount of shares is significant capital structure can be changed materially, whereas open-market share repurchases are more fine-tuning of capital structure. As a result, the magnitude of this hypothesis to market reaction is naturally highly dependent on the amount shares repurchased and how it is financed.

Chan et al. (2004) find that companies who repurchase shares in order to alter their capital structure do not generate larger abnormal returns on the time of the announcement of a share repurchase program. The survey made by Brav et al. (2005) shows that only 28.2 per cent of financial executives answer that changing debt-to-equity ratios is an important factor when considering share repurchases. Compared to signaling and free cash-flow hypotheses, leverage hypothesis does not seem to be a key motivation to share repurchases and hence, do not play significant role in explaining their market reaction.

Bondholder expropriation hypothesis is closely related to leverage hypothesis. Dann (1981) suggests that according to bondholder expropriation hypothesis an unexpected share repurchase transfers wealth from bondholders to shareholders. Dann found some evidence to support his argument but effect was not economically significant. Unexpected wealth transfers are mitigated by covenants in bonds restricting repurchases and the general restrictions by law.

3.3.4 Dividend substitution hypothesis

The use of share repurchases has been explained by different tax treatment of capital gains and dividends. Grullon and Michaely (2002) find that tax affairs are significant determinants of the market reaction to share repurchase announcements. These findings when substituting dividends with share repurchases, were true in some countries such as US and UK. However, the recent amendments to the Canadian and US legislation have made dividends more competitive from tax perspective and many institutions and pension funds do not pay taxes on

dividends. In Finland it has had only little relevance due to equal tax treatment for both dividends and capital gains, especially for domestic shareholders. However, dividends are nowadays taxed at an effective tax rate of 19.6 per cent whereas capital gains are taxed at 28 per cent. Foreign investors from countries where taxation is softer for capital gains, benefit when company pays out excess cash through share repurchases compared to dividends. In fact, study made by Liljeblom and Pasternack (2006) with Finnish data strongly indicates that higher foreign ownership is related to higher likelihood for share repurchases and explains this with tax-related factors.

Brav et al. (2005) report in their survey that financial executives view tax affairs as a minor factor when considering share repurchases or the company's payout policy. Grullon and Michaely (2002) find that although the US Tax Reform Act of 1986 greatly reduced the relative tax advantage of capital gains, the gap between the top marginal rate on ordinary income and the marginal rate on capital gains is still positive and significant. This evidence argues against that taxes would have a significant role when considering share repurchases and supports the proposition.

According to the dividend substitution hypothesis, the positive market reaction is due to an unanticipated announcement of share repurchases and the shareholders receiving tax-benefits from share repurchases instead of dividends. Critique against the hypothesis has been put by Dann (1981) and Vermaelen (1981) who express doubts in their independent studies about tender offers. They question whether the tax-benefits can explain the substantial 10% announcement effect.

3.3.5 Increasing bump hypothesis and offset dilution effect of stock options

A very common explanation for starting a repurchase program is to increase the earnings per share by decreasing the number of shares outstanding. According the survey made by Brav et al. (2005) to corporate executives, increasing earnings per share is the second most important reason when considering share repurchases. In the survey, 76.1 percent per cent of respondents explain that increasing earnings per share is an important or very important factor in the payout decision.

Grullon and Ikenberry (2000) suggest that investment bankers and analysts often cite the increase in earnings per share, if not the primary, as a key benefit of share repurchases. They also point out that, as long as earnings fall by less in percentage terms than the percentage of shares outstanding, then earnings per share will indeed go up and if we assume that the market sets prices by mechanically capitalizing reported EPS at common multiples, share prices will also go up. Behind the motivation for increasing earnings per share is a hidden assumption that the firm has idle or unproductive assets and by distributing these excess funds to shareholders the firm's ability to generate higher EPS increases. The theory suggests that if company has only negative NPV projects, then the excess cash should be reallocated to better uses. However, if positive NPV investment projects exist, then distributing excess by share repurchases may actually destroy shareholder value.

Decreasing the amount of shares outstanding is not a very unambiguous thing, since it may not actually decrease the amount of shares outstanding at the end of the repurchase program due to the employee stock options. When company repurchases its own shares, at the same time it most often issues shares in order to fulfill the company's employee stock options. According to a study by Li and McNally (2007), the real number of shares of repurchasing companies actually increases by 4.73 per cent while the corresponding figure of companies who do not make share repurchases amounts 10.02 per cent. They argue that the number of shares outstanding rises because of the exercise of stock options and convertible securities. Thus, the main impact of repurchases is not that they reduce shares outstanding, but that they slow the rate of dilution. Preventing the dilution effect is also supported by Kahle (2002) and Brav et al. (2005) who find in their survey that 67.6 per cent of respondents see that offsetting the dilutionary effect of stock option plans or other stock-based compensation programs is the third most important factor when considering share repurchases.

3.3.6 Takeover defense

According to Sidharth (1991), share repurchases that are usually financed by new debt are a common response of target management to a real or perceived takeover threat. Targeted repurchase or greenmail, where management buys out the holdings an actual or potential take-over bid candidate, is a defensive action against hostile take-over. However, share repurchases used as takeover defense in Finland are very rare due to small takeover activity.

4 DATA AND METHODS

4.1 Data

4.1.1 Sample Identification

This study focuses on all listed Finnish companies trading on the Helsinki Stock Exchange that have announced open market share repurchase programs during the period between January 1, 1998 and December 31, 2008. I will examine all open market share repurchase programs authorized by the General Meeting of shareholders regardless of the execution level.

The announcements of share repurchase programs and initial actual share repurchases were identified from Kauppalehti online[3] database for stock exchange releases, NASDAQ OMX [4]database of corporate press releases and companies' homepages. I was able to find 96 companies that have made public 476 share repurchase program announcements. However, ten announcements were excluded from the final sample. Six of them were excluded, according to a common practice, because these companies operate in the financial sector. In addition, four events had to be excluded due to lack of data during the event window. As a result, the final sample consists of 93 companies that announced 466 share repurchase authorizations. The sample sizes vary in the calculations presented in the sixth chapter according to the data which is required to perform the tests. The used sample size is specified one at a time in each calculation. A complete list of the sample firms and events are presented in Appendix 1.

The majority of repurchase program announcements come in the form of board's proposal to the shareholders meeting as described in the second chapter. This proposal includes often other information as well, e.g. information about dividends and other proposals. Although announcements include additional information, they are not excluded from the final sample due to substantial loss of data. This practice is in line with the past studies by Karhunen (2002) as well as by, e.g., Comment and Jarrel (1991) whose findings are similar for the whole sample and for the cleaned sub-sample.

The data on actual share repurchases is relatively easy to collect in Finland because of strict disclosure requirements described in the second chapter of the study. The firms are required

[3] www.kauppalehti.fi
[4] http://nasdaqomx.com/whoweare/newsroom/

to disclose practically all information related to acquisitions of own shares and information is available online. The final sample in the analysis related to actual repurchases consists of 133 initial repurchases for 58 companies. A complete list of companies that acquired their own shares are presented in Appendix 1.

The identified companies are listed or have been listed on the OMX Helsinki Stock Exchange (In appendix 1, companies are listed according to the latest name. For example, Ramirent PLC used to be A-Rakennusmies in 1999). The stock price information and daily returns as well as the OMX Helsinki CAP index are collected from the Thomson ONE Banker database for all sample companies. In OMX Helsinki CAP index the weight of one security is limited to 10% compared to OMX Helsinki index where Nokia's weight is dominating. The returns are based on closing prices with adjustments for splits, stock dividends and cash dividends. The risk free rate used in the calculations is one year Finnish government bond and this is retrieved from Datastream. Thomson ONE Banker database is also used for collecting relevant accounting information for the sample companies. The missing information is retrieved from the companies' financial statements. Data used in the liquidity calculations is also retrieved from Thomson ONE Banker database. Trading volume and number of shares outstanding are gathered for each trading day and bid and ask prices are daily closing prices.

Information on foreign ownership is gathered from the database of Euroclear Finland Oy[5] (former Finnish Central Securities Depository or Arvopaperikeskus in Finnish), which stores statistics of foreign ownership on a monthly basis. The month I have used in the analysis is the previous month to the event.

4.2 The Methodology

4.2.1 Event Study

In this study, to measure the price effects and CARs of share repurchase announcements and initial actual share repurchases, I conducted a standard (single index) market model event study. The event study method is first introduced by Fama et al. (1969), who proposed a new event study methodology for measuring the effects of actions and events on security prices. The event study methodology was later described more rigorously by Brown and Warner

[5] www.euroclear.eu (former Finnish Central Securities Depository or Arvopaperikeskus)

(1985). The model was initially formed and used to examine if market adjusts rapidly to new information. I will go through briefly the event study methodology in the following.

The first step in the model is to estimate the standard market model parameters for all the events. The estimated parameters α and β are figured out by regressing each company's daily excess returns against the overall market's daily excess returns over a period starting 205 trading days and ending six trading days before an announcement of a repurchase program or before an initial repurchase (Formula 1). The estimated parameters are α_i and β_i in the following expression:

$$(r_{i,t} - r_{f,t}) = \alpha_i + \beta_i(r_{m,t} - r_{f,t}) \quad (1)$$

where $r_{i,t}$ is the daily logarithmic return of the firm i at day t, $r_{f,t}$ the daily risk-free rate[6] at day t and $r_{m,t}$ the daily logarithmic return for the market's stock index[7] at day t. In some events I was not able to estimate the parameters for the whole time period (-205 to -6) due to the lack of data, so I extended the period to include the missing number of days after the event window.

After the market model parameters (alfa and beta) are estimated, the next step is to calculate the expected excess returns for the event window surrounding each share repurchase announcement or initial actual share repurchase (Formula 2). In order to find out the CARs, we must calculate abnormal returns (AR_t) on a day t for a given security i (Formula 3). The average daily abnormal returns for the whole sample are calculated according the Formula 4.

$$E(r_{i,t} - r_{f,t}) = \alpha_i + \beta_i(r_{m,t} - r_{f,t}) \quad (2)$$

$$AR_{i,t} = r_{i,t} - [r_{f,t} + \alpha_i + \beta_i(r_{m,t} - r_{f,t})] \quad (3)$$

[6] Finnish government bond (1-year). The data is retrieved from Datastream database.
[7] OMX Helsinki CAP index

$$\overline{AR_t} = \frac{1}{n}\sum_{i=1}^{n} AR_{i,t} \quad (4)$$

In Equations (2) – (4), i refers to the firm announcing a repurchase program or an initial actual share repurchase, t is the day and n is the number of companies in the sample. The cumulative average abnormal return during an event window of [-T;+T] is calculated by summing up the daily average abnormal returns over the event window as follows (Formula 5):

$$\overline{CAR} = \sum_{-T}^{+T} \overline{AR_t} \quad (5)$$

To analyze the CARs statistical significance and to calculate the t-statistic, I need the average cumulative abnormal returns (Formula 5) and the standard deviation of average daily abnormal returns which is calculated as follows (Formula 6 and 7):

$$S(\overline{AR}) = \left[\frac{1}{199}\sum_{t=-205}^{-6}(AR_t - \overline{AR})^2\right]^{\frac{1}{2}} \quad (6)$$

where

$$\overline{AR} = \frac{1}{199}\sum_{t=-205}^{-6} AR_t \quad (7)$$

As can be seen from Formula (6), the standard deviation of average daily abnormal return is the standard deviation of the average residuals of the company making an announcement over the 200-day market model estimation period.

By exploiting the results of the Formulas (5) and (6), it enables to calculate the t-statistic for the average CAR with the null hypothesis of zero for the announcement effect of CAR over

the investigated event window [-T;+T]. According to the results of the t-satistic Formula below (Formula 8), conclusions can be carried out about the statistical significance regarding abnormal retuns or losses on announcement effects or initial actual share repurchases at different significance levels.

$$t = \frac{\overline{CAR}}{S(CAR)} = \frac{\overline{CAR} - \ null\ hypothesis}{\frac{S(\overline{CAR})}{\sqrt{number\ of\ days\ in\ the\ event\ window}}} \quad (8)$$

4.2.2 Multivariate Regressions

A series of regression analyses is applied to find out the relationships between the cumulative abnormal returns and the key determinants behind them. The cumulative abnormal returns are regressed on sets of explanatory variables which, according to findings of earlier studies, can be expected to have an effect on shareholder wealth in share repurchase activities.

When building up regression models, it is important to study multicollinearity (i.e. correlation between two or more explanatory variables) because high correlation between explanatory variables may lead to large standard deviations for the coefficient estimates and therefore difficulties in identifying statistically significant determinants. As the correlation matrix of Table 2 shows, two correlation coefficients (LN of market capitalization and foreign ownership, cash and equivalents / total assets and long term debt / total assets) are actually higher than 0.5 meaning that there might exist multicollinearity between independent variables (Garson, 2009). According to Garson (2009), multicollinearity can be studied and questioned by collinearity statistics, such as tolerance and VIF (variance-inflation factor) measures. In sum, multicollinearity should not cause problems in this case when interpreting the regression coefficients as the explanatory variables have tolerance over 0.2 and VIF-figures below 5.0.

The explanatory variables used in this study's regressions include company-specific financial ratios, foreign ownership percentages and dummy variables. The explanatory variables are presented more rigorously in the following:

PRE-EVENT CUMULATIVE ABNORMAL RETURN [-200, -21]: A variable calculated to reflect the long-term return before the announcement of a share repurchase program.

PRE-EVENT CUMULATIVE ABNORMAL RETURN [-20, -3]: A variable calculated to reflect the short-term return before the announcement of a share repurchase program.

FIRM SIZE: This value is the natural logarithm of market value. Market value is the total value of outstanding shares at the end of the year.

MARKET-TO-BOOK: A ratio reflecting the market capitalization at the latest balance sheet date to book value of total assets at the latest balance sheet date.

FREE CASH FLOW / TOTAL ASSETS: A financial ratio reflecting the free cash flow at the latest balance sheet date before the announcement and the market value of its assets defined by the sum of total debt and market value of equity.

CASH AND EQUIVALENTS / TOTAL ASSETS: A financial ratio reflecting the size of cash reserves before the authorization. The ratio is calculated as book value of cash and cash equivalents at the latest balance sheet date before the authorization divided by market value of assets.

TOTAL DEBT / TOTAL ASSETS: A financial ratio reflecting the leverage ratio. The ratio is calculated as book value of total debt at the latest balance sheet date before the authorization divided by market value of assets.

FOREIGN OWNERSHIP: A variable reflecting the percentage amount of foreign ownership in a company.

PREVIOUS AUTHORIZATIONS: A dummy variable showing, whether a company has previous authorizations to buy back shares. If a company has previous authorizations the dummy variable gets a value of one, otherwise zero.

ACTUAL REPURCHASES: A dummy variable showing, whether a company have utilized the authorization by the Annual General Meeting. If company has made share repurchases, the dummy gets a value of one, otherwise zero.

Table 2:

Correlation Matrix on the Explanatory Variables of the Regression Model

This table presents the correlation coefficients between different company related characteristics that are used to explain the Cumulative Abnormal Returns in the multivatiate regressions of this study. "Pre-event CAR (-200, -21)" is a variable that takes into account the long-term share price performance. "Pre-event CAR (-20, -3) reflects the short-term share price performance before an event. "LN of Market Capitalization" is the natural logarithm of the latest year end market capitalization before an announcement. "Market-to-Book Equity Ratio" is the year end value before the announcement. "Free Cash Flow / Total Assets" is the ratio of free cash flow at the latest balance sheet date before the announcement and the market value of its assets (the sum of total debt and market value of equity). "Cash and Equivalents / Total Assets" is the company's cash and cash equivalents at the latest balance sheet date divided by its total assets as defined before. "Long-Term Debt / Total Assets" is the ratio of company's book value of total long-term debt at the latest balance sheet date before the announcement and the market value of its total assets. "Foreign Ownership" is the percentage amount of shares owned by foreigners. "Prior Repurchase Program" is a dummy variable that takes a value of one if a company has had previous authorizations. "Actual Repurchases" is a dummy variable that takes a value of one if a company has made actual share repurchases.

	Pre-event CAR (-200, -21)	Pre-event CAR (-20,-3)	LN of Market Capitalization	Market-to-Book Equity Ratio	Free Cash Flow / Total Assets	Cash and Equivalents / Total Assets	Long-Term Debt / Total Assets	Foreign Ownership	Prior Repurchase Program	Actual Repurchases
"Signaling Hypothesis"										
Pre-event CAR (-200-21)	1.00									
Pre-event CAR (-20,-3)	0.22	1.00								
LN of Market Capitalization	0.00	-0.05	1.00							
Market-to-Book Equity Ratio	0.00	0.04	0.28	1.00						
"Free Cash Flow Hypothesis"										
Free Cash Flow / Total Assets	-0.04	-0.03	0.19	0.43	1.00					
Cash and Equivalents / Total Assets	-0.02	-0.01	-0.13	0.25	0.19	1.00				
"Leverage Hypothesis"										
Long Term Debt / Total Assets	-0.04	-0.04	0.01	-0.25	-0.26	-0.63	1.00			
"Dividend Substitution Hypothesis"										
Foreign Ownership	-0.02	0.02	0.67	0.23	0.06	-0.10	0.03	1.00		
Prior Repurchase Program	-0.02	-0.03	0.06	-0.09	-0.08	-0.10	0.01	0.07	1.00	
Actual Repurchases	-0.02	-0.01	0.15	-0.05	0.10	0.01	-0.06	0.14	-0.02	1.00

4.2.3 Liquidity effects

Liquidity effects of share repurchases are a central focus area of this study. They are analyzed around the announcement of a repurchase program as well as around the first day an actual repurchase takes place. The methodology is the same as the one introduced and used by De Ridder and Råsbrant (2004). I study and analyze abnormal trading volume and bid-ask spreads for firms which have an authorization and for firms that have made actual repurchases.

First, I study the change in trading volume around the announcement date and the initial share repurchase date. I have calculated this as a ratio between number of shares traded on a specific day and the average number of shares traded during the period -50 to -25 before share repurchase event. When analyzing the results, a ratio of more than one indicates that trading volume has increased on a specific day and ratio less than one indicates that trading volume is below its short-term average. Formula 9 shows the calculation steps.

$$Change\ in\ trading\ volume_{i,t} = \frac{Trading\ Volume_{i,t}}{\frac{1}{25}\sum_{-50}^{-25} Trading\ Volume_{i,t}} \quad (9)$$

To figure out the abnormal trading volume, I first calculate the natural logarithm of turnover for firm *i* at day *t*. According to Lo and Wang (2000), to overcome problems with skewness and kurtosis, a logarithm of trading volume measure is used, more specificly, the logarithm between number of shares in firm *i* traded during day *t* divided by the number of outstanding shares in firm *i* traded during day *t*. The formula is as follows:

$$LN\ Turnover\ (\Omega_{i,t}) = LN\ \left[\frac{Trading\ Volume_{i,t}}{Outstanding\ Shares_{i,t}}\right] \quad (10)$$

The abnormal trading volume is then calculated as the difference between LN Turnover (Formula 10) and the average LN Turnover estimated in the period -40 to -11 days. Thus the abnormal trading volume is given by the expression:

$$Abnormal\ Trading\ Volume_{i,t} = \Omega_{i,t} - \left[\frac{1}{30}\sum_{-40}^{-11}\Omega_{i,t}\right] \quad (11)$$

To test the hypothesis that bid-ask spreads remain unchanged at the time of an announcement of a share repurchase program or an initial actual repurchase, I use the relative spread which is calculated according to Formula 12. I try to find out whether there is a significant change in the relative Bid-Ask spread between the trading days -20 to -1 and +1 to +20.

$$The\ relative\ \ Bid - Ask\ spread = \frac{(Ask\ price - Bid\ price)}{\left[\frac{(Ask\ price + Bid\ price)}{2}\right]} \quad (12)$$

To test whether companies use superior information in acquiring own shares for the first time in declining or bearish market, I analyze the return of the company against the return on the market as well as if an acquisition took place. This regression analysis follows the method used by Grullon and Ikenberry (2000):

$$R_{i,t} = \alpha_0 + \beta_1 R_{m,t} + \beta_2 R_{m,t}\gamma_t + \beta_3 R_{m,t}\gamma_t\delta_t + \varepsilon_{i,t} \quad (13)$$

where $R_{i,t}$ is the daily return for firm i acquiring own shares and α_0 is the intercept of the regression. $R_{m,t}$ is the daily value-weighted market return, γ_t is a dummy variable equal to 1 if the market return is negative, zero otherwise, δ_t is dummy variable equal to 1 if the firm

repurchased any shares during day t and 0 otherwise. The interaction variable $\beta_3 R_{m,t}\gamma_t\delta_t$ captures the impact we are interested in. It measures the market sensitivity of the company's returns on days when both the market is declining and the company is acquiring shares. I expect a negative sign, their beta risk should be decreasing, on the estimated coefficient β_3 if acquiring firms trade in a way that is supporting their shares in downturns.

5 HYPOTHESES

This chapter introduces the main hypotheses of this study. The hypotheses are based on the key findings of earlier literature. The first two hypotheses focus on the wealth creation of the share repurchase announcements and initial actual share repurchases. The two other hypotheses are related to the liquidity effects surrounding the same events. I will also analyze the key findings of multivariate regressions which are formed to explain the motives for announcements. There are four hypotheses (motivations to share repurchases) to which I try to find support: Signaling hypothesis, Free Cash Flow hypothesis, Leverage hypothesis and Dividend Substitution hypothesis.

5.1 Cumulative Abnormal Returns around Events

As mentioned earlier, share repurchase program announcement effects have been widely studied in the past decades. Historically share repurchase announcements, and especially open-market share repurchase announcements, have generated a significant positive market reaction. A typical abnormal return around the share repurchase announcements have been about 3% in the US. In Finland the announcement return has been slightly less than 3% but in Canada interestingly only around 1%. According to the earlier studies, managers seem to have some timing ability when they announce share repurchase programs. In Finland, the timing ability is not likely to be a significant factor since Finnish share repurchase announcements are usually included in the invitations to the Annual General Meetings which takes place in the springtime. However, it is interesting to study if repurchase announcements in Finland receive similar cumulative abnormal returns as found in other countries.

Based on earlier studies, share repurchase announcements are usually a consequence of bad share price performance (Comment and Jarrell, 1991) and followed by a good share price performance with an effect even up to four years (Ikenberry et al., 1995). All in all, the market reaction to share repurchase announcements seems to have changed over time, as was seen on Table 1 where cumulative abnormal returns have decreased steadily. I expect to find similar patterns in Finland and smaller cumulative abnormal returns than Karhunen (2002). As the first hypothesis, I try to find support to the following:

H_1: An announcement of a share repurchase program has increased the shareholder value in the Finnish stock market during 1998 – 2008.

I also try to find evidence if the announcement of the first actual share repurchase has increased the shareholder value during the event window. Karhunen (2002) studied the cumulative abnormal returns when the firm discloses that it will start actual repurchases. He found statistically significant (at 1% level) return of 1.08% at the event day and positive but not statistically significant returns of 0.65% and 0.56% for the periods [-1, +1] and [-2, +2], respectively. The second hypothesis that is related to initial actual share repurchases is presented as follows:

H_2: An initial actual share repurchase has increased shareholder value in the Finnish stock market during 1998 – 2008.

5.2 Hypotheses on Key Drivers of Abnormal Returns

The financial literature has presented a number of motivations for share repurchase programs but in the following, I will concentrate on four key hypotheses that may explain the abnormal returns observed at the time of an announcement of a share repurchase program. These four hypotheses are: signaling hypothesis, free cash flow hypothesis, leverage hypothesis and dividend substitution hypothesis. I will go briefly through these hypotheses and their empirical proxies in the following.

The signaling hypothesis can be associated with three different elements. The first element is, misvaluation, where the hypothesis predicts that positive market reaction is negatively related to the earlier share price performance. The strong negative correlation between these two variables is presented by Comment and Jarrell (1991). The second element is studied by Vermaelen (1981) who finds that announcement period returns and firm size has a strong negative correlation because of information asymmetries. According to him, small companies are linked to higher information asymmetries than large firms. Thus, the increase in share prices for small firms are larger since share repurchase programs reveal valuable information to the market. According to Ikenberry et al. (1995), undervaluation is the third important reason motivating share repurchases. To distinguish undervaluation from other motivations, they sorted firms on the basis of book-to-market ratios (later converted to market-to-book

ratio). They argue that undervaluation is more likely to drive repurchases by high book-to-market companies, while other reasons may motivate repurchases announced by companies with low ratios.

Free cash flow hypothesis suggests that cash flow in excess of what is needed to daily operations should be distributed to shareholders. According to Jensen (1986), positive market reaction is due to reduced agency costs. I use two variables to assess the amount of financial slack in the firm and to test the free cash flow hypothesis: free cash flow divided by total assets as well as cash and cash equivalents divided by total assets.

According to leverage hypothesis, companies increase their debt-to-equity ratios by repurchasing shares and lowering the total amount of shares outstanding. Masulis (1980) and Vermaelen (1981) propose that firms can get closer to the optimal capital structure by repurchasing shares with debt, increase the interest tax shield and therefore increase the firm value. According to Li and McNally (2007) the announcement period return should be inversely related to the firm's debt level, because the potential benefits are due to increased leverage of the firm. I proxy the leverage hypothesis by a ratio of total debt and total assets.

Dividend substitution hypothesis[8] is closely related to taxation because outside Finland dividends have mostly been more heavily taxed than capital gains. As an increasing number of investors in the Finnish market are from countries, such as United States, were repurchases have a tax-advantage the hypothesis is valid also in this study. According to the tax hypothesis, there should be a positive relation between abnormal returns and the amount of foreign ownership.

In addition to the variable related to the above-mentioned four hypotheses, I include two dummy variables in the regressions. First dummy variable "Prior repurchase program" gets a value of one if the company has had previous authorizations of share repurchases, and zero otherwise. The second dummy variable "Actual repurchases" gets a value of one if a company has made previous share repurchases, and zero otherwise. Table 3 summarizes the hypotheses presented above and their proxies.

[8] Dividend distribution hypothesis is also known as Tax hypothesis

Table 3:
Predicted Relationships between the Market Reaction and Selected Explanatory Variables

Hypothesis	Proxy for	Explanatory Variable	Expected Sign
"Signaling Hypothesis"	Misvaluation	Pre-event CAR	-
	Information Asymmetries	Size	-
	Undervaluation	Market-to-Book	-
"Free Cash Flow Hypothesis"	Free Cash Flow	FCF / Assets	+
	Excess Cash	Cash and Equivalents / Assets	+
"Leverage Hypothesis"	Optimal Capital Structure	Debt / Assets	-
"Dividend Substitution Hypothesis"	Tax Reasons	Foreign Ownership (%)	+

5.3 Liquidity Effects around Events

The next two hypotheses are related to liquidity effects around share repurchase announcements and first actual repurchases. I approach and test these hypotheses with three different methods: changes in trading volume, abnormal trading volume and the relative bid-ask spreads. The findings in previous research on liquidity impact are mixed and do not provide conclusive evidence whether liquidity increase or decrease. Thus, I have two hypotheses that assume that liquidity remains the same before and after an event.

H_3: An announcement of a share repurchase program does not have an effect on liquidity / trading volume in the Finnish stock market during 1998 – 2008.

H_4: An initial actual share repurchase does not have an effect on liquidity / trading volume in the Finnish stock market during 1998 – 2008.

6 RESULTS ON THE INFORMATION CONTENT OF SHARE REPURCHASE ANNOUNCEMENTS AND INITIAL ACTUAL REPURCHASES

This chapter presents the results of the market reaction to share repurchase announcements and initial actual share repurchases. Also results regarding the liquidity effects surrounding the same events are presented. In addition to this, I will go through and analyze the results of multivariate regressions that measure the determinants of potential abnormal returns associated with share repurchases. I have calculated all tests for the total sample as well as for the two sub-samples, large firms and small firms, to find out the different behavior in share prices and in liquidity measures.

6.1 Announcement Period Returns

The cumulative abnormal returns around the announcements of share repurchase programs and initial actual share repurchases are calculated according to the methodology described in chapter 4. The cumulative abnormal returns are calculated for five different event windows between the period 20 days before and 20 days after the announcement date. Table 4 presents the cumulative abnormal returns for the whole sample and for two sub-samples, large firms and small firms.

As can be seen from Panel A in the Table 4, the event day gets a positive and statistically significant value for all event windows. The announcement effects during the event windows Day 0, (-1, +1) and (-2, +2) are 0.22% (*), 0.42% (***) and 0.52% (***), respectively. Interestingly, the magnitude of the reaction is, as expected, substantially smaller than found in earlier studies abroad and by Karhunen (2002) with the Finnish data. Karhunen detected for the same event windows cumulative abnormal returns of 0.67% (**), 1.86% (***) and 2.78% (***), respectively. The second study with Finnish data by Örmä (2008) finds CARs of similar magnitude as I found, namely 0.25%, 0.30% and 0.52%, respectively but not statistically different from zero. The CARs have become smaller most likely because investors are more conscious about the subject and more active as investors. Panel B shows the cumulative abnormal returns around the announcement of an initial actual repurchase. The market reactions are again slightly positive as in Panel A but not highly significant. The results related to actual repurchases during the event windows Day 0, (-1, +1) and (-2, +2) are 0.36%. 0.52% (*) and 0.63%, respectively, which are very close to what detected by Karhunen (2002) 1.08% (***), 0.65% and 0.56%, respectively.

As already discussed, Stephens and Weisbach (1998), Grullon and Michaely (2004) and Chan et. al. (2004) argue, the event period returns are negatively related to firm size. This means that it is harder for small companies to communicate information to the market and more likely that there is information asymmetries but that these firms generate higher announcement period abnormal returns. This can be seen when analyzing the cumulative abnormal returns for the two sub-samples, large firms and small firms. As Table 4 reports, small firms generate substantially higher returns compared to large firms in both Panel A and Panel B. The market reaction surrounding the announcement of a repurchase program for small firms is close to threefold compared to large firms and highly statistically significant. In Panel B the difference between the sub-samples are material since small firms generate high positive CARs at significance level of at least 5%, whereas CARs of large firms are slightly negative for most event windows. All cumulative abnormal returns for the whole sample and for sub-samples are presented in the Table 4 below.

Table 4:
Market Reaction around Share Repurchase Announcements

This table reports the stock market reactions around the announcement of a share repurchase program and announcement of an initial actual share repurchase between January 1, 1998 and December 31, 2008. The announcement date in Panel A and Panel B is the date when the announcement was initially made public. In both, Panel A and Panel B, the CARs are calculated for the whole sample and for the two sub-samples, large firms and small firms. The companies are divided into two sub-samples according to the median value of Market Capitalizations from the sample of all firms. The methodology used to calculate the CARs is presented in Chapter 4.

Panel A: Announcement of a share repurchase program

	All firms n = 455			Large firms n = 228			Small firms n = 227		
Event window	CAR	*t* -value		CAR	*t* -value		CAR	*t* -value	
Day 0	0.22 %	1.88	*	0.24 %	1.45		0.19 %	1.19	
Days (-1,+1)	0.42 %	2.62	***	0.33 %	1.46		0.52 %	2.27	**
Days (-2,+2)	0.52 %	2.73	***	0.29 %	1.01		0.78 %	3.10	***
Days (-10,+10)	1.21 %	3.71	***	0.66 %	1.46		1.81 %	3.87	***
Days (-20,+20)	2.15 %	4.61	***	1.16 %	1.73	*	3.22 %	5.05	***

Panel B: Announcement of an initial actual repurchase

	All firms n = 131			Large firms n = 81			Small firms n = 50		
Event window	CAR	*t* -value		CAR	*t* -value		CAR	*t* -value	
Day 0	0.36 %	1.51		-0.25 %	-1.51	*	1.35 %	2.47	**
Days (-1,+1)	0.52 %	1.70	*	-0.20 %	-0.69		1.68 %	2.75	***
Days (-2,+2)	0.63 %	1.62		-0.10 %	-0.23		1.82 %	2.56	**
Days (-10,+10)	1.24 %	1.81	*	0.32 %	0.41		2.73 %	2.20	**
Days (-20,+20)	0.41 %	0.46		-0.59 %	-0.56		2.03 %	1.29	

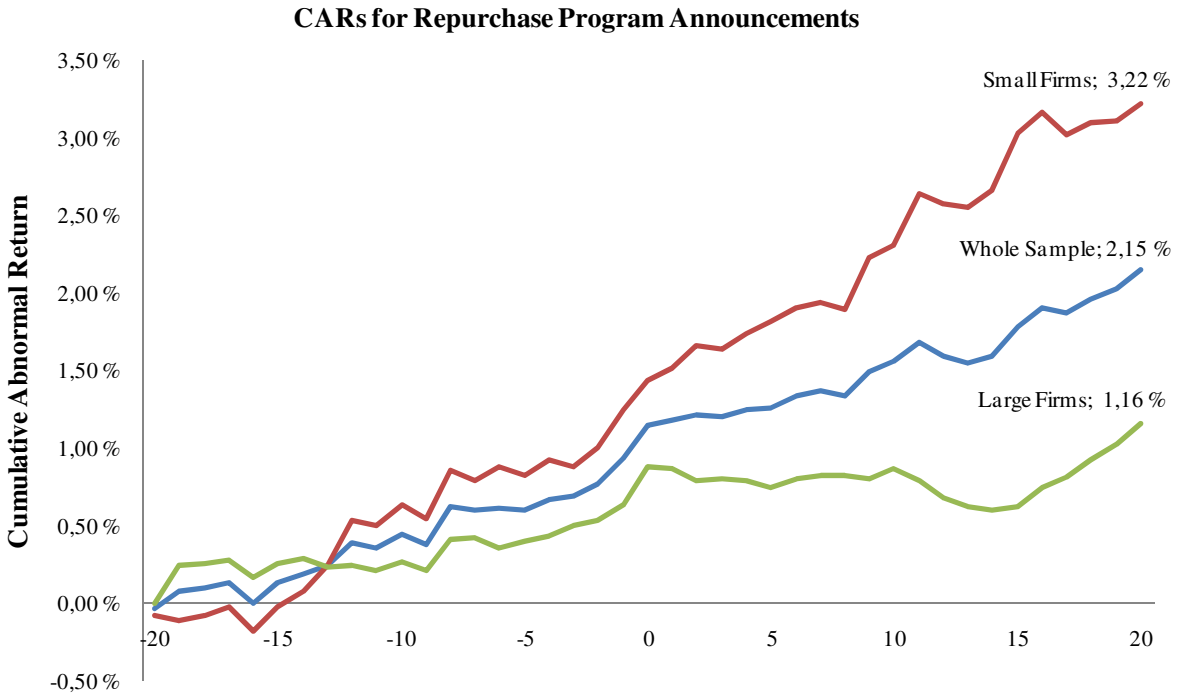
*,** and *** refer to the significance level at 10%, 5% and 1% respectively

Figure 1 describes the cumulative abnormal returns (-20, +20) around the share repurchase program announcements for the period from 1998 to 2008. Figure 1 plots CARs for the whole sample as well as for the two sub-samples. As mentioned earlier, share repurchase program announcements may be a consequence of bad share price performance (Comment and Jarrell, 1991) and followed by a good share price performance with an effect even up to four years (Ikenberry et al., 1995). According to my analysis and calculations, I can not find evidence of bad share price performance before the announcement which is logical, because timing of the announcement does not have an important role in Finland since they are usually incorporated into the invitation to the annual general meeting. As can be seen from the Figure 1, all three

lines for different samples are upward sloping which means that abnormal returns for the whole event window are mostly positive.

Figure 1:
Panel A: CARs for Repurchase Program Announcements

This figure reports the stock market reactions around the announcement of a share repurchase program between January 1, 1998 and December 31, 2008. Daily abnormal returns are summed up over the period from 20 days before to 20 days after an announcement of a repurchase program. The announcement date is the date when the announcement of a share repurchase program was initially made public. The CARs are plotted for the whole sample (n = 455) and for the two sub-samples, large firms (n = 228) and small firms (n = 227). The companies are divided into two sub-samples according to the median value of Market Capitalizations from the sample of all firms.

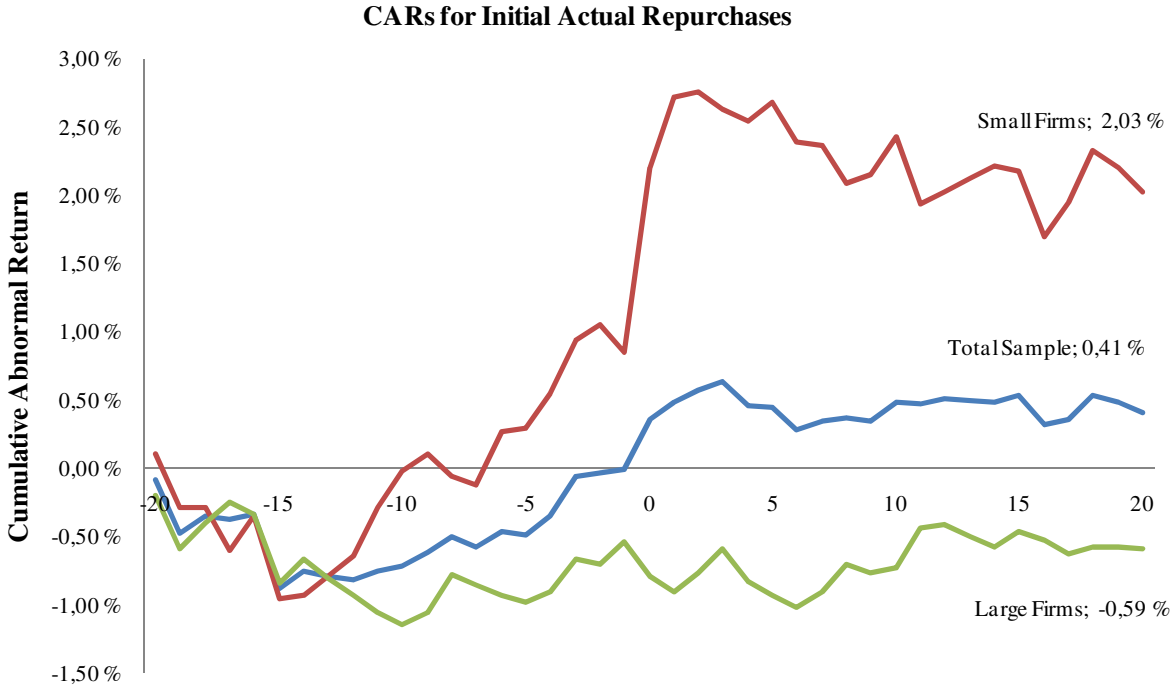


As described in the second chapter, the Finnish regulatory environment regarding share repurchases is very strict and requires a public announcement one week before the first actual share repurchase takes place. In recent years about half of the listed companies have received the authorization to buy own shares but the number of companies that make actual repurchases is only around 25% of the authorized firms. Since the number of firms that repurchase own shares is so small, it is suggested that announcement to buy own shares convey positive information to the market. As can be seen from Figure 2, the cumulative abnormal returns around initial actual repurchases are positive for the whole sample and for small firms but highly statistically significant only for small firms. Large firms generate negative CARs for all event windows except (-10, +10) days. This is most likely due to the

higher information asymmetries of small firms and when they announce to start actual repurchases the signal is strongly positive.

Figure 2:
Panel B: CARs for Initial Actual Share Repurchases

This figure reports the stock market reactions around the announcement of an initial actual share repurchase between January 1, 1998 and December 31, 2008. Daily abnormal returns are summed up over the period from 20 days before to 20 days after an announcement to start actual repurchases. The announcement date is the date when the announcement of an initial actual repurchase was initially made public. The CARs are plotted for the whole sample (n = 131) and for the two sub-samples, large firms (n = 81) and small firms (n = 50). The companies are divided into two sub-samples according to the median value of Market Capitalizations from the sample of all firms (n = 455).



6.2 Results on Regression Analysis Explaining the Market Reaction

This sub-chapter analyzes the main determinants behind the observed event window returns. Previous studies about this subject have concentrated on understanding the market's reactions to the announcements by the help of previously mentioned hypotheses. I approach the announcements of share repurchase programs in a similar way and try to find proof for the hypotheses in the Finnish market. The dependent variable in the regressions is the cumulative abnormal return between (-2, +2). The three regressions in Table 5 are run separately for all

initial share repurchase program announcements. In the following, I will go through the findings one hypothesis at a time.

Results on the signaling hypothesis are mixed. As mentioned earlier, the signaling hypothesis predicts that returns preceding the announcement and the event window returns are negatively related. In this study, long-term pre-event cumulative abnormal return gets, in Regression 1 and 2, positive coefficients and statistically significant values at 1% level. The sign is opposite what expected which indicates that the repurchase announcements are on average preceded by positive share price performance and treated by the market positively. This means that the relation between the two variables is not negative in the Finnish market. The short-term pre-event cumulative abnormal return gets the predicted sign but is not statistically significant. These findings support the fact that, in Finland, timing of share repurchase program do not have as important role as in some other countries, since the announcements are usually during the springtime at the Annual General Meetings.

According Stephens and Weisbach (1998), Grullon and Michaely (2004) and Chan et. al. (2004), abnormal returns around the announcement day are negatively related to firm size. This means that it is harder for small companies to communicate information to the market and more likely that there is information asymmetries but that these firms generate higher announcement period abnormal returns. The natural logarithm of market capitalization explains the power of size and gets in Regressions 1 and 2 predicted signs for coefficients but without statistical significance. One reason for the weak relationship might be that firms that use repurchases in a way to distribute cash flows to shareholders are in general larger in size, and thus the information asymmetries are smaller.

Market-to-Book equity ratio is a proxy for undervaluation and according to earlier studies it should receive a negative sign. The variable seems to have a negative relation with the event window cumulative abnormal returns and gets in Regressions 1 – 3 predicted negative signs with highly statistical significance. This indicates that value firms, low market-to-book value, have larger market reactions to repurchase announcements.

Free cash flow hypothesis hypothesis suggests, as described earlier, that cash flow in excess of what is needed to daily operations should be distributed to shareholders. Li and McNally (2007) and Kahle (2002) find that the amount of free cash-flow is positively related to abnormal returns around repurchase announcements, whereas Grullon and Michaely (2004)

find the same reaction to the overall level of cash in the firm. In this study, the relationship between the free cash flow to total assets variable and cumulative abnormal returns is positive, as predicted, and in Regression 2 statistically significant at 10% level. This might indicate that companies with excess financial resources are more likely to make actual repurchases and distribute the financial slack to its owners. As the relation is not very strong, it can be interpreted that the positive market reaction is only weakly associated with reduced agency costs.

Long-term debt to total assets measures the power of leverage hypothesis. The variable gets the predicted sign but is statistically insignificant. Foreign ownership is used to measure the tax reasons because foreign investors might benefit when company repurchases shares compared to dividends. The regression model indicates that tax reasons are not related to the observed cumulative abnormal returns since the coefficient is statistically insignificant. This evidence argues against the proposal that taxes would have significant role when considering share repurchases. Thus, my finding related to foreign ownership is contrary to Liljeblom and Pasternack (2006) whose results strongly indicate that higher foreign ownership is related to likelihood for share repurchases.

The two dummies, “prior repurcase program” and “actual repurchases”, are included in the model to assess the companies’ share repurchase policy. “Prior repurchase program” variable is expected to receive negative sign; if a company has had earlier repurchase authorizations, it is most likely and expected that it will continue to apply new authorizations in future and thus the information shouldn’t surprise the market in a positive way anymore. On the other hand, “Actual repurchases” variable again should receive positive sign, because an announcement of starting actual repurchases is a strong signal to the market that the company is serious with its repurchase program and will make actual repurchases. However, as can be seen from Table 5, the two abovementioned dummies get statistically insignificant coefficients and are thus not able to explain the positive event window returns.

Table 5:
Determinants behind the Event Period Returns in the Total Sample

The table presents results of three different regressions explaining the cumulative abnormal returns surrounding the event window (-2, +2) relative to the announcement date. The announcement date is the date when the repurchase program was initially made public. The sample includes 432 repurchase announcements by firms listed in the Helsinki Stock Exchange between January 1, 1998 and December 31, 2008 for which the required return data and accounting data is available. Regression 1 includes all variables when testing the relationships between variables and the event period cumulative abnormal returns. Regressions 2 and 3 focus on the two most common hypotheses explaining the observed returns in the previous literature. Statistical significance measured by t-test and the values are reported in the parentheses under the coefficients.

Regression:		1	2	3
Dependent Variable:		CAR (-2, +2)		
Independet variables	Predicted Sign			
Constant		0.020	0.011	0.005
		(2.181) **	(1.992) **	1.499
"Signaling Hypothesis"				
Pre-event CAR (-200-21)	-	0.026	0.025	
		(3.300) ***	(3.316) ***	
Pre-event CAR (-20,-3)	-	-0.027		
		-(0.805)		
LN of Market Capitalization	-	-0.001	-0.001	
		-(1.159)	-(1.541)	
Market-to-Book Equity Ratio	-	-0.001	-0.002	-0.002
		-(2.058) **	-(2.545) **	-2.879 ***
"Free Cash Flow Hypothesis"				
Free Cash Flow / Total Assets	+	0.030	0.034	0.029
		(1.410)	(1.654) *	1.384
Cash and Equivalents / Total Assets	+	-0.022		
		-(1.300)		
"Leverage Hypothesis"				
Long Term Debt / Total Assets	-	-0.011		
		-(0.695)		
"Dividend Substitution Hypothesis"				
Foreign Ownership	+	-0.004		
		-(0.371)		
"Dummies"				
Prior Repurchase Program (1/0)	-	-0.004		
		-(0.943)		
Actual Repurchases (1/0)	+	0.003		
		(0.687)		
Adjusted R^2		0.03	0.04	0.01
Observations		432	432	432

*,** and *** refer to the significance level at 10%, 5% and 1% respectively

In order to compare the results between large and small companies, I have divided the total sample into two sub-samples again according to the median value of market capitalization. This gives the possibility to examine whether market behaves differently depending on the firm size. The findings for the variables measuring the power of signaling hypothesis are in line with the findings of the total sample, since the long-term pre-event cumulative abnormal return and market-to-book equity ratio get similar signs for the coefficients with highly statistically significant values. The difference to the total sample is that free cash flow to total assets in large firms gets the predicted sign in all regressions with statistically significant level of 5%. Also cash and equivalents variable captures statistically significant value at 10% level but the coefficient is not what expected. Interestingly, in Regression 1 focusing on large firms, the dummy variable prior repurchase programs gets the expected sign at 10% significance level which indicates that companies that have had earlier repurchase authorizations generate smaller cumulative abnormal returns than those having the first authorization.

Table 6:
Determinants behind the Event Period Returns in the Two Sub-Samples

The table presents results of three different regressions explaining the cumulative abnormal returns surrounding the event window (-2, +2) relative to the announcement date. The announcement date is the date when the repurchase program was initially made public. The two sub-samples include 216 repurchase announcements by large and small firms listed in the Helsinki Stock Exchange between January 1, 1998 and December 31, 2008 for which the required return data and accounting data is available. The total sample is divided into sub-samples according to the median value of market. Regression 1 includes all variables when testing the relationships between variables and the event period cumulative abnormal returns. Regressions 2 and 3 focus on the two most common hypotheses explaining the observed returns in the previous literature. Statistical significance measured by t-test and the values are reported in the parentheses under the coefficients.

	Regression:	1		2		3	
	Dependent Variable:	CAR (-2, +2)					
Independet variables	Predicted Sign	Large	Small	Large	Small	Large	Small
Constant		0.015	0.015	0.004	0.014	-0.006	0.020
		(0.963)	(1.010)	(0.276)	(1.246)	-(1.079)	(3.832) ***
"Signaling Hypothesis"							
Pre-event CAR (-200-21)	-	0.017	0.045	0.017	0.045		
		(1.724) *	(2.964) ***	(1.840) *	(3.070) ***		
Pre-event CAR (-20,-3)	-	-0.005	-0.022				
		-(0.105)	-(0.491)				
LN of Market Capitalization	-	-0.001	0.001	-0.001	0.001		
		-(0.370)	(0.288)	-(0.795)	(0.409)		
Market-to-Book Equity Ratio	-	-0.001	-0.008	-0.002	-0.008	-0.002	-0.007
		-(1.705) *	-(3.280) ***	-(2.256) **	-(3.446) ***	-(2.499) **	-(3.328) ***
"Free Cash Flow Hypothesis"							
Free Cash Flow / Total Assets	+	0.081	0.030	0.078	0.030	0.083	0.013
		(2.183) **	(1.076)	(2.272) **	(1.137)	(2.412) **	(0.487)
Cash and Equivalents / Total Assets	+	-0.047	-0.008				
		-(1.807) *	-(0.326)				
"Leverage Hypothesis"							
Long Term Debt / Total Assets	-	-0.013	-0.005				
		-(0.562)	-(0.208)				
"Dividend Substitution Hypothesis"							
Foreign Ownership	+	-0.005	0.003				
		-(0.383)	(0.158)				
"Dummies"							
Prior Repurchase Program (1/0)	-	-0.012	0.003				
		-(1.865) *	(0.427)				
Actual Repurchases (1/0)	+	0.003	0.001				
		(0.506)	(0.216)				
Adjusted R^2		0.04	0.05	0.04	0.08	0.03	0.04
Observations		216	216	216	216	216	216

*,** and *** refer to the significance level at 10%, 5% and 1% respectively

As can be seen from Tables 5 and Table 6, Regression 1 includes all variables when testing the relationships between variables and the event period cumulative abnormal returns. Regressions 2 and 3 focus on the two most common hypotheses explaining the observed returns in the previous literature. Regression 2 reports the relationships between signaling hypothesis, without short-term pre-event cumulative abnormal return, and free cash flow to total assets variable and get similar results as in Regression 1. The only difference in the total sample is that free cash flow hypothesis gets statistically significant coefficient at 10% level.

The regression 3 uses only Market-to-Book ratio and free cash flow to assets as explanatory variables and here free cash flow loses its statistical significance. In Table 6, the coefficients for small firms follow the same pattern as in Table 5 when changing the explanatory variables. The coefficients for large firms deviate only in respect of free cash flow where it gets a statistically significant value.

As Table 5 and Table 6 report, the regressions are not able to explain the observed cumulative abnormal returns very well. The adjusted R-squares are quite low in all regressions with a value of less than 0.1. In the total sample only the long-term pre-event cumulative abnormal return and Market-to-Book equity ratio have significant power to explain the observed event period returns. When analyzing the two sub-samples, I find support also for the free cash flow hypothesis as the free cash flow to total assets gets a statistically significant value in the large firms sub-sample.

All in all, findings of the multivariate regressions are quite similar to the ones detected by Örmä (2008). I have measured the pre-event cumulative abnormal return with two variables i.e. long-term and short-term CARs as described earlier whereas Örmä has tested the relationship with a variable from -50 days to day -1. Short-term variable in this study and Örmä's prior return variable receives coefficients with similar signs and magnitudes. The effect of long-term pre-event cumulative abnormal return in this study deviates notably from the effect found in previous studies, because I find statistically significant values but not with the predicted sign. Findings by Karhunen (2002) are also in line with my coefficients since he finds market-to-book ratio to be statistically significant. In addition, he finds some support for the variable of size and prior return with significant values which I was not able to detect.

6.3 Liquidity Effects around Announcements

In this sub-chapter, I test and measure the changes in liquidity by trading volume and turnover (trading volume / number of outstanding shares) as well as with bid-ask spreads. The methodology used to measure the liquidity changes around an announcement of share repurchase program and around an initial actual share repurchase was presented in chapter 4. Since the announcement of a share repurchase program generally contains other information as well, it is interesting to compare the findings of liquidity effects around the announcement

of an initial actual share repurchase, because the latter announcements are “clean” and do not contain other information.

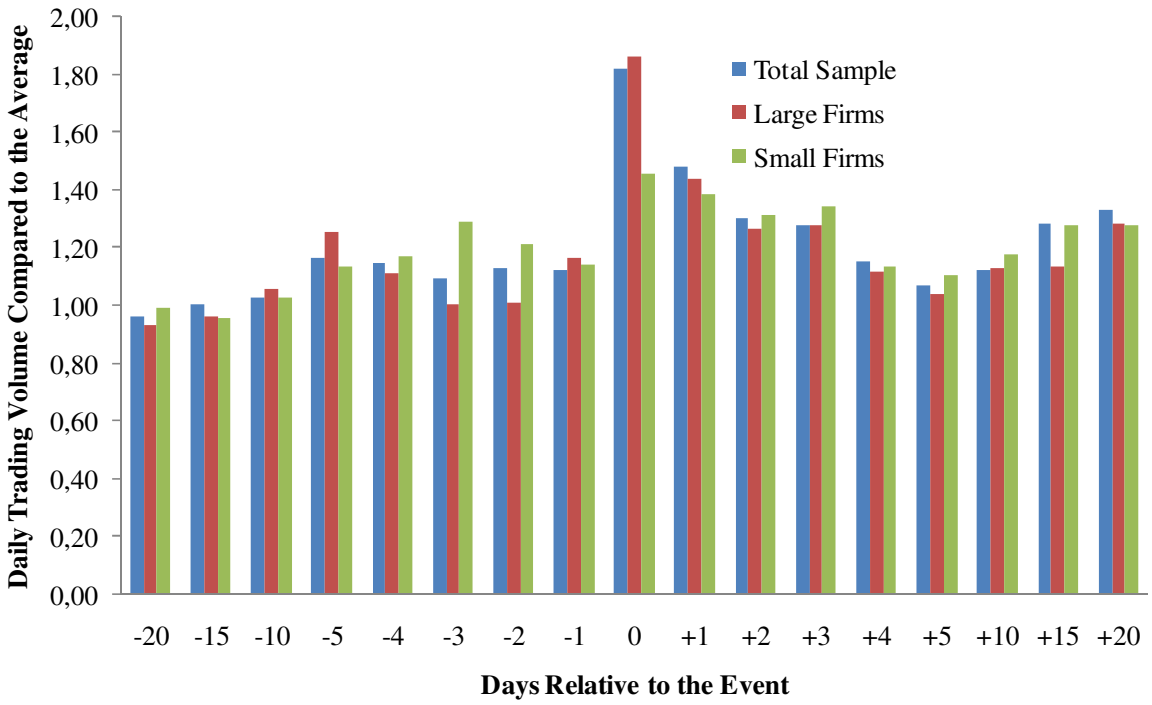
6.3.1 Changes in trading volume

I analyze the trading volume surrounding the announcement of a share repurchase program as well as around the initial actual repurchase. In order to find out whether trading volume has increased or decreased, I have defined abnormal trading volume as the number of shares traded during day *t* divided by the average number of shares traded during -50 to -25 days before an event. I have calculated the trading volumes with two different data sets, one with the whole data and another with the data where events that are bigger than three times the standard deviation are removed so that the results are not driven by the outliers. A complete table of all results is presented in Appendix 2. I will discuss the two events, announcement of a program and initial share repurchase, separately since the results deviates from each other and the events are different by nature.

The results of this study imply that, an announcement of a share repurchase program brings new information to the market and on average increases the trading volume. As can be seen from the Figure 3, the trading volume is rather close to the average before the announcement day but increases dramatically at the event day when on average, the trading volume is 1.82 (2.63 with the initial sample) times the average trading volume and statistically different from one at 1% level. Although the finding for the trading volume during the event day is highly statistically significant, it is much smaller than detected by De Ridder and Råsbrant (2004) who found a trading volume 4.15 times the average volume. The trading volume continues to be exceptionally large until day +3 with statistically significant level at 1% and until day +4 at significance level of 5%. From day +5 on the daily trading volume converges to the average. Because the trading volume is around the average before the event day, it indicates that there is no information leakage to the outsiders and the announcement has an effect on trading activity. The results follow the same pattern also in the two sub-samples, large firms and small firms.

Figure 3:
Trading Volume around the Announcement of a Repurchase Program

This figure plots the trading volume around an announcement of a share repurchase program between January 1, 1998 and December 31, 2008. Figure shows average trading volumes after removing events that are bigger than three times the standard deviation. The trading volume is defined as the number of shares traded during day *t* divided by the average number of shares traded during -50 to -25 days before the event day. The trading volumes are plotted for the whole sample (n = 459) and for the two sub-samples, large firms (n = 230) and small firms (n = 229).



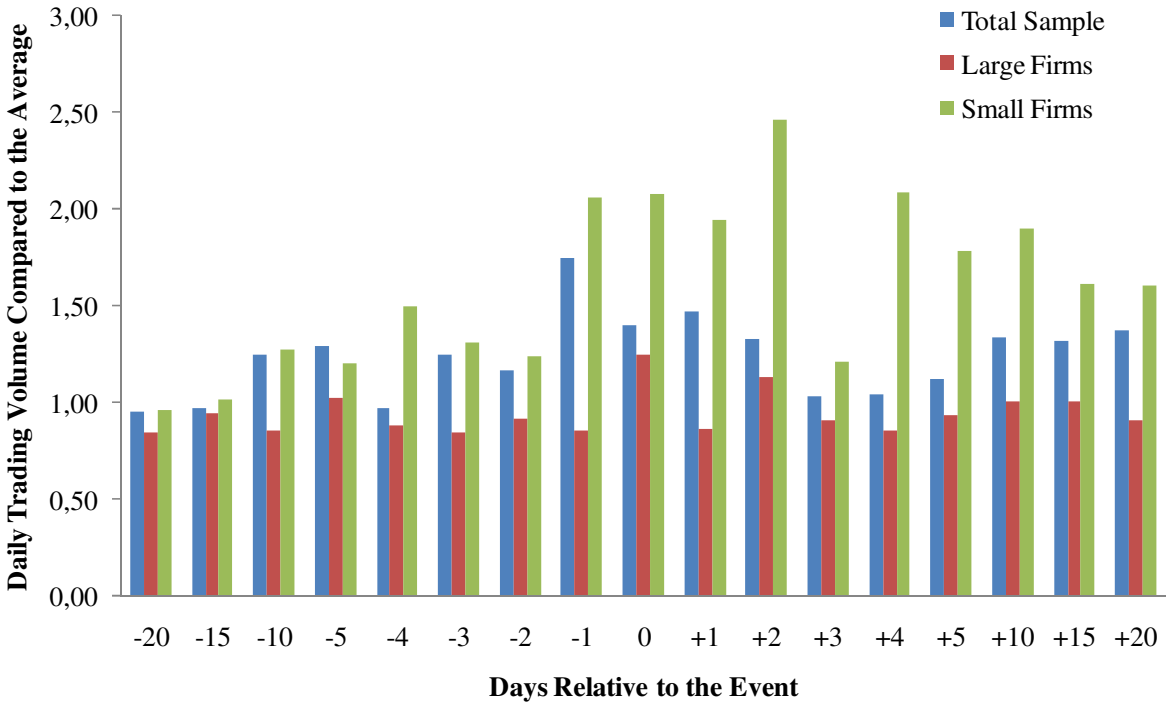
Also trading volumes around the initial actual share repurchase day reveal some interesting information. Trading volume for the total sample starts to be statistically different from one at 1% level on day -1 and continues to be large till day +2. As Figure 4 illustrates, trading volume on day -1 is 1.75 times the average volume and decreases to 1.40 on the day of the announcement. It is interesting to notice, that less than half of the companies' shares are traded above the average which shows that announcement of initial actual repurchases do not affect the trading volume especially in large firms. Because the exceptionally high trading volume starts one day before the event, it is most likely that some investors know in advance that company will start the actual repurchases. As mentioned earlier, the Finnish regulation requires companies to announce that they will start actual repurchases one week prior to the first repurchase. Interestingly, the trading volumes are relatively low and close to the average at the time when the first actual repurchases takes place (day +5). This indicates that the

announcement to start actual repurchases make investors more active regarding trading, but the actual repurchases do not result in higher trading volume.

When analyzing findings in the two sub-samples, I find interesting information about trading volume when size effect is eliminated. Large companies' trading volumes are on days -1 and 0, 0.86 and 1.25 respectively, whereas small companies' trading volumes during the same days are 2.06 and 2.08 respectively. Only one third of large companies trade above the average during those days, whereas the same percentages for small firms are 52% for both days. This provides proof that the announcement is not very interesting for shareholders in large firms but the information content, maybe due to information asymmetries, makes smaller companies' shareholders more active in trading. As Figure 3 shows, trading volumes in large and small firms around share repurchase program announcements are quite close to each other. However, as can be seen from the Figure 4, trading volumes around initial actual repurchases of small companies are substantially higher compared to large companies.

Figure 4:
Trading Volume around the Initial Actual Repurchase

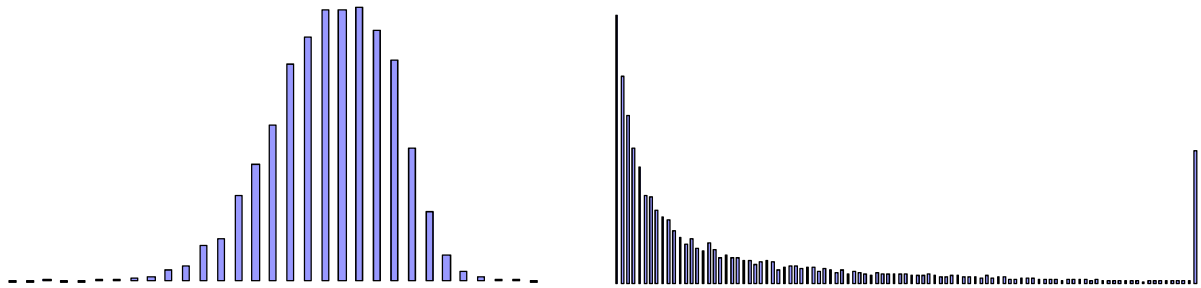
This figure plots the trading volume around an announcement of an initial actual repurchase between January 1, 1998 and December 31, 2008. Figure shows average trading volumes after removing events that are bigger than three times the standard deviation. The trading volume is defined as the number of shares traded during day *t* divided by the average number of shares traded during -50 to -25 days before the event day. The trading volumes are plotted for the whole sample (n = 459) and for the two sub-samples, large firms (n = 230) and small firms (n = 229).



6.3.2 Changes in turnover

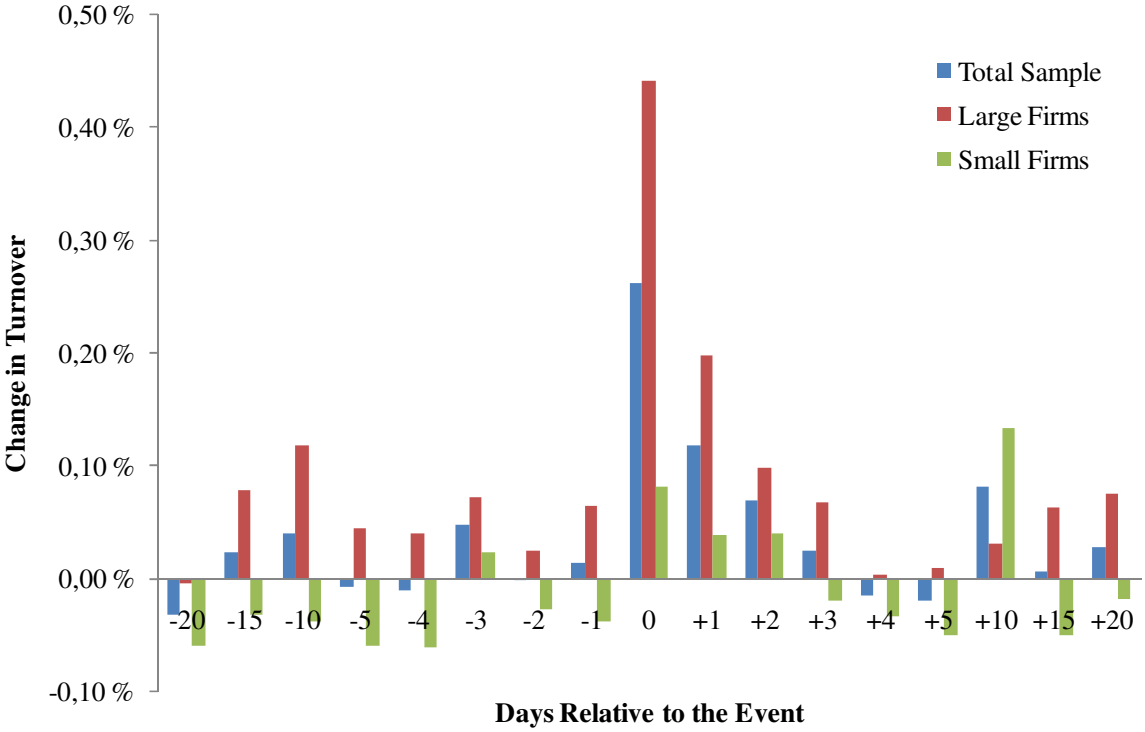
In addition to analyzing changes in trading volume, I have also measured liquidity by changes in turnover. The method used in the calculations is presented in chapter 4. I have calculated the turnovers around the announcement of a share repurchase program as well as when the initial actual repurchase takes place. The calculations of turnover are made with absolute values and with natural logarithms to overcome problems with skewness and kurtosis as done by Lo and Wang (2000). Figure 5 plots the turnover distributions with absolute values and with natural logarithmic values. As the results around the announcement of an initial actual share repurchase do not get statistically significant values, I have left it out from the following analysis and concentrated on the announcements of a share repurchase program. A complete list of findings is presented in Appendix 3.

Figure 5:
Turnover Distributions with Absolute and Logarithmic Values
This figure illustrates the turnover distributions. The right-hand side presents the distribution of turnover (trading volume / number of outstanding shares) calculated as absolute values, whereas the left-hand side presents the distribution when natural logarithm is taken from the turnover. The natural logarithm is taken to overcome problems with skewness and kurtosis.



Daily turnover compared to the average turnover as a value is very small by nature since the amount of shares traded during one day compared to the total number of shares outstanding is fractional. As can be seen from the Figure 6, the turnover for the total sample increases substantially on the event day and continues to be exceptionally high until day +2. The turnovers get statistically significant values at 1% level during these days. Results in the two sub-samples differ from each other greatly, since small companies do not get any statistically significant values whereas large companies get significant values at 5% level for the days -1 and +3 and for the days 0 to +2 at 1% level. According to this method, the liquidity increases in large firms and the effect lasts until day +3 compared to what found when investigated trading volume, the announcement of a share repurchase program provided exceptional liquidity until day +4. Interestingly, changes in turnovers around the initial actual repurchases are very small and according to this method, the announcements do not increase liquidity. In conclusion, it can be said that these two methods, trading volume and turnover, generated quite similar results about liquidity around repurchase program announcements.

Figure 6:
Turnover around the Announcement of a Repurchase Program
This figure plots the turnover around an announcement of a share repurchase program between January 1, 1998 and December 31, 2008. The method how turnover is calculated is described in the fourth chapter. The turnovers are plotted for the whole sample (n = 459) and for the two sub-samples, large firms (n = 230) and small firms (n = 229).



6.3.3 Changes in bid-ask spreads

In previous studies, findings about changes in bid-ask spreads before and after share repurchase announcements and initial actual repurchases are mixed and do not provide conclusive evidence whether liquidity increase or decrease. I try to find proof for the two hypotheses that assume that liquidity remains the same before and after an event. The test is calculated as a relative bid-ask spread as shown in chapter 4.

As can be seen from the Table 7, the event window used in the calculations is 20 days before and 20 days after an event. The shorter event windows 10 and 5 days before and after an event were also analyzed but not presented here, since the findings did not differ from the reported results. As done in previous tests as well, I have calculated the bid-ask spread for the total sample and for the two sub-samples, large and small firms, in order to test whether there are

any differences between more and less liquid firms. The division is done according to the median value of market capitalizations at the latest balance sheet date before an event.

Table 6 concludes the findings of the relative spread surrounding an event. As can be seen, the changes in all samples' relative spreads are small and not statistically significant before and after an event in both Panel A and Panel B. Thus, the hypothesis that share repurchases do not affect the liquidity of a firm's share is not rejected. The spread is consistently substantially wider in small firms since they are not traded as frequently as larger firms' shares. These findings are in line with the results reported by De Ridder and Råsbrant (2004) with the Swedish data.

Table 7:
Relative Spread Surrounding an Event

This table shows the relative spreads around the announcement of a share repurchase program and announcement of an initial actual share repurchase between January 1, 1998 and December 31, 2008. The announcement date in Panel A and Panel B is the date when the announcement was initially made public. In both, Panel A and Panel B, the relative spreads are calculated for the whole sample and for the two sub-samples, large firms and small firms. Companies are divided into two sub-samples according to the median value of Market Capitalizations from the sample of all firms. Table presents average relative spread 20 days before and 20 days after an announcement of a share repurchase program as well as when the first repurchase takes place. The sample size in Panel A is 461 and in Panel B 131. The relative spread is defined as (Ask price - Bid price) / [(Ask price + Bid price) / 2]

	Trading days -20 to -1			Trading days +1 to +20		
Panel A: Announcement of a share repurchase program						
	All Firms	Large Firms	Small Firms	All Firms	Large Firms	Small Firms
Mean	2.03 %	0.86 %	3.20 %	1.98 %	0.84 %	3.11 %
Standard Deviation	0.0280	0.0093	0.0348	0.0275	0.0101	0.0339
n	461	231	230			
Panel B: Announcement of an initial actual repurchase						
Mean	2.11 %	1.00 %	3.75 %	2.11 %	0.92 %	3.87 %
Standard Deviation	0.0251	0.0145	0.0283	0.0245	0.0103	0.0286
n	131	78	53			

		t- Test	
Announcement of a share repurchase program			
	All Firms	0.7752	Not rejected
H_0: Pre event spread = Post event spread	Large Firms	0.8462	Not rejected
	Small Firms	0.7864	Not rejected
Announcement of an initial actual repurchase			
	All Firms	0.9928	Not rejected
H_0: Pre event spread = Post event spread	Large Firms	0.6687	Not rejected
	Small Firms	0.8281	Not rejected

6.3.4 Timing of initial actual share repurchase in relation to overall market performance

Grullon and Ikenberry (2000) studied whether companies can use superior information and conduct the actual repurchases in declining market on average. I have made a similar analysis for the whole sample as well as for two sub-samples, i.e. large firms and small firms, based on the median value of market capitalization. The method used in the analysis was described in chapter 4.

To test whether companies use superior information in acquiring own shares for the first time in a declining market, I analyze the return against the return on the whole market as well as if an acquisition took place. The interaction variable $\beta_3 R_{m,t}\gamma_t\delta_t$ captures the impact I am interested in. It measures the market sensitivity of the company's returns on days when both the market is declining and the company is acquiring shares. I expect a negative sign, i.e. beta risk should be decreasing on the estimated coefficient β_3 if acquiring firms trade in a way that is supporting their shares in downturns.

As can be seen from Table 8, there is some timing effect since β_3 coefficient gets the predicted sign in the entire sample as well as in large firms. It is still important to notice that the results are not statistically significant and thus, we can conclude that Finnish companies are, on average, not able to repurchase shares when the market is declining.

Table 8:
Timing of Share Repurchases

To test whether companies use superior information in acquiring own shares for the first time in a declining market, I analyze the return against the return on the whole market as well as if an acquisition took place. The dependent variable ($R_{i,t}$) is the daily return on the repurchasing firm's share. The independent variables are: (1) Daily value-weighted market return ($R_{m,t}$), (2) the overall return on the market with a dummy variable (γ_t) with a value of 1 if the market return is negative, zero otherwise, (3) the overall return on the market with two dummy variables (γ_t and δ_t) where the former takes a value of 1 if the overall return on the market is negative and 0 otherwise and the latter dummy variable takes a value of 1 if the firm repurchased shares during the day and 0 otherwise. The interaction variable $\beta_3 R_{m,t}\gamma_t\delta_t$ captures the impact we are interested in. It measures the market sensitivity of the company's returns on days when both the market is declining and the company is acquiring shares. This regression analysis follows the method used by Grullon and Ikenberry (2000):

$$R_{i,t} = \alpha_0 + \beta_1 R_{m,t} + \beta_2 R_{m,t}\gamma_t + \beta_3 R_{m,t}\gamma_t\delta_t + \varepsilon_{i,t}$$

	α_0	β_1		β_2	β_3	N	R^2
Total Sample	0.001	0.757		-0.120	-0.108	461	0.066
	(0.453)	(3.754)	***	-(0.312)	-(0.296)		
Large Firms	-0.001	1.493		-0.362	-0.515	231	0.186
	-(0.169)	(5.200)	***	-(0.661)	-(0.976)		
Small Firms	0.003	-0.152		0.315	0.237	230	0.006
	(0.998)	-(0.572)		(0.623)	(0.502)		

*,** and *** refer to the significance level at 10%, 5% and 1% respectively

7 SUMMARY AND CONCLUSION

Share repurchases are a relatively new corporate activity in Finland as repurchases were allowed only at the end of 1997. The interest in the subject has increased substantially year by year and share repurchases are nowadays a common way of distributing excess cash to shareholders. This study examines the wealth and liquidity effects of share repurchases surrounding share repurchase announcements and initial actual repurchases. I study a sample of 466 open-market share repurchase programs by 93 companies and 133 initial actual repurchases by 58 companies.

The research question of this study is twofold. First, I examine whether the announcements of share repurchase programs and the initial actual share repurchases have, on average, increased shareholder value in the Finnish stock market during 1998 – 2008. In accordance with the findings in earlier studies, my first and second hypotheses predict that such announcements generate positive cumulative abnormal returns for the company's shareholders. In addition, key determinants that are expected to explain the observed CARs are investigated. Second, I study whether the share repurchase program announcements and initial actual repurchases have increased the liquidity or trading volume in the Finnish stock market during the same period. Based on the different arguments and results from the previous researches, I have formed third and fourth hypotheses that predict that the abovementioned announcements do not have an effect on liquidity or trading volume.

The first research question is studied in Section 6.1. The section provides convincing support to the first hypothesis, as the average CARs are positive and highly significant over all studied event windows. The average CARs during event windows (-1,+1) and (-2,+2) are +0.42% and +0.52%, respectively and statistically significant at 1% level. These results support prior evidence that share repurchase announcements act as a positive signal to the market but findings are, as expected, substantially smaller than those detected in earlier studies abroad and by Karhunen (2002) with the Finnish data. However, it is important to point out that the CARs in the two sub-samples, large firms and small firms, deviates materially from each other. Large firms do not receive statistically significant values, whereas small firms get statistically significant values at 1% level during the abovementioned event windows totaling to +0.52% and +0.78%, respectively.

I also find some support for the second hypothesis as the cumulative abnormal returns, on average, surrounding announcements of initial actual repurchases received positive values in all event windows. The average CARs during event windows (-1,+1) and (-2,+2) are +0.52% and +0.63%, respectively, but only the first is statistically significant at 10% level. These finding are in line what found by Karhunen (2002). Large firms generate, on average, slightly negative CARs without any statistical significance, whereas the announcement effect in small firms is fairly large. The announcement effects in small firms are highly statistically significant and get values during event windows (-1,+1) and (-2,+2) 1.68% and 1.82%, respectively.

The earlier literature introduces many motivations for a company to make share repurchases. The most popular motivations are signaling hypothesis and free cash flow hypothesis. Overall, the results from the regressions analysis suggest that commonly used variables to test various hypotheses and to explain the cumulative abnormal returns are not able to explain the announcement period returns very well in Finland. However, market-to-book and free cash flow / total assets variables get statistically significant values which gives some support for the signaling and free cash flow hypothesis. The statistically weak results in explaining the market reaction may be due to the small sample size or the fact that companies announce about repurchase programs every year at the same time and are not able to utilize the timing, as can be done in some other countries.

The second research question is addressed in Section 6.3. I measure liquidity effects with three different methods: trading volume, turnover and bid-ask spreads. The section provides support that liquidity increases (hypotheses 3 and 4 are rejected) surrounding an announcement of a share repurchase program and around an initial actual repurchase. Trading volume is rather close to the average before the announcement of a share repurchase program but increases materially at the event day when the trading volume, on average, is 82% higher and statistically significant at 1% level. The trading volume continues to be exceptionally high until day +3 with statistically significant level at 1% and until day +4 at 5% significance level. The results follow the same pattern also in the two sub-samples, large firms and small firms. Since the trading volume is close to the average before the event day, it indicates that there is no information leakage to the outsiders and that the announcement has an effect on trading activity.

Trading volume around the initial actual repurchase starts to be statistically different from the average at 1% level on day -1 and continues to be large until day +2. As the trading volume starts to be exceptionally different from the average one day before the announcement, it is most likely that some investors know in advance that company will start actual repurchases. It is important to point out that trading volumes in the small firms are substantially higher compared to large firms. Interestingly, trading volumes are close to the average at the time when first actual repurchases takes place (day +5). According to the results, an announcement to start repurchases makes investors more active regarding trading but the actual repurchases do not affect trading volume.

Turnover also provides support that liquidity increases after an announcement of a share repurchase program. The increase in turnover gets, on average, statistically significant values at 1% level between days 0 and +2. However, the results deviate greatly in the two sub-samples as only large firms get statistically significant values. The analysis of turnover around initial actual repurchases is left out because no statistically significant results were found. In conclusion, it can be said that these two methods, trading volume and turnover, generate quite similar results around repurchase program announcements.

A commonly used method testing liquidity effects is bid-ask spreads. I have calculated the bid-ask spreads for both events but these remain unchanged. Timing of actual share repurchases is also closely related to liquidity tests. According to the Finnish stock market data between 1998 – 2008, companies have some ability to time their first actual repurchases in a declining market but the results are not statistically significant. All in all, the results about liquidity indicate that share repurchase announcements and initial actual repurchases increases trading volume and liquidity in the Finnish stock market. Thus, according to the various tests in this study, I reject the third and fourth hypotheses and conclude that liquidity increases around the discussed events.

Share repurchases as a topic offer many further research opportunities. Given the achievements of this study, a logical focus of future studies should be on the wealth and liquidity effects of daily repurchase transactions. Namely, it would be interesting to conduct an analysis about the timing of repurchases and to investigate if the companies follow some foreseeable patterns. Also a study whether companies follow the Finnish legislation as well as rules and regulations of the Helsinki Stock Exchange would be interesting.

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APPENDIX 1

All share repurchase program and initial actual repurchase announcements used in this study.

Company	Announcement of a share repurchase program	Announcement of an initial actual share repurchase
Affecto OYJ	14.2.2008	
	14.2.2007	
	8.3.2006	30.5.2006
Ahlstrom OY	1.2.2008	
	2.2.2007	
Aldata Solutions OYJ	11.3.2008	
	8.3.2007	
	14.3.2006	
	22.3.2005	
Amanda Capital PLC	25.2.2008	30.9.2008
	8.3.2007	
	22.2.2006	
	23.2.2005	
	22.1.2002	
	23.1.2001	
Amer Sports Corporation	16.2.2007	23.8.2007
	25.2.2005	
	16.2.2001	
	9.2.2000	
	11.2.1999	
Aspo PLC	14.3.2008	3.9.2008
	5.3.2007	
	13.3.2006	
	9.2.2005	6.6.2005
	27.2.2004	17.5.2004
	10.3.2003	
	25.3.2002	
	26.3.2001	
Aspocomp Group PLC	28.2.2005	
	27.2.2004	17.12.2004
	28.2.2003	
	15.2.2002	14.5.2002
	19.2.2001	30.7.2001
Atria PLC	3.4.2008	2.10.2008
Basware OYJ	24.1.2008	4.11.2008
	8.2.2007	
	29.1.2002	
Beltton-Group PLC	13.3.2008	
	15.3.2007	
	16.3.2006	
	15.3.2005	
	18.3.2004	
	13.3.2003	
	8.3.2002	

Company	Announcement of a share repurchase program	Announcement of an initial actual share repurchase
Capman PLC	31.1.2008	
	2.2.2007	
	16.2.2006	
	2.3.2005	
	11.3.2004	
	6.3.2003	
	26.2.2002	27.8.2002
	14.5.2001	
Cargotec 'B' OYJ	17.1.2008	22.7.2008
	17.1.2007	
	16.1.2006	14.6.2006
	12.7.2005	26.10.2005
Componenta OYJ	30.1.2008	
	5.2.2007	
	20.1.2006	
	20.1.2005	
	22.1.2004	
Comptel OYJ	13.2.2008	
	14.2.2007	21.2.2007
	13.3.2006	
	8.2.2005	
	16.2.2004	
	14.2.2003	
	15.2.2002	
	5.3.2001	
Cramo PLC	2.4.2008	
	17.3.2005	
	4.3.2004	
	13.3.2003	
	15.3.2002	2.9.2002
	22.3.2001	31.8.2001
Done Solutions OYJ	13.3.2008	6.11.2008
	14.3.2007	
Efore PLC	9.1.2008	
	4.1.2006	
	14.2.2001	
	29.2.2000	24.8.2000
	26.2.1998	
Elcoteq SE	21.2.2007	
	3.3.2006	
	21.2.2001	
Elecster OYJ	21.2.2008	
	29.3.2007	

Company	Announcement of a share repurchase program	Announcement of an initial actual share repurchase
Elektrobit Corporation	6.2.2008	
	15.2.2007	
Elisa OYJ	12.2.2008	12.8.2008
	8.2.2007	25.4.2007
	3.3.2006	27.10.2006
	10.2.2005	
Etteplan OYJ	6.3.2008	22.7.2008
	8.3.2007	2.11.2007
	8.3.2006	27.10.2006
	1.3.2005	
	10.3.2004	
	25.3.2003	22.5.2003
	6.3.2002	23.5.2002
	22.2.2001	19.9.2001
Exel PLC	13.3.2008	
	13.3.2007	
	8.3.2006	
	23.3.2005	
	19.3.2004	
F-Secure OYJ	14.2.2008	
Finnair OYJ	25.2.2008	6.2.2008
	23.2.2007	
	28.2.2006	
	1.3.2005	1.9.2005
	9.3.2004	1.7.2004
	3.3.2003	
Finnlines PLC	23.2.2005	
	23.2.2004	12.5.2004
	24.2.2003	
	25.2.2002	25.10.2002
	8.10.2001	
Fiskars OYJ	13.2.2008	
	15.2.2007	
	14.2.2006	
	16.2.2005	
	6.2.2004	
	28.1.2003	9.12.2003
	29.1.2002	
	1.2.2001	
	10.2.2000	
	1.2.1999	
Fortum Corp.	30.1.2008	
	27.2.2007	
	2.2.2006	8.6.2006

Company	Announcement of a share repurchase program	Announcement of an initial actual share repurchase
Glaston Corporation	15.2.2007	
	23.2.2006	
	23.2.2005	
	24.2.2004	
	20.2.2003	
	28.2.2002	
Hkscan Corporation	20.3.2008	
	21.3.2007	14.5.2007
	24.3.2006	
Honkarakenne OYJ	13.3.2008	15.5.2008
	13.3.2007	30.3.2007
	15.3.2006	7.9.2006
	8.3.2005	29.9.2005
	17.3.2004	
	21.3.2003	30.5.2003
Huhtamaki OYJ	25.2.2002	12.9.2002
	13.2.2001	11.4.2001
Interavanti OYJ	29.1.2008	
	2.2.2007	
	24.3.1999	
Ixonos PLC	12.3.2008	
	2.3.2007	
	16.2.2006	
	17.2.2005	
	11.3.2004	
	5.3.2003	23.4.2003
	1.3.2002	
	22.3.2001	5.9.2001
	7.9.2000	
Julius Tallberg OYJ	24.2.1999	
Kasola OYJ	19.3.2007	
	17.3.2006	8.11.2006
	11.3.2005	5.1.2006
	19.3.2004	12.8.2004
Kemira OYJ	6.2.2008	
	7.2.2006	
	8.2.2005	
	11.2.2002	
	12.2.2001	
	14.3.2000	
	19.2.1999	
Keskisuomalainen OYJ	27.3.2008	

Company	Announcement of a share repurchase program	Announcement of an initial actual share repurchase
Kesla OYJ	6.2.2008	
	7.2.2007	
	15.2.2006	
	14.2.2005	
	9.2.2004	
	10.2.2003	3.11.2003
Kone Corp.	25.1.2008	
	26.1.2007	
	10.1.2006	15.5.2006
	2.5.2005	5.9.2005
	19.12.2003	29.3.2004
	8.1.2002	3.6.2002
	10.1.2001	27.3.2001
	11.1.2000	17.3.2000
Konecranes PLC	8.2.2008	
	14.2.2007	8.11.2007
	15.2.2006	
	11.2.2005	
	11.2.2004	29.10.2004
	13.2.2003	
	15.2.2002	22.8.2002
	19.2.1999	11.10.1999
	17.2.1998	
Lannen Tehtaat PLC	20.2.2008	19.5.2008
	14.3.2001	
	7.3.2000	26.6.2000
	2.3.1999	18.10.1999
	3.3.1998	23.9.1998
Larox OYJ	1.3.2007	
Martela OYJ	19.2.2008	
	14.2.2007	
	16.2.2006	
	16.2.2005	
	12.2.2004	
	25.2.2003	
	18.2.2002	29.5.2002
	20.2.2001	14.11.2001
	18.2.2000	20.12.2000
	2.3.1999	
	10.3.1998	

Company	Announcement of a share repurchase program	Announcement of an initial actual share repurchase
Metso Corp.	6.2.2008	
	7.2.2007	
	8.2.2006	
	2.2.2005	
	4.2.2004	
	11.3.2003	
	7.2.2002	
	13.2.2001	
	16.2.2000	
	1.7.1999	
Neomarkka PLC	8.5.2008	
Nokia Corporation	24.1.2008	16.5.2008
	25.1.2007	4.5.2007
	26.1.2006	21.4.2006
	27.1.2005	4.5.2005
	22.1.2004	19.4.2004
	23.1.2003	22.4.2003
	24.1.2002	
	30.1.2001	
	1.2.2000	
Norvestia PLC	7.2.2008	
	13.2.2007	
	8.2.2006	
	14.2.2005	
	11.2.2004	
	12.2.2003	
Okmetic OYJ	7.10.2008	
Olvi PLC	25.2.2008	
	1.3.2007	27.8.2007
	23.2.2006	31.5.2006
	8.3.2005	
	18.3.2004	
	9.3.2000	
	20.4.1998	
Oriola-KD Corporation	20.2.2008	
	1.2.2007	
Orion Corp.	7.2.2008	
	6.2.2007	
	14.2.2005	
	13.2.2004	
	18.2.2003	
	4.3.2002	

Company	Announcement of a share repurchase program	Announcement of an initial actual share repurchase
Outokumpu OYJ	31.1.2008	
	1.2.2007	
	2.2.2006	
	10.2.2005	
	10.2.2004	
	17.2.2003	
	21.2.2002	
	31.1.2001	9.4.2001
	4.2.2000	
Outotec OYJ	1.2.2008	
	5.2.2007	
Panostaja OYJ	29.11.2007	4.11.2008
	24.11.2006	5.7.2007
	11.10.2005	
	15.1.2004	31.3.2004
	16.1.2003	26.9.2003
Perlos Corp.	2.3.2007	
	3.3.2006	
	3.3.2005	
	19.3.2002	8.11.2002
Ponsse OYJ	9.4.2008	
	16.3.2007	
Poyry PLC	1.2.2008	
	2.2.2007	
	3.2.2006	
	3.2.2005	
	10.2.2004	
	7.2.2003	20.3.2003
	8.2.2002	30.9.2002
	13.2.2001	23.8.2001
	11.2.2000	
	19.2.1999	
QPR Software PLC	13.2.2008	
	14.2.2007	11.5.2007
	18.6.2002	
Raisio PLC	12.2.2007	10.4.2007
	16.2.2005	10.8.2005

Company	Announcement of a share repurchase program	Announcement of an initial actual share repurchase
Ramirent PLC	18.2.2008	
	26.2.2007	
	22.2.2006	
	10.3.2005	
	23.3.2004	
	7.4.2003	
	5.4.2002	
	30.3.2001	
	28.3.2000	
	24.3.1999	
Rapala VMC Corp.	13.3.2008	6.5.2008
	15.3.2007	
Rautaruukki Corp.	6.2.2008	
	7.2.2007	
	8.2.2006	
	17.2.2005	
Raute PLC	10.3.2008	
	26.2.2007	
	20.2.2006	
	14.2.2005	
Rocla OYJ	3.3.2008	
	15.3.2007	
	16.3.2006	
	10.3.2005	
	1.3.2004	
	14.2.2003	
	18.2.2002	
	16.2.2001	
	29.5.2000	13.7.2000
Ruukki Group OYJ	11.3.2008	5.11.2008
	6.4.2006	
	19.5.2005	
	6.5.2004	
Salcomp PLC	7.3.2008	
Sanoma-Wsoy Corp.	7.2.2008	
	8.2.2007	
	4.3.2005	
	20.2.2004	
Satama Interactive PLC	26.2.2008	
	28.2.2007	
	6.3.2006	15.8.2006
	7.3.2005	6.5.2005

Company	Announcement of a share repurchase program	Announcement of an initial actual share repurchase
Scanfil PLC	13.3.2008	
	13.3.2007	
	2.3.2006	4.9.2006
	17.3.2005	1.6.2005
Solteq OYJ	27.2.2008	3.7.2008
	27.2.2007	11.3.2008
	1.3.2006	
	25.2.2005	
	4.3.2004	
	7.3.2003	
	7.3.2002	
	9.3.2001	
	16.3.2000	
Soprano OYJ	2.4.2008	
	5.4.2007	10.3.2008
	26.4.2006	
	15.3.2005	
Sponda PLC	28.2.2008	
	15.3.2007	
	28.2.2006	
	1.3.2005	
	17.3.2004	
	18.3.2003	
	1.3.2002	25.6.2002
SRV Group PLC	17.3.2008	9.6.2008
Stora Enso OYJ	2.2.2006	
	3.2.2005	30.3.2005
	4.2.2004	31.3.2004
	30.1.2003	27.3.2003
	30.1.2002	24.5.2002
	7.2.2001	28.3.2001
	10.2.2000	14.9.2000
Stromsdal OYJ	6.4.2004	
	24.4.2003	
Suomen Helasto OYJ	28.11.2006	
	30.11.2005	
	21.1.2004	
	22.1.2003	
	23.1.2002	

Company	Announcement of a share repurchase program	Announcement of an initial actual share repurchase
Suominen Corporation OYJ	11.2.2008	
	12.2.2007	
	15.2.2006	3.11.2006
	16.2.2005	
	6.2.2004	
	5.2.2003	
	6.2.2002	25.9.2002
Sysopendigia PLC	18.2.2008	29.10.2008
	8.2.2007	
	2.3.2004	
Talentum OYJ	12.2.2008	28.3.2008
	23.2.2007	
	2.3.2006	
	2.3.2005	
	3.3.2004	
	12.2.2003	
	26.2.2002	
	15.2.2001	
	14.3.2000	
	11.3.1999	26.5.1999
Technopolis PLC	28.2.2008	
	8.3.2007	
Tecnomen Corp.	13.2.2008	
	14.2.2007	
	14.2.2006	
	27.2.2004	
	14.2.2003	
Tekla OYJ	25.2.2008	
	16.2.2007	
	27.2.2006	
Teleste OYJ	4.3.2008	
	14.3.2007	
	3.3.2006	
	7.3.2005	
	13.2.2004	
	13.3.2003	
	8.3.2002	15.5.2002
	1.3.2001	27.6.2001
	21.3.2000	

Company	Announcement of a share repurchase program	Announcement of an initial actual share repurchase
Tietoenator OYJ	6.2.2008	
	6.2.2007	1.8.2007
	9.2.2006	4.5.2006
	11.2.2005	1.9.2005
	12.2.2004	29.9.2004
	14.2.2003	
	14.2.2002	
	15.2.2001	2.10.2001
Tulikivi OYJ	6.2.2008	
	21.3.2007	
	7.2.2006	
	7.2.2005	
	5.2.2004	
	28.2.2003	
UPM-Kymmene Corp.	5.2.2008	
	12.2.2007	29.8.2007
	31.1.2006	
	1.2.2005	28.4.2005
	29.1.2004	9.2.2005
	30.1.2003	
	5.2.2002	
	21.2.2001	29.3.2001
	16.5.2000	21.6.2000
	12.2.1999	31.8.1999
Uponor OYJ	7.2.2008	
	14.2.2007	
	9.2.2006	
	9.2.2005	29.3.2005
	3.2.2004	16.12.2004
	12.2.2003	26.3.2003
	5.2.2002	12.6.2002
	8.2.2001	24.4.2001
Vacon PLC	29.2.2008	31.10.2008
	28.3.2007	
	10.3.2006	
	4.3.2005	
	3.3.2004	27.12.2004
	28.2.2003	
	7.3.2002	
Vaisala Corp.	31.1.2005	27.2.2006

Company	Announcement of a share repurchase program	Announcement of an initial actual share repurchase
Wartsila Corp.	7.2.2006	
	3.2.2005	
	6.2.2003	
	7.2.2002	
	15.2.2001	
	16.2.2000	
YIT Corp.	15.2.2005	16.12.2005
Yleiselektroniikka OYJ	18.2.2008	
	20.2.2007	
	21.2.2006	29.11.2006
	22.2.2005	
	3.3.2004	
	4.3.2003	
	5.3.2002	
TOTAL	466	133

APPENDIX 2

This table reports the Abnormal Trading Volume (ATV) around the announcement of a share repurchase program and around the initial actual share repurchase. The abnormal trading volume is defined as the number of shares traded during day *t* divided by the average number of shares traded during -50 to -25 days before the event day. Statistical significance is measured by t-Test where symbols *** and ** refer to the levels 1% and 5% respectively. Null hypothesis implies that mean should be one (= average trading volume).

Panel A: Announcement of a share repurchase program n = 459

Total Sample																	
Day	**-20**	**-15**	**-10**	**-5**	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**	**+10**	**+15**	**+20**
Mean	0,96	1,01	1,28	1,20	1,21	1,49	1,30	1,43	2,63	2,16	1,84	1,53	1,41	1,53	1,94	1,60	1,52
% > 1	34 %	34 %	36 %	36 %	37 %	34 %	35 %	36 %	50 %	45 %	43 %	42 %	37 %	37 %	37 %	38 %	37 %
t-Test	-0,70	0,14	1,91	2,62	2,52	2,77	2,67	1,95	6,65	3,65	4,53	3,47	3,11	3,09	2,19	4,05	4,35
				***	**	***	***		***	***	***	***	***	***	**	***	***
Large Firms (n = 230)																	
Mean	0,93	1,05	1,34	1,25	1,25	1,48	1,05	1,22	2,81	1,66	1,53	1,51	1,37	1,38	1,26	1,63	1,58
% > 1	35 %	36 %	40 %	39 %	43 %	36 %	40 %	42 %	61 %	49 %	48 %	47 %	42 %	40 %	39 %	42 %	45 %
t-Test	-1,19	0,64	1,68	2,61	2,39	1,69	0,68	2,45	5,36	4,64	3,43	2,11	2,19	1,52	2,44	2,81	4,04
				***	**			**	***	***	***	**	**		**	***	***
Small Firms (n = 229)																	
Mean	0,99	0,96	1,22	1,14	1,17	1,50	1,55	1,64	2,46	2,65	2,15	1,55	1,45	1,69	2,62	1,58	1,47
% > 1	32 %	31 %	32 %	34 %	31 %	32 %	29 %	30 %	39 %	41 %	38 %	37 %	33 %	35 %	35 %	34 %	30 %
t-Test	-0,09	-0,47	1,03	1,22	1,32	2,37	2,60	1,47	4,08	2,68	3,41	2,93	2,22	2,88	1,90	2,94	2,41
						**	***		***	***	***	***	**	***		***	**
Total Sample	*Removed events that are bigger than 3 times standard deviation*																
Mean	0,96	1,01	1,03	1,17	1,15	1,10	1,13	1,12	1,82	1,48	1,30	1,28	1,15	1,07	1,13	1,29	1,33
% > 1	34 %	34 %	35 %	36 %	36 %	33 %	34 %	35 %	47 %	43 %	41 %	41 %	36 %	36 %	34 %	36 %	36 %
t-Test	-0,70	0,14	0,57	2,39	2,04	1,38	1,65	1,84	7,68	5,39	3,87	3,89	2,19	1,09	1,80	3,31	3,71
				**	**				***	***	***	***	**			***	***
Large Firms (n = 230)																	
Mean	0,93	0,97	1,06	1,25	1,12	1,01	1,01	1,16	1,86	1,44	1,27	1,28	1,12	1,04	1,13	1,14	1,29
% > 1	35 %	35 %	38 %	39 %	42 %	34 %	40 %	42 %	56 %	47 %	47 %	47 %	41 %	39 %	37 %	39 %	42 %
t-Test	-1,19	-0,54	0,86	2,61	1,47	0,11	0,17	2,21	6,91	4,48	3,13	3,35	1,54	0,59	1,56	1,77	3,09
				***				**	***	***	***	***					***
Small Firms (n = 229)																	
Mean	0,99	0,96	1,03	1,14	1,17	1,29	1,21	1,14	1,46	1,39	1,32	1,35	1,14	1,10	1,18	1,28	1,28
% > 1	32 %	31 %	31 %	34 %	31 %	31 %	27 %	29 %	35 %	38 %	35 %	36 %	32 %	32 %	32 %	32 %	29 %
t-Test	-0,09	-0,47	0,27	1,22	1,32	1,93	1,51	1,13	3,09	2,90	2,37	2,64	1,27	0,91	1,32	1,98	1,88
									***	***	**	***				**	

Panel B: Announcement of an initial actual repurchase, n = 132

Total Sample																	
Day	**-20**	**-15**	**-10**	**-5**	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**	**+10**	**+15**	**+20**
Mean	0,96	0,97	1,25	1,74	1,19	1,25	1,17	1,75	2,11	2,63	2,22	1,03	1,78	2,26	1,53	1,33	1,38
% > 1	34 %	31 %	33 %	36 %	34 %	33 %	39 %	45 %	48 %	42 %	41 %	36 %	36 %	39 %	38 %	37 %	35 %
t-Test	-0,48	-0,25	1,53	1,57	0,82	1,46	1,17	2,95	2,65	2,58	2,65	0,35	1,64	1,79	2,10	1,69	2,01
								***	***	**	***				**		**
Large Firms (n = 78)																	
Mean	0,95	0,94	1,23	1,36	0,97	1,21	1,13	1,53	1,25	1,76	1,13	0,91	0,86	1,88	1,25	1,11	1,21
% > 1	36 %	31 %	36 %	33 %	31 %	28 %	35 %	40 %	44 %	38 %	40 %	29 %	24 %	37 %	31 %	40 %	35 %
t-Test	-0,40	-0,55	1,04	1,32	-0,23	0,95	0,58	1,84	1,94	1,95	1,02	-1,02	-1,60	0,95	0,97	0,76	0,90
Small Firms (n = 54)																	
Mean	0,96	1,01	1,27	2,29	1,50	1,31	1,24	2,06	3,35	3,88	3,80	1,21	3,12	2,82	1,94	1,65	1,64
% > 1	31 %	31 %	30 %	39 %	39 %	39 %	46 %	52 %	56 %	46 %	44 %	48 %	54 %	44 %	50 %	35 %	37 %
t-Test	-0,27	0,06	1,16	1,19	0,95	1,11	1,34	2,31	2,38	2,02	2,59	1,11	1,85	1,66	1,93	1,51	2,00
								**	**	**	**						
Total Sample	*Removed events that are bigger than 3 times standard deviation*																
Mean	0,96	0,97	1,25	1,30	0,97	1,25	1,17	1,75	1,40	1,48	1,33	1,03	1,04	1,12	1,34	1,32	1,37
% > 1	34 %	31 %	33 %	35 %	33 %	33 %	39 %	45 %	46 %	39 %	37 %	36 %	33 %	36 %	36 %	36 %	34 %
t-Test	-0,48	-0,25	1,53	1,57	-0,29	1,46	1,17	2,95	2,82	2,57	2,04	0,35	0,38	1,03	1,83	1,64	1,97
								***	***	**	**						
Large Firms (n = 78)																	
Mean	0,85	0,94	0,85	1,03	0,89	0,85	0,92	0,86	1,25	0,87	1,13	0,91	0,86	0,94	1,01	1,01	0,91
% > 1	35 %	31 %	32 %	31 %	29 %	24 %	33 %	33 %	44 %	31 %	38 %	28 %	23 %	35 %	28 %	37 %	31 %
t-Test	-2,06	-0,55	-1,67	0,23	-1,04	-1,42	-0,95	-1,56	1,94	-1,41	1,02	-1,02	-1,60	-0,70	0,07	0,06	-0,83
	**																
Small Firms (n = 54)																	
Mean	0,96	1,01	1,27	1,21	1,50	1,31	1,24	2,06	2,08	1,95	2,46	1,21	2,09	1,79	1,90	1,61	1,61
% > 1	31 %	31 %	30 %	37 %	39 %	39 %	46 %	52 %	52 %	43 %	39 %	46 %	50 %	41 %	48 %	33 %	35 %
t-Test	-0,27	0,06	1,16	0,83	0,95	1,11	1,34	2,31	2,07	1,97	2,26	1,11	1,92	1,72	1,89	1,46	1,93
								**	**		**						

APPENDIX 3

This table reports the Turnover around the announcement of a share repurchase program and around the initial actual share repurchase. The calculation method of Turnover is presented in chapter 4. Statistical significance is measured by t-Test where symbols *** and ** refer to the levels 1% and 5% respectively. Null hypothesis implies that mean should be zero.

Panel A: Announcement of a share repurchase program n = 459

Total Sample	Calculated with logarithmic terms																
Day	**-20**	**-15**	**-10**	**-5**	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**	**+10**	**+15**	**+20**
Mean	-0,03 %	0,02 %	0,04 %	-0,01 %	-0,01 %	0,05 %	0,00 %	0,01 %	0,26 %	0,12 %	0,07 %	0,02 %	-0,02 %	-0,02 %	0,08 %	0,01 %	0,03 %
% > 0	30 %	33 %	34 %	34 %	35 %	32 %	33 %	35 %	48 %	42 %	41 %	41 %	36 %	36 %	35 %	36 %	36 %
t-Test	-2,02 **	0,72	1,20	-0,38	-0,61	1,19	-0,10	0,60	6,30 ***	3,88 ***	2,59 ***	1,09	-0,84	-1,08	1,01	0,23	1,00
Large Firms (n = 230)																	
Mean	-0,01 %	0,08 %	0,12 %	0,04 %	0,04 %	0,07 %	0,02 %	0,06 %	0,44 %	0,20 %	0,10 %	0,07 %	0,00 %	0,01 %	0,03 %	0,06 %	0,07 %
% > 0	33 %	36 %	40 %	36 %	43 %	36 %	38 %	42 %	60 %	47 %	47 %	48 %	40 %	39 %	37 %	42 %	45 %
t-Test	-0,25	1,33	1,95	1,31	1,53	1,29	0,76	2,37 **	6,80 ***	5,21 ***	3,16 ***	2,40 **	0,15	0,33	1,15	1,68	2,44 **
Small Firms (n = 229)																	
Mean	-0,06 %	-0,03 %	-0,04 %	-0,06 %	-0,06 %	0,02 %	-0,03 %	-0,04 %	0,08 %	0,04 %	0,04 %	-0,02 %	-0,03 %	-0,05 %	0,13 %	-0,05 %	-0,02 %
% > 0	28 %	29 %	29 %	31 %	27 %	28 %	28 %	28 %	36 %	37 %	35 %	34 %	32 %	33 %	33 %	30 %	28 %
t-Test	-2,40 **	-1,32	-1,49	-2,20 **	-2,24 **	0,40	-0,84	-1,24	1,65	0,81	0,92	-0,62	-1,13	-1,77	0,83	-1,81	-0,40
Total Sample	Carculated with absolute values																
Mean	-0,02 %	0,03 %	0,05 %	0,00 %	0,00 %	0,06 %	0,01 %	0,02 %	0,27 %	0,13 %	0,08 %	0,03 %	-0,01 %	-0,01 %	0,09 %	0,01 %	0,04 %
% > 0	34 %	33 %	36 %	36 %	37 %	34 %	34 %	36 %	50 %	45 %	42 %	41 %	37 %	37 %	36 %	37 %	37 %
t-Test	-1,83	1,02	1,46	0,02	-0,18	1,45	0,29	1,06	6,67 ***	4,45 ***	3,20 ***	1,64	-0,44	-0,74	1,12	0,65	1,39
Large Firms (n = 230)																	
Mean	-0,01 %	0,08 %	0,12 %	0,04 %	0,04 %	0,07 %	0,02 %	0,06 %	0,44 %	0,20 %	0,10 %	0,07 %	0,00 %	0,01 %	0,03 %	0,06 %	0,07 %
% > 0	35 %	36 %	40 %	39 %	43 %	36 %	40 %	42 %	61 %	48 %	47 %	47 %	42 %	39 %	38 %	42 %	44 %
t-Test	-0,29	1,34	1,93	1,23	1,40	1,26	0,70	2,24 **	6,71 ***	5,21 ***	3,02 ***	2,28 **	0,10	0,29	1,06	1,61	2,33 **
Small Firms (n = 229)																	
Mean	-0,04 %	-0,01 %	-0,02 %	-0,04 %	-0,04 %	0,04 %	-0,01 %	-0,02 %	0,10 %	0,06 %	0,06 %	0,00 %	-0,02 %	-0,03 %	0,15 %	-0,03 %	0,00 %
% > 0	32 %	31 %	32 %	34 %	31 %	32 %	28 %	30 %	39 %	41 %	38 %	36 %	33 %	35 %	34 %	33 %	29 %
t-Test	-2,58 **	-0,60	-0,80	-2,34 **	-2,40 **	0,78	-0,38	-0,77	2,22 **	1,34	1,59	-0,09	-0,73	-1,61	0,95	-1,67	-0,01

Panel B: Announcement of an initial actual repurchase, n = 132

Total Sample	Calculated with logarithmic terms																
Day	**-20**	**-15**	**-10**	**-5**	**-4**	**-3**	**-2**	**-1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**	**+10**	**+15**	**+20**
Mean	-0,02 %	0,02 %	0,02 %	0,06 %	-0,01 %	0,01 %	0,04 %	0,10 %	0,08 %	0,13 %	0,03 %	-0,04 %	-0,02 %	0,02 %	-0,03 %	0,01 %	-0,01 %
% > 0	30 %	26 %	32 %	34 %	35 %	32 %	39 %	41 %	47 %	40 %	40 %	33 %	33 %	39 %	39 %	31 %	35 %
t-Test	-1,00	0,50	0,61	1,41	-0,27	0,31	0,82	1,74	1,82	1,79	0,96	-1,98 **	-0,79	0,51	-1,42	0,33	-0,33
Large Firms (n = 78)																	
Mean	-0,01 %	0,06 %	0,04 %	0,08 %	-0,01 %	0,02 %	0,07 %	0,16 %	0,05 %	0,14 %	-0,03 %	-0,05 %	-0,06 %	0,01 %	-0,07 %	0,03 %	-0,03 %
% > 0	33 %	28 %	36 %	33 %	32 %	28 %	36 %	36 %	44 %	36 %	37 %	29 %	24 %	38 %	32 %	35 %	35 %
t-Test	-0,17	0,81	0,78	1,17	-0,25	0,44	0,86	1,72	0,99	1,17	-0,90	-1,37	-1,86	0,23	-2,23 **	0,53	-0,64
Small Firms (n = 54)																	
Mean	-0,04 %	-0,03 %	-0,01 %	0,03 %	0,00 %	-0,01 %	0,00 %	0,01 %	0,12 %	0,13 %	0,13 %	-0,03 %	0,03 %	0,03 %	0,02 %	-0,02 %	0,02 %
% > 0	26 %	22 %	26 %	35 %	39 %	37 %	43 %	48 %	52 %	46 %	44 %	37 %	44 %	39 %	48 %	26 %	35 %
t-Test	-3,15 ***	-1,86	-0,47	0,87	-0,09	-0,29	-0,07	0,32	1,56	1,82	1,91	-2,33 **	0,82	0,61	0,63	-0,65	0,47
Total Sample	Carculated with absolute values																
Mean	-0,02 %	0,03 %	0,02 %	0,07 %	0,00 %	0,02 %	0,04 %	0,10 %	0,08 %	0,14 %	0,04 %	-0,04 %	-0,02 %	0,02 %	-0,03 %	0,02 %	0,00 %
% > 0	34 %	31 %	33 %	36 %	34 %	32 %	39 %	44 %	49 %	42 %	41 %	35 %	36 %	39 %	37 %	36 %	34 %
t-Test	-0,76	0,61	0,78	1,54	-0,09	0,47	0,93	1,83	1,95	1,85	1,09	-1,77	-0,59	0,68	-1,17	0,48	-0,13
Large Firms (n = 78)																	
Mean	-0,01 %	0,06 %	0,04 %	0,08 %	-0,01 %	0,02 %	0,07 %	0,16 %	0,05 %	0,14 %	-0,03 %	-0,05 %	-0,06 %	0,01 %	-0,07 %	0,03 %	-0,03 %
% > 0	36 %	31 %	36 %	33 %	31 %	27 %	35 %	38 %	45 %	38 %	40 %	28 %	26 %	37 %	31 %	37 %	33 %
t-Test	-0,19	0,79	0,78	1,17	-0,27	0,43	0,86	1,71	0,98	1,17	-0,92	-1,41	-1,88	0,22	-2,24 **	0,53	-0,65
Small Firms (n = 54)																	
Mean	-0,03 %	-0,02 %	0,00 %	0,05 %	0,01 %	0,01 %	0,01 %	0,02 %	0,13 %	0,14 %	0,14 %	-0,02 %	0,05 %	0,04 %	0,03 %	0,00 %	0,03 %
% > 0	31 %	31 %	30 %	39 %	39 %	39 %	46 %	52 %	56 %	46 %	43 %	44 %	52 %	43 %	46 %	33 %	35 %
t-Test	-2,28 **	-1,12	0,13	1,19	0,36	0,17	0,43	1,15	1,75	1,99	2,08 **	-1,45	1,15	0,95	1,06	-0,09	0,89