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Why are share repurchases and special dividends both in use in the Swedish market?

– An empirical analysis of the announcement effects

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ABSTRACT

Share repurchases were made legal in Sweden in March 2000. Since then, Swedish companies have been able to choose between share repurchases and special dividends for non-recurring distributions of excess capital. The purpose of this thesis is to determine why both methods are still in use. We identify three possible explanations:

- a) There is no difference in usefulness; the two methods are perfect substitutes.
- b) There is a difference in usefulness, but different companies have different opinions as to which method would be preferred. Some use the correct method, the others would be better off using the other method.
- c) The usefulness of either method is contingent on company characteristics. For some companies, special dividends is the preferred method, others are better off using repurchases.

We use empirical tests where usefulness is approximated into announcement effects in order to determine which explanation that is correct. These tests consist of an event study, a logistic regression and two multivariate regressions and are based on announcements of either redistribution method in the period of January 2000 – March 2006 as well as accounting and financial data. This data is used in order to stipulate a decision model, based on the majority choice given certain company characteristics. We find no significant difference in announcement effect between share repurchases and special dividends, but a significant difference between the firms who have followed the decision model and those who have not. We thus conclude that our third explanation is correct: **The usefulness of either method is contingent on company characteristics. For some companies, special dividends is the preferred method, others are better off using repurchases.**

Keywords: share repurchases, buybacks, special dividends, extraordinary dividends, event study, logistic regression.

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1. INTRODUCTION

Before March 2000, Swedish companies were limited to dividends when redistributing capital to their shareholders. Then a new law was enforced that made it possible for a company to repurchase its own shares. Ever since, Swedish companies have been able to choose between three main redistribution methods; ordinary dividends, special dividends and share repurchases.

Ordinary dividends have by far been the most common method. By ordinary dividends we refer to annual/recurring dividends, usually following a company dividend policy¹ - the kind most profitable companies pay every year. When a company as a non-recurring action wants to redistribute excess capital not needed for the ongoing operation, raising the ordinary dividend is not an option. Instead it chooses between share repurchases and special dividends. At a first glance, these two methods can appear to be perfect substitutes; they are both non-recurring actions and they both redistribute capital from a company to its shareholders. We will show in this paper, however, that the two methods in several aspects have different characteristics, both when it comes to their usefulness as a signal and their real effects, tax treatment, etc.

Ever since share repurchases were made legal, both special dividends and share repurchases have been used. This could be due to three different reasons:

- a) There is no difference in usefulness; the two methods are perfect substitutes.
- b) There is a difference in usefulness, but different companies have different opinions as to which method would be preferred. Some use the correct method, the others would be better off using the other method.
- c) The usefulness of either method is contingent on company characteristics. For some companies, special dividends is the preferred method, others are better off using repurchases.

¹ It could for example be a pre-determined percentage of net income, or just a fixed amount.

There are several theories explaining which method would be most beneficial to shareholders and/or which method would be preferred by management. We will use these theories together with empirical data on announcement effects in order to show why both redistribution methods are in use. In this case announcement effects in share price are a proxy for usefulness.

1.1 PURPOSE

The purpose of our study is to determine why both special dividends and over the market repurchases are in use.

1.2 METHODOLOGY

We will test the three hypotheses above using announcement observations of share repurchases and special dividends, accounting data, share price and index price data and a number of theories that could explain the choice of either redistribution method.

The data will be tested through an event study, a logistic regression and two multivariate linear regressions.

1.3 DELIMITATIONS

- We have excluded all observations of over the market share repurchases and special dividends where the redistributing company is an investment company. This was done due to the fact that there does not exist any consensus estimate of net earnings of these firms - net income is not a relevant measure when examining the performance of an investment company.
- The study is limited to Swedish registered listed companies, who have announced over the open market share repurchases or special dividends during the period of January 1, 2000 to March 31, 2006. Compared to previous studies, this is quite a short time span, which can affect the reliability of our results and their applicability for future market conditions. During this time span, the stock market has first gone through a very bearish period followed by a very bullish period. These strong drifts might not be representative for future stock market movements.

- We have also limited our sample of share repurchases and special dividend observations to companies with certain characteristics. These are:
 - A market capitalisation above 3 BSEK.
 - Liquidity in the companies share.
 - An analyst coverage exceeding three brokerages or investment banks – the minimum coverage needed in order to calculate a consensus estimate of net earnings.²
- The study only includes companies which have announced share repurchases over the open market and we have excluded all tender offers.
- We have approximated the term *usefulness* of either redistribution method with announcement effects. By doing so, we have not taken long term effects on share return or scenarios where management would have an incentive to not act in the interest of shareholders into account.³
- As a consequence of our definition of usefulness, we have only used theories where the redistribution method is chosen in order to enhance shareholder value in our empirical tests and models. We have still stated examples of other theories, but these theories have not been used in order to derive our empirical results.
- We evaluate the choice of redistribution method as a binary variable; share repurchase *or* special dividend. We do thus not take any size effects into consideration; a 1% dividend and a 50% dividend are treated equally. If we had taken size effects into consideration, it would not have been possible to measure the effects of the actual binary choice.

² Primarily we have used SME Direkt consensus estimates. When these have not been available, we have calculated the consensus estimates ourselves as the average of net earning estimates made by investment banks and brokerages.

³ We find some support for not taking long term effects into account in the *efficient market hypothesis* (cf Fama (1970)). The efficient market hypothesis states that asset prices reflect all of the information available, including information regarding the future. If an action has a long term effect on performance, it follows that the announcement of such an action should cause an increase in share price even in the short run.

- When we measure the announcement effect, we measure the effect at the day when the board announces that it will give a proposal of a share repurchase or special dividend to the shareholders at the annual general meeting. At this point, it is not completely certain that their proposal will be accepted and the redistribution will take place. We choose this date since the probability of the shareholders accepting the proposal is very high, close to a hundred percent.⁴ It follows that the market reaction can be expected to be stronger on the day of the board's initial announcement than on the day the shareholders make their decision.

1.4 DEFINITIONS

The following terms will be frequently used in this thesis:

- *Share repurchase*: A program by which a company repurchases its own shares from the marketplace, reducing the number of outstanding shares.⁵
- *Special dividend*: A non-recurring distribution of company assets, usually in the form of cash, to shareholders. A special dividend is normally larger compared to normal dividends paid out by the company.⁶
- *Announcement day*: The day when a company announces a share repurchases program or a special dividend. This is not the same date as when the share repurchase program or special dividend are approved by the shareholders.
- *Earnings surprise*: When the earnings reported in a company's quarterly or annual report are above or below analysts' earnings estimates. Earnings that exceed estimates create a positive earnings surprise, and vice versa.

1.5 OUTLINE

The remainder of this thesis is organised as follows. *Section 2* will provide the reader with an overview of previous studies on related topics and a more detailed description of the characteristics of special dividends and over the market repurchases. In *section 3* we will present a number of theories, each explaining any positive announcement effects of capital redistributions and/or why either redistribution method would be preferred. In *section 4*,

⁴ www.stockholmsborsen.se 2006-10-15.

⁵ www.investopedia.com, 2006-10-15.

⁶ www.investopedia.com, 2006-10-15.

these theories are, when relevant and possible, approximated into testable variables. *Section 5* presents our sample and data material. *Section 6* provides the methodology of our thesis, which empirical tests that are to be made. This section will also show which conclusions we can draw from the outcomes of these tests. *Section 7* presents the empirical results. The final analysis and conclusion are presented in *Section 8*. This section also discusses and criticises our results, interpretation and conclusion and stipulates alternative explanation models. We will in this section also give our suggestions for further research related to the topic of our thesis.

2. LITERATURE AND BACKGROUND

2.1 PREVIOUS STUDIES

Within the field of corporate finance, there have been many studies on the topic of redistribution of capital. These studies have ranged from normative studies on the benefit of redistributing capital⁷, to positive studies describing the effects of capital redistributions⁸, or which motivation managers' had when choosing their redistribution method.⁹ These three main groups of studies have in general also used three different methodologies. The normative studies have algebraically derived economic theory and fundamentals into a recommendation; how to act given the circumstances. The studies describing managements' motivation and arguments have mainly used interview studies and/or written sources together with theory. Finally, the studies focusing on measuring and analysing the announcement effects have to a large extent based their studies on empirical and statistical research and data analysis.

Our study does not completely fall into any of these three groups. We have used an empirical and statistical approach in order to determine why both repurchases and special dividends are in use. Perhaps due to this characteristic and the fact that we only study special dividends and over the market repurchases - we do not include redemptions and ordinary dividends - we have not found a previous study with the exact same purpose and methodology as ours.

⁷ See for example Modigliani & Miller (1958) and (1961).

⁸ See for example Nayar, Singh and Zebedee (2005), Li & McNally (2001), Vermaelen (1981), Hackethal & Wolfgang (2002), Aronsson & Hagelborn (2003).

⁹ See for example Ivarsson & Nabseth (2006), Gustafsson & Rydell (2004).

Even though our study does not fit into any of the three groups mentioned above, their findings and reasoning have still been very important for us when choosing our purpose and research method, as well as when conducting our study. In this section we will give a description of previous studies, sorted into the three main groups mentioned above.

Since share repurchases are a fairly recent phenomenon in Sweden, there have not been many studies using our data set. The segment on studies describing the effects of redistributions will thus focus on international studies. The segment on studies describing management motivation will focus on Swedish studies. Since our study is made on companies on the Stockholm stock exchange, we consider these studies more relevant. This section will only briefly discuss normative theory. Normative theories will be described and analysed in more detail in our segment on theoretical framework.

In general, studies on share repurchases have recently been more common than studies on special dividends; perhaps because dividends are still seen as the norm.

2.1.1 Normative studies

In 1958, *Franco Modigliani and Merton H Miller* published their famous article *The Cost of Capital, Corporate Finance and the Theory of Investment*. They argued that the choice of capital structure is irrelevant in a world without taxes and costs of financial distress. In 1961, they published a second article, *Dividend Policy, Growth and the Valuation of Shares*, arguing that under the same circumstances, a company's dividend policy is also irrelevant. It does not matter whether a firm redistributes capital to its shareholders or not. Of course, Modigliani and Miller limited their propositions to a case when corporate taxes, costs of financial distress, transaction costs and market imperfections are not an issue. Should any of these factors enter the picture, the choice to redistribute cash might affect share value.

2.1.2 Positive studies describing management motivation

The most recent study based on the Swedish market available to us was made by *Carl Ivarsson and Andreas Nabseth (2006)*. In their master thesis they examined Swedish companies' payout policies, trying to determine which arguments that drive Swedish companies to pay out dividends rather than to repurchase shares, in spite of the more beneficial tax treatment associated with share repurchases. In order to answer this question

they conducted an interview study, covering a significant part of the Stockholm Stock Exchange. On basis of their interview results, previous research and opinions expressed in media they came up with ten arguments. These arguments were analysed empirically on the basis of data, or through logical reasoning. Their main findings were that the stated arguments did not seem to be rational explanations.

In their master thesis, *Gustafsson & Rydell (2004)* compared the characteristics of special dividends, share repurchases and redemptions. For each redistribution method, they described its impact on taxes and financial ratios, possible signal values and any legal restrictions. This theory-based description was then contrasted by an interview study, where the motives behind capital redistributions of three different Swedish companies were investigated. The authors found no clear-cut decision model, shared by the companies, but overall share repurchases seemed to be preferred.

2.1.3 Positive studies describing the effects of capital redistributions

Several studies have investigated the announcement effects of share repurchases. *Comment & Jarrel (1991)* found an average abnormal return of 2 % following the announcement of an open-market repurchase program. *Ikenberry, Lakonishok and Vermaelen (1995)* showed a positive return immediately after the announcement, but also a continued superior performance during the following years, suggesting that the market was under reacting.

In 2002, *Andreas Hackethal and Alexandre Zdantchouk* investigated the magnitude and the main determinants of share price reactions to buy-back announcements of German corporations. They first conducted an event study, with a sample consisting of 224 announcements that took place between May 1998 and April 2003. They found average cumulative abnormal returns around -7.5% for the thirty days preceding the announcement and around +7.0 % for the ten days following the announcement. They later tried to explain these cumulative abnormal returns in a multivariate regression, using various firm characteristics as explaining variables. Their study provided evidence supporting the theory of share repurchases acting as a signal of undervaluation but they did not find any support for the excess cash hypothesis or the tax-efficiency hypothesis.

In 2000 *da Silva Rosa, Lee, Preda and Walter* conducted their study *Market to share buybacks and special dividends under a tax imputation system*. The aim of their study was

in part to examine which of share repurchases or special dividends that gave the strongest market response at announcement. On average, the market response to announcements of special dividends was higher. They concluded that the Australian market response to announcements of on-market share repurchases is about the same as the response observed in the US, in spite of Australian buybacks having more salient outcomes and arguably therefore being more credible as signals of undervaluation or diminution of agency costs.

In their master thesis, *Cecilia Aronsson and Karin Hagelborn (2003)* investigated the development of profitability and investment opportunities of Swedish listed companies that had announced a share repurchase. They presented a number of hypotheses explaining positive announcement effects to share repurchase announcements. These hypotheses were later summarised into two separate hypotheses, which were each assigned a testable variable. They then tested the latter two hypotheses using a Wilcoxon rank test. Aronsson and Hagelborn found that profitability declined after an announcement. The interpretation of their findings concerning investment opportunities depends on whether the size or the return on the investment is considered.

2.2 REDISTRIBUTION METHODS

As we have mentioned earlier we will only examine the redistribution models special dividends and share repurchases. The characteristics and functions of these methods will be described below. We will focus on each method's effect on the company and its shareholders. Share repurchases and special dividends have at least one common feature - they are irregular disbursements of cash to investors.

2.2.1 SPECIAL DIVIDENDS

A special dividend is a type of dividend. Traditional dividends are a way for a profitable company to redistribute capital to its shareholders, annually, semi-annually or quarterly. The size of the dividend is usually predetermined by a dividend policy, for example as a percentage of net income.

Special dividends differ from traditional dividends in the sense that they are not recurring and do not follow a predetermined policy. There are some companies that pay a special dividend every year. In these cases it could be argued that the special dividend really is a regular, traditional dividend.

It is the board of the company who proposes to give a special dividend. In Sweden these propositions are most often presented in the year end report. After a proposition has been made, it has to be approved by the shareholders. This decision usually takes place at the ordinary shareholder meeting or at an extraordinary shareholder meeting. If the shareholders approve the special dividend, which they most often do, it is paid out to all shareholders within approximately a month after the annual shareholder meeting. The company has to pay out the special dividend when it has been approved by the shareholder. Here the treatment is different from that of share repurchases, where the shareholder meeting gives the board the option but not the obligation to go through with their share repurchase program.¹⁰

When the special dividend is paid out the share price, *ceteris paribus*, depreciates with the same amount as the special dividend. The size of the special dividend is limited, just as with an ordinary dividend, by the company unrestricted equity. When the dividend or special dividend is paid out, the unrestricted equity will decrease with an equal amount.¹¹

2.2.2 SHARE REPURCHASES

Share repurchases share the main traits of dividends and special dividends – they redistribute capital from a company to its shareholders. The company will in a share repurchase program repurchase some of its own shares and then most likely cancel them. The result of share repurchases will be an increased profit per share, *ceteris paribus*, and a reduced unrestricted equity.

The size of a share repurchase is limited by the company's equity. The size of the share repurchase cannot be larger than the smallest of the parent company or group company unrestricted equity in the beginning of the year depreciated with total dividend (ordinary dividend plus special dividend) during the year.

Since 1895 Swedish companies have been prohibited to repurchase their own share. In 1999 the Swedish government came with a proposition to the Swedish parliament

¹⁰ 19 kap Aktiebolagslagen.

¹¹ 17 kap 3§ Aktiebolagslagen.

proposing that companies should be allowed to repurchase their own shares under a number of conditions. There were several reasons why the government came with this proposition:

- Sweden was the only country in northern Europe not allowing share repurchases.¹²
- Companies needed alternative methods to redistribute capital to their shareholders.¹³
- Share repurchases could create an additional method for companies to pay for acquisitions with their own shares, thus avoiding the costs and other setbacks related to issuing new shares.¹⁴

Regulation regarding share repurchases:

- Share repurchases must be accomplished on the open market or via tender offers.
- The share repurchasing company is only allowed to hold 10 percent of its outstanding shares. This implies that a company cannot repurchase more than 10 percent of outstanding shares without terminating shares that already have been repurchased or sell them.
- It is the company who decides whether to terminate or keep repurchased shares. The repurchased shares have no voting right at shareholders' meetings.¹⁵
- The company is only allowed to repurchase 25 % of the average daily trading volume during the last four weeks.¹⁶
- The company is not allowed to repurchase shares during the 30 days before an interim report is presented, which is consistent with Swedish Insider trading regulation.¹⁷ In reality this implies that the company only can repurchase shares during approximately 190 trading days.¹⁸
- The share repurchasing company is only allowed to purchase share within the bid-ask spread.¹⁹

¹² Prop. 1999/2000:34.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ 19 kap Aktiebolagslagen.

¹⁶ Ibid.

¹⁷ 15 § lagen (2000:1087) om anmälningsskyldighet vid innehav av finansiella instrument.

¹⁸ On average there are 280 trading days. Given 4 interim reports per year, and that 30 days equals a month, the calculation is as follows: $280 \times (1 - 4/12) = 187 \approx 190$.

¹⁹ Stockholm Stock Exchange, Listing agreement 29-33 §.

Apart from restrictions to share repurchases, stated by Swedish law, the Stock Exchange has issued a number of recommendations.²⁰ The purpose with these recommendations is to minimise the risk of share price manipulation as a result of share repurchases. When a company decides to repurchase shares it should immediately make this information public as well as information concerning:

- The purpose of the share repurchase program.
- Accomplished share repurchases programs and how many of its own shares the company holds.
- The size of the share repurchases.
- For how long a time period the share repurchase can be conducted.

3. THEORETICAL FRAMEWORK

The purpose of our study is as mentioned to explain why both share repurchases and special dividends are in use. One of our hypotheses explaining this, states that the usefulness of either method is contingent on company characteristics. In order to facilitate the testing of this hypothesis, we will in this chapter present a number of theories on the topic of redistribution of capital to shareholders.

These theories have been organised into three main groups. The first group of theories explain why the stock market would react positively to the decision to redistribute capital to shareholders. We have analysed these theories, in order to determine whether, according to the theory, one can expect the stock market to react more positively to share repurchases or to special dividends.

The second group of theories explain why the choice of redistribution method could affect shareholder value *per se*, if we consider the redistribution as given.

²⁰ Stockholm Stock Exchange, Trading agreement.

The third group of theories gives various explanations as to why management might choose a redistribution method over the other contrary to the interest of shareholders.

Due to the way we define *usefulness*, as announcement effects in a firms share price, these theories will not be considered in our empirical tests and models. We include them here in order to give the reader a more complete view of possible motives behind the choice of redistribution method.

The first group of theories are virtually the same as the hypotheses stated in Aronsson & Hagelborn. Since they only focus on share repurchases, we have added some additional theories, many of which are presented in Ivarsson & Nasbeth.

For the first group of theories, we have tried to distinguish between *signalling* and *real* effects. Real effects are assumed to directly affect the company and/or its owners, whether it is through personal tax benefits, reaching an optimal capital structure or simply returning money that otherwise would have to be spent on negative-NPV investments. Signalling effects on the other hand assume an information gap between company managers and stock owners. Their effects on shareholder wealth are indirect in that they only effects owners' and analysts' *interpretation* of company value. If the signal is interpreted positively, share value increases.

Before presenting the theories, we will provide a further discussion on the subject of signalling and credibility.

3.1 SIGNALLING

In an ideal world of strong efficient markets there would be no need for signalling. All information, private as well as public, would already be incorporated in asset prices.²¹ The world we live in, however, is different. Here, corporate insiders often have superior knowledge to those who ultimately value company shares (owners and analysts). It follows that the valuation of a company as reflected by its share price is limited by the information available to owners and analysts. Under the assumption that corporate insiders, managers, want to maximise their current shareholders' wealth, they may want to signal the content of their superior information, especially if they believe the stock to be undervalued. Rather than making all information public, an action that might also benefit the competition, managers can send positive signals through, amongst other means, dividends and repurchases.²²

For a signal to have any effect it is important that it is credible.²³ An example of when a signal is credible is when the party who sends the signal suffers a significant loss if the information turns out to be false. For example, if someone wants to signal that he knows the outcome of an event, he might make such a commitment that he suffers a significant loss, should the event turn out differently than he expected. Likewise, if he wants to signal that he will take on a certain action in the future; he might make such a commitment that he will suffer a loss, should he act differently.²⁴

3.2 THEORIES EXPLAINING POSITIVE REACTIONS TO REDISTRIBUTION ANNOUNCEMENTS

3.2.1 Theory 1, Signalling undervaluation

Managers might through superior private information have come to the conclusion that company shares are undervalued. If they believe the market eventually will come to the same conclusion, and they want to maximise current shareholders' wealth, at the expense of future shareholders, they may choose to repurchase stock.²⁵

²¹ Fama (1970).

²² Grullon & Michaely (2003).

²³ Spence (1973)-

²⁴ Ibid.

²⁵ Ikenberry, Lakonishok and Vermaelen (1995).

From the share owner's or analysts' perspective this chain of logic is applied backwards. Given managements' choice to repurchase stock, it is probable that it is undervalued. If the market believes this signal, share prices will rise.²⁶

Extra dividends, on the other hand, do not directly signal undervaluation. Management does not have any extra incentives to give cash back to its owner simply because it believes its shares to be undervalued.

The theory of repurchases being a signal of undervaluation is supported by a number of empirical studies. Dann (1981), Vermaelen (1981) and Comment and Jarrell (1991) found that share repurchases had been associated with significantly positive long term abnormal returns.

3.2.2 Theory 2, Signalling future cash surplus

All things being equal, a cash surplus is better than a cash deficit. In the case of a current surplus it means that past investments have rendered a positive cash flow, in the case of a future surplus it means that current and or past investments are believed to do so. Either way this is good news for the investors.²⁷ The fact that the cash is being paid back to investors can be both good and bad news however. Good news since it means management does not intend to take on negative NPV investments, as we will see later.²⁸ Bad news if the market was expecting further positive NPV investments that are now not going to take place.²⁹

Regardless of whether cash surplus should be seen as good news or bad news, there is in this case no difference in the information content of the signal sent through special dividends or share repurchases.³⁰ However, an extra dividend might be seen as a more credible signal. The decision to pay out an extra dividend is irreversible, whereas a

²⁶ The signal is perhaps more credible if there are substantial transaction costs related to the share repurchase. In that case, management would have less of an incentive to repurchase non-undervalued shares just for the purpose of a short term increase in share price.

²⁷ Grullon & Michaely (2003).

²⁸ Jensen (1986).

²⁹ Grullon & Michaely (2003).

³⁰ Note that the term future in this case applies to a semi – long term perspective. If the future cash surplus is perceived to be stable in the long run, it is perhaps more appropriate to raise ordinary dividends.

repurchase program can be cancelled.³¹ Thus, the decision to pay out an extra dividend might show an extra strong confidence in future cash flows.

3.2.3 Theory 3, Improving capital structure 1, Corporate tax shields

According to Modigliani & Miller's first proposition,³² financial leverage has no effect on shareholders' wealth, in a world free from taxes and costs of financial distress. When these costs enter the picture, financial leverage can have an effect on shareholders' wealth; there is an optimum capital where the benefits from leverage, mainly tax shields, are balanced with the costs of leverage, in form of costs of financial distress. If the market believes current management to have been overly conservative in its leverage policy, or if it believes that the cost and benefit situation has changed, perhaps through a change in corporate taxes or bankruptcy costs, it would react positively to increased leverage.

This is what we would like to call a real effect, the market reacts to a real action taking place, in this case the change in capital structure increasing the value of tax shields rather than the signal of some kind of other change, as in previous examples.

There is no reason to expect a major difference in announcement effect between the two different forms of redistribution. In both cases equity is intended to decrease while debt will be held constant which in turn increases debt/equity. In the case of repurchases, however, equity does not decrease until the shares are cancelled. Even though the vast majority of repurchases lead to the shares being cancelled, there is a slight chance that the shares will be kept or used for something else, thus not increasing leverage. There might therefore be a slight preference for special dividends.

3.2.4 Theory 4, Improving shareholders' stake at the expense of debt holders

A stock can be seen as a call option on a company's assets.³³ When a company's assets are worth less than its debt, it follows that the equity share, $V-D$ ³⁴, is worthless. It does not

³¹ See Literature and Background, section special dividends.

³² Modigliani & Miller (1958).

³³ Black & Scholes (1973).

³⁴ Market value of company assets – market value of debt.

become more worthless if V should decrease even further, however. Thus, the downside of equity is limited while the upside is unlimited, very much like a call option.³⁵

This definition of equity is seldom more than hypothetical due to the fact that most firms are far from a 100% D/V ratio. For a volatile firm close to bankruptcy, however, it becomes relevant. It follows that managers can increase shareholder value by making the option even more volatile. One way of doing so is to increase the debt ratio even further.

This scenario is not common; firms close to bankruptcy face legal restrictions when it comes to different kinds of redistributions to shareholders. Either way, we do not see any major reason for shareholders to prefer either form of payout. But there might be a slight preference towards special dividends, if they can be assumed to be paid out more quickly.

3.2.5 Theory 5, Share repurchases are options

Stock repurchases are also options. Management has the right but not the obligation to repurchase stock, sometimes at a determined price. When valuing the share, the stock market takes this option in to consideration.³⁶ Since special dividends are fixed, once the payout decision has been made, this hypothesis suggests a weaker reaction to their announcements.

3.2.6 Theory 6, Agency theory and management prudence

According to certain theories, there is a principal-agent relationship between shareholders and managers. Managers manage the shareholders' money, but do not always share their objectives.³⁷ If manager compensation is not perfectly tied to shareholder value, they might value projects in a different manner than their shareholders would have. For example, if management sees a personal value in empire building, they might undertake less than 0 NPV projects, once they run out of positive NPV projects to invest in. It follows that a redistribution of cash to the shareholders is a signal that management does not intend to destroy shareholder value by taking on negative NPV projects.³⁸ Any positive effect would be a signal effect rather than a real effect. The signal sent by either redistribution form contains the same information.

³⁵ Merton (1974).

³⁶ Ikenberry & Vermaelen (1969).

³⁷ Jensen & Meckling (1976).

³⁸ Jensen (1986).

However, a special dividend might be seen as a more credible signal. This would be due to two different causes. First, the decision to pay out a special dividend is irreversible, whereas a repurchase can be cancelled. Second, no redistribution of funds to the shareholders has taken place until the shares have been cancelled. Management might be performing a repurchase program in order to use the repurchased shares for the acquisition of another company or for some other investment. In that case, the repurchase does not imply any improved management prudence.

3.3 OTHER THEORIES EXPLAINING WHY EITHER METHOD WOULD AFFECT SHAREHOLDER VALUE

3.3.1 Theory 7, Capital gain and dividend taxation

Modigliani & Miller concluded in their paper 1958 “The Cost of Capital, Corporate Finance and the Theory of Investment” that in a world without taxes all redistribution methods of capital are equal in terms of creating wealth to company shareholders.³⁹ However, in our world dividends are taxed more heavily than capital gains. It follows that share repurchases will create more shareholder wealth, due to the more beneficial tax treatment. This implies that many corporations will be tempted to eliminate dividend payments.⁴⁰

The Swedish taxation rules for dividend and capital gains are as follows:⁴¹

- 30 percent of the entire dividend amount is paid in tax.
- Capital gains are taxed with 30 percent, however due to the standard rule the maximum tax base is 80 percent of the selling price. Consequently, taxes on capital gains never exceed 24 percent (80x30 percent = 24 percent).

An additional implication of the Swedish taxation system renders capital gains even more beneficial than dividends. It gives the shareholder the possibility to defer the tax until the

³⁹ Modigliani & Miller (1958).

⁴⁰ Black, Fischer (1976).

⁴¹ This segment provides a general and simplified view of the Swedish taxation of dividends and capital gains. The situation is often much more complex.

shares are sold, whereas dividends are taxed immediately on the distribution day. This means that an investor will earn interest on their deferred taxes, until the day the gain will be realised.⁴²

Using the Modigliani & Miller concept regarding capital taxation, share repurchases should always be superior to the shareholder compared to special dividends.

However, different rules than the general regulations stated above may apply to investors in Swedish companies. The table below shows which investors would prefer share repurchases and which would be indifferent from a sole taxation perspective.

Investors	Preferred alternative from a tax perspective
Private individual	Share repurchases
Mutual funds	Share repurchases
Investment Company	Share repurchases
Charitable foundation	Indifferent
Non-charitable foundation	Share repurchases
Pension funds	Indifferent
The state	Indifferent
Foreign owner	Share repurchases
Company	Share repurchases
Business related owners	Indifferent

Table 1. Preference to special dividend and share repurchases.⁴³

3.3.2 Theories 8-9, Owner concentration

3.3.2.1 Owner concentration and moral hazard

Over the market repurchases are not necessarily symmetric. A shareholder that does not sell any of his shares consequently increases his stake in the company. Sometimes this might be important, especially when one party is close to single-handedly controlling the company. *Morck, Schleifer and Vichny* showed that when a party controls enough shares to effectively control a firm, but does not receive large enough percentage of its value, a moral hazard occurs, and shareholder value will not be maximised.⁴⁴

⁴² Ivarsson C. & Nabseth A. (2006).

⁴³ Ibid.

⁴⁴ Morck Schleifer & Vichny.

Special dividends on the other hand are symmetric; in the sense that they do not alter the owner structure of a firm. It follows that they may be a better alternative when owner concentration is a problem.

3.3.2.2 Number of shareholders and liquidity

A related aspect is the importance of having many shareholders and liquidity in the share. If there is a significant owner concentration in the company, share repurchases will often increase the owner concentration even more and thus decrease share liquidity even further. Therefore owner concentration has been a common argument as to why special dividends are to prefer before share repurchases.⁴⁵

3.3.3 Theory 10, Behavioural finance

In 1984 Shefrin and Statman developed a theory of dividends stating that investors are not indifferent between a dividend and a share repurchase even if the amount is equal. It can still make a difference for the investor whether the redistribution is in terms of cash or as an indirect capital gain through a share repurchase.⁴⁶ Their model is not based on the traditional utility maximisation theory; instead it is based on behavioural theory. Their explanation as to why investors prefer dividends before share repurchase has to do with self control. Investors want to restrict themselves from consuming too much in the present. They do not want to dip into capital and, therefore, they only allow themselves to consume current income such as dividends. Shefrin and Statman also showed that this preference was not equally strong for all investors: they found that retired individuals preferred dividends even more than investors who were still working.

3.4 FURTHER THEORIES EXPLAINING THE CHOICE OF REDISTRIBUTION METHOD

3.4.1 Theory 11, Takeover defence

A share repurchase can be used in order to fend off a take over.⁴⁷ By reducing the free-float, management makes it more difficult for raiders to accumulate a control post over the open market. In this case a repurchase does probably decrease shareholder value (as compared to a special dividend or no action at all), but is still the most likely choice of

⁴⁵ Dagens Industri, 2000-06-16.

⁴⁶ Shefrin and Statman (1984).

⁴⁷ Hackethal & Wolfgang (2002).

redistribution method. A takeover often benefits shareholders, at least on a short term basis, as the buying firm offers a premium on top of the market price. Management, on the other hand, is likely to lose their employment and are thus often negative towards a takeover attempt.

3.4.3 Theories 12-13, Management options and incentive plans

There are several theories regarding redistributions effect on management options and incentive plans. An issue concerning special dividends and management options is that all options are not dividend protected. Murphy (1998) found that only a fragment of the options plans in the US firms are dividend protected. This could be a very strong incentive for management to use share repurchases instead of special dividends.⁴⁸ Lambert, Lanen and Larcker (1989) investigated the change in the way companies redistributed capital after they had implemented management options. Their results showed that the use of dividends decreased.⁴⁹

Another argument against share repurchases that has been raised in Sweden is that a share repurchase program could be used by management to manipulate the share price the days before the strike date of management options.⁵⁰

	Theory	Contingent factor	Proxy	Preference
1	Signalling undervaluation	Undervalued share	Negative total share return, negative stock development	Share Repurchase
2	Signalling cash surplus	Estimated cash flow	-	Special Dividend
3	Personal taxes	Investors that can profit from deferred taxes	Low owner % institutional investors	Share Repurchase
4	Improving capital structure 1, corporate taxes	Company can benefit from a more leveraged capital structure	Low debt-to-equity	Special Dividend
5	Improving capital structure 2, shareholders vs debt holders	Close to bankruptcy	High debt-to-equity High stock-beta	Special Dividend
6	Repurchases are options	Volatile future share price	High stock-beta	Share Repurchases
7	Agency theory and management prudence	Cash surplus, lack of investment opportunities	Low market-to-book, low debt-to-equity	Special Dividend
8	Owner concentration	Single owner close to control post, incentives not aligned	High % of shares owned by major shareholders	Special Dividend
9	Behavioural finance	Investors that prefer cash	-	Special Dividend

Table 2.

⁴⁸ Murphy (1998).

⁴⁹ Lambert, Lanen and Larcker (1989).

⁵⁰ Gunnar Ek at Aktiespararna (2003).

4. CHOICE OF PROXY VARIABLES

We have associated each theory from the previous section with a condition, or a contingent factor. For example, the theory stating that repurchases should be preferable due to a lighter tax treatment is contingent on the fact that company shareholders can take advantage of the tax benefits.

Each condition/factor has then been approximated into one or several testable variables. In most cases the testable variables are continuous, but the proxy for beneficial tax treatment is a dummy. When possible, our approximations have been done in line with those made by *Hackethal & Zdantchouk (2002)*. Our theories, contingent factors and testable variables are summarised in table 2 above. The purpose of the testable variables, from hereon referred to as proxy variables, is to test the hypothesis:

*The usefulness of either method is contingent on company characteristics. For some companies, special dividends is the preferred method, others are better off using repurchases.*⁵¹

In this segment we will explain how each proxy is calculated along with its underlying assumptions. We will also explain why some theories share proxy variable while others lack proxy variables. It is important to remember that the purpose of our thesis is *not* to test these theories one by one. The theories are instead used as a way to collect explanatory variables as to whether the choice of redistribution method is contingent on other factors or not.

4.1 PROXY VARIABLES

4.1.1 Theory 1, Signalling undervaluation

The contingent factor to this theory is that management actually believes the share to be undervalued. One approach when determining this could be to conduct an interview with the management of each firm and create a dummy (undervalued or not) based on their answers. This approach is very time-consuming, and subjective; we would be depending on

⁵¹ Our third explanatory hypothesis. See chapter 1, introduction.

management' remembering what it thought when the decision was formed, and whether they are willing to reveal this information to us.

Instead, we have used previous stock performance as a proxy for this contingent factor. Previous stock performance is defined as total share return over the 180 days preceding our event window. The worse the performance, the larger is arguably the potential for undervaluation.⁵²

4.1.2 Theory 2, Signalling future/current cash surplus

This theory is contingent on the company having a cash surplus, or expecting to have one in the future. Further, in order for the signal to be positive, it should not be interpreted as a lack of investment opportunities. The most appropriate proxy for this factor would be future estimated cash flow. We have not found any source for this figure, and as it would be rather difficult and time consuming to calculate the estimated cash flow for each company at the time of each event, we have chosen to omit this variable all together.

4.1.3 Theory 3, Improving capital structure 1, Corporate tax shields

The contingent factor to this theory is whether an increased leverage will lead to a better trade-off between tax shields and costs of financial distress. It follows that debt/equity is the most appropriate proxy for this factor. Arguably, increased leverage is more likely to be beneficial for firms with a low leverage, a low debt/equity ratio.

4.1.4 Theory 4, Improving capital structure 2, Increasing shareholders stake at the expense of debt holders

This theory is contingent on firms being volatile and close to bankruptcy or liquidation. We have chosen beta as a proxy for volatility and debt/equity as a proxy for how close a firm is to bankruptcy. Debt/equity as a proxy for bankruptcy is in reality very industry specific.⁵³ We could perhaps have improved this measure by setting it in relation to industry benchmarks. Further, the volatility of EBIT might have been a better measure than beta, but in both cases, the calculation of both measures would have been very time consuming. Again we wish to stress that the purpose of our thesis is not to test the relevance of our individual theories.

⁵² This proxy is chosen in line with Hackethal & Zdantchouk

⁵³ Debt capacity differs between industries.

4.1.5 Theory 5, Repurchases are options

The value of an option is determined by share price, exercise price, time to maturity, the risk-free interest rate and volatility. We consider volatility to be the most important contingent factor in this case. As for the previous theory, we have chosen beta as a proxy for volatility.

4.1.6 Theory 6, Agency theory and management prudence

This theory is contingent on the company having a surplus of capital, a lack of investment opportunities, and the shareholders suspecting management to consequently take on negative-NPV investments. We approximate capital surplus with a low debt/equity ratio and a lack of investment opportunities with a low market/book. A firm with excess capital or cash is more likely to have a low debt/equity, and a firm lacking investment opportunities is more likely to have a low market/book. One way of interpreting market/book is a measurement of the ratio between discounted future profits, and the value of current assets.

4.1.7 Theory 7, Capital gain and dividend taxation

This theory states that repurchases can be more beneficial from a tax perspective as they might face a lower effective tax rate. Here, the contingent factor is whether the owners can take advantage of this tax benefit. Certain owner groups - charitable foundations, pension funds, the state and business related owners - are exempt from capital taxation and thus according to this theory alone indifferent to the choice of redistribution method. Other owner groups - private individuals, investment companies, mutual funds, non-charitable foundations, foreign owners and other companies - are not exempt, and should thus prefer repurchases.

It is arguable that only the tax treatment of main owners matter in this case - the owners that de facto control the company. Our proxy variable is a dummy variable that assumes the value of 1 when both of the two main owners can take advantage of the tax benefits associated with repurchases and 0 when both of the two main owners are indifferent. In the case where only one of the two main owners is indifferent we have for the sake of simplicity set the variable to 0.

4.1.8 Theories 8-9, Owner concentration

These two theories both explain why increased owner concentration might have a negative impact on shareholder value. Owner concentration can be both in terms of owned value and in terms of votes. As we believe the moral hazard to be even more severe when a party controls enough votes without owning as large a percentage of share value, we find owner concentration in terms of votes to be the most interesting measure. As a proxy for owner concentration we have thus chosen the percentage of total votes that is being held by the three largest shareholders. This is done in line with previous studies.

4.1.9 Theory 10, Behavioural finance

The contingent factor of this theory is whether shareholders of a particular firm actually prefer a payment in cash, *ceteris paribus*. We cannot find a good enough proxy for this. Consequently, this theory is not assigned a proxy variable.

4.1.10 Theories 11-13

These theories explain different reasons as to why management would have other motives than the enhancement of shareholder value when choosing redistribution method. Since the purpose of the proxy variables is to test whether the *usefulness* of either redistribution method is dependant on company characteristics, and we have defined usefulness as announcement effects, we will not use these theories in our study. We have consequently not assigned them any proxy variables.

4.1.11 Summary

By analysing each theory, we have estimated six proxy variables:

- 1) Total share return over the 180 days preceding the event.
- 2) Debt/equity.
- 3) Market/book.
- 4) Beta.
- 5) A dummy variable, reflecting whether the two main owners can take advantage of the capital tax benefit associated with repurchases.
- 6) Percentage of total shares held by the three main owners.

As one can see, there are more theories than variables. Also, some of the theories are associated with more than one proxy variable, and some proxy variables even support opposite conclusions. This is not a problem, since we do not intend to use the proxy variables in order to test the theories. Their purpose is instead to test whether the usefulness of redistribution method is contingent on *company characteristics*.

5. DATA

In this section we present our data, its sources, relevant assumptions concerning the data and criticism of our data. We have divided the data into three categories: announcement observations of share repurchases and special dividends, accounting data and finally share price and index price data.

5.1 ANNOUNCEMENT OBSERVATIONS

5.1.1 Choice of timeframe

We have chosen the investigation period January 2000, when the first share repurchases program was announced in Sweden, to March 2006. The announcements of share repurchase and special dividends show a very clear seasonal pattern in Sweden. Almost every announcement occurs at the same time as the year end report is present. The year end report is most often presented between the middle of January and the end of March. Some companies present their year end report in fall, but this has not been the case for any of our sample companies.

5.1.2 Choice of companies

We have used a number of criteria's when we have selected the sample. These are:

- Liquidity in the company share. - The liquidity should reach a certain level in order to limit the risk of miss pricing due to lack of liquidity.
- Minimum market capitalisation.
- There should exist a consensus estimation of net income of each company in our data set. We have used consensus estimates from SME Direkt.⁵⁴

⁵⁴ SME Direkt, is financial news company in Sweden, their consensus estimates are based on estimates from several analyst reports made by Swedish and foreign brokerage firms, banks and investment banks.

5.1.3 Choice of announcement point

In order to conduct our study we had to determine at what day the announcement of share repurchases and special dividends occurs and have an impact on the share price. It is not obvious which day to choose. On the one hand announcements of special dividends and share repurchases are suggested by the board and presented at the year end report. On the other hand, special dividends and share repurchase programs must first be approved by the shareholders at the annual shareholders meeting before it is certain that they will occur. Even if the board has suggested a special dividend or share repurchase program there is a chance that it will not be approved by the shareholders, at the annual shareholder meeting. It could be argued that the true announcement does not occur until the shareholders approve proposal of special dividends or share repurchases. However, it is extremely unusual that a share repurchase program or a special dividend is not approved by the shareholders. Shareholders most often have a very positive attitude to the redistribution of capital. Our choice of announcement day is thus the same day as the board first presents a special dividend or a share repurchase.

5.1.4 Source of announcements

We have used two different sources to locate the announcement days of share repurchase programs and special dividends. To find the share repurchase programs we have used information from the Stockholm Stock Exchange webpage. They have a database of all share repurchase programs that have occurred at their exchange. This database only states in which year each company has announced its share repurchase program, not the specific day on which it was announced. After gathering this information we have identified the specific announcement days in each company's year-end report.

To find the special dividend we have used DataStream dividend reports. These reports only show which year the special dividend was paid out and not the announcement data. After gathering this information from DataStream we repeated the same procedure as with the share repurchase observations, to identify the announcement day.

5.1.5 Source of consensus estimate

In our study we have tried to remove the noise in the stock market reaction caused by positive and negative earnings surprises. To categorise which observations that has been affected by a positive or negative earnings surprise we have collected net earnings and

consensus estimates for each observation and compared these two figures. We have used two sources to collect these consensus values. As a first choice we have used SME Direkts consensus estimates. If SME Direkt has not had any estimates for an observation we have calculated our own consensus value. These calculations have been done through gathering earnings estimates from analyst reports on the respective company. We collected these analyst reports from Investtext database.

5.1.6 Description of sample

Our sample consists of 100 observations, 75 share repurchases and 25 special dividends. Our final sample is shown in Appendix A. This appendix shows the name of each company, the stock list it is traded on and the announcement day.

The sample consists of companies in a number of different industries. We have divided our sample into industries according to Affärsvärldens company industry index.⁵⁵ The industries that are represented in our sample are: industry, retail products, commodities, services, telecommunication, finance and medical & drugs. The most common industries are industry and finance.

Apart from these industries, we also had 22 observations from investment companies. The problem with these observations is that there is no earnings consensus for investment companies. It was thus impossible to calculate earnings surprise. In order to make our sample more consistent, these observations were removed altogether from our study.

Almost all companies are rather mature companies with a stable profit and solid financial situation. All companies are listed on the Stockholm Stock Exchange. 93 percent are listed on the “Large Cap” list, 7 percent on the “Mid Cap” list.⁵⁶ All observations refer to the period of 2000-2006.

⁵⁵ Affärsvärldens Bolagsindelning, www.affarsvarlden.se, 2006-11-14.

⁵⁶ Stockholm Stock Exchange, www.stockholmsborsen.com 2006-12-01.

Announced	Share Repurchases	Special Dividend
2000	10	3
2001	9	3
2002	12	2
2003	13	2
2004	12	4
2005	13	4
2006	6	7
Total	75	25

Table 3.

Our sample consists of 75 observations of share repurchases and 25 observations of special dividends. The sample includes 25 different companies. During the examination period 83 companies announced a share repurchase program. Of these 83 companies 58 of the companies did not fulfil our criteria's to be a part of our study. Most of the removed observations were unable to fulfil our requirements for market capitalisation and liquidity.

All companies in our sample are still listed on the Stockholm Stock Exchange, which could be a sign of the stability in our sample companies' finance.

5.1.7 Weaknesses and criticism of our sample

Since share repurchases have only been legal in Sweden since 2000, our sample is in some aspects less robust than those of previous studies:

- Our sample size is fairly low if we compare it with prior studies made in the same area.⁵⁷
- Several of our observations originate from the same companies.
- The sample of special dividends is significantly smaller than the sample of share repurchases.

5.2 ACCOUNTING DATA

We have used accounting data in order to calculate our earnings surprise variable, and in order to calculate the proxy variables mentioned in the previous segment. The sources of our accounting data are shown below.

⁵⁷ See Appendix A.

Measure	Source of Data
Book equity	DataStream, Annual Reports
Book total asset	DataStream, Annual Reports
Book debt	DataStream, Annual Reports
Market capitalisation	Number of shares from annual reports, Market data from DataStream
Industry	Affärsvärlden
Owner concentration	SIS Ägarservice
Owner characteristic	SIS Ägarservice

Table 4.

5.3 SHARE PRICES AND INDEX DATA

Share prices and index data have been gathered from DataStream. Share prices are adjusted for dividends, share repurchases and share issues. If a company in our sample had more than one type of share listed on the stock exchange, we choose the share with the highest liquidity. The index data is adjusted to correspond to the adjustments of the share price data. In the study we have used all-share market indices corresponding to OMX Stockholm Stock Exchange.

6. METHODOLOGY

6.1 TESTING OUR SECOND HYPOTHESIS

We start out by testing the second hypothesis, mentioned in the beginning of this thesis;

There is a difference in usefulness, but different companies have different opinions as to which method would be preferred. Some use the correct method, the others would be better off using the other method.

We use announcement effects as a proxy for usefulness. If there were a general difference in usefulness between the two redistribution methods we should see a significant difference in announcement effect. As a first step, we test the difference in announcement effect between the two redistribution methods.

We measure announcement effects as Cumulative Abnormal Returns, from hereon referred to as CAR. CAR for each observation is estimated using an event study.

We first estimate a normal share return for each share, prior to the observation. We use the *market model* when calculating normal return; $R_{it} = \alpha_i + \beta_i * R_{mt} + \varepsilon_{it}$, where the daily return of a firm on a given day is a linear function of the market return on the same day plus a normally distributed error term. The parameters of the market model, α and β , are estimated for each observation in a 180 – day estimation window, stretching from 181 to 2 days prior to each announcement. We choose the end-date of our estimation window in order for it not to overlap with our event window.

For the days surrounding our announcements, we compare the normal return, as predicted by the market model, to actual observations of daily return. The difference between the two, $R_{it} - (\alpha_i + \beta_i * R_{mt} + \varepsilon_i)$ is defined as Abnormal Return (AR). We add up the abnormal returns of each event over the event window. Our event window is defined to include the days $t=-1$, $t=0$ and $t=1$ where $t=0$ is the actual event day. This event window is consistent with previous research.⁵⁸ We now have a CAR for each observation.

We now want to test whether the choice of redistribution method has a significant impact on CAR. This is done through a linear regression, where CAR is the dependant variable and the explaining variable is a dummy; $D=1$ for repurchases $D=0$ for special dividends.

Here we face a significant problem: The decision to redistribute more capital than the annual recurring dividend to shareholders is usually announced in the Year End Report. It follows that other relevant information is released to the market at the same time. Since we want to isolate the market reaction to our announcements we have to clear for other possible explanations to our CAR. A significant part of the new information released to the market is qualitative statements regarding management's view of the future. Since that kind of information is virtually impossible to quantify, we have chosen to only clear for the effect of *earnings surprise*. Earnings surprise is defined as *actual earnings – expected earnings*. In order to remove the natural size effect of measuring earnings surprise in absolute terms, we have standardised our measure by dividing it with booked value of company assets.

⁵⁸ See Appendix A.

We thus add a variable to our linear regression⁵⁹; CAR is explained by earnings surprise/Booked Assets and our dummy.

$$CAR = \alpha + \beta D + \gamma^*(\text{earnings surprise}) / \text{Booked Assets}.$$

To determine whether the choice of redistribution method has a significant impact on CAR we reformulate our hypothesis to:

$$H_0: \beta = 0$$

tested against

$$H_1: \beta \neq 0$$

If H_0 cannot be rejected, the conclusion is that our second hypothesis is not valid. If we can reject H_0 , we still need to test for the influence of our proxies; there could still be a correlation between them, the choice of redistribution method, and announcement effects.

6.2 TESTING OUR THIRD HYPOTHESIS 1, A LOGISTIC REGRESSION

Regardless of whether we reject our second hypothesis or not, we will still need to test our third hypothesis;

The usefulness of either method is contingent on company characteristics. For some companies, special dividends is the preferred method, others are better off using repurchases.

The first step when doing so is to calculate a proxy variable for each theory and firm.⁶⁰

The next step is to test the impact of these variables, when management chooses which redistribution method to use. This is done through a logistic regression,⁶¹ where the dummy, $D=1$ for repurchases, $D=0$ for special dividends, is explained by our variables.

⁵⁹ See Appendix B for a description of multiple linear regressions.

⁶⁰ See section 4, *Choice of proxy variables*, and table 2.

⁶¹ See Appendix C.

In some cases the same variable will be associated with two different theories. This, of course, makes it more difficult to determine which theory has the strongest impact, but it does not affect the validity of our hypothesis. After all, it does not matter which theory that affects the dummy and the announcement effects, the mere fact that they are contingent on *any* theory supports the hypothesis.

Our logistic regression gives us two important insights: It tests the significance of each variable as an explanation to the dummy, and it uses those results to formulate a prediction model. The prediction model predicts which value each company dummy will take, according to the value of the proxy variables. We then compare the predicted value to the observed value for all observations, and sort them into four groups:

		Predicted Method	
		Special Dividend	Share Repurchase
Actual Method	Special Dividend	E = 1	E = 0
	Share Repurchase	E = 0	E = 1

We use these groups in order to construct a new dummy variable, E. E=1 if the value of D predicted by the logistic regression is the same as the observed value, and E=0 if the predicted value is different from the observed value. The result of the prediction model will depend on which variables it is based on. We will base our prediction model on the variables that we find having a sufficient impact on the choice of redistribution.

6.3 TESTING OUR THIRD HYPOTHESIS 2, A MODIFIED LINEAR REGRESSION

Our third hypothesis does not just claim that management's choice of redistribution method is contingent on company characteristics; it claims that the *usefulness* is contingent on these characteristics. We have defined usefulness as announcement effects and company characteristics as our proxy variables. The next step in order to test this hypothesis is to run a linear regression where CAR is explained by our new dummy E, and, as before, an earnings surprise factor.

$$CAR = \alpha + \beta E + \gamma * (\text{earnings surprise}) / \text{Booked Assets}.$$

By testing the significance of β , we determine whether there is a difference in announcement effects between the firms that have chosen redistribution model in line with our prediction model, and those who have not. We test:

$$H_0: \beta = 0$$

against

$$H_1: \beta \neq 0$$

6.4 INTERPRETING THE RESULTS OF OUR REGRESSIONS

The two linear regressions can yield four different outcomes. We will in this segment discuss each possible outcome, one by one.

		Linear regression 1	
		H0 is not rejected	H0 is rejected
Linear regression 2	H0 is not rejected	Hypothesis a) is correct	Hypothesis b) is correct
	H0 is rejected	Hypothesis c) is correct	No conclusion can be drawn

If none of our null-hypotheses can be rejected, we know that neither of the two redistribution methods is superior to the other, and it does not seem to matter whether one chooses redistribution method according to company characteristics. Thus, our first explanatory hypothesis seems to be true;

a) There is no difference in usefulness; the two methods are perfect substitutes.

If our first but not our second null-hypothesis can be rejected, we know that one method is superior to the other, but it does not matter whether one chooses redistribution method in line with company characteristics. Since some companies have still chosen the other redistribution method, we can conclude that our second explanatory hypothesis is true:

b) There is a difference in usefulness, but different companies have different opinions as to which method would be preferred. Some use the correct method, the others would be better off using the other method.

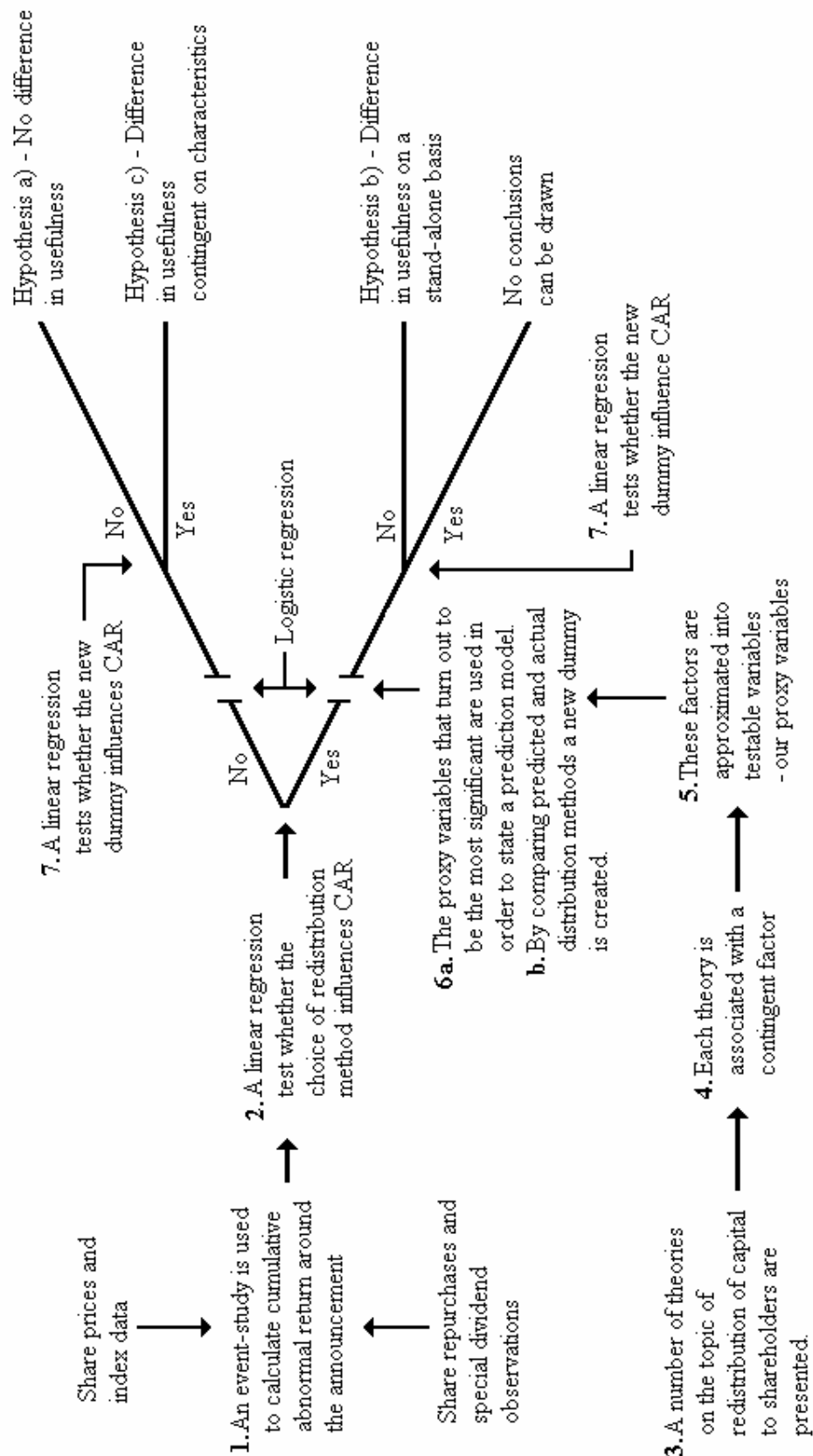
If our second but not our first null-hypothesis can be rejected, we know that none of the redistribution methods is superior to the other on a stand-alone basis, but that it matters whether one chooses redistribution method in line with company characteristics. In other words, we can conclude that our third explanatory hypothesis is true:

- c) The usefulness of either method is contingent on company characteristics. For some companies, special dividends is the preferred method, others are better off using repurchases.*

Finally, if both null-hypotheses can be rejected, the conclusion is not as clear-cut. In this case we know that the companies who have chosen repurchases on average have had a more positive announcement effect. This has also been true for companies who have chosen their redistribution method in line with their characteristics. Since our prediction model only shows whether one has interpreted characteristics the same way as the majority, we cannot say which effect that has been the strongest. To determine whether the existence of both redistribution methods on the Swedish market is due to our second or our third explanatory hypothesis, we would need a holistic analysis of both linear regressions together with the logistic regression. If we are unlucky, we still will not be able to distinguish which explanatory hypothesis that is correct.

The process of our thesis leading up to these final conclusions is summarised in the diagram on the following page.

DETERMINING WHY BOTH SHARE REPURCHASES AND SPECIAL DIVIDENDS ARE IN USE



7. RESULTS

7.1 RESULTS FROM OUR FIRST LINEAR REGRESSION

The regression $CAR = \alpha + \beta D + \gamma^*(earnings\ surprise) / Booked\ Assets$ rendered the following results:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,180(a)	0,032	0,012	0,0451

a Predictors: (Constant), Surprise/assets, Dummy D, repurchase=1

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0,011	0,009		1,210	0,229
	Dummy D, repurchase=1	0,001	0,011	0,005	0,049	0,961
	Surprise/assets	1,119	0,625	0,180	1,789	0,077

a Dependent Variable: CAR t= (-1) - 1

As one can see from these tables, R^2 is very low. This implies that our model does not provide a good explanation to CAR. The variable for earnings surprise, earnings surprise/ booked assets is significant on a 10% level, but not on a 5%.

The hypothesis we want to test is:

$$H_0: \beta=0$$

against

$$H_1: \beta \neq 0$$

As shown by the second table, H_0 cannot be rejected. The p-value of such a test, 1-significance, is extremely low. In fact, the data supports H_0 enough to reject H_1 at a 5% level. In other words, we can conclude that there is no difference in announcement return between share repurchases and special dividends, on a stand-alone basis.

7.2 RESULTS FROM OUR LOGISTIC REGRESSION

The logistic regression where D is explained by all proxy variables rendered the following results:

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	79,074(a)	0,284	0,420

a Estimation terminated at iteration number 7 because parameter estimates changed by less than 0,001.

Classification Table(a)

	Observed		Predicted		
	Dummy D, repurchase=1		Percentage Correct		
	0	1			
Step 1	Dummy D, repurchase=1		11	14	44,0
	0		6	69	92,0
	Overall Percentage				80,0

a The cut value is 0,500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step	Market/book	-0,205	0,133	2,352	1	0,125	0,815
1(a)	Debt/equity	0,409	0,295	1,923	1	0,166	1,505
	Main shareholder	-0,047	0,014	10,387	1	0,001	0,954
	Total return	-0,058	0,899	0,004	1	0,948	0,944
	Beta	-0,257	0,765	0,113	1	0,736	0,773
	Tax preference	0,557	0,643	0,751	1	0,386	1,746
	Constant	3,279	1,289	6,471	1	0,011	26,541

a Variable(s) entered on step 1: MB, DE, @3mainowners, Totreturn, Beta, Dummytax.

As one can see from the first table, the two R^2 figures are much higher than in the previous, linear, regression.

The second table shows which predictions the logistic model would make based on the proxy variables. As one can see, the model predicts that 83 observations should use repurchases as a redistribution method, and 17 should use special dividends. 69 of our 75 repurchase observation were predicted correctly. The equivalent number for special dividends is only 11 out of 25.

From the third table, one can read the significance of each explaining variable. The proxy variable showing owner concentration, 3 main owners, is significantly separate from zero at a 1% level. No other variables are significantly separate from zero at a 10% significance level, but market/book and debt/equity are significant at a 15% and 20% level, respectively.

Based on the information regarding the significance of the proxy variables, we run the regression again. This time we let only 3 main owners, market/book and debt/equity be the explaining variables.

Model Summary

	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
Step			

1	79,918(a)	0,278	0,411
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a Estimation terminated at iteration number 7 because parameter estimates changed by less than 0,001.

Classification Table(a)

	Observed		Predicted		
	Dummy D, repurchase=1		Percentage Correct		
	0	1			
Step 1	Dummy, repurchase=1		11	14	44,0
	1		10	65	86,7
	Overall Percentage				76,0

a The cut value is 0,500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Market/book	-0,169	0,110	2,361	1	0,124	0,845
	Debt/equity	0,451	0,292	2,393	1	0,122	1,570
	3 main owners	-0,042	0,012	11,588	1	0,001	0,959
	Constant	3,070	1,029	8,897	1	0,003	21,545

a Variable(s) entered on step 1: MB, DE, @3mainowners.

The explanation value of the model is virtually the same, in spite of us having removed three explaining variables. The prediction of the dummy corresponds less which the actual management choice, still 11/25 correct predictions for special dividends, but correct repurchase predictions decrease from 69/75 to 64/75.

Our proxy variable for owner concentration remains significant even for very low levels. The significance of market/book stays virtually the same, significant at 15% level, but debt/equity becomes more significant. This variable is now significant at a 15% level.

7.2.1 Results from our second linear regression, E(D) is based on all proxy variables

We believe the second logistic regression, where we have excluded insignificant proxy variables, to be the most relevant. But just to be certain, we construct two different new dummy variables, E.

E is defined to show whether the model prediction is consistent with management's actual choice of redistribution method. $E = \{1 \text{ when } D = E(D); 0 \text{ when } D \neq E(D)\}$.

When E(D) was defined as the prediction based on all proxy variables, the linear regression $CAR = \alpha + \beta E + \gamma * (earnings \ surprise) / Booked \ Assets$ rendered the following results:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,291(a)	0,085	0,066	0,043

a Predictors: (Constant), Dummy E₁, Surprise/assets

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0,010	0,010		-0,965	0,337
	Surprise/assets	1,312	0,608	0,212	2,157	0,033
	Dummy E ₁	0,026	0,011	0,232	2,361	0,020

a Dependent Variable: CAR t= (-1) - 1

R^2 is still quite low, but at least twice as high as in our first linear regression. Earnings Surprise/Booked Assets is significantly separate from 0 at a 5% level – as opposed to a previous level of 10%. The biggest difference, however, is that our new dummy is significant at a 5% (2%) level. This means that we can reject the null hypothesis:

$$H_0: \beta=0$$

against

$$H_1: \beta \neq 0$$

On average, the firms who follow the prediction model extracted from the logistic regression seem to have a 2.6% higher cumulative abnormal return.

7.2.2 Results from our second linear regression, 2, E(D) is based on the three most significant variables

We run the same regression under the assumption that E(D) is defined as the prediction model that was only based on three proxy variables; market/book, debt/equity and the percentage of total shares held by the three largest owners.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,343(a)	0,118	0,100	0,043

a Predictors: (Constant), Dummy E₂, Surprise/assets

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0,013	0,009		-1,433	0,155
	Surprise/assets	1,319	0,595	0,213	2,215	0,029
	Dummy E ₂	0,032	0,010	0,294	3,065	0,003

a Dependent Variable: CAR t= (-1) - 1

R^2 is now even higher than in the previous example, approximately 12%. Earnings Surprise/Booked Assets is still significant at a 5% level. Our dummy is now significant even at 1%. By using this definition of E(D), supported by our logistic regression, we can reject the null hypothesis even more strongly.

$$H_0: \beta=0$$

is rejected against

$$H_1: \beta \neq 0$$

on a 1% level.

In other words we can reject the hypothesis that it never matters which method that is used. It clearly matters whether one has chosen redistribution method in line with the majority's choice, given company characteristics. It follows that the usefulness of each is *contingent on company characteristics*.

8. ANALYSIS CONCLUSION & DISCUSSION

8.1 ANALYSIS

The purpose of our study is to determine why both special dividends and over the market repurchases are in use. We have previously stated three possible explanations:

- a) There is no difference in usefulness; the two methods are perfect substitutes.
- b) There is a difference in usefulness, but different companies have different opinions as to which method would be preferred. Some use the correct method, the others would be better off using the other method.
- c) The usefulness of either method is contingent on company characteristics. For some companies, special dividends is the preferred method, others are better off using repurchases.

These three explanations have been tested in the previous segment. We have done this using first a linear regression, then a logistic regression, and finally used data output from the logistic regression in a second linear regression. The conclusion of our thesis is completely dependant on the outcome of our empirical tests. In particular, the four possible combinations of outcomes of the two linear regressions would render four different conclusions:

		Linear regression 1	
		H0 is not rejected	H0 is rejected
Linear regression 2	H0 is not rejected	Hypothesis a) is correct	Hypothesis b) is correct
	H0 is rejected	Hypothesis c) is correct	No conclusion can be drawn

It follows that this section will be rather short – the outcomes have been analyzed and interpreted beforehand.⁶² Here, we will focus on summarising and explaining the results from our regressions, in order to see which conclusion we can draw. Our results will be explained in a chronological order.

According to the first linear regression, we cannot reject our first hypothesis - that the two methods are perfect substitutes. In fact, the results of this regression allow us to reject the second hypothesis at a 5% level. Since our dummy has virtually no impact, we can conclude that we cannot draw any general conclusion as to which redistribution method that is superior. But we still do not know whether the choice of method is *irrelevant*, or whether the usefulness of either model is *contingent on company characteristics*.

⁶² See section 6.4 *Interpreting the results of our regressions*.

The logistic model shows that the choice of redistribution method seems to correlate with some of our proxy variables. Especially owner concentration has a significant negative impact on our dummy, suggesting that firms with a high owner concentration prefer special dividends. Further, market/book and debt/equity seem to play a role. Their coefficients were not significant on a 10% level, but they could still be expected to have a negative and a positive effect, respectively.

Based on the values of market/book, debt/equity and owner concentration we predicted which method that would be preferred by management for each observation. Our prediction is based on the estimated coefficient for each of the three remaining proxy variables. It is thus not our suggested choice, but rather the majority's choice, given these circumstances. We then created a new dummy variable, reflecting whether the actual choice was the same as our predicted choice.

Running a second linear regression, where our new dummy, together with earnings surprise, explained CAR we found that the coefficient of our new dummy had a value of 3.2% and was significant at a 1% level. Also, earnings surprise was significant at a 5% level, which is in line with what one can expect.⁶³ This shows that the announcement effects of each method are dependant on whether the distribution method is chosen in line with the majority choice or not. In other words we can reject the hypothesis that it never matters which method that is used. It follows that the usefulness of each is *contingent on company characteristics*. On average, the firms following the prediction model have a 3.2% more positive announcement effect.

⁶³ See for example MacKinlay (1997).

8.2 CONCLUSION

The purpose of our study was to determine why both special dividends and over the market share repurchases are in use on the Swedish market today. We let the explanation of why both methods are in use be contingent on their usefulness and define usefulness as announcement effects on the company share price. After analyzing the results of our empirical study, we conclude that:

The usefulness of either method is contingent on company characteristics. For some companies, special dividends is the preferred method, others are better off using repurchases.

8.3 DISCUSSION

In this section we will discuss and criticise our model, and our results. We will also stipulate any alternative explanation models. A specific section will discuss the validity and reliability of our conclusion.

8.3.1 Our first linear regression

Our first linear regression tested the hypothesis that one redistribution method was always superior to the other, that the reason both methods are in use is that the management of some companies use the wrong model. The relevant test statistic was the coefficient of our dummy variable. It turned out not significantly different from zero, and the hypothesis was rejected. We later tested whether this coefficient was significantly 0, which would support our hypothesis that the two methods are substitutes. This turned out to be supported by the test, significantly zero at a 5% level.

The explanation value of this regression, measured as R^2 , turned out to be very low, however. This means that the depending variable, CAR, is to a large extent depending on other factors, factors that we have not included in our regression. This is probably an effect of the date when the share repurchases and special dividends are announced, the same day as the year end report. This report contains a lot of new information, which should lead to market reactions. We have tried to capture the reaction to earnings announcements, using

our variable for earnings surprise, but the report also contains information about future profits and growth, information that is difficult to formalise into a variable.

8.3.2 Our logistic regression

Our next test was run through a logistic regression. The purpose of this test was to use a number of proxy variables in order to determine a prediction model, which in turn would give us a new testable dummy variable.⁶⁴

8.3.2.1 Our choice of proxy variables

When choosing which variables to include in our logistic regression, we have only considered variables that are connected to our theories. This was not a requirement for testing the hypothesis that the usefulness of either method is contingent on company characteristics. An alternative method would have been to test all kinds of accounting and financial variables, regardless of whether there is a theory supporting their connection to the choice of redistribution method. We chose to only include proxy variables for our theories for two reasons: We wanted a simple rule limiting which data to include and at the same time we wanted to provide the reader with a theoretical background as to why the prediction model and our second dummy variable turn out the way they do.

At the same time, all of the theories have not been assigned a proxy variable. There are two cases where we have chosen not to calculate and include a proxy variable: The first case was when a theory explains the choice of redistribution method as dependant on something other than shareholder value – this is not consistent with our definition of usefulness. We have also omitted a testable variable for those theories where it has simply been impossible for us to find and calculate a relevant proxy variable. An example of this is our theories based on behavioural finance, might very well be relevant, explaining both the choice of redistribution method and the difference in announcement effects, but it is impossible to assign it a testable variable.

The way we have chosen our testable variables may affect the reliability of our prediction model, the definition of our dummy, and thus our conclusion.

⁶⁴ Dummy variable E, described above.

8.3.2.2 Our prediction model

Our prediction model was based on the most significant variables from our first run of the logistic regression; market/book, debt/equity and percentage of votes held by the three main shareholders. An alternative approach would have been to include all of our variables, regardless of their significance, or to only include the last one, as it was the only one significant at a 5% level. We chose these three variables because we perceived quite a big gap between the significance level of debt/equity, 16.6% and the next variable, tax preference, 38.6%.

To make our results more reliable, we included a linear regression with a dummy based on all proxy variables as an explaining variable. We did not base our conclusion on this regression, but the results were basically the same as that of our dummy.

8.3.3 Our second linear regression

A part from the choice and definition of the variables entering this regression, its low explanation value is still a problem. The explanation value, measured as R^2 , though twice as high as in our first linear regression, is still quite low. A probable explanation for this is, as before, the fact that many other kinds of information are released at the same time as our announcements.

8.3.4 Critique of our conclusion

This section discusses and criticises the conclusion of our thesis. A particular focus will be on the three concepts *internal* and *external validity* and *reliability*.⁶⁵

The most important aspect of **internal validity** is whether our model measures what it is supposed to measure. Here, an essential issue is our definition of usefulness. By defining usefulness as announcement effects, we exclude any long term effects, when those deviate from short term effects. We also exclude any scenario where management would choose method using with any other objective than the enhancement of shareholder value. We find some support for our focus on announcement effects in the efficient market hypothesis, but even so we do not take scenarios where management does not act in the interest of shareholders into consideration.

⁶⁵ Carmines & Zeller, (1979).

Our third hypothesis focuses on **company** characteristics. Perhaps some other factors, say environmental factors, have an impact on the usefulness of the redistribution method. We have not found any theory supporting this, and thus only based our testable variables on company information.

External validity focuses on whether the results of our study can be generalised – whether it will be valid in a wider setting. Since our study has been made on Swedish data in a Swedish setting, our results are not applicable to other countries or geographical regions. This has not been the case with previous studies on the topic of announcement effects of capital redistributions either - Appendix A shows how the results have differed between different geographical settings.

This study is based on observations from a period of strong course movements. This has two impacts on our results. First, the estimation windows are only 180 days per observation. It follows that one observation might have its entire estimation window in a bullish market, while another has its in a bearish market. The normal return formula, used to calculate our CAR, clears for idiosyncratic risk, but these market characteristics might still have had an impact. Also, the market characteristics influence the **external validity** of our study. Our results can not necessarily be generalised in future research or predictions. What has been true during this turbulent period will not necessarily be true in the future.

Finally, the concept of **reliability** focuses on whether a study can be replicated in the same setting and yield the same result. Since our results are significant, we believe this is the case. Still, as mentioned in previous sections, our low R^2 values may pose a problem.

8.4 SUGGESTIONS FOR FUTURE RESEARCH

Share repurchases are still a fairly recent phenomenon in Sweden which means that there are several interesting aspects left to investigate. Another consequence of this is that each new study will benefit from a larger sample size. An updated version of our study, if made a couple of years from now, would therefore be more robust.

We have in our thesis approximated usefulness as short-term announcement effects. It would be interesting to see whether our results hold when long-term effects are taken into account. Perhaps a similar study could be made using one-year or even five-year returns.

When running our logistic regression we found a strong correlation between our variable measuring owner concentration and the choice of redistribution method. This could be interesting to investigate further. The political aspects of repurchases in companies with a strong owner concentration could be more thoroughly examined, for example through a qualitative study.

It would also be interesting to test the two theories related to owner concentration that we have stipulated – moral hazard and liquidity. Do they determine the choice of redistribution method? Or is there another connection between this choice and owner concentration?

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SEB, Annual Report 2001
JM, Annual Report 2001

10. APPENDICES

APPENDIX A

Prior empirical results on abnormal returns from announcing open-market repurchase programs (OMR)

Country	Study	Abnormal Returns	Dataset
U.S.	McNally (1999)	CAR [-1;+1]: 2.3%	451, 1985-1988
	Vermaelen (1981)	CAR [-1;+1]: 3.7%	243, 1970-1978
	Stephens/Weisbach (1998)	CAR [-1;+2]: 2.7%	591, 1981-1990
	Ikenberry et al (1995)	CAR [-2;+2]: 3.5%	1239, 1980-1990
	Comment/Jarrell (1991)	CAR [-1;+1]: 2.3%	1157, 1985-1988
Canada	Li/McNally (1999)	CAR [-2;+2]: 3.6%	183, 1989-1992
	Ikenberry et al (2000)	CAR [-15;+15]: 0.9%	1060, 1989-1997
Germany	Schremper (2002)	CAR [-1;+1]: 4.1%	112, 1998-2000
	Gerke et al (2002)	CAR [-1;+1]: 6.1%	156, 1998-2000
U.K.	Raghavendra et al (2002)	CAR [-5;+5]: 1.1%	264, 1985-1998
	Oswald/Young (2002)	CAR [-1;+1]: 1.4%	266, 1995-2000
	Lasfer (2000)	CAR [-2;+2]: 1.6%	465, 1985-1998
France	Ginglinger/L'Her (2002)	CAR [-1;+1]: 0.7%	363, 1998-1999
Brazil	Moreira/Procianoy (2001)	CAR [-1;+1]: 0.03%	110, 1997-1998
Japan	Zhang (2000)	CAR [-1;+2]: 6.0%	39, 1995-1999
Australia	Lamba/Ramsay (2000)	CAR [-1;+1]: 3.3%	103, 1989-1998
	Otchere/Ross (2000)	CAR [-1;+1]: 4.3%	132, 1991-1999
Korea	Jung (2003)	CAR [0;+5]: 2.8%	382, 1994-1998

Prior studies according to Hackethal & Zdantchouk.

APPENDIX B

Multiple linear regression

The multiple linear regression is an extension of the ordinary least square linear regression.

Its general model is:

$$y_t = \alpha + \beta x_{t2} + \dots + \gamma x_{tk} + \varepsilon_t$$

where y_t is related to a number of explanatory variables, $x_{t2}, x_{t3}, \dots, x_{tk}$.

An example from our thesis would be:

$$\text{CAR} = \alpha + \beta D + \gamma (\text{earnings surprise}) / \text{booked assets}.$$

The coefficients; α , β , γ , etc. are estimated deriving the function and solving the following set of equations:

$$\begin{bmatrix} \sum_{i=1}^n x_i^2 & \sum_{i=1}^n x_i y_i & \sum_{i=1}^n x_i \\ \sum_{i=1}^n x_i y_i & \sum_{i=1}^n y_i^2 & \sum_{i=1}^n y_i \\ \sum_{i=1}^n x_i & \sum_{i=1}^n y_i & n \end{bmatrix} \begin{bmatrix} \hat{\alpha} \\ \hat{\beta} \\ \hat{\gamma} \end{bmatrix} = \begin{bmatrix} \sum_{i=1}^n x_i z_i \\ \sum_{i=1}^n y_i z_i \\ \sum_{i=1}^n z_i \end{bmatrix}$$

These coefficients can later be statistically tested, for example in order to determine whether they are significantly not zero.

The assumptions of the multiple linear regression model are:

$$\text{MR1: } y_t = \alpha + \beta x_{t2} + \dots + \gamma x_{tk} + \varepsilon_t$$

$$\text{MR2: } E(y_t) = y_t = \alpha + \beta x_{t2} + \dots + \gamma x_{tk} \leftrightarrow E(\varepsilon_t) = 0$$

$$\text{MR3: } \text{var}(y_t) = \text{var}(\varepsilon_t) = \sigma^2$$

$$\text{MR4: } \text{cov}(y_t, y_s) = \text{cov}(\varepsilon_t, \varepsilon_s) = 0$$

MR5: The values of x_{tk} are not random and are not exact linear functions of the other explanatory variables.

$$\text{MR6: } y_t \sim N[(\alpha + \beta x_{t2} + \dots + \gamma x_{tk}), \sigma^2] \leftrightarrow \varepsilon_t \sim N(0, \sigma^2)$$

Cf Hill, Griffiths & Judge and www.wikipedia.org 2006-12-06.

APPENDIX C

Logistic regression

The logistic regression is a generalized linear model using logit as its link function.

It takes the form:

$$\text{logit}(p_i) = \ln \left(\frac{p_i}{1 - p_i} \right) = \alpha + \beta_1 x_{1,i} + \cdots + \beta_k x_{k,i},$$

Where $p_i = \Pr(Y_i = 1)$.

The logarithm of the odds (probability divided by 1-probability) of the outcome is determined by a linear function of the explanatory variables, x_i .

$$p_i = \Pr(Y_i = 1|X) = \frac{e^{\alpha + \beta_1 x_{1,i} + \cdots + \beta_k x_{k,i}}}{1 + e^{\alpha + \beta_1 x_{1,i} + \cdots + \beta_k x_{k,i}}}.$$

The coefficients, $\beta_1 \dots \beta_k$, are determined through iterations, finding the best explanation to the set of y given by the set of x .

Our prediction model is based on the set of coefficients that gave the best explanation to the set of y . Our cut-off value is 0.5. If the probability of a share repurchase is above 0.5, our model will class the expected choice as a share repurchase.

Cf Gujarati (2003) and www.wikipedia.org 2006-12-06.

APPENDIX D

Definitions used in Appendix D

Announcement: day of share repurchase or special dividend announcement.

Assets: total book assets in SEKm.

Equity: total book equity in SEKm.

Earnings surprise: (actual earnings-consensus estimate)/total assets.

Market/book: market capitalisation divided by book equity value.

Return: share price changes from 180 trading days before announcement day until announcement.

Owner concentration: the three largest shareholders total stake in terms of votes.

Tax preference: the companies tax preference according to the largest shareholders preferences.

SR = share repurchases and IND = indifferent.

SR/SD: announcement, SR = share repurchase and SD = special dividend.

P/A 1: the company's preference of share repurchases and special dividend according to our theories compared to their actual choice. 1 actual = preference, 0 actual \neq preference. In this test we have used all theories as explanation variables.

P/A 2: the same as P/A 2 but we have only used theories with a significant value as explanation variables.

Company	Industry	Announcement	Assets	Equity	Earnings surprise	Equity/Assets
Ericsson	Telecommunication	28-jan-00	202628	71150	0,004	0,351
Castellum	Finance & Real Estate	31-jan-00	10514	3969	0,0004	0,377
Holmen	Commodities	31-jan-00	29172	15883	-0,0019	0,544
NCC	Industrial	09-feb-00	29030	9795	0,0041	0,337
Swedish Match	Retail Products	09-feb-00	16670	3700	-0,0278	0,222
NCC	Industrial	09-feb-00	29030	9795	0,0041	0,337
SSAB	Commodities	10-feb-00	17126	10500	-0,0002	0,613
Trelleborg	Industrial	14-feb-00	13893	9213	-0,0048	0,663
Volvo	Industrial	14-feb-00	195612	97692	0,0002	0,499
Seco Tools	Industrial	16-feb-00	3328	1875	0,0063	0,563
Handelsbanken	Finance & Real Estate	22-feb-00	922799	38570	0,0004	0,042
Skanska	Industrial	24-feb-00	51338	16391	0,0004	0,319
Skanska	Industrial	24-feb-00	51338	16391	0,0004	0,319
Volvo	Industrial	01-feb-01	2000743	88834	0,0001	0,044
Holmen	Commodities	05-feb-01	24394	17014	-0,0077	0,697
Holmen	Commodities	05-feb-01	24394	17014	-0,0077	0,697
Trelleborg	Industrial	06-feb-01	17132	8552	-0,0059	0,499
Swedish Match	Retail Products	08-feb-01	16281	3700	-0,0021	0,227
NCC	Industrial	12-feb-01	36693	9922	-0,0062	0,270
Seco Tools	Industrial	14-feb-01	3852	2006	-0,0179	0,521
Sandvik	Industrial	16-feb-01	43908	23019	0	0,524
Telia	Telecommunication	19-feb-01	91494	54466	0,0175	0,595
Handelsbanken	Finance & Real Estate	20-feb-01	1020353	42466	0,0004	0,042
JM	Finance & Real Estate	20-feb-01	12097	3770	0,0021	0,312
Skanska	Industrial	21-feb-01	83303	18937	-0,0039	0,227
Holmen	Commodities	31-jan-02	24948	14072	0,0024	0,564
Trelleborg	Industrial	05-feb-02	17722	7690	0,0003	0,434
Electrolux	Retail Products	08-feb-02	94447	28864	0,0017	0,306
Volvo	Industrial	08-feb-02	260925	85185	0,0019	0,326
Telia	Telecommunication	08-feb-02	82796	52642	-0,0046	0,636
Handelsbanken	Finance & Real Estate	12-feb-02	1174521	48112	0	0,041
NCC	Industrial	12-feb-02	39312	7597	-0,0038	0,193
Swedish Match	Retail Products	12-feb-02	16623	3800	0,0005	0,229
Sandvik	Industrial	14-feb-02	49549	23972	0,0032	0,484
Skanska	Industrial	14-feb-02	93084	17871	0,0002	0,192
ÅF	Services	14-feb-02	1276	528	0,0024	0,414
Nordea	Finance & Real Estate	21-feb-02	2215490	99819	0	0,045
SEB	Finance & Real Estate	21-feb-02	1163315	44292	0,0002	0,038
JM	Finance & Real Estate	26-feb-02	12888	3823	-0,0013	0,297
Autoliv Inc	Industrial	23-jan-03	4295	2047	0,0027	0,477
Billerud	Commodities	28-jan-03	6873	3233	-0,0015	0,470
H&M	Retail Products	29-jan-03	25013	19088	0,0237	0,763
Holmen	Commodities	05-feb-03	26773	15073	0	0,563
Trelleborg	Industrial	05-feb-03	14856	7284	-0,0011	0,490
Volvo	Industrial	07-feb-03	231611	78278	0,0001	0,338
Cardo	Industrial	10-feb-03	6111	3875	-0,0137	0,634
NCC	Industrial	11-feb-03	35215	6188	-0,0005	0,176
Sandvik	Industrial	11-feb-03	49069	23205	0,0021	0,473

Company	Industry	Announcement	Assets	Equity	Earnings surprise	Equity/Assets
Swedish Match	Retail Products	11-feb-03	15241	4007	-0,0011	0,263
Electrolux	Retail Products	12-feb-03	82433	27629	0,0009	0,335
Hufvudstaden	Finance & Real Estate	13-feb-03	10952	4791	0	0,437
JM	Finance & Real Estate	13-feb-03	10628	3570	-0,0209	0,336
Handelsbanken	Finance & Real Estate	18-feb-03	1277514	52192	0,0002	0,041
Nordea	Finance & Real Estate	19-feb-03	2276281	110567	0	0,049
AstraZeneca	Drugs & Medical	29-jan-04	104868	51658	-0,0032	0,493
H&M	Retail Products	29-jan-04	25675	20097	-0,0014	0,783
Holmen	Commodities	03-feb-04	26063	15254	0	0,585
Holmen	Commodities	03-feb-04	26063	15254	0	0,585
TietoEnator	Telecommunication	05-feb-04	794	479	0,0067	0,603
Sandvik	Industrial	11-feb-04	46949	21440	-0,0014	0,457
Swedish Match	Retail Products	11-feb-04	14857	4010	0,0025	0,270
Telia	Telecommunication	11-feb-04	175100	121656	-0,003	0,695
Electrolux	Retail Products	12-feb-04	75114	27462	-0,0005	0,366
Swedbank	Finance & Real Estate	12-feb-04	957240	41919	0,0002	0,044
Hufvudstaden	Finance & Real Estate	12-feb-04	10932	4792	-0,0004	0,438
SEB	Finance & Real Estate	13-feb-04	1277903	48464	0,0001	0,038
Eniro	Services	17-feb-04	6975	4693	-0,0178	0,673
Handelsbanken	Finance & Real Estate	17-feb-04	1260454	56835	0,0001	0,045
Nordea	Finance & Real Estate	18-feb-04	2375836	113133	0	0,048
Volvo	Industrial	14-mar-04	224424	72420	0,0001	0,323
AstraZeneca	Drugs & Medical	27-jan-05	106105	52582	0,002	0,496
Axfood	Retail Products	27-jan-05	7008	2513	0,0191	0,359
Holmen	Commodities	05-feb-05	26263	13737	-0,0033	0,523
NCC	Industrial	08-feb-05	26131	6728	-0,0054	0,257
NCC	Industrial	08-feb-05	26131	6728	-0,0054	0,257
SEB	Finance & Real Estate	09-feb-05	1590064	51008	0,0002	0,032
Seco Tools	Industrial	09-feb-05	3633	1982	0,0124	0,546
Volvo	Industrial	10-feb-05	217884	69409	0,002	0,319
Swedbank	Finance & Real Estate	11-feb-05	1002101	43624	0,0003	0,044
Hufvudstaden	Finance & Real Estate	11-feb-05	10479	5209	0,0296	0,497
Swedish Match	Retail Products	11-feb-05	14224	4358	-0,0011	0,306
TeliaSonera	Telecommunication	11-feb-05	180880	121656	-0,001	0,673
Hufvudstaden	Finance & Real Estate	11-feb-05	10479	5209	-0,0056	0,497
Electrolux	Retail Products	15-feb-05	71995	23410	0,0043	0,325
Eniro	Services	17-feb-05	6920	3543	0,0103	0,512
Handelsbanken	Finance & Real Estate	22-feb-05	1349090	61109	0,0001	0,045
Nordea	Finance & Real Estate	23-feb-05	2484968	121504	0	0,049
OMX	Finance & Real Estate	01-feb-06	10375	4735	0,0027	0,456
Holmen	Commodities	02-feb-06	31862	16079	0,0023	0,505
Axfood	Retail Products	02-feb-06	7531	2825	-0,0033	0,375
Volvo	Industrial	03-feb-06	251803	78508	-0,004	0,312
NCC	Industrial	08-feb-06	26779	6900	0,0013	0,258
Seco Tools	Industrial	08-feb-06	4155	2207	0,0121	0,531
Telia	Telecommunication	10-feb-06	191470	127049	-0,0025	0,664
AstraZeneca	Drugs & Medical	14-feb-06	110454	55394	0,0011	0,502
Electrolux	Retail Products	14-feb-06	79608	25887	0,0078	0,325
AstraZeneca	Drugs & Medical	14-feb-06	110454	55300	0,0011	0,501
Swedish Match	Retail Products	15-feb-06	16354	5080	0,0057	0,311
Skanska	Industrial	16-feb-06	69029	18454	0,002	0,267
Handelsbanken	Finance & Real Estate	21-feb-06	1580536	65651	0,0001	0,042

Company	Announcement	Market/book	Return	Owners C.	Tax pref.	SR / SD	P/A 1	P/A 2
Ericsson	28-jan-00	2,87	180%	35,82	SR	SR	1	1
Castellum	31-jan-00	1,12	-7%	13	IND	SR	1	1
Holmen	31-jan-00	1,55	36%	77,1	SR	SR	0	0
NCC	09-feb-00	0,84	1%	80,9	SR	SR	1	1
Swedish Match	09-feb-00	3,34	11%	14,2	IND	SR	1	1
NCC	09-feb-00	0,84	1%	80,9	SR	SD	0	0
SSAB	10-feb-00	0,43	19%	32,9	SR	SR	1	1
Trelleborg	14-feb-00	0,62	-15%	61,56	IND	SR	1	1
Volvo	14-feb-00	0,89	-8%	30,1	IND	SR	1	1
Seco Tools	16-feb-00	0,69	13%	93,3	IND	SD	1	1
Handelsbanken	22-feb-00	1,86	-4%	25,7	SR	SR	1	1
Skanska	24-feb-00	0,54	0%	34	SR	SR	1	1
Skanska	24-feb-00	0,54	0%	34	SR	SD	0	0
Volvo	01-feb-01	0,82	-13%	30,1	IND	SR	1	1
Holmen	05-feb-01	1,38	33%	77,1	SR	SR	1	0
Holmen	05-feb-01	1,32	33%	77,1	SR	SD	0	1
Trelleborg	06-feb-01	0,72	20%	61,56	IND	SR	1	1
Swedish Match	08-feb-01	4,14	40%	14,2	IND	SR	1	1
NCC	12-feb-01	0,69	0%	80,9	SR	SR	1	1
Seco Tools	14-feb-01	0,65	4%	93,3	IND	SD	1	1
Sandvik	16-feb-01	0,53	17%	28	SR	SR	1	1
Telia	19-feb-01	2,13	11%	59,1	IND	SD	0	0
Handelsbanken	20-feb-01	2,61	27%	25,7	SR	SR	1	1
JM	20-feb-01	1,09	6%	21,25	IND	SR	1	1
Skanska	21-feb-01	2,27	26%	34	SR	SR	1	1
Holmen	31-jan-02	1,43	24%	77,1	SR	SR	1	0
Trelleborg	05-feb-02	0,97	23%	61,56	IND	SR	1	1
Electrolux	08-feb-02	0,81	4%	37,68	SR	SR	1	1
Volvo	08-feb-02	0,77	-6%	30,1	IND	SR	1	1
Telia	08-feb-02	2,35	-37%	59,1	IND	SD	1	0
Handelsbanken	12-feb-02	2,24	-2%	25,7	SR	SR	1	1
NCC	12-feb-02	0,78	-5%	80,9	SR	SR	1	1
Swedish Match	12-feb-02	5,71	34%	14,2	IND	SR	1	1
Sandvik	14-feb-02	0,50	3%	28	SR	SR	1	1
Skanska	14-feb-02	1,56	-31%	34	SR	SR	1	1
ÅF	14-feb-02	0,74	4%	54,39	IND	SD	0	0
Nordea	21-feb-02	1,50	-17%	27	IND	SR	1	1
SEB	21-feb-02	1,40	-14%	32	SR	SR	1	1
JM	26-feb-02	0,85	-19%	21,25	IND	SR	1	1
Autoliv Inc	23-jan-03	8,52	-25%	23	SR	SR	1	1
Billerud	28-jan-03	1,73	5%	28,2	SR	SR	1	1
H&M	29-jan-03	6,85	-24%	72,9	SR	SD	1	1
Holmen	05-feb-03	1,09	-19%	77,1	SR	SR	1	0
Trelleborg	05-feb-03	0,80	-34%	61,56	IND	SR	1	1
Volvo	07-feb-03	0,77	-27%	30,1	IND	SR	1	1
Cardo	10-feb-03	1,53	-11%	49,3	SR	SD	0	0
NCC	11-feb-03	0,69	-33%	80,9	SR	SR	1	1
Sandvik	11-feb-03	0,38	-27%	28	SR	SR	1	1
Swedish Match	11-feb-03	5,17	-24%	14,2	IND	SR	1	1

Company	Announcement	Market/book	Return	Owners C.	Tax pref.	SR / SD	P/A 1	P/A 2
Electrolux	12-feb-03	0,91	-22%	37,68	SR	SR	1	1
Hufvudstaden	13-feb-03	1,17	-17%	90,9	SR	SR	0	0
JM	13-feb-03	0,42	-54%	21,25	IND	SR	1	1
Handelsbanken	18-feb-03	1,59	-26%	25,7	SR	SR	1	1
Nordea	19-feb-03	1,02	-30%	27	IND	SR	1	1
AstraZeneca	29-jan-04	11,88	22%	20,48	SR	SR	1	1
H&M	29-jan-04	7,00	-2%	72,9	SR	SD	1	1
Holmen	03-feb-04	1,30	23%	77,1	SR	SR	0	1
Holmen	03-feb-04	1,30	23%	77,1	SR	SD	1	1
TietoEnator	05-feb-04	37,46	77%	5,9	SR	SD	1	1
Sandvik	11-feb-04	0,58	17%	28	SR	SR	1	1
Swedish Match	11-feb-04	6,10	20%	14,2	IND	SR	1	1
Telia	11-feb-04	1,36	24%	59,1	IND	SD	0	0
Electrolux	12-feb-04	1,09	14%	37,68	SR	SR	1	1
Swedbank	12-feb-04	2,72	27%	32,7	IND	SR	1	1
Hufvudstaden	12-feb-04	1,60	33%	90,9	SR	SR	0	0
SEB	13-feb-04	1,55	30%	32	SR	SR	1	1
Eniro	17-feb-04	2,81	19%	19,9	SR	SR	1	1
Handelsbanken	17-feb-04	1,73	6%	25,7	SR	SR	1	1
Nordea	18-feb-04	1,31	35%	27	IND	SR	1	1
Volvo	14-mar-04	1,36	47%	30,1	IND	SR	1	1
AstraZeneca	27-jan-05	7,81	-33%	20,48	SR	SR	1	1
Axfood	27-jan-05	4,73	28%	50,5	SR	SD	0	0
Holmen	05-feb-05	1,32	5%	77,1	SR	SR	1	0
NCC	08-feb-05	1,56	88%	80,9	SR	SR	1	1
NCC	08-feb-05	1,56	88%	80,9	SR	SD	0	0
SEB	09-feb-05	1,70	14%	32	SR	SR	1	1
Seco Tools	09-feb-05	0,97	7%	93,3	IND	SD	1	1
Volvo	10-feb-05	1,91	24%	30,1	IND	SR	1	1
Swedbank	11-feb-05	1,93	15%	32,7	IND	SR	1	1
Hufvudstaden	11-feb-05	1,99	47%	90,9	SR	SR	0	0
Swedish Match	11-feb-05	6,28	8%	14,2	IND	SR	1	1
TeliaSonera	11-feb-05	1,56	33%	59,1	IND	SR	1	1
Hufvudstaden	11-feb-05	1,99	47%	90,9	SR	SD	1	1
Electrolux	15-feb-05	1,15	-5%	37,68	SR	SR	1	1
Eniro	17-feb-05	3,63	14%	19,9	SR	SR	1	1
Handelsbanken	22-feb-05	1,94	21%	25,7	SR	SR	1	1
Nordea	23-feb-05	1,51	29%	27	IND	SR	1	1
OMX	01-feb-06	2,97	38%	24,5	SR	SD	0	0
Holmen	02-feb-06	1,54	42%	77,1	SR	SR	0	0
Axfood	02-feb-06	4,11	14%	50,5	SR	SD	0	0
Volvo	03-feb-06	2,05	25%	30,1	IND	SR	1	1
NCC	08-feb-06	2,55	59%	80,9	SR	SD	1	1
Seco Tools	08-feb-06	5,40	24%	93,3	IND	SD	1	1
Telia	10-feb-06	1,59	16%	59,1	IND	SD	0	0
AstraZeneca	14-feb-06	10,04	12%	20,48	SR	SR	1	1
Electrolux	14-feb-06	1,45	43%	37,68	SR	SR	1	1
AstraZeneca	14-feb-06	10,05	12%	20,48	SR	SD	0	0
Swedish Match	15-feb-06	5,86	16%	14,2	IND	SR	1	1
Skanska	16-feb-06	2,88	45%	34	SR	SD	0	0
Handelsbanken	21-feb-06	1,90	20%	25,7	SR	SR	1	1