

EMPLOYEE STOCK OPTIONS AND SHARE REPURCHASES

AN EMPIRICAL STUDY OF THE SWEDISH MARKET

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**KTH Industrial Engineering
and Management**

Master of Science Thesis
Stockholm, Sweden 2010

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Master of Science Thesis INDEK 2010:132
KTH Industrial Engineering and Management
Industrial Management
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Abstract

During the last two decades, the employee stock option plans (ESOPs) have become more important in the global remuneration policies for first level executives. As a consequence of this, the repurchase activity has been increased to face the exercise of those options.

This text is committed to give the reader a general overview of the ESOPs and share repurchases (SR), as well as analyse the current situation in some of the biggest companies in Sweden. To do this, the following report is divided in two main parts; first it will be introduced “why” and “when” ESOPs are profitable for the company and which facts could influence a company to start a buyback of own shares. The second part will introduce the data collected from the annual reports of the Swedish companies and will analyse if the fact of having an ESOP implemented influences the choice on the benefits distribution method.

Considering the tightly relation between share repurchases and dividends distributions, this text includes a small summary of the impact of the ESOPs in the dividends policies. For that reason, the database also includes data regarding to the share yields and profit distribution.

After having analysed all the data collected, the results point to a non-influence of the Employee Stock Option Plans on the benefits distribution method. Thus, a significant difference between the fraction of total number of shares repurchased and the dividend yield in companies with and those without outstanding stock options among their managerial group cannot be confirmed.

Although having found a non-significant difference on the dividend treatment between companies with and without stock options, a weak negative relation between the magnitude of the ESOP and the dividend yield was found for those companies with stock options among their managerial group.

Moreover, after having divided the sample depending on the type of stock options their managerial group held, the results show a slight difference between those companies with outstanding warrants and employee options; and those without stock options. Despite this fact, it is not possible to assert a real influence of these facts due to a not enough number of observations gathered for the sample.



OUTLINE

1. Purpose	6
2. Employee stock option plans	7
2.1 Introduction	7
2.2 Employee stock option plans	8
2.3 Stock options versus other financial products.....	10
2.4 Employee stock option plan’s advantages	11
2.4.1 Motivation of employees	12
2.4.2 Attract and retain personnel.....	12
2.4.3 Capital and liquidity related reasons.....	13
2.5 Historical data	13
2.6 Share source of the employee stock option plans.....	14
2.6.1 Outstanding shares	15
2.6.2 Newly issued shares	15
2.6.3 Cash payments associated to share performance.	16
2.7 Legal issues and taxation.....	17
2.7.1 Swedish legislation and taxation.....	17
2.7.2 USA legislation and taxation	18
2.8 Other share related incentive plans.....	19
2.8.1 Matching share-based plan.....	19
2.8.2 Performance share-based plan	20
2.9 Other variables affecting the employee stock option plans	20
3. Share repurchases.....	22
3.1 Introduction to share repurchases.....	22
3.2 Share repurchase methods	23
3.2.1 Fixed price tender offer.....	23
3.2.2 Dutch auction tender offer	23
3.2.3 Private or targeted share repurchases.....	24
3.2.4 Open market share repurchase.....	24
3.2.5 Synthetic repurchases	25
3.3 Evolution of the share repurchase	25
3.4 Legal Issues.....	26
3.5 Effects on share price	27



3.6	Dividend distribution versus repurchases.....	28
4.	Literature conclusions and hypotheses.....	30
4.1	Share repurchases impact.....	30
4.2	Dividend impact	31
5.	Sample study and analysis	32
5.1	Sample characteristics.....	32
5.2	Methodology.....	33
5.2.1	Student's t-test.....	33
5.2.2	Regression analysis.....	34
5.3	Sample analysis	34
5.3.1	Share repurchase impact	35
5.3.2	Dividend impact	39
5.3.3	Share repurchase and dividend police impact for different schemes	42
6.	Conclusions	48
7.	References.....	50
7.1	In print references.....	50
7.2	Internet references	52
8.	Attachments.....	54
8.1	Attachment N1: data sample collected.....	54
8.2	Attachment N2: data obtained from the sample.....	55
8.3	Attachment N3: share repurchases, evolution (2001-2009).....	56
8.4	Attachment N4: ESOP magnitude and ratio repurchases	59
8.5	Attachment N5: ESOP magnitude and dividend yield.....	60



1. PURPOSE

The aim of this project is to evaluate the current situation of the employee stock option plans in Swedish companies and analyze the impact on share repurchases and dividend policies. This report will also try to establish if there is any influence from the managers/employees rewarded with ESOPs on the decision to repurchase shares.

Hence, the research quest can be stated as “Is there any difference on the level of repurchases and dividend distributions between companies with and without employee stock options among their managerial group?”. From this question and in order to find the thesis statement, the next hypotheses are established:

- H₁ – The number of repurchases is bigger for those companies with outstanding employee stock option plans.
- H₂ – The expected value of the employee stock options have a positive impact on the number of shares repurchased.
- H₃ – The number of shares repurchased and the amount dividend distributed is different between companies with and without stock options among their managers depending on the type of stock option held by managers.
- H₄ – The dividend distributed is smaller for those companies with outstanding employee stock option plans.
- H₅ – The expected value of the employee stock options have a negative impact on the total amount of dividend distributed.

In order to analyse those hypothesis, one project phase will be focused on a database development with information from the annual reports provided by Swedish companies between the years 2006 and 2010. The data collected will be divided in two different samples; one will contain those observations with managers holding employee stock options and the other with managers without stock options.

Those two samples will be analysed through different statistical tests. To compare them, different t-tests will be run; and different regression models will be made to analyse the impact of the expected value of the stock options over the number of shares repurchased and the amount of dividend distributed.



2. EMPLOYEE STOCK OPTION PLANS

2.1 Introduction

One of the main things company owners are most worried about is how to attract, motivate, stimulate and retain key talented employees, with special emphasis on key managers. In accordance with the agency problem, owners or shareholders, in most of the cases are not able to manage their business directly and have to grant almost all decisions to an executive group [1].

Ideally, managers should always act in accordance with the owner's interests; nevertheless it's not always as simple because the executives have their own motivation: remuneration, status, authority, good pension plans, etc. This is the reason why owners would be interested to find a way to align executive interests with their own interest, through positive and negative incentives in accordance with the established targets.

Apart from how to align the executive targets with those of the shareholders, there is another problem, how can the managerial group be rewarded in a fair way. Additionally, how to distinguish individual contribution from the collective contribution on the company's results. There are ways to measure how successful a project is, but it is not so easy to establish what each individual has contributed with.

Anyway, remuneration should be a reason to motivate employees to focus basically on their tasks and targets. Supposing that the reward is enough to attract a professional, the importance of his objectives will be determined by the remuneration structure. Then, as bigger the proportion of reward for a target is, more effort and time will be dedicated to accomplish the task. That is why the variable part will play an important role to motivate all the employees and drive efforts in the right direction.

Even though managerial remuneration is difficult to establish in a fair way for everyone, rewarding employees through stock option plans seems to be a good solution to align the managerial targets with the ownership's ones.

In fact, ESOPs are becoming more and more integrated on executive and non-executive remuneration plans in the last years. Especially in relative young companies with a high-growth potential where this kind of ESOP scheme are considered important to attract and retain best-in-class professionals. This is because ESOPs are a good method to reward in a generic way the



company growth without spending a big amount of cash before having good results. It is important to know that with these financial products, companies do not have to pay the employee or spend money repurchasing shares if the share price falls [2].

2.2 Employee stock option plans

An Employee Stock Option Plan (ESOP) is an extended method to remunerate all or some executives and employees in accordance with the correct evolution of the company where they work. With this method the company offers or gives employees the option to buy a specific number of shares of the company between future dates with a fixed price (exercise price).

These stock options can be configured in different ways depending on the target of the remuneration. Some variables to take care about are:

- a. **Scope:** stock options can be granted to some or all the executive members and employees depending on the aim of the plan. When stock options are granted to non-managerial employees, these plans will be less important than the fixed pay.
- b. **Conditions:** options exercise can be linked to different parameters, like target accomplishments or continuity on the company. Moreover, some ESOP schemes promote employees to maintain the shares a time period.
- c. **Terms:** every ESOP has a different term or duration. The companies could adjust the duration of their employee remuneration plans in accordance with the aim of the plan. Generally in the USA Employee Stock Option Plans have a term of up to ten years while in Sweden almost all the plans have a term between three and five years.
- d. **Strike price**¹: different prices can be chosen, while in the USA is common to use the price of the underlying asset in the moment the option is issued (at-the-money²)[7], in Sweden companies tend to issue options out of the money³. It is common to see options granted with an average price of 110% or 120% the share price.

¹ Strike price: fixed price at which the owner has the right to buy the underlying asset. Also known as exercise price.

² At-the-Money: a stock option will be “at-the-money” when the price of the underlying asset is the same than the strike o exercise price.

³ Out of the money: a stock option will be “out of the money” when the price of the underlying asset is below the strike o exercise price.



- e. **Quantity:** this type of contracts has a non-standardized allotment of underlying shares, it depends on the employee, the role he has on the company or the total remuneration.
- f. **Exercise mode** or when the option can be exercised. Some can be exercised only at the maturity date, others can be exercised during a period of time or in a staggered way.
- g. **First day of exercise:** for those that can be exercised during a period of time, it is the first day that the option can be exercised. Usually on ESOPs, this date is some years after the option is granted or issued. It is also known as vesting date. In some circumstances, different taxations are applied depending on the day of execution.
- h. **Delivery:** options exercise can be exchanged for company shares or cash, in the last case, the employee receives the difference between the strike price and the price of the underlying asset on that date. This method is also known in some publishing as “cashless exercise programs” [3].
- i. **Right of first refusal:** in order to maintain the proportional number of shares in shareholders hands, some ESOPs include a clause that gives the company the right to buy back the shares in first place if the employee would like to sell their shares after having exercised the options.
- j. **Transferability:** employee stock options can only be exercised by the employee and can't be sold to any third part. Only in some special situations, as e.g. death of the option holder, the option plan allows the possibility of transfer. For employees this lack of transferability has the effect that the option holder never knows the time value⁴ of the option [23].
- k. **Hedging:** in order to avoid the option sale or any other hedging operations, articles on the contracts often limit some operations as call selling or put buying. Any short behaviour could be understood by the market as bad future prospective and it also would be against the aim of the ESOP.
- l. **Vesting conditions:** usually the employee options forfeit if the employee leaves the firm before the option can be exercised, then it is said that the option has not vested. In some conditions the employee can require a compensation for the forfeited options.
- m. **Taxability:** There are different taxability depending on the type and the size of the compensation plan. Depending on the country where the options are issued, options

⁴ Time value: the difference between option value and the intrinsic value due to the uncertainty price of the asset in the future.



may have other taxability, but in general, options related to ESOPs are tax-advantaged with respect to standardized options bought on the market. For Sweden there are two different methods to tax the options granted on employee programs, as a marketable security or as employee stock option. These two methods have different taxability, the details are explained below.

- n. **Non-employment insurance:** to avoid giving wrong expectations about an implied employment, the plan agreement could contain a clear statement that options do not guaranty a continued employment.

It is important to know that almost all the options granted in ESOPs are calls options or “call warrants”⁵ issued by the companies, which means only administrative costs in the beginning and a “high customized” plan for every employee. Therefore this “private” or “over the counter”⁶ derivative products may have substantial differences compared with other similar stock options found on the common markets.

Although stock option are usually granted to employees (executive or not), similar plans could be sometimes offered to other stakeholders such as, suppliers, consultants, lawyers or other people involved with the company.

From the legal point of view, shareholder must be informed about the implementation of any ESOP in their company. Moreover, they must agree with any issue of shares or warrants; this is commonly made during the Annual General Meeting. Any scheme modification must also be reported and approved by shareholders.

2.3 Stock options versus other financial products.

First of all, it is important to keep in mind that the owners or shareholders pursue the optimal profit, or what is the same, the maximum price of their shares. Then it is rational to focus managerial targets on this, creating awareness on mutual profits but at the same time, with as low risk as possible.

One option could be to reward the employees with the firm’s own shares. This scheme implies a strong capital investment at the start and the employee remuneration whether the share

⁵ Warrant: security similar to a call option. It should be bought over the counter.

⁶ Over the counter or “off-exchange” trading is when the financial instruments are negotiated directly between two parties, ergo out of the exchange markets.



price grows or reduces. If the share rises, everything will be correct, but if it falls, shareholders would have lost part of their earnings and the managerial group will continue having shares with value. Then, the most fair would be a type of financial product, derivate from the company shares, without value if the share falls and with great profits if the share rises.

Hence, to grant stock options to the manager could be an appropriately solution to solve part of the remuneration issue. Considering the properties that this financial product has, if the underlying asset has a price lower than the exercise price, then the option has no value, thereby employees will not get any profit of it if the share price is not above the price marked on the option. Normally in Swedish companies, the strike price is set from a specified range of prices of the previous sessions before the grant and this value is equal to an estimated percentage above this price, usually between 110% and 120%, depending on the term of the option and the goal of the plan.

It also is a relative inexpensive method, if the agreement is between the company and the employee; it only has administrative costs on the issuing moment. In case the share falls, the company will not have to spent money but, if the price rises, then they will have to pay for it or just grant repurchased shares, but then it will be worth because the shareholders profit will be positive even paying the difference between the share price and the stock option price.

In some circumstances, as for example after several falls of the stock price, the company may consider to re-price the option. This could be possible in order to hold the main purpose of the ESOP plan, the employee motivation.

Several Swedish companies have implemented different exotic option plans where the employee remuneration and the number of options granted are linked to company's performance indicators and the h of shares for a specified period of time. Some of those performance items are company's revenues, leverage control or market share.

2.4 Employee stock option plan's advantages

The main argument in favour of stock option plans is that they *"give executives greater incentives to act in the interests of shareholders by providing a direct link between realized compensation and company stock-price performance"* [3]. Other capital and liquidity reasons could also be another reason not related to the employee motivation. The report made by a group of experts for the European Union divides the ESOP advantages in three categories;



motivation of employees, attract and retain personnel; and capital and liquidity related reasons [23].

2.4.1 Motivation of employees

As is explained in previous paragraphs, stock options give employees an important reason to enhance their efficiency and work more time to achieve specified goals. It is obvious that as the higher the expected remuneration is, the bigger the effort made by the employee will be. So, this will have direct effect on the company results.

Furthermore, a good method to link an employee with the company is making them part of the ownership. The implication of the employees on the financial results also tends to increase horizontal control, what means a higher control between employees on the same levels of the organization as well as a higher commitment with the success of the different projects.

This fact will be more remarkable as smaller the company is. For these ones, the individual influence in the results is more significant so the importance of the employee remuneration will be more important.

2.4.2 Attract and retain personnel

One of the main problems in companies is to attract and retain talented best-in-class professionals. Looking to all the rewards possibilities, the global salary expectation seems to be the most valuable. Stock options bring the opportunity to most talented executives to achieve bigger bonuses.

Most of the people are more likely to work in bigger companies than smaller ones, some reasons are that they use to provide better career opportunities or more attractive remuneration packages. So small but growing companies may have in Stock Option Plans a good tool to attract key talent employees that in other situations would prefer to work in bigger companies.

The fact that most of the Stock Options granted are considered long-term investments also have an important influence to retain key talented employees, since some stock options granted in the ESOPs contain clauses about maintaining part of the shares for a period of time.



2.4.3 Capital and liquidity related reasons

Employee Stock Option Plans are a good way to remunerate managerial employees without distributing cash before results, Hall and Murphy commented how ESOPs “lets the companies obtain employments services without expending cash”[3]. Since the initial investment on the plan means just administrative expenses, the final amount paid depends on the previous results of the company share and, sometimes, on the company’s performance.

So, considering the growth of the company’s share as reflect of future expectations of this, by the time the company has to face the exercise of the options, this will be in a better situation than at the start of the plan.

This fact will allow the company to offer more competitive remunerations to their employees and other key talented people on the market. Also, it will allow those companies with high-growth expectations but with fewer resources to attract those employees that, in other circumstances, would prefer bigger companies.

2.5 Historical data

The employee stock ownership idea appears at the middle of the 20th century in the United States. This concept was developed by a lawyer and banker called Louis Kelso [19] who argued that the capitalism system would be improved if employees, not just a few shareholders, could share the company profits belonging to the stakeholder equity [4]. But, for those years, few companies introduced this remuneration method due to ambiguous legislation about the issue.

Later in 1973, Kelso together with Senator Russell Long promoted the approval of a series of tributary advantages for companies with ESOPs [4]. As a consequence of that, in the next years the number of companies adopting ESOPs in their remuneration plans increased.

“Figure 1” shows the evolution of the total value of the options granted through employee stock option programs and the proportion belonging to the CEO and top managerial group between 1992 and 2002. On the chart it is possible to see how the total of remuneration from stock options have been loosely ten times bigger in 2001 than in 1992, this reflect the fast increase on the use of this variable remuneration method.

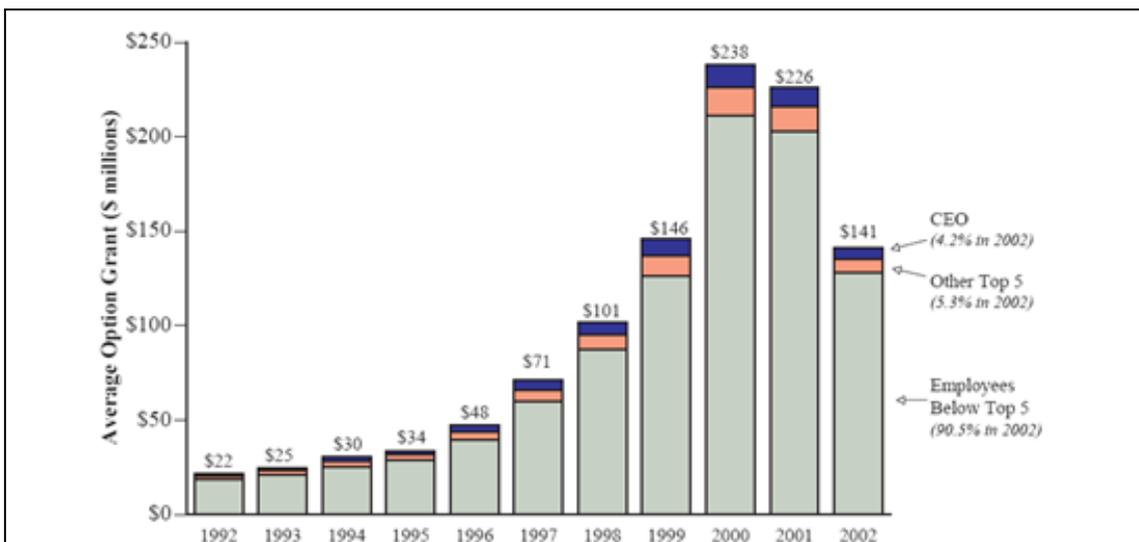


Figure 1: **Grant-Date Values of Employee Stock Options in the S&P 500 during the period of 1992-2002**
(Reproduced from “The Trouble with Stock Options”)

NOTE: The “Figure 1” shows the grant-date value of options (in millions of 2002-constant dollars) granted to all employees in an average S&P 500 firm, based on data from S&P’s ExecuComp data. Grants below the Top 5 are estimated based on “Percent of total grant” disclosures; companies not granting options to any of their top five executives are excluded. Grant-values are based on ExecuComp’s Black-Sholes calculations [*]. The number in parentheses indicates the fraction of the grant, on average, that is awarded to the indicated employee. Fiscal 2002 results are based on the April 2003 “cut” of ExecuComp, which includes only companies with fiscal closings in December 2002 or earlier. [7])

It is interesting to underline that the value distributed to the non-top 5 managers has increased from the 85% to 90.5%, this is in line with the fact that ESOPs are widely being extended too between employees that don’t belong to the top managerial group. It shows the corporative trend of involving the employee with the results of the company through the Stock Option Programs.

Hall and Murphy also highlight the importance of the “new economy” companies (firms related to hardware, software, internet, telecommunications...), which the variable part of the salary had an important impact on their employee remunerations [3]. That was in order to stimulate the growth of the company in their early years, linking closely the employee salary with the value of the company.

2.6 Share source of the employee stock option plans

Companies use several ways to remunerate employee based on company success and value increase of shares. Also there are several differences between companies’ ESOPs, all of them



should adjust the different variables related to the stock options to improve the impact of the plan implementation.

It is possible to distinguish between three ways that companies use to supply the shares from the stock option exercise, vesting outstanding shares, vesting newly issued shares or paying the revenue with cash.

2.6.1 Outstanding shares

The company can vest the option exercise with outstanding shares from the market. This means that the firm will have to repurchase the shares in the market, or through a private deal, in any moment prior to the exercise of options to face the due. This could be considered the traditional stock option and supposes the “non-issuing” of new shares. Hence the shareholder’s structure will not change.

The main advantage of this kind of share vesting would be that allows the company to buy the shares whenever they want in order to face the options exercise. It can also be a disadvantage while dealing with the administrative cost of possible buybacks.

2.6.2 Newly issued shares

A stock option linked to a new issue of share, imply that if the option is exercised, the company will have to issue a “non in the market yet” share for the employee. This fact will increase the number of outstanding shares, reducing the percentage of the total shares held by the original shareholders.

Something to bear in mind with these stocks is that the company will not have any direct cost of this transaction. In contrast, all the cost will be assumed by the shareholders.

Some investors may not be interested in using this kind of remuneration in order not to lose a specified percentage of the outstanding shares, which could mean the loss of a relative majority on the shareholders board.

This kind of share options can lead to some repurchases in order to avoid or face the dilution⁷ of the number of shares. Some researches link these buy backs to the maintenance of the shareholders structure.

⁷ Dilution: stock value diminution due to the issue of new company shares. Also implies a diminution on the shareholders’ influence.



To face those kinds of option programs companies have two possibilities. The first is issuing a defined number of new shares when the program starts. The second possibility is to issue warrants linked to new shares issues, which will permit the company to issue new shares at the same time as the options are being exercised. It is easy to see that the first method is less efficient since some options, those that are out-of-money at the exercise time, will not be exercised.

In Sweden, as in most of the countries, both methods, issuing warrants and new shares, are regulated by law. So then, the shareholders must support the board of director's proposal.

2.6.3 Cash payments associated to share performance.

Cash payments associated to share performance are linked to those ESOPs based on "phantom options" or Stock Appreciation Rights (SAR). With these alternatives methods companies directly provide cash to employees involved on the plan depending on the revenue of the underlying asset, instead of giving them company's shares.

For a phantom option program, the employee will receive cash in accordance with the growth of the company's price in the market, it does not have to be a proportional remuneration, but it should be linked.

A Stock Appreciation Right is similar to a call warrant, but it gives the employee the right to the monetary equivalent of the value increase in a specific number of shares between two periods of time [20].

These two methods are not used in situations where the aim of the ESOP is to encourage the employees be part of the shareholder group, since the employees do not receive any share at the end of the period, they just obtain cash for performance.

This type of ESOPs could also be of interest for those companies that are unlisted and therefore with an uncertain liquidity. If the company's value grows the employee will have the option to exercise his "phantom option" and get paid in accordance with the company's revenue as under a real stock option plan.



2.7 Legal issues and taxation

Every country has a different, but almost always similar, legislation and taxation of the employee stock options plans. It seems to be a general consensus on the idea that derivative benefits from stock option plans should be taxed as income. In some cases, these options are taxed on the grant date, but in most of the countries they are taxed at exercise.

2.7.1 Swedish legislation and taxation

The actual legislation allows employee and employers to structure stock options plans in two different ways: as marketable securities⁸ or as employee stock option. These different methods have different taxation treatment [21].

To secure good practices in the Swedish securities markets, the Swedish Security Council was created in 1987 by the Federation of Swedish Industries and the Stockholm Chamber of Commerce. This body is responsible of the evaluation of every action related to the stock market by a Swedish listed company⁹ [22].

Up to July of 1998 stock option plans could only be taxed as marketable securities. Promoted by a group of large multinational companies, the new legislation introduced the “employee stock option” structure into the legal framework. Since then, these kinds of companies have generally been using employee share options structure, although the marketable security is also used.

The main difference between both structures is the taxation treatment. If the option is classified as a marketable security, the tax charge will be carried out on the grant date if it is given free of charge, but if it is as an employee stock option, then the tax charge and the security contributions will be due on the date of exercise.

Apart from the different taxation, for the employee stock option, if the employee leaves the employment the contract has a pre-emption clause where the employee is forced to offer the company the opportunity to buy his options.

For the marketable securities the tax liability is calculated with the Black Scholes formula as the Fair Market Value (FMV) [16]. If the employee had to pay any fee for the option, this amount would be deducted from the FMV of the option. However, for the employee stock option, the

⁸ Marketable security: security that can be easily converted into cash such as bonds or stocks.

⁹ Only companies with shares listed on the OMX Nordic Exchange Stockholm or the Nordic Growth Market list are under the supervision of the Securities Council.



taxation is proportional to the difference between the FMV of the shares at exercise of the option and the exercise price.

From the employee point of view, in both cases the tax rate will be up to 56%. Once the share is acquired under a marketable security or an employee stock option, the sale of this will be linked to Capital Gains Tax at a flat rate of 30%. The gains will be calculated as the difference between the acquisition value of the share and the sell price. If the shares are sold at loss, the loss can be treated as a negative capital gain. If the gains relate to shares the loss can be fully offset, but if not, the taxation is restricted to 70% of the loss.

Other difference between the two taxable models is the different treatment of the loss if the option is unexercised on time. For the marketable case, the price paid for the option becomes a capital loss. However, if it is an employee stock option, then the price paid can be deducted against other employment income during the year the option lapses.

From the point of view of the employer, if there is a taxable benefit, the applicable rate of social security contribution is 32.82% if options are treated as employee stock option. In accordance with the Swedish legislation, if a company sells its own shares, capital gain is not taxable; this provision is also applicable where the employing company transfers shares to employees as a part of their participation in a stock option plan.

2.7.2 USA legislation and taxation

In accordance with the USA legislation, there are two methods for the accounting of stock options derived from the remuneration plans. Either, they are classified as Incentive Stock Options (ISOs) or Non-Qualified Stock Options (NQSOs). Generally, ISOs are limited to senior management while NQSOs are granted throughout the organization. Any Employee Stock Option Plan in the USA must be approved by the shareholders within 12 months before or after the plan is adopted [21].

The most relevant difference between both is the taxation scheme. Nevertheless both are not considered property; therefore there will not give rise to a taxable event at the grant and vesting date.

For the ISOs taxation, employees do not have to pay ordinary income tax or social security contributions from the difference between the sales proceeds and the exercise price, however



this income will be included on the Alternative Minimum Tax¹⁰ what implies that the profits may be taxed as long-term capital gain if the shares, resulting from the ESOP, are held one year from the exercise date and two years from the date of grant. In that case any capital gain will be taxed with a maximum federal rate of 18%.

For the NWSO case, the employee will be subjected to income and social security contributions at the time the options are exercised. Then, the taxation will be made also from the FMV at the time of exercise over the exercise price. Income federal taxes will vary from 10% to 38.6%, not including state rates. Furthermore a security contribution will be applied. The capital gains will be, as in ISOs case, taxed at a maximum federal rate of 18%.

Despite of having a lower taxation, ISOs are considered as a long-term capital gain, so the risk that the holder takes is higher since the owner has to hold the stock for a long period of time to receive the optimal tax treatment.

In both situations capital losses would be offset against capital gains, whether short-term or long-term. A maximum of \$3000 can be offset against ordinary income every year.

2.8 Other share related incentive plans

Some companies prefer other share related remuneration to promote the employees to become owners of company shares. Some examples of these plans are those related to matching shares and performance shares. These kinds of plans are completely compatible with other ESOPs and often companies combine different types of share-based remunerations.

2.8.1 Matching share-based plan

For this kind of remuneration employees are invited to acquire company shares at the market value. In accordance with the number of shares bought by the employee, the company will grant him a specific number of shares free of charge after a time period or vesting time. Continuation of employment will be a requirement linked to share grant.

Furthermore if the employees have to pay to obtain companies shares (even if they will get extra shares in the future), these ones will be more devoted to the rise on the share price [23].

¹⁰ Alternative Minimum Tax: US federal tax system created to ensure that wealthy individuals pay a minimal level income tax.



The main disadvantage of this plan is that not all the employees will be able to acquire the initial matching shares. Also, this money outlay could be understood as an investment decision that directly connects the employment risk with the capital risk.

Matching shares also used to be non-transferrable, they could be issued by the main company or any third part interested in the plan and they do not provide entitlement to receive dividends on the underlying shares during the period called “Qualification period¹¹”.

2.8.2 Performance share-based plan

Employees under this kind of plan will receive a specified number of shares free of charge in accordance with the accomplishment of targets. Usually these objectives will be linked to the share performance but it also can be linked to other specified performance targets, project’s successes or new customers. Performance shares can also be granted to an employee in accordance with his specific role on the company as remuneration for the individual performance.

2.9 Other variables affecting the employee stock option plans

Other variables involving ESOPs have been studied in previous reports by many researchers. In this part of the report, some relevant results regarding the aim of the project will be introduced.

There are different opinions about stock pricing. While Banerjee, Gatchev and Noe documented that 95% of the North American CEOs stock options were granted at-the-money in 2005 [5]; Liljeblom, Pasternack and Rosenberg found in Finish companies a positive significant relationship between the rest of the share price and the exercise price at the time the option was granted; and the length of the vesting period [6]. They justify this through the fact that shareholders will tend not to reduce the incentives of the managers over the time.

Also, some other singular relations were defined on Liljeblom *et al.* research. Based on the hypothesis that option premium was strongly negatively related to the prior stock return. They said that the result “*was consistent with the view that shareholders respond to poor prior stock price performance by requiring a higher corresponding stock price appreciation to reward*”

¹¹ Qualification period: period between matching shares are vested and the underlying shares are granted.



managers" [6]. It could be also explained as a modest expectation of the stock value by the shareholders after a significant appreciation of the share's price.

Related to this, Liljeblom, *et al.* found a significant relation between the scope of the option plans in Finish companies and the cost/difficulty of monitoring the managerial activity (using Tobin's Q¹² as a proxy for monitoring costs) [6].

¹² Tobin's Q: ratio between the market value and the replacement value. It compares the market value of the company with the firm's assets.



3. SHARE REPURCHASES

3.1 Introduction to share repurchases

For any company, the share repurchase policies are really important to determinate part of their own financial structure as the shareholders strategy. As Vermaelen remarked, there are four facts to consider regarding share repurchases (SR). In the first place, it is an investment decision since the firm can use that cash to start new business. Second, it is a payout decision as alternative to dividend distribution. Also, buybacks are a capital structure decision since it increases the financial leverage. And finally it relates directly to the ownership structure since once made the repurchase, remaining shareholders owns more of the company and thus have a bigger exposure to the risk [7]. All these reasons imply the stakeholders in the stock repurchase issue.

One of the facts, could bias CEOs to not repurchase shares is that buybacks can be considered as a sign of poor investment projects and lack of imagination. In accordance with this, CEOs will not be very enthusiastic with this idea, so their prestige and salary grows in accordance with to this.

But maybe, the best way to know “why do firms repurchase shares” is asking directly to the CEO. Some researchers did it, as Brav, Graham, Harvey and Michaely who stated a list of factors that drive the share repurchase decision, in order of importance [8]:

- a. When the stock is a good investment
- b. Increasing earnings per share
- c. Offset dilution from stock option plans
- d. The overall liquidity of the stock
- e. Investors paying lower taxes on capital gains than dividends.

For the aim of this project, the reason to repurchase shares that is going to be deeply analysed is to offset dilution from stock option plans, especially on Swedish companies.

In accordance with the answers given by CEOs most of them like better to start repurchase moves because “the stock was undervalued”. This is consistent with the fact that managers take advantage of information asymmetries between them and the uninformed investor. Therefore, they will tend to repurchase when the stock is undervalued and sell when it is overvalued.



3.2 Share repurchase methods

When a company plans to do a share repurchase, it has different ways to do it, the first way is to make a tender offer with a fixed plan or in a Dutch auction, they can also negotiate a repurchase from private investors or do it using derivative products. But maybe, the most common way to repurchase shares is doing it on the open market.

3.2.1 Fixed price tender offer

This method involves a share acquisition offer with a fixed price for a specific number of shares, the target number of shares. The company makes a formal offer to the shareholders, who have to decide if they agree or not to sell their shares. If the share offer is bigger than the target number, the company is not obligated to buy all the shares, but has to treat all the shareholders equally (with the exception of the odd-lot shareholders¹³, who, depending on the circumstance, get priority over the other shareholders). This method is common when the number of shares repurchases is big and the market, or is not able to repurchase that amount of shares or the price of the share could be significant distorted by the buy back.

Those shareholders with a pessimistic view on the share performance will be more willing to sell their holding than those who have positive expectation. This could be a good way to minimize the risk of takeover, because these kinds of investors are more likely to sell their shares to potential raiders.

Another way to do this is through transferable put rights (TPR), where the company issues the same number of put options than the number of share they are willing to own, in the same proportion to all the shareholders. With TPRs the company allow them to sell rights to those who want to sell their participation in the company.

3.2.2 Dutch auction tender offer

Similar to the fixed price tender offer method, with the Dutch auction tender offer the company establish the higher and the lower price they are willing to pay for each share. Every shareholder has to decide then, at what price he is going to offer his shares (if he does it), then the company select the minimum price which allows them to repurchase the desired number of shares.

¹³ Odd-lot shareholders: shareholders with a small number of shares of the company (usually less than 100 shares).



Compared to Dutch auctions, the fixed price tender offer could be more likely for the companies because it provides a stronger signal of confidence in the future since, on average, it tends to pay a higher price for its stocks and also, setting a unique price, seems to be more convincing than establishing a range.

3.2.3 Private or targeted share repurchases

In this situation, the company directly repurchase their own shares to a single investor or a group of investors. Peyer and Vermaelen establish different reasons to use this method, the first would be when the repurchase is considered as greenmail¹⁴ and the company buys back shares from a potential raider at a premium above the market price attempting to stop hostile bids. Also, the company can repurchase shares to their own employee under some stock program policies. They also report that 45% of the private repurchases announced between 1984 and 2001 were made at discount with the aim to provide liquidity for investors in a poor negotiation position [9].

3.2.4 Open market share repurchase

Maybe, the most common and easy way to make repurchases of own shares, is to buy it on the open market. It is the best option when the time is not a requirement because it could take a long period of time depending on the country's legislation since buybacks are often subject to different volume and price restrictions.

Depending on the legislation of the country, the company has to publish the repurchase intention, but contrary to tender offers, these announcements are not firm commitments and the company do not have the obligation to buy back all the shares purposed¹⁵.

The Swedish legislation compels all the companies to announce the daily volume of the repurchases that are done. All the information about the companies repurchases are collected on the Nasdaq OMX Webpage [24].

Some studies, like the one who Ikenberry, Lakonishok and Vermaelen did, report that companies are less likely to buy back shares if the rises strongly during the first repurchases periods. This is agreeing with the idea that managers try to take advantage of undervalued stock prices [10].

¹⁴ Greenmail: A defensive manoeuvre aimed at thwarting a potential takeover in which the target firm purchases shares of its own stock from a raider at a price above that available to other shareholders, who are ordinarily excluded from the transaction. Also called negotiated share repurchase.

¹⁵ Researches point that in the US the average completion rate is around 80%.



3.2.5 Synthetic repurchases

Also called repurchases enhanced with derivative products, typically are distinguished different operations as buying collars¹⁶ or issuing forward contracts.

The main difference between using synthetic derivatives from the other buyback methods is that the first strategy allows a company to take advantage of a certain underlying asset using less cash. It could be a good solution for those firms who view the stock price to be undervalued and in this moment has capital needs or just is involved in other investment expenses.

Normally, these operations are carried out over the counter⁶, since the liquidity of the public markets may be limited and the terms of the traded products could not fit the desired scheme.

If the company has bought calls and the price fall there is no problem, but if the operation involves collars or futures, then the company will have to face the losses. Bearing in mind that this buy back method is good in situations when the company has poor cash, it could jeopardize the firm health. Another way to solve this problem would be issuing shares to fulfil the agreement.

3.3 Evolution of the share repurchase

This section will try to provide a wide vision of the evolution of share repurchases as in the World as in Europe. The number of shares repurchases has become significantly important since 1985 (especially in USA, some years after in Europe). Prior to this period, the number of share repurchases was insignificant.

From the data collected by Vermaelen from more than 21,500 repurchase announcements representing 2.6 \$trillion between 1985 and 2003 it's possible to have a broad vision of the importance of buybacks in the world as well as in Europe [7]. As it is shown on the data, the European buyback operations only represent 14% of the World activity in comparison with the US (74%).

Vermaelen remarks the relation between the volume of repurchases and the economical situation. The author says that *"it seems that during recessions repurchase activity falls and*

¹⁶ Buy collar: long strategy involving derivative products that consist in buying a call and selling a put with the same strike price. It is called also synthetic share.



during boom periods it rises". He justifies this by two facts: the first (and more important for the aim of the research), highlights the relation between the exercise of the options granted to the employees (as agreed on the ESOPs) and the underlying stock prices, since the economy is healthy the stock prices will rise and the options will be "in the money"¹⁷, then the company will have to do repurchases to face the potential options' execution [7]. This is also in concordance with the theory of the information asymmetries, since most of the repurchases are promoted by the belief of an undervaluation of the company's shares. Another reason that promotes the positive correlation between stock prices and repurchase activity could be the aim to reduce taxation distresses on positive economies where the treasure cash balance uses to be positive.

From the data obtained from the Swedish companies' repurchases (Table 1 and Figure 2, 3, 4 and 5 (Attachment N3")) it is possible to appraise the same relation between the number of shares repurchased and the market's situation. As Vermaelen found, the link between the economic situation and the number of shares repurchases is also strong on the Swedish companies registering a pike on 2007 year that most of the European and Nord-American economies reach their maximum. Vermaelen research also shows the number of companies that bought back shares for each period [7].

Analysing the information on Vermaelen's research, the importance of the different repurchase methods is showed. As previously said, the open market method is clearly preferred by the companies for repurchase own shares (approx. 80% of the operations) [7]. Note also that, although Dutch auction repurchases supposedly have economic advantages represent less than 20% of all tender offers during the sample period. This is in accordance with the theory that, in fixed price repurchases, the company is providing a stronger signal of confidence for the future.

3.4 Legal Issues

With the increase of repurchases the regulation of the same has become a factor particularly important to avoid market manipulations or unequal treatment of shareholders. Each country has its own laws regarding to "how to do fair share repurchases". Some facts related to the regulation are:

¹⁷ In the Money: a stock option will be "in the money" when the price of the underlying asset is higher than the strike or exercise price.



- a. **Price manipulation:** some share repurchases involve a huge volume of transactions, with the aim to avoid price manipulations or other profitable operations these should be closely controlled. Some countries delimitate the volume of repurchases (e.g. the repurchases should represent less than 20% of the daily transactions), the number of brokers working for the same company or the hours of the day that the repurchases can be made (e.g. forbidding the trades the first and the last daily hour).
- b. **Fair treatment of shareholders:** all the shareholders are supposed to be treated in the same way. Since some investors sell their shares to the company and others do not, this fact should be regulated.
- c. **Risk assumption:** This issue involves all the stakeholders, since the company decrease its capitalization in the market, the exposure of shareholders, creditors and other stakeholders rise. For this reason, some countries has polities to control the maximum percentage of own shares a company can buyback.
- d. **Taxation:** in some countries dividend tax policies make repurchases more attractive, since they have less taxes than dividends. In order to control this, some countries obligate companies to trade in specific trading platforms.

In order to deal with the “unequal treatment to shareholders” problem, in many countries, companies have to announce publicly that they have the intention to start a repurchase process and the maximum number of shares to repurchase. After that, companies don’t have to buy compulsory all the announced shares. This process can take years, it is important to bear in mind that a high volume of repurchases in a short period of time can affect the share price, so this issue should be controlled by the authorities.

Also, in situations where a company has a positive cash situation, it could be interesting to repurchase own shares to reduce this excess and have taxation advantages, as cash excess is considered as “negative debt”. So, this could also be a reason to start a buyback process. Related to this, are some researches that link the repurchase activity to the difference between the target and the actual leverage ratio [11].

3.5 Effects on share price

Numerous articles have been written about share repurchases and how they directly affect the share price, most of them point to the fact that there are anomalous positive returns around this fact during the 60 days before and after the share repurchase announcement [7] [12]. In



their article, Vermaelen found that the signalling and free cash flow theories are possible explanation to this [7].

In accordance with the signalling theory, the stock repurchase is a signal of the good future prospects of the company or just an undervaluation of the share price, this is confirmed by Ikenberry, Lakonishok and Vermaelen who analyse the stock return four years after the announcement and found positive abnormal returns of 45 % for this period [10].

Also, in anonymous inquiries that were made to some CEOs they assert that one of the main reasons to repurchase was the undervaluation of the share price [10]. This seems to be reasonable, as they as managers of companies have access to internal data that could justify the operation. Undervaluation could be explained through an underestimation by the market of the expected cash-flows or a risk overestimation.

Grullon and Michaely research reflect company's risk falling after repurchases. They argue that with the repurchase action, managers are sending a signal of "end-growth opportunities" that tend to be more risky than the current assets of the firm [13].

3.6 Dividend distribution versus repurchases

When a company close the fiscal year and has to distribute the profits usually give dividends to shareholders. An alternative to this is the share repurchase. By buying back own shares, the company is reducing the number of participations on the market and therefore, increasing the value of the held shares.

Even though some shareholders prefer to get cash every year through the dividend instead of share repurchases, one of the stated reasons for buying back is that a company can reduce the investors' tax bill if capital gains are taxed less than dividends [14]. Also, it is important to remember that some countries have different treatment depending on the repurchase method used.

It is important to bear in mind that dividend distribution can also contribute to future expectations by the market that will suppose similar returns for nearly years. In fact, dividend cuts could be perceived as bad news by investors. However, share repurchases does not create expectation of future repurchases or other financial movements.



In contrast, by buying back shares instead of distributing dividends, the company raises the stakeholders risk exposure by increasing the own participation on the firm. This fact is included in legislations that usually set up an upper boundary, around the 5% - 10%, of the total share repurchases.

In conclusion, firms seem to tend to repurchase shares instead on distributing dividends. One situation when it is preferable to pay dividends is when the stock price is thought to be overvalued.



4. LITERATURE CONCLUSIONS AND HYPOTHESES

4.1 Share repurchases impact

Companies have different reasons for purchasing own shares. Some researchers, like Weisbenner did, found significant differences between the number of shares repurchased in companies with and without ESOP. He also analysed some other variables to determine their influence on the buybacks [15].

Employee stock option programs have been suggested in several occasions to be one of the main reasons to prefer share repurchases instead of dividend distribution. First, dividend reduces the price of the share the day after the dividend payout; hence the stock option value will be lower after this date, especially if it is not dividend protected affecting directly to the employee and, more importantly, the managerial members wealth.

Moreover, share repurchases could be used as a method to “hedge” or face the dilution of some stock options being exercised. Some parts, as the board of directors, will be interested in protecting shareholders against swings on the share price [17].

In this paper, the situation of the Swedish companies will be analysed¹⁸. From other similar studies, the expected result will be the existence of a significant difference in the number of shares repurchased between Swedish companies who have ESOPs and those who do not (H_1). About this, Liljeblom and Pasternak found significantly higher activity in Finish companies with option programs from those without [17].

Also, the effect of different ESOP variables, such as their characteristics and type, will be studied as a potential influence on the company buybacks. In this case it is expected to find a direct relation between the ESOP magnitude and the number of buybacks (H_2).

The type of stock options granted to the employees would have an important impact on the number of shares repurchased. For those ESOPs involving new shares issued, the expected effect is an increase of the repurchase activity (H_3) in accordance with the theory that establishes that there is an interest from the managers to avoid the dilution of the outstanding shares price. For programs that will grant outstanding shares to their employees, the increase of the share repurchases seems to be more obvious due to face the grant of that options that are in-the-money. For this reason it is expected to find a strong positive relation in share

¹⁸ All the hypotheses are listed as (H_x), $x \in 1,2,\dots,6$.



repurchases and the ESOPs that grant outstanding shares to the employees. For plans involving synthetic options or phantom options this type of effect is not expected to be as significant as it would be with those mentioned before.

4.2 Dividend impact

In accordance with the Black Scholes model to price options, the dividend policies have a strong impact on the option price. Since most of the stock options programs in Sweden are not dividend protected, the negative impact of the dividend on the long term stock price could be a motivation for managers to reduce or cut the dividend distribution [16].

Vermaelen argue that, using the Black-Sholes model, the value of a 10-year call option (something not really odd in stock option plans) on a non-dividend paying stock with 30% annual volatility is twice as large as the value of an option with a 4% dividend yield. This is a good overview of the impact of dividend distribution on the employee remuneration [7].

Bearing in mind that most of the employee stock options plans in Sweden are not dividend protected, it is expected to find significant differences on dividend treatments between companies with and without ESOPs (H_4). Also, in accordance with the reasons exposed, it is expected to find a negative relation between the size of the stock option program and the dividend yield granted to the shareholders (H_5).

Research has been done about this, Liljebloom and Pasternack found from data samples of Finish companies significant differences between companies with and without dividend protected ESOPs (40% of the option program's data where dividend protected (April 1996 – September 2001)). They conclude that when the program is dividend protected, the dividend distribution and the scope of the options were positively related, instead of negatively as was documented for U.S. data [17].

5. SAMPLE STUDY AND ANALYSIS

5.1 Sample characteristics

To provide an analysis of the impact of the Employee Stock Option Plans on share repurchases and the dividend distributions on Swedish companies, a database has been set up with different key items for a group of 76 companies on the NASDAQ OMX Nordic exchange market.

For each company, the data has been extracted from the annual reports displayed on each company's website between the years 2006 and 2009. The information about the number of shares repurchased has been obtained from the official web site of the NASDAQ OMX Nordic exchange market [24].

A total of 291 annual reports have been analysed and 28 cross-sectional key items have been collected from a total of 4 years as time-sectional data. All the information about the content of the database is located on the "Attachment N1" at the end of the report.

From the data collected and with the aim of analysing the different parameter of the empirical research, 17 indicators have been introduced on the database as from the previous data collected. All the information about the different indicators is located on the "Attachment N2".

Between 2006 and 2010 in 95 different occasions an ESOP has been implemented on the remuneration schemes. In 147 different years and companies, the management group held different stock option, convertible bonds or warrants.

For each cross-sectional observation, the dividend included on the data is the dividend chose by the managers from the previous year. This is because the previous year's dividend is the last earning distribution made during the year that is being analysed, and the proposed dividend is granted during the following year when the stock options might have been exercised.

All the currency values are expressed in SEK. For those companies whose costs are accounted in Euros on the annual reports, the conversion rates for currencies used are:

EUR/SEK	End year price
2009	10.23
2008	10.92
2007	9.42
2006	9.03

Table 2: EUR/SEK change



In one year, the CEO and President of Investment AB Latour held put options of his own company. This fact was justified by the company as a hedging method in order to protect the president's wealth and ownership due to the high-risk exposure.

5.2 Methodology

In order to analyse the samples, different statistical analysis have been run. To analyse if there are differences between samples the tool used is the t-student; and to establish if there is a relation between two different parameters the analysis made is the regression analysis.

5.2.1 Student's t-test

This test compares two samples and helps to decide if the null hypothesis can be rejected, or what is the same, if they belong to the same population of data. The indicator used is the t-value. This parameter indicates for what significant level the null hypothesis can be rejected.

For each t-value, degrees of freedom¹⁹ and significance level²⁰ there is a critical t-value. This parameter is used to compare the t-value obtained on the t-test in order to refuse or not the null hypothesis.

As bigger the sample is, more accurate solutions are achieved with this test. The numbers of observations in both samples are recommended to be bigger than 30 in order to reach truthful results.

The t-test is designed for normal distributed samples. Despite this fact, the test results are quite precise for samples enough big²¹. On the analysis made, parameters used where found to be lognormal distributed. In order to normalise the distribution, the natural logarithm has been applied to all the indicators. This transformation results in an accuracy increase for the samples used, especially for those with less the number of observations.

¹⁹ The number of degrees of freedom is the number of values in the final calculation of a statistic that are free to vary. Hence, it is an indicator of the number of observations used on the analysis.

²⁰ The amount of evidence required to accept that an event is unlikely to have arisen by chance is known as the significance level or critical p-value.

²¹ *"If you apply the t-test to non-normal data, you are probably increasing the risk of error. Now, in fact, the Central Limit Theorem shows that the t-test can avoid becoming unusually fallible when applied to non-normal datasets: If the control/treatment datasets are sufficiently "large" the t-test does not lie outrageously even when applied to non-normal data."*[26]



The t-test can be used to analyse if two samples belong to the same population (two-tailed test) or if one of the samples is bigger than the other one (one-tailed test). For the analysis ran on this research, the two-tailed test has been used.

5.2.2 Regression analysis

This method is used in order to establish the impact that a parameter has over any other variable by modelling a regression equation. Different types of equations can be used to predict future results.

For the analysis of the gathered data, the model used is the linear equation. This equation is obtained from the minimization of the sum of all standard error²² between the observations and their predicted value. The value of the coefficient of determination (R^2) measures of how well future outcomes are likely to be predicted by the model and the p-value is used as indicator of the linear relation between the two parameters.

5.3 Sample analysis

The aim of the study is to find significant differences between the cross-sectional data of those companies with outstanding ESOPs and those that do not have any outstanding ESOP remuneration.

For that, the number of stock options and the value of those have been used in order to represent the magnitude of the ESOP. As an estimation of the underlying value of shares that the options represent, the parameter “number of stock options multiplied by the end-year share price” has been used.

With this purpose the original sample has been divided in two different samples in accordance with those years that managers held different types of outstanding options and those years that they did not held any option.

The sample is composed of 291 panel data points, of which 144 year’s observations are from companies without outstanding options among their managers and 147 year’s observations are with outstanding options.

²² The standard error is the difference between the predicted value and the observation value.



GENERAL INFORMATION	
Years in which managers had stock options	147
Years in which managers had no stock options	144
TOTAL year's data	291

Table 3: **General information about the number of observations of each sample.**

5.3.1 Share repurchase impact

With the aim of evaluating the impact of the options granted to managers over the share repurchase decisions, the sample previously explained has been used.

To determinate different ratios as the mean and the standard deviation of the annual estimated value of share repurchases or the mean and standard deviation of the number of repurchases divided by the total number of shares, the data with repurchases has been extracted from the original table. This means that for the calculation of those ratios, those years in which the companies did not repurchase shares, have not been used.

From the sample of 291 year's data, in 132 times there were share repurchases. Of those, 66 times correspond to companies that did not have any option outstanding among their managerial group and 66 times that they did.

To establish an approximation of the total cost of the repurchases made by the companies for each year, the end-year price of the shares have been multiplied by the number of repurchases.

It is possible to appraise on "Table 4" nearly the same proportion of years in which the companies did repurchases (around 45%) for both samples. Although the mean ratio of repurchases divided by the total number of shares is bigger (2.99%) for those companies without outstanding options than those with them (2.55%), the average estimated cost of the repurchases every year is a 42% higher in companies with outstanding options among their managerial group.

SHARE REPURCHASES INFORMATION	
Years without stock options	144
- Years with repurchases	66
- Years without repurchases	78
- Ratio (Years with repurchases/Total years without options)	45.83%
- Total amount of shares repurchased	147,239
- Total estimated value of repurchases	14,345,390 tSEK
- Mean of the estimated value of shares repurchases per year	217,354 tSEK
- STD of the estimated value of shares repurchases per year	641,430 tSEK
- Mean (Repurchases / Total number of shares)	2.99%
- STD (Repurchases / Total number of shares)	4.66%
Years with stock options	147
- Years with repurchases	66
- Years without repurchases	81
- Ratio (Years with repurchases/Total years with Options)	44.90%
- Total number of shares repurchased	205,961
- Total estimated value of repurchases	20.335.972 tSEK
- Mean of the estimated value of share repurchased	308.120 tSEK
- STD of the estimated value of share repurchased	797.101 tSEK
- Mean (Repurchases / Total number of shares)	2.55%
- STD (Repurchases / Total number of shares)	2.94%

Table 4: **Information about Swedish companies that repurchased shares during the years 2006-2009**

Content: **Years with (without) stock options:** number of years in which managers had (not) stock options. **Years with repurchases:** number of cross-sectional observations in which companies repurchased shares. **Years without repurchases:** number of cross-sectional observations in which companies did not repurchase shares. **Ratio (Years with repurchases/Total years with (without) options):** percentage of companies with (without) options that repurchased shares on the different cross-sectional observations. **Total amount of shares repurchased:** total number of shares repurchased compiled on the database. **Total estimated value of repurchases:** Total estimated value of the shares repurchased on the market. **Mean of the estimated value of shares repurchased:** Mean of the value of shares repurchased per year on the Swedish market estimated as the multiplication of "End-year share price" and "Repurchases". **STD of the estimated value of shares repurchased:** Standard deviation of the estimated value of shares repurchased on the Swedish market. **Mean (Repurchases/Total number of shares):** Mean of the ratio "Repurchases" divided by "Total number of shares". **STD (Repurchases/Total number of shares):** standard deviation of the ratio "Repurchases" divided by "Total number of shares".

Two-tailed t-test (Ratio "Repurchases/Total number of shares")

In order to establish if there is a significant difference between the two samples and analyse if there is a real influence on the share repurchase policies in companies who have outstanding options and those who do not (H_1), different tests have been run to clear up the significance level of the results. In this case the test used has been the t-test [18].

Although the samples were big enough to run the test with the non-normalised data, all the observations have been normalised applying the natural logarithm to all the different parameters in order to achieve more accurate results.



The first test has the aim to analyse if there is any difference between the two means “Number of repurchases divided by the total number of shares” between those companies with and without outstanding options among their managers. It is important to bear in mind that those years without repurchases have not been included on the samples for this test.

For that purpose, the t-test has been run. The null hypothesis is that both means are equal or what is the same, $H_0: \mu_1 - \mu_2 = 0$, where μ_1 is the mean for those companies without outstanding options and μ_2 for those with. The test results are summarised on “Table 6”²³:

Ratio "Repurchases/Total number of shares"	N. of observations	Mean	St. Deviation	SE. Mean
LN(Companies without outstanding options)	66	-4.29	1.47	0.18
LN(Companies with outstanding options)	66	-4.66	1.87	0.23
RESULTS				
t-Value	1.27			
p-Value	0.207			
Degrees of freedom	123			

Table 5: **Sample information and t-test results of the ratio "Repurchases/Total number of shares"**.

Content: **N. of observations:** Number of observations in each sample. **Mean:** mean of the observations. **St.Deviation:** Standard deviation of the observations. **SE Mean:** Mean of the Standard Error. **t-Value:** indicates the score obtained from the test. **p-Value:** indicates the significance level needed to refuse the hypothesis. **Degrees of freedom:** indicator of the test accuracy.

NOTE: The mean for both samples is negative due to the fact that, for numbers between 0 and 1 the logarithm functions result into negative value.

For a significance level of 5% ($\alpha=0.05$) in a two-tailed test and with 123 degrees of freedom, the critical t-value was found near to 1.98.

The decision rule can be stated as a rejection of H_0 if t-value is outside the range 0 ± 1.98 for a significance level of 5%. Then, the null hypothesis is not rejected since the t-value for the two-sample test is 1.27. Thus, a significant difference between the diverse treatments of repurchases in companies with and without stock options among their managers cannot be confirmed.

For the t-test, the p-value indicates that significance level that makes the null hypothesis to be rejected. For this case, the significance level of the test should be near to the 20% to be able to reject H_0 .

Two-tailed t-test (Average number of repurchases per year)

This test is used to establish if there is any significant difference between the annual amounts spent on share repurchases in companies with and without stock options among their

²³ All the tests have been run with the statistical tool Minitab® 16.1.0

managerial group. To normalise the observations the natural logarithm has been applied in order to assure more accurate results.¹⁹

Again, the null hypothesis is that both means are equal or what is the same, $H_0 : \mu_1 - \mu_2 = 0$, where μ_1 is the mean for those companies without outstanding options and μ_2 for those with. The test results are summarised on “Table 6”²⁰:

Estimated cost of repurchases per year	N. of observations	Mean	St. Deviation	SE. Mean
LN(Companies without outstanding options)	66	17.44	2	0.25
LN(Companies with outstanding options)	66	17.57	2.13	0.26
RESULTS				
t-Value	-0.35			
p-Value	0.724			
Degrees of freedom	129			

Table 6: **Sample information and t-test results of the estimated cost of repurchases per year**

Content: **N. of observations:** Number of observations in each sample. **Mean:** mean of the observations. **St.Deviation:** Standard deviation of the observations. **SE Mean:** Mean of the Standard Error. **t-Value:** indicates the score obtained from the test. **p-Value:** indicates the significance level needed to refuse the hypothesis. **Degrees of freedom:** indicator of the test accuracy.

NOTE: The mean for both samples is less than zero, due to the fact that for numbers between 0 and 1 the logarithm function results into negative values.

For a significance level of 5% ($\alpha=0.05$) in a two-tailed test and with 129 degrees of freedom the critical t-value was found near 1.98. The fact that t-value is smaller than 0 only indicates μ_2 being bigger than μ_1 .

The decision rule can be stated as a rejection of H_0 if t-value is outside the range 0 ± 1.98 for a significance level of 5%. Then, the null hypothesis is not rejected since the t-value for the two-sample test is -0.35. Although the average cost of the share repurchases was 42% higher in companies with outstanding stock options, a significant difference between the average costs for the two different samples cannot be confirmed.

ESOP magnitude and share repurchases

For those companies with outstanding stock options that did repurchases, a regression analysis has been run in order to establish if there is any relation between the ESOP magnitude and the number of buybacks made during the year by the company (H_2).

With the purpose of establishing an estimator of the ESOP magnitude, the coefficient “End-year price multiplied by the number of stock options” has been used. The other parameter used is the number of repurchases, represented by the ratio “Number of repurchases divided by the Total number of shares”, on the data analysis



In order to achieve a better differentiation of the data, a logarithm transformation has been applied to both groups of observations (Figure 6C (Attachment N4)). The results of the regression analysis are shown on the “Table 6” and the “Attachment N4”:

Regression Analysis: ESOP magnitude vs. Repurchases	
Number of observations	66
Coefficient of determination (R^2)	0.016
p-Value	0.320
Equation	$LN(Y) = -0.124 LN(X) - 2.6382$

Table 7: **Regression analysis: ESOP magnitude versus Repurchases**

Content: **Number of observations:** indicator of the test accuracy. **Coefficient of determination (R^2):** provides a measure of how well future outcomes are likely to be predicted by the model. **p-Value:** is used as an indicator of the linear relation between the two parameters. **Equation:** establishes the expected value of observations for the found model where X represents the ESOP magnitude and Y represents the ratio (Repurchases/Total number of shares).

From the results of the analysis, a non relation between the number of shares repurchases and the estimated value of the outstanding options for the managers is observed. The small coefficient of determination ($R^2 = 0.016$) indicates a clear non-explanation of the number of repurchases; and the size of the p-value indicates a non-linear relation between the two parameters²⁴.

In accordance with the residual analysis (Figure 6B (Attachment N4)) there are 2 observations with residues bigger than two times the standard deviation. After analysing these observations independently, it is possible to assert that without those observations, the result of the analysis does not change significantly.

5.3.2 Dividend impact

In order to establish if the Employee Stock Option Programs bias the dividend distribution, different parameters have been analysed from the original sample.

To determinate different ratios as the mean and the standard deviation of the annual “estimated value of dividend” or the mean and standard deviation of the “dividend yield”, the data of those companies with dividend distribution has been extracted from the original sample. This means that for the calculation of that ratio, those years in which companies did not distribute dividend, have not been used.

²⁴ Using the value 0.05 as a reference, it is correct to consider that up to this value, there is a lineal relation between the samples.

From the sample with a total of 291 observations, in 225 times there were dividend distributions during the year before. Of those, 112 times correspond to companies that did not have any option outstanding among their managerial group and 113 that did.

To establish an approximation of the total value of the dividend distributed by the companies during the year before, the total number of shares for each year has been used.

DIVIDEND DISTRIBUTION INFORMATION	
Years without stock options	144
- Years with dividend distribution	112
- Years without dividend distribution	32
- Ratio (Years with dividend distribution/Total years without options)	77.78%
- Average amount of dividend distributed per share	3,59 SEK
- Total estimated value of the dividend distribution	53,723,900 tSEK
- Mean of the estimated value of the dividend distribution	479,677 tSEK
- STD of the estimated value of the dividend distribution	853,278 tSEK
- Mean (Dividend per share / End-year share price)	5.82%
- STD (Dividend per share / End-year share price)	4.88%
Years with stock options	147
- Years with dividend distribution	113
- Years without dividend distribution	34
- Ratio (Years with dividend distribution/Total years with options)	76.87%
- Average amount of dividend distributed per share	3,82 SEK
- Total estimated value of the dividend distribution	62,376,051 tSEK
- Mean of the estimated value of the dividend distribution	552,000 tSEK
- STD of the estimated value of the dividend distribution	1,106,630 tSEK
- Mean (Dividend previous year/ End-year share price)	5.14%
- STD (Dividend previous year / End-year share price)	5.73%

Table 8: **Information about Swedish companies that distributed dividend during the years 2006-2009**

Content: **Years with (without) stock options:** Number of years in which managers had (not) stock options. **Years with dividend distribution** Number of cross-sectional observations in which companies distributed dividend. **Years without dividend distribution** Number of cross-sectional observations in which companies did not distribute dividends. **Ratio (Years with dividend distribution/Total years with (without) options):** percentage of companies with (without) options that distributed dividend on the different cross-sectional observations. **Average amount of dividend distributed per share:** average amount of dividend distributed on those observations that distributed dividend. **Total estimated value of dividend distribution:** Total estimated value of the dividends distributed to shareholders. **Mean of the estimated value of dividend distribution:** Mean of the value of dividend distributed estimated as the multiplication of "Dividend previous year" and "Total number of shares". **STD of the estimated value of the dividend distribution** Standard deviation of the estimated value of the dividend distribution. **Mean (Dividend previous year/ End-year share price):** Mean of the ratio "Dividend previous year" divided by "End-year share price". **STD (Dividend previous year/ End-year share price):** Standard deviation of the ratio (Dividend previous year/ End-year share price).

It is possible to appraise on "Table 8" nearly the same proportion of years in which the companies distributed dividend (around 77%). Although the average dividend distributed is higher in companies with outstanding options (3.82 SEK/Share) than those who do not (3.59 SEK/Share), the mean the ratio "Dividend divided by the End-year share price" is smaller for those companies with outstanding stock options (5.14% against 5.72%).

Two-tailed t-test (Ratio “Dividend previous-year/Share price at the end of the year”)

This test tries to determine if there is any significant difference between the dividend policies in companies with and without stock options among their managerial group (H_4). With this purpose, the data analysed has been the ratio “dividend previous-year divided by the end-year share price”). To normalise the observations the natural logarithm has been applied in order to assure more accurate results.

Again, the null hypothesis is that both means are equal, or what is the same, $H_0: \mu_1 - \mu_2 = 0$, where μ_1 is the mean for those companies without outstanding options and μ_2 for those with. The test results are summarised on “Table 9”²⁰:

Ratio “Dividend previous-year/Share price”	N. of observations	Mean	St. Deviation	SE. Mean
LN(Companies without outstanding options)	112	-3,134	0.779	0.074
LN(Companies with outstanding options)	113	-3,289	0.784	0.074
RESULTS				
t-Value	1.48			
p-Value	0.14			
Degrees of freedom	222			

Table 9: **Sample information and t-test results of the ratio “Dividend previous-year/Share price”.**

Content: **N. of observations:** Number of observations in each sample. **Mean:** mean of the observations. **St.Deviation:** Standard deviation of the observations. **SE Mean:** Mean of the Standard Error. **t-Value:** indicates the score obtained from the test. **p-Value:** indicates the significance level needed to refuse the hypothesis. **Degrees of freedom:** indicator of the test accuracy.

NOTE: The mean for both samples is less than zero, due to the fact that for numbers between 0 and 1 the logarithm function results into negative values.

For a significance level of 5% ($\alpha=0.05$) in a two-tailed t-test and with 222 degrees of freedom the critical t-value is found to be near to 1.98.

The decision rule can be stated as a rejection of H_0 if t-value is outside the range 0 ± 1.97 for a significance level of 5%. Then, the null hypothesis is not rejected since the T-value for the two-sample test is 1.48. Thus, a significant difference between the diverse dividend policies between those companies with outstanding options and those without cannot be confirmed.

ESOP magnitude and dividend yield

For those companies with outstanding stock options and dividends, this regression analysis has been run in order to establish if there is any relation between the ESOP magnitude and the dividend yield granted by the company during the year before (H_5).



With the purpose of establishing an estimator of the ESOP magnitude, the coefficient “End-year price multiplied by the Number of stock options” has been used. The other parameter used is the dividend yield, represented as the ratio “Previous year dividend divided by the End-year price of the share”, on the data analysis.

In order to achieve a better differentiation of the data, a logarithm transformation has been applied to both groups of observations (Figure 7C (Attachment N5)). The results of the regression analysis are shown on the “Table 10” and the “Attachment N5”:

Regression Analysis: ESOP magnitude vs. Dividend yield	
Number of observations	113
Coefficient of determination (R^2)	0.172
p-Value	0.000
Equation	$LN(Y) = -0.2211 LN(X) + 0,3309$

Table 10 :**Regression analysis: ESOP magnitude versus Dividend yield**

Content: **Number of observations:** indicator of the test accuracy. **Coefficient of determination (R^2):** provides a measure of how well future outcomes are likely to be predicted by the model. **p-Value:** is used as an indicator of the linear relation between the two parameters. **Equation:** establishes the expected value of observations for the found model where X represents the ESOP magnitude and Y represents the dividend yield.

From the results obtained on the analysis, a weak negative relation between the estimated value of options and the dividend yield was found with a coefficient of determination equal to 17.2% as the “Figure 7A (Attachment N5)” shows. Also the p-value equal to zero indicates a linear relation between the observations.

In accordance with the residual analysis (Figure 7B (Attachment N5)) there are 8 observations with residues bigger than two times the standard deviation. This fact could point to a non-normal distribution of the samples or a leptokurtic distribution. After having analysed this observations independently, is it possible to assert that without these observations, the results of the analysis does not change significantly.

5.3.3 Share repurchase and dividend police impact for different schemes

The aim of this analysis is to find out if there is a significant difference in the number of shares repurchased between Swedish companies who have ESOP and those who do not; and if there is any kind of influence depending on the type of stock option outstanding (H_3). For that purpose the original sample has been divided in two different groups, those observations with and those without outstanding stock options. At the same time, the sample of companies with outstanding options has been divided in four different groups depending on the type of stock

options they are outstanding (call options, employee options, warrants and convertible bonds).

In order to separate the diverse companies depending on the different types of options they held, those cross-sectional observations with more than one type of outstanding stock option appear as different data in more than one group. This should not suppose an interference since the aim of the test is to compare the data of the different groups with the observations of the companies without stock options among their managerial group. Thus, there will not be any observation repeated on both samples at the time of running the comparison tests.

As in others analysis, those observations without share repurchases have not been included for testing the amount repurchased per year and the percentage of shares repurchased respect the total amount of shares. Likewise there have not been included those years without dividend distribution to calculate the estimated value of this and the ratio "dividend divided by the End-year share price". The different observations on the "Tables 11 and 12" have been compiled depending on the treatment made by their annual report for each case.

SHARE REPURCHASES	No. of obs	With repurch	Ratio repurch	Mean Repurch	STD Repurch
Call Options	69	31	44.93%	2.89%	3.16%
Employee options	27	15	55.56%	2.30%	2.77%
Warrants	43	14	32.56%	1.81%	2.36%
Subscription rights	8	4	50.00%	0.54%	0.71%
Convertible bonds	24	10	41.67%	2.38%	3.03%
Without stock options	144	66	46,98%	2,82%	4,58%

Table 11: **General information from Swedish companies that repurchased shares depending on the type of outstanding options.**

Content: **No. Of obs:** Number of observations of the sample. **With repurch:** Number of observations on the sample that repurchased shares. **Ratio repurch:** percentage of companies in the sample that repurchased shares. **Mean Repurch:** mean of the ratio "repurchases/Total number of shares". **STD Repurch:** Standard deviation of the ratio "repurchases/Total number of shares".

NOTE: The left column indicates the type of stock options the managerial group held for each sample.

DIVIDEND DISTRIBUTION	No. of obs	With dividend	Ratio dividend	Mean dividend	STD dividend
Call Options	69	56	81.16%	5.24%	4.68%
Employee options	27	24	88.89%	4.14%	3.43%
Warrants	43	28	67.44%	5.81%	8.94%
Subscription rights	8	5	62.50%	3.44%	2.02%
Convertible bonds	24	16	66.67%	4.57%	3.44%
Without stock options	144	112	77.85%	5.72%	4.80%

Table 11: **General information from Swedish companies that distributed dividend depending on the type of outstanding options.**

Content: **No. Of obs:** Number of observations of the sample. **With dividend:** Number of observations on the sample that distributed dividend. **Ratio dividend:** percentage of companies in the sample that distributed dividend. **Mean dividend:** mean of the dividend yield. **STD dividend:** Standard deviation of the dividend yield.



NOTE: The left column indicates the type of stock options the managerial group held for each sample.

From the results found for the samples with different stock options, there are two cases where the number of observations is enough to run a t-test with precision. Those cases are the number of observations for companies with call options that did share repurchases and the same with dividend distribution. Although the sample with warrants and employee options that distributed dividends are not bigger than 30 (there are 28 and 24 observations), this data was also analysed in order to have a reference to decide the evaluation of bigger samples.²⁵

Two-tailed t-test for diverse samples.

Three different t-tests have been run to establish if there is significant difference between the next samples²⁰:

1. Companies with outstanding call options that repurchased shares against companies without outstanding stock options that repurchased shares.
2. Companies with outstanding call options that distributed dividend against companies without outstanding stock options that distributed dividend.
3. Companies with outstanding warrants that distributed dividend against companies without outstanding stock options that distributed dividend.
4. Companies with outstanding employee options that distributed dividend against companies without outstanding stock options that distributed dividend.

For all those test the null hypothesis is the same, $H_0: \mu_1 - \mu_2 = 0$, where μ_1 is the mean for those companies without outstanding options and μ_2 for those with. In order to improve the reliance of those tests, the natural logarithm has been applied to all the parameters to resemble the sample distribution to the normal distribution.

To test the ratio “repurchases divided by the total number of shares” between companies with outstanding call options and those without any type of stock options, the t-test has been run. For a significance level of 5% ($\alpha=0.05$) in a two-tailed test and with 49 degrees of freedom a critical t-value that is near to 2.01 is found.

²⁵ The simple is considered small if there are less than 30 observations. If the sample is small and the distribution is non-normal, there is no reliable statistical test.



Ratio "Repurchases/Total number of shares"	N. of observations	Mean	St. Deviation	SE. Mean
LN(Companies without outstanding options)	66	-4.29	1.47	0.18
LN(Companies with outstanding call options)	31	-4.46	1.8	0.32
RESULTS				
t-Value	0.46			
p-Value	0.647			
Degrees of freedom	49			

Table 13: **Sample information and t-test results of the ratio "Repurchases/Total number of shares"**

Content: **N. of observations:** Number of observations in each sample. **Mean:** mean of the observations. **St.Deviation:** Standard deviation of the observations. **SE Mean:** Mean of the Standard Error. **t-Value:** indicates the score obtained from the test. **p-Value:** indicates the significance level needed to refuse the hypothesis. **Degrees of freedom:** indicator of the test accuracy.

NOTE: The mean for both samples is less than zero, due to the fact that for numbers between 0 and 1 the logarithm function results into negative values.

The decision rule can be stated as a rejection of H_0 if t-value is outside the range 0 ± 2.01 for a significance level of 5%. Then, the null hypothesis is not rejected since the t-value for the two-sample test is 0.46. Thus, a significant difference between the diverse dividend policies between those companies with outstanding call options and those without any type of option cannot be confirmed.

Also, to test the ratio "Dividend previous-year divided by the Share price" between companies with outstanding warrants and those without any type of stock options, the same t-test has been run. Then, for a significance level of 5% ($\alpha=0.05$) in a two-tailed test and with 117 degrees of freedom the critical t-value that is near to 1.98 is found. The results of the test are shown:

Ratio "Dividend previous-year/Share price"	N. of observations	Mean	St. Deviation	SE. Mean
LN(Companies without outstanding options)	112	-3,134	0.779	0.074
LN(Companies with outstanding call options)	55	-3,206	0.707	0.095
RESULTS				
t-Value	0.6			
p-Value	0.552			
Degrees of freedom	117			

Table 14: **Sample information and t-test results of the ratio "Dividend previous-year/Share price"**

Content: **N. of observations:** Number of observations in each sample. **Mean:** mean of the observations. **St.Deviation:** Standard deviation of the observations. **SE Mean:** Mean of the Standard Error. **t-Value:** indicates the score obtained from the test. **p-Value:** indicates the significance level needed to refuse the hypothesis. **Degrees of freedom:** indicator of the test accuracy.

NOTE: The mean for both samples is negative due to the fact that, for numbers between 0 and 1, the logarithm function results into negative value.

This time, the rejection of H_0 will take place if the t-value is outside the range 0 ± 1.98 for a significance level of 5%. Then, the null hypothesis is not rejected since the t-value for the two-sample test is 0.6. Thus, a significant difference between the diverse dividend policies between

those companies with outstanding warrants and those without any kind of stock option cannot be confirmed.

Another two t-tests have been run for analysing if there is any difference between the ratio “dividend previous-year divided by the Share price” for companies with outstanding warrants and employee options; and those without any stock option. In this case, the number of observations for the companies with outstanding warrants and employee options is not big enough to establish a clear relation, but the result of the test can be considered as an indicator for future analysis.

Ratio “Dividend previous-year/Share price”	N. of observations	Mean	St. Deviation	SE. Mean
LN(Companies without outstanding options)	112	-3,134	0.779	0.074
LN(Companies with outstanding employee options)	24	-3,464	0.781	0.16
RESULTS				
t-Value	1.88			
p-Value	0.069			
Degrees of freedom	33			

Table 15: **Sample information and t-test results of the ratio “Dividend previous-year/Share price” for different types of ESOP.**

Content: **N. of observations:** Number of observations in each sample. **Mean:** mean of the observations. **St.Deviation:** Standard deviation of the observations. **SE Mean:** Mean of the Standard Error. **t-Value:** indicates the score obtained from the test. **p-Value:** indicates the significance level needed to refuse the hypothesis. **Degrees of freedom:** indicator of the test accuracy.

NOTE: The mean for both samples is less than zero, due to the fact that for numbers between 0 and 1 the logarithm function results into negative values.

Ratio “Dividend previous-year/Share price”	N. of observations	Mean	St. Deviation	SE. Mean
LN(Companies without outstanding options)	112	-3,134	0.779	0.074
LN(Companies with outstanding warrants)	28	-3,463	0.854	0.16
RESULTS				
t-Value	1.86			
p-Value	0.071			
Degrees of freedom	39			

Table 16: **Sample information and t-test results of the ratio “Dividend previous-year/Share price” for different types of ESOP.**

Content: **N. of observations:** Number of observations in each sample. **Mean:** mean of the observations. **St.Deviation:** Standard deviation of the observations. **SE Mean:** Mean of the Standard Error. **t-Value:** indicates the score obtained from the test. **p-Value:** indicates the significance level needed to refuse the hypothesis. **Degrees of freedom:** indicator of the test accuracy.

NOTE: The mean for both samples is less than zero, due to the fact that for numbers between 0 and 1 the logarithm function results into negative values.

With 39 and 33 degrees of freedom, and for a significance level of 5% ($\alpha=0.05$) in a two-tailed test, the critical t-value that is near to 2.02 was found.



The decision rule can be stated as a rejection of both H_0 if t-values are outside the range 0 ± 2.02 for a significance level of 5%. Then, the null hypotheses are not rejected since the t-values for the two-sample test are 1.86 and 1.88. Although a significant difference between the diverse dividend policies between those companies with outstanding warrants and employee options; and those without stock options for this significance level cannot be confirmed, the t-values are big enough to reject both null hypotheses for a significance level of 10%, in which case, the critical t-value would be approximately 1.68.



6. CONCLUSIONS

In the literature, many significant reasons were found for managers to act in their personal interest when they had to establish how many company's shares repurchase or the amount of dividend to distribute among the shareholders [15][17]. Research previously made highlighted companies with outstanding Employee Stock Option programs to be more sensible to this kind of behaviours from part of the managerial group since these parameters were directly affecting their personal wealth.

The share repurchase as a method to improve share's price was stated, and a significant difference between companies with and without options due to the face of the option exercise was also assumed. The analysis of the data compiled indicates that there is no difference in the treatment of repurchases between those companies in which managers held stock options as a result of an ESOP and those that did not (H_1 and H_2). The t-test ran in order to compare the two population samples indicates a non-rejection of the null hypothesis that stated the two samples means to be equal. This means that statistically, a significant difference between the number of shares repurchased in companies with and those without outstanding stock options among their managerial group cannot be confirmed.

As a result of this and in order to establish if there was any difference on the annual amount expended in share repurchases between both samples, another t-test has been run. As an estimator of the amount expended in repurchases, the coefficient "number of shares repurchased multiplied by end-year price of the share" has been used due to the lack of a better price average for the share buybacks. For this test, the result was again a non-rejection of the hypothesis that stated the two means to be equal. So, although being the annual value of the shares repurchased a 44% higher for companies with outstanding stock options, there is no statistical difference in the estimated value of share repurchases between both samples due to the wide standard deviation.

The dividend distribution was also highlighted to be an important item to control dishonest behaviours by the managerial group since the share price falls with the dividend amount just after the distribution. The analysis assures that there is not a significant difference in dividend yields between those companies with and without outstanding options among their managers (H_4). Another test ran is the analysis of the amount distributed through the dividend as a possible indicator of managers acting in favour of their own interests. From this test it was



concluded that there are not significant differences in the amount of dividend distributed between those companies with and those without outstanding options.

An interesting fact was also found when analysing whether or not the dividend yield was affected by the estimated number of outstanding options, and a soft negative relation between those two parameters in a regression test was found (H_5). Although the results pointed a coefficient of determination (R^2) equal to 17.2%, this value is not enough to assert that there is an influence of the value of options in the dividend distributed, since the value could be result of a data-mining bias.

From the t-test made to the sample result of the division of the observations in different groups depending on the type of stock options they held, there was no evidence found that stock options affect the repurchase and dividend policies for a significance level of 5% (H_3). Despite this fact, significant differences between companies without options and those with warrants and employee options for a significance level of 8% were found. Since this data compilation did not have enough observations to assert that the test was accurate, it is suggested that those particular cases could be studied independently.

In trying to find a reasonable explanation to these results, it is important to bear in mind the economic environment during the period the data came from. From the beginning of 2006 until the end of 2009 the OMX Nordic 40 index fell around 19%, losing nearly 60% of its value between October of 2007 and March of 2009. In accordance with this, the lack of significant results obtained may be due to the adverse economic environment of the time, with most stock options experiencing a complete loss of value. Due to this, companies did not have to face the exercise of most of the stock options granting outstanding shares.

On the other hand, the results of the analysis could also be interpreted as a result of a well functioning stock market in Sweden as well as a successful implementation of the different legislations by the governing bodies in accordance with this topic.

In conclusion, keeping apart the economic situation during the period the sample comes from and the diverse speculations, it seems logical to assert that managers have not been able to influence the level of repurchases and dividend distribution.



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- [23] **“European Commission: Enterprise and Industry” Webpage,** “Employee Stock Option: The Legal and Administrative Environment for Employee Stock Options in the EU”, report provided by a European Expert Group.
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- [24] **“Nasdaq OMX” Webpage:** Repurchases of own shares.
<http://nordic.nasdaqomxtrader.com/newsstatistics/corporateactions/Stockholm/Repurchases_of_own_shares/ > (Oct. 2010)
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< <http://finance.yahoo.com/q?s=^OMXN40> > (Nov. 2010)



- [26] **“Physics department (CSB/SJU)” Webpage: Kolmogorov-Smirnov Test**
< <http://www.physics.csbsju.edu/stats/KS-test.html> > (Dec. 2010)

8. ATTACHMENTS

8.1 Attachment N1: data sample collected

ITEM	DEFINITION
Company	Company name
Date	Date of the last day accounted on the annual report
End-year share price	Share price at the end of the year
Total number of shares	Total number of shares registered on the market. Includes all kind of shares the company had at the end of the year (Type A, B and C depending on the company).
Repurchases	Number of shares repurchased during the year. Does not include any type of redemption or share cancelation. For those companies with different types of shares, the sum of them is accounted.
Sale of own shares	Number of shares sold to the market during the year. Does not include any kind of redemption or share cancelation
Dividend previous year	Dividend granted on the previous year
Type of scheme	Type of options granted to the managers on the ESOP
No. Of options	Number of options issued by the company during these year
Issued at	The date on which the option is issued
Date of first ex.	Vesting date, date since the options can be exercised
Maturity date	Last day that the options can be exercised
Exercise price	Price of the stock options at the moment of exercise
CEO pay (SEK)	CEO salary. Includes fixed salary and a variable salary. Does not include other benefits as long term compensation plans, benefits proceeding from redemption of variable compensation plans or any kind of benefit from pension plans. Also does not include any company's cost
CEO holding of shares	Number of shares owned by the CEO directly and indirectly
Number managers	Number of managerial members including the CEO or President.
Management & CEO shares	Number of shares owned by management, The number of shares include CEO's shares accounted also in the column "CEO holding of shares"
No. Call options	Number of call options owned by the managerial group
No. Employee/Personnel options	Number of employee options owned by the managerial group. Also called personnel options.
No. Warrants	Number of warrants owned by the managerial group
Synthetic options	Number of synthetic options owned by the managerial group
Convertibles	Number of convertible bonds owned by the managerial group
Performance shares	Number of performance shares owned by the managerial group as a result of a Performance Share program
Put options	Number of put options owned by the managerial group
Name of Chairman	Name of Chairman
Chair pay (SEK)	Chairman salary. Includes the fees from being chairman of the board of directors. Does not include other benefits as long term compensation plans, benefits proceeding from redemption of variable compensation plans or any kind of benefit from pension plans. Also does not include any company cost
Chair h. shares	Number of shares owned by the Chairman directly and indirectly

Table 17: Data collected for the sample



8.2 Attachment N2: data obtained from the sample

ITEM	DEFINITION
Ratio Repurchases/Shares	Ratio (Last year repurchases / Total number of shares) (%)
Total Repurchases value	Estimation of the value of the shares repurchased as Repurchases x Share's Price
Total option's value	Total granted option's value (Share price x Number of options)
Dividend yield	Dividend yield the year before repurchases
Total value of dividend	Estimation of the total dividend value (Dividend previous year multiplied by total number of shares)
Ratio OPT/Shares	Ratio (options delivered / Total number of shares) (%)
Total option granted value	Total value of the options granted during that year.
Management Shares	Number of shares owned by managers. The number of shares does not include CEO's shares.
A Management & CEO shares	Average number of shares owned by each management member, The number of shares include CEO's shares accounted also in the column "CEO holding of shares". (Management & CEO shares / number of managerial members)
A Management shares	Average number of shares owned by each management member. The number of shares does not include CEO's shares. (Management shares / Number of managerial members)
Ratio CEO/Shares	Ratio (shares owned by CEO / Total number of shares) (%)
Ratio Manag Shares/Shares	Ratio (shares owned by managers / Total number of shares) (%)
Ratio AMCS / Shares	Ratio (A Management & CEO shares / Total no. of shares) (%)
Ratio AMS / Shares	Ratio (A Management shares / Total no. of shares) (%)
No. Of outstanding options	Number of stock options owned by the management group. Represents the sum of the number of call options, employee options, warrants and convertible bonds
Total Managerial option value	Estimation of the value of the option owned by the managerial group (No. Of outstanding options x End-year price of shares)
Ratio Total Options / Total shares	Ratio (Options owned by managers / Total number of shares) (%)

Table 18: Data obtained from the data collected



8.3 Attachment N3: share repurchases, evolution (2001-2009)

End Year	N. of firms	N. of shares repurchased	N. SR %Increase	Estimated Value of SR	EV %Increase	OMX Nordic 40	Index %Increase
2001	44	196,784,570	-	21,007,870,499 SEK	-	1,000	-
2002	37	130,096,354	-33.89%	7,935,049,936 SEK	-62.23%	605	-39.54%
2003	35	169,172,324	30.04%	9,857,106,043 SEK	24.22%	715	18.25%
2004	26	270,749,010	60.04%	24,900,067,934 SEK	152.61%	802	12.17%
2005	15	262,100,745	-3.19%	28,897,533,028 SEK	16.05%	1,019	27.09%
2006	22	200,844,932	-23.37%	22,655,283,908 SEK	-21.60%	1,208	18.56%
2007	49	422,306,109	110.26%	17,023,669,710 SEK	-24.86%	1,265	4.67%
2008	58	256,967,648	-39.15%	9,161,882,954 SEK	-46.18%	626	-50.52%
2009	21	48,255,269	-81.22%	3,705,882,062 SEK	-59.55%	829	32.54%

Table 1: Evolution of the Share Repurchases on Swedish Companies from the OMX Swedish Market.

Content: **N. of firms.** Total number of firms that did share repurchases. **N. of Shares Repurchased.** Total number of shares repurchased. **N. SR %Increase.**

Increase of the number of shares repurchased. **Estimated Value of SR.** Estimated value of share repurchases. **EV %Increase.** Increase on the estimated value of repurchases. **OMX Nordic 40.** Index value at the end of the year. **Index %Increase.** Increase on the value of the OMX Nordic 40 Index.

(*) The estimation is obtained from an extrapolation of the available data, since part (14.7% of the sample) the repurchase's operations accounted on Nasdaq's webpage have no info about the repurchase's price [24].

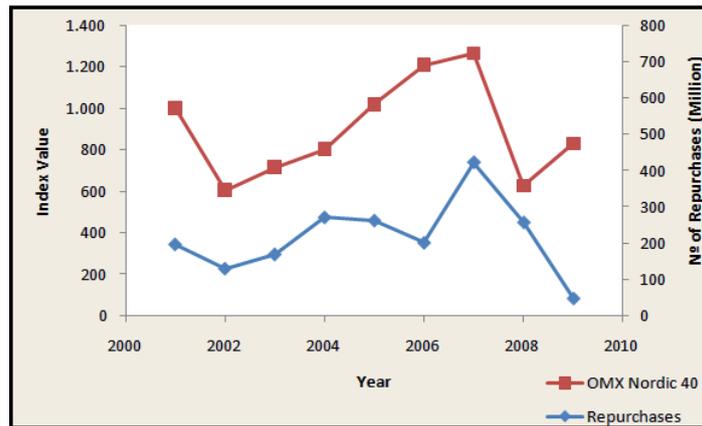


Figure 2: Time Plot: Number of shares repurchased and OMX Nordic 40 Index

Comparison of the number of shares repurchased on the OMX Swedish market and the price of the OMX Nordic 40 Index at the end of the year during the period 2000-2010.

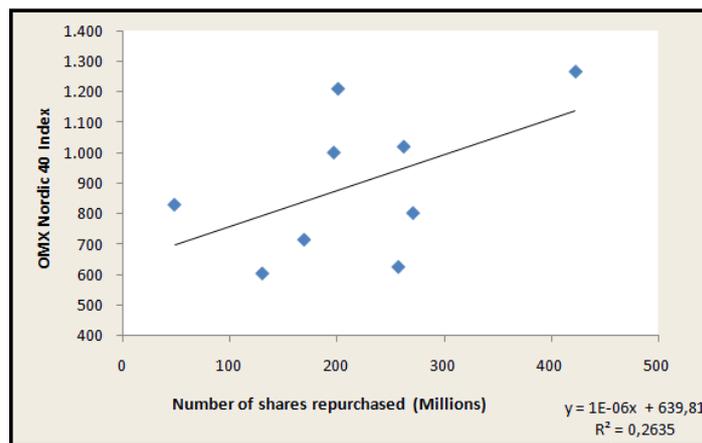


Figure 3: Scatterplot: OMX Nordic 40 Index and the Number of shares repurchased

Scatterplot and regression line between the OMX Nordic 40 Index and the number of shares repurchased. Also includes the line equation and the “coefficient of determination (R^2)”.

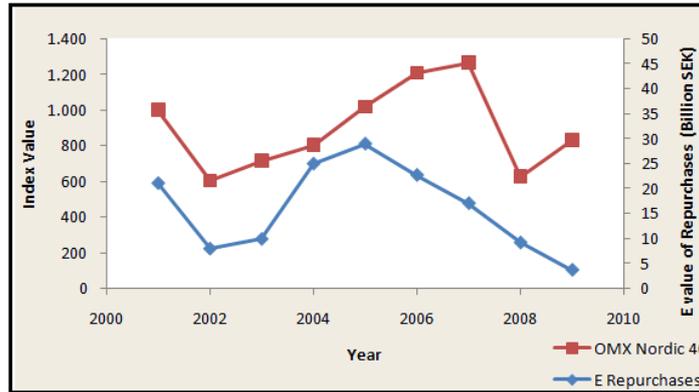


Figure 4: Time Plot: Estimated value of repurchases and OMX Nordic 40 Index

Comparison of the estimation* of shares repurchased on the OMX Swedish market and the price of the OMX Nordic 40 Index at the end of the year during the period 2000-2010.

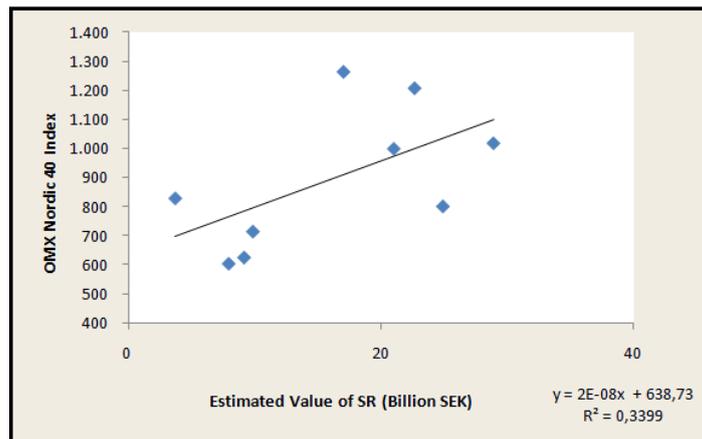


Figure 5: Scatterplot: Estimated value of the shares repurchased and OMX Nordic 40 Index

Scatterplot and regression line between the OMX Nordic 40 Index and the estimated value of the shares repurchased. Also includes the line equation and the “coefficient of determination (R^2)”.

8.4 Attachment N4: ESOP magnitude and ratio repurchases

The next figures have been obtained from the regression analysis: the Scatterplot shows the distribution of the different cross-sectional observations, the graphic Residual vs. Fits shows the distribution of the observation's residue and the Provability Plot compares the ideal normal distribution of the observations with the real distribution.²⁰

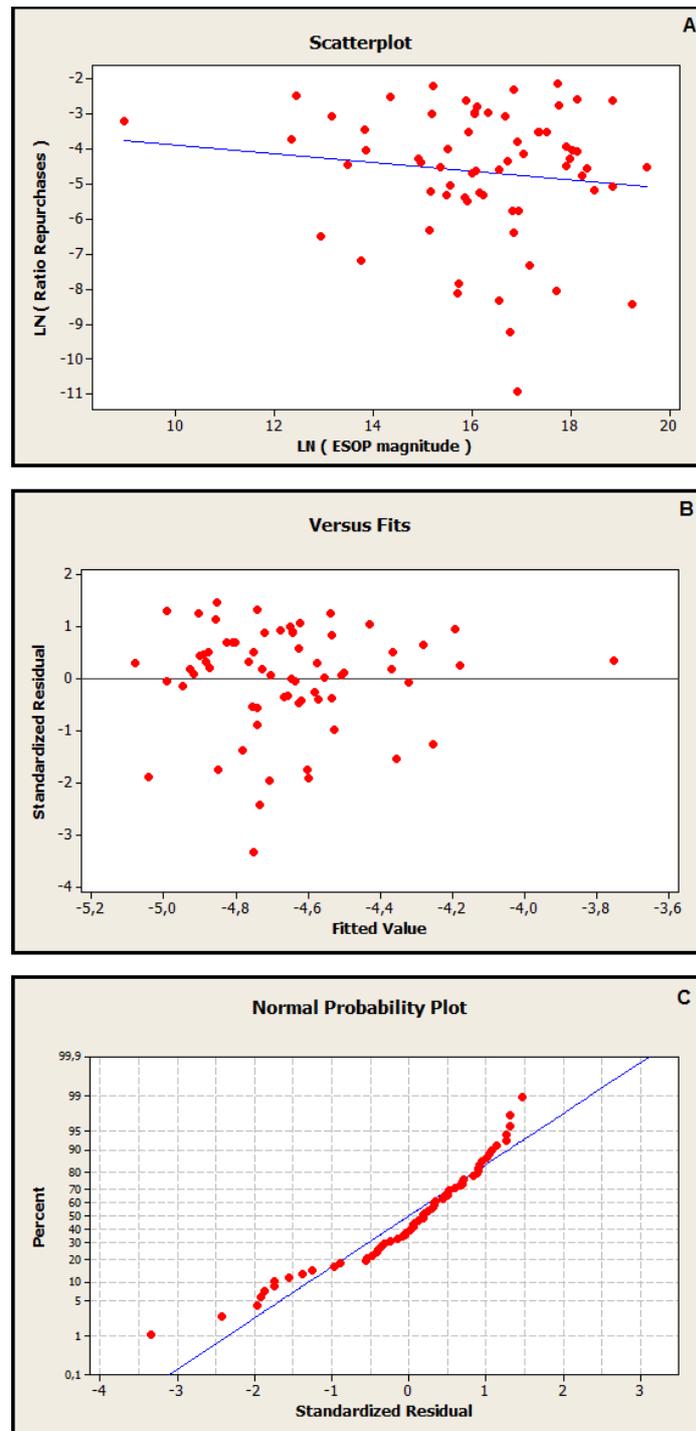


Figure 6 (A,B,C): Regression analysis: Ratio repurchases vs. ESOP magnitude.

8.5 Attachment N5: ESOP magnitude and dividend yield

The next figures have been obtained from the regression analysis: (A) the Scatterplot shows the distribution of the different cross-sectional observations, (B) the graphic Residual vs. Fits shows the distribution of the observation's residue and (C) the Provability Plot compares the ideal normal distribution of the observations with the real distribution.²⁰

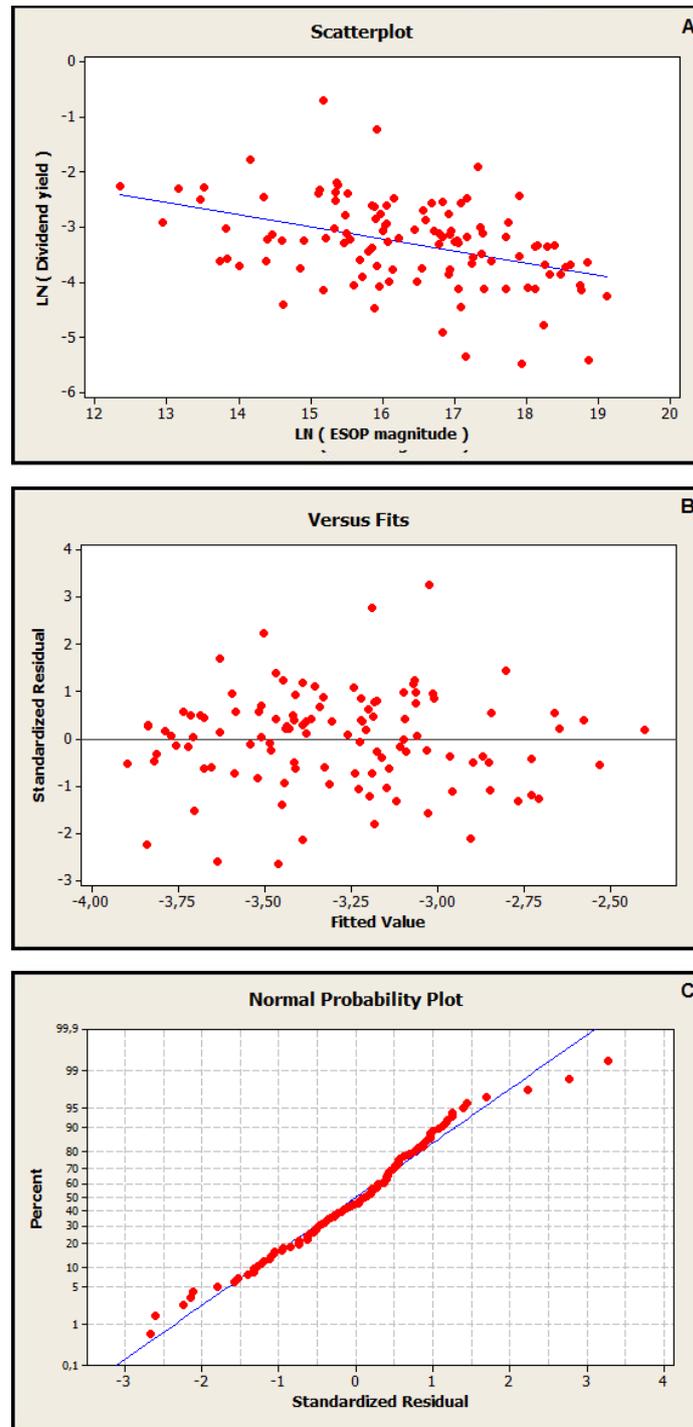


Figure 7 (A,B,C): Regression analysis: Dividend yield vs. ESOP magnitude.