



UNIVERSITY OF GOTHENBURG  
SCHOOL OF BUSINESS, ECONOMICS AND LAW

## **Determinants of Share-Based Compensation**

Evidence from companies listed at the Stockholm Stock Exchange

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## ABSTRACT

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**Master thesis within Business Administration, in Accounting, School of Business, Economics and Law at the University of Gothenburg, spring 2010.**

**Title:** Determinants of Share-Based Compensation: *Evidence from companies listed at the Stockholm Stock Exchange*

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**Background and problem:** The role of Share-based compensation (SBC) has been discussed frequently. While there are many studies that consider positive role of SBC for alignment of agent and principal interests, many other authors believe in an opportunity for earnings management and misuse financial statements. However, the role of SBC may also be related to the determinants of the application of these plans. Studying the determinants of SBC provides relevant information to, mainly, owners and management about the circumstances which use of SBC, brings efficiency to the firm. This, in fact, is often missing in the recent debates.

**Purpose:** The present study investigates how firm's characteristics are related with the use of SBC for firms listed at Stockholm Stock Exchange. By observing the relations and consequently finding out the determinants of SBC, we are able to assess the role of SBC.

**Delimitations:** The delimitations of this thesis concern the application of SBC for listed companies at Stockholm Stock Exchange for the years 2007 to 2008 which apply IFRS 2. Furthermore, it is out of the scope of this thesis to investigate the relation of firm's characteristics other than those studied in this thesis and the effect of SBC on the performance of these firms.

**Method:** Quantitative approach was conducted with statistical correlation and regression analysis in order to understand the variables relation and finding out how firms' characteristics are related to SBC use.

**Conclusion:** The statistical results indicate that the use of SBC differs between companies with different particularities. From the analyzed characteristics, intangible assets ratio, company size, and ownership structure are discovered to be the determinants of SBC as they present significant relation with SBC use. The reasoning for such correlation is grounded on the agency theory and pay-performance relation, where SBC as an efficient incentive method is strongly linked to entities with different characteristics.

**Suggestions for further research:** As a longitudinal research, this study provides the opportunity to apply the same kind of study in different periods of time. It would be interesting to investigate the determinants of SBC for a longer span period of time, since not only it is possible to analyze the historical development of firms' characteristics, but also the effect of financial crisis can be observed. Another suggestion is to observe the same research question separately for selective and broad-based scheme in order to have more comprehensive conclusion regarding the objective of SBC.

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**Keywords:** Share-based compensation, determinants, use, and firms' characteristics.

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## Abbreviations

<b>CEO</b>	Chief Executive Officer
<b>EDA</b>	Exploratory Data Analysis
<b>ESOPs</b>	Employee stock ownership plans
<b>ESPs</b>	Employee stock option plans
<b>ESPPs</b>	Employee stock purchase plans
<b>EU</b>	European Union
<b>FASB</b>	Financial accounting standards board
<b>FV</b>	Fair Value
<b>GICS</b>	Global Industry classification standard
<b>IASB</b>	International Accounting Standards Board
<b>IFRS 2</b>	International Financial Reporting Standards
<b>Large cap</b>	NASDAQ OMX Stockholm Stock exchange Large Cap
<b>Mid cap</b>	NASDAQ OMX Stockholm Stock exchange Mid Cap
<b>NASDAQ</b>	National Association of Securities Dealers of Automated Quotations
<b>NGM Equity</b>	Nordic growth companies
<b>ROE</b>	Return on Equity
<b>SBC</b>	Share-based compensation
<b>SFAS 123</b>	Statement of Financial Accounting Standards 123
<b>Small cap</b>	NASDAQ OMX Stockholm Stock exchange Small Cap
<b>SPSS</b>	Statistical Package for the Social Sciences
<b>USA</b>	United States of America

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# 1. INTRODUCTION

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*In the study's first chapter we start with the background of share-based compensation, with the intention of highlighting the subject's environmental issues and importance. Thereafter, the research problem and its contribution are presented and followed by its research question. We conclude by describing the purpose of this research and its limitations.*

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## 1.1 Background

Share-based compensation (SBC) issued by IASB is regulated by IFRS 2. This standard addresses payments and compensation plans which have been more and more accepted and adopted. According to Alexander et al. (2007, p. 488) “bonus and profit sharing plans have for a long time been the only widely used instrument to increase compensation for executives and employees”. However, from the beginning of 1990s stock based compensation, or more broadly share-based payments, became very popular. There has been, since then, an increased attention and use of SBC.

In parallel to this increased used of SBC, the recent economic world has also been developing its concerns. Collapses, scandals and economic problems require attention to their drivers. Experts seem to be contradictory in explaining and giving solutions to financial problems. Additionally, increased competition adds special concern and is considered a problematic issue. It is a must for firms to find alternative solutions in order to increase performance and be efficient. All these problems appear to have some relation with the much discussed area of compensation or rewarding plans and by which our research is based on. SBC is, thus, this discussed area whereby economists, academic authors and media have turned their focus to.

Besides, it has been pointed out in the literature that SBC is a hot issue concerning these mentioned problems. That is due to an ambiguous controversy which tries to explain the role of SBC. While there are many studies that consider the positive role of SBC for bringing the values of management and shareholders closer and aligned to each other, many authors believe that these plans provide management an opportunity for earning management and misusing financial statements. In other words, compensation plans can be seen as a foremost innovation in managerial compensation, a crucial tool for retention and satisfaction of key employees or as a chance for manipulation and self-interest behavior.

SBC seems to present a paradox in terms of giving contribution to firms. Its use may relate to some firm's characteristics and it may represent important and relevant information to owners and management. The “negative side” regarding the use of SBC related to an opportunistic behavior may be replaced once potential users of this incentive remuneration plan are aware of the benefits of its use when appropriated. That is the reason why studying the determinants of SBC use plays a significant role.

## 1.2 Problem discussion

SBC has been in the spotlight in recent decades and there are different arguments about the role of this kind of plan. Providing the increased attention and use of SBC, the focus on this subject brings significant interest. As already stressed, the literature concerning SBC is made by the discussion regarding the role and motivation for the use and effects of SBC. However, not much focus has been made on the determinants of SBC, especially when it comes to knowing about companies' characteristics influence on implementation of such plans. Also, prior studies have been unable to reach an agreement on the determinants of CEO compensation. The importance of looking at the determinants is that it shows the users including owners and managers a way in which SBC is used as an efficient tool for motivation and monitoring.

Thus, despite numerous studies on employee ownership plans in companies, there is relatively less research exploring the determinants of these kinds of incentive plans. However, it is interesting to investigate how companies' characteristics are associated to the mentioned incentive plan. Connecting the SBC use with companies' characteristics and finding certain patterns of determinants for its application, provides relevant information regarding what kind of companies' characteristics is a predictor for the use of SBC as an efficient tool. Thus, understanding the determinants bring advantages for the users as it helps them to know in which way the use of SBC can be a good alternative for other remuneration plans. Moreover, a lack of enough research regarding factors predicting the use and maintenance of these plans and also the lack of consistent findings among current conducted studies shows that there is a need for more investigation in the SBC area.

Therefore, we found due to this lack of knowledge and inconsistency of the results there is a need for further exploration of the above mentioned problem. In summary, in this paper, we observe determinants of using share-based programs. Our research covers share-based transactions where equity instruments are transferred by its shareholders to parties that have supplied services, most specifically, its employees in a broad-based incentive plan and executives in a selective scheme.

## 1.3 Research question

Based on the previous background and problem discussion we raised the following research question.

- *How are companies' characteristics<sup>1</sup> associated with the use of share-based compensation?*

## 1.4 Purpose

The purpose of our research is to look at Stockholm Stock Exchange (OMX) market, examining specific characteristics of the listed companies. Yet further, it is intended to observe how firms' characteristics are related to SBC use. Besides this, finding the relation between companies and their particularities associated with SBC application provides us with

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<sup>1</sup> Firm's characteristics in this study include: industry sectors, ownership structure, size, human capital intensity, total debt, and previous share return performance.

information about SBC objective. In a nutshell, this study is intended to present evidence indicating the determinants of the use of SBC at this market. Our data considers all publicly traded firms in Sweden, a sample of 286 companies and this data spans the years 2007 to 2008.

## **1.5 Delimitation**

This thesis delimitation concerns the application of the study for listed companies at the Stockholm Stock Exchange only for the years 2007 to 2008 which apply IFRS 2. Furthermore, the current study is limited to investigate the relation of some of the firms' characteristics with use of SBC. Finally, it is outside the scope of this thesis to investigate the effects brought to the performance of these companies from the use of the focused plan.

## **1.6 Study disposition**

<b><i>Introduction</i></b>	Chapter 1 begins with the background by which SBC is inserted on to highlighting its issues and importance. The problem, contribution and purpose of this study are presented and the delimitations discussed.
<b><i>Theoretical Framework</i></b>	Chapter 2 provides the concepts and theories to enable the reader to get knowledge of what SBC is. This is through presenting its emergence, development and classifications. Previous research is also mentioned in this chapter. The objective of the framework is to provide basis to the analysis and to support our findings.
<b><i>Methodology</i></b>	Chapter 3 is intended to present the methodology used in our research and provide a presentation of the research strategy. It shows the study's statistical methods and how the collection of data was completed.
<b><i>Findings</i></b>	Chapter 4 provides the findings from preliminary analysis concerning our research question and discussion of our collected data.
<b><i>Analysis</i></b>	Chapter 5 is built upon reasoning and analysis of the hand collected data through statistical analysis to ensure objectivity and reliability results.
<b><i>Conclusions</i></b>	Chapter 6 answers the paper's purpose and research question based on the statistical results, the findings made, and the analysis. Lastly, implications and suggestions for further research are presented.

## **2. THEORETICAL FRAMEWORK**

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*In this chapter the concepts and theories are presented to enable the reader to get knowledge of what SBC is. This is through presenting its emergence, development and classifications. Previous research is also mentioned in this chapter. The objective of the framework is to provide basis to the analysis and to support our findings.*

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### **2.1 Share-based compensation**

The section 2.1 is devoted to look back over a historical development of IFRS 2 made by an overview of the emergence of equity compensation. It also gives an insight of what SBC is and its different categories according to IFRS 2. Since our study covers an investigation of the determinants of SBC, it is worthwhile looking at the standard which governs this kind of transaction, its development and concepts.

#### ***2.1.1 Development of Share-based compensation plan***

The emergence of share options is dated to the 1920s when it highlighted a change in ownership of the company. Due to an increasing number of private investors that became interested in the Stock Exchange and in yield investments, the separation of ownership and control of the companies started. Some decades later the use of share options as a component of employee payment emerged. One of the major reasons for this event is linked by many authors to the reduction in the USA of taxes on the sale of shares in the 1950s. This event brought to light an awareness of the potential use of share options as a component of employee payment.

Since many organizations consider people as important resource, employers or management started to believe that to keep employees motivated and to increase a firm's performance, a benefit package is well worth it. One way to do that is through the use of share-based incentive programs which have increased since the 1980's. And according to Blasi et al. (1996, p. 60), "employee ownership received substantial attention in Western economies in the 1970s and 1980s". These share-based programs were used, to encourage the employees to actively participate in increasing the company's results. By the 1990s the use of share options as a component of employee payment was widespread. Then, in the late 1990s, corporate regulators began to issue warnings about the potential overstatement of firms' earnings due to the non-recognition of share options.

Only at the beginning of 1990s, the U.S. FASB drafted a new standard imposing that the stock options should be expensed (SFAS 123, Accounting for SBC). This draft was not welcome and, in fact, brought many protests before its publication. However, in the beginning of 2000s, the notorious scandals associated with remuneration of CEOs, such as the case Enron Corporation and World.com, to name a few, provided a need for regulation and expensing of share-based payments came into force. That is the origin of IFRS 2 which was the result of the recent environmental happenings and which called for a standard issue in 2004. IASB wanted

to solve the recognition and valuation of the equity benefit compensation schemes, Alexander et al. (2007, p. 489). The IASB, then, presented the IFRS 2 standard which governs that equity compensation should be expensed and disclosed as according to paragraphs 44 to 52.

### ***2.1.2 Introduction to IFRS 2***

Share-based payment issued by IFRS 2 was issued in the beginning of 2004 and from 1<sup>st</sup> of January of 2005, the new accounting regulation of IFRS 2 regarding share-based payments was implemented. The scope of IFRS 2 includes not just share-based transactions with employees or top management<sup>2</sup>. With IFRS 2 issued by IASB the recognition and measurement of these equity based remuneration transactions is on a balance sheet. It is demanded that all companies listed on a stock exchange in the European Union (EU) account for the share-based payments and expenses in the income statement. Before this implementation, these payments only had to be described in notes as a disclosed form.

### ***2.1.3 Different categories of Share-based compensation plan***

In the book written by Alexander et al (2008, p. 489-490), there is a good explanation about IFRS2. This book also addresses practical explanations such as if a company uses existing shares for equity SBC, then the company has to buy existing shares from shareholders or issue extra shares. According to this book, there are three types of share-based payment transaction. One is defined as equity settled share-based payment transactions (IFRS 2, P. 10-29) in which an entity receives goods or services in exchange for equity instruments. For example an entity acquires equipment from a manufacturer and uses shares as consideration or an executive receives part of its remuneration shares. The second is named cash settled share-based payment transactions (IFRS 2 P. 30-33), which is based on the price of the entity's shares, and the last is share-based payment transaction with cash alternatives (IFRS 2, P. 34-43).

*Equity settled SBC:* In this category of SBC plan share, share options and other equity instruments are transferred to directors, senior executives and other employees. There are different types of share options including, call options, subscription options, synthetic options, and convertibles. An example brought by Alexander et al. (2008) is used to illustrate this kind of transaction and this is when top executives or/and employees receive as part of remuneration, shares, options or other equity instruments. This can be received through different kind of compensation plans including, employee stock option plans (ESPs), and employee stock purchase plans (ESPPs), restricted stock plans, and employee stock ownership plans (ESOPs).

*Cash-settle shared-based payment transaction:* In this transaction the entity shall measure the services acquired and the liability incurred at the fair value (FV) of the liability. The amount will depend on the future market price of the equity instruments as part of a remuneration plan. Until liability is settled the entity shall measure the FV of the liability at each reporting

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<sup>2</sup> This study covers share-based transaction where equity instruments are transferred by its shareholders to parties that have supplied goods and services, most specifically, its employees and executives.

date with any changes in the FV of the liability is recognized in profit or loss account. The amount of cash to be received will be determined by the value of the option at the exercise date.

*Alternatives cash or share options:* In this transaction it is up to the counterparty or the entity to choose the settlement of the SBC. In this case the entity grants the counterparty the right to choose whether share-based transaction is done by cash or by issuing equity instruments.

#### **2.1.4 Disclosure of Share-based compensation**

The disclosure of SBC is considered a relevant issue in accounting regulation. Because of the importance of this topic, disclosure of this plan is required by different accounting regulations. The main disclosure requirements for stock option plans are mentioned in the standards (IFRS 2 and FAS 123). Besides that further requirements may be needed in different countries based on their own codes of corporate governance. Therefore, we have mentioned in this part the general requirements for disclosure of this standard according to IFRS 2. Furthermore, we have looked at the further disclosure requirements according to Code of corporate governance and annual accounts (Årsredovisningslagen) in Sweden as our sample is from Swedish NASDAQ public companies.

The requirements that are provided by IFRS 2 for disclosure include the nature and the extent of share-based payment arrangements during the period, information about the fair value of the equity instruments and how it is achieved, and the effect of the share-based payment transactions on the financial position and profit/loss of the entity. The standard requires that a detailed description of all share-based payments should be disclosed. This includes all different types of share-based arrangements and their conditions, all the information about the granted options including, number of options at the beginning of the year and outstanding options at the end of the year, number of granted options, exercised options and expired options, weighted average exercise price of options and all the detailed information for this transaction which can have an impact on the decision of the users of financial statements.

The information should be disclosed in the financial notes in the annual reports. In the Årsredovisningslagen or Swedish annual account act this is stated that bonuses and similar compensation to directors, executive director and the other executives must be disclosed separately (Lag, 1999:1112). Furthermore, in the Swedish code of corporate governance it is stated that the board is responsible for the remuneration of the company's managing directors in accordance with the policy determined in at the shareholder's meeting. The managing director decides for the other members of senior management with the same policy (P.4.2).

## **2.2 Positive accounting research on share-based compensation plan**

This section looks at different studies and theories inside SBC, those that are close to our question. Positive accounting research based on positive accounting theory, searches for explanations and predictions of a particular fact based on observations. This theory is distinguished from the normative theory which is involved with prescriptions. The pioneers of this theory in accounting are Watts and Zimmerman (1986). They state that Positive accounting studies do not consider which method a firm should use, but instead this theory seeks to explain why specific methods are implemented in a firm.

According to Watts and Zimmerman, the main assumption of the positive accounting theory is “*nonzero contracting*” and “*information costs*”. This is also interpreted as the agency problem and information asymmetry. SBC is stated as a way to solve these mentioned problems. In positive accounting theory this is mentioned under the efficiency perspective. On the other hand, some of the research shows that using SBC plans and thus addressing the agency problem by granting shares or options to executives may induce managers to manipulate accounting numbers and act inappropriately. This latter argument is usually supported by management-power theory in articles and clarified under opportunistic perspective in positive accounting research.

By looking at different articles in this area we can easily understand both perspectives have been examined by different authors. Therefore, we can divide different studies in two categories based on these two perspectives. In each perspective we are faced with diverse observations, Watts and Zimmerman (1986) state this as “*competing theories*”. Therefore, it is important to test alternative theories to understand which one explain the facts and may suit better. It is important to generate some evidence to revise existing theories in good research. This leads us to base this study on better evidences and consequently have a better explanation and more reliable prediction. Here the main assumptions of these two different perspectives are explained which can be helpful for understanding the different arguments in SBC literature.

### ***2.2.1 Efficiency perspective***

Efficiency perspective explains that different accounting methods and policies are used to reflect the underlying performance of the firm in the efficient way. Deegan and Unerman, (2006) state this theory can also explain why a particular method is implemented inside companies with different organizational characteristics. This perspective is very close to this research as we observe different characteristics of the companies and see the relation that they have with the implementation of SBC plan. This perspective can be closely related to the agency theory explained by Jensen and Meckling, (1976). They argue that this practice can lead to cost saving. Based on this perspective the adoption of this plan is based on the management consideration for solving the agent problem and enhancing the performance of the company. Deegan and Unerman, (2006) refer this view usually to “*ex ante perspective*” which means the mechanism is put in the place to minimize the future cost of an/the agent.

Advocates of this perspective express their arguments through different theories. The pioneers in this area are Jensen and Meckling (1976), and Jensen and Murphy (1990). Some argue that use of SBC can motivate management to choose a method that helps to reduce the agency cost. The reason is that, firms will be allowed to choose those accounting methods that best reflect the performance of the firm. It would be argued that management is best able to select which accounting methods are appropriate for the special situation. Therefore, use of SBC is considered as the most effective tool in pay-performance relation. Another related argument for supporting this perspective is that this method can also solve the information asymmetry by giving the principle an opportunity to monitor the agent. In this context, SBC is a bridge which can bring efficiency for both sides of this bridge, principal and agent.

### *Solving the principle-agent problem:*

The principal–agent problem is found in most employer and employee relationships and it tends to give rise to agency costs, which are expenses incurred in order to sustain an effective agency relationship and to encourage managers to act in the shareholders' interests. A corporation's managers may have personal goals that compete with the owner's goal of maximization of shareholder wealth. Since the shareholders authorize managers to administer the firm's assets, a potential conflict of interest exists between the two groups.

Agency theory is inspired by the agency paradigm and exists between the firms and external contractors. These contractors are including, shareholders, debt holders, and the government and other regulatory authorities. This theory based on the principal-agent problem, arises from the relation of the manager of the firm (agent) and its shareholders (principals). The pioneers for explaining this theory in positive accounting contexts are Jensen and Meckling (1976). They define the concept of agency costs and investigate the nature of that. Agency theory arises from agency relationship which according to Jensen and Meckling, (1976, p. 308) defines as:

*We define an agency relationship as a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent.*

The key assumption in the agency theory is that all parties are acting in self- interests. Therefore, in imperfect labour and capital markets, managers will seek to maximize their own utility as other stakeholders do. This is assumed by the principals that managers as the agents have the ability to maximize their interests at the expense of corporate shareholders. Evidence of self-interested managerial behavior includes the consumption of some corporate resources in the form of perquisites and the avoidance of optimal risk positions. Therefore the principals will anticipate that the managers will undertake “*self-serving*” activities that could be detrimental to the economic welfare of the principals. In the absence of any contractual mechanism to restrict the agent’s potentially opportunistic actions, the principal will pay the agent a lower salary in anticipation of opportunistic behavior. This is one of the central arguments mentioned by Jensen and Meckling that agents have more incentive to contract for monitoring though accounting and auditing to offer guarantees to limit their consumptions of perks.

Baumann et al. (1996, p.751), affirms that “the assumptions of agency theory are that agents are motivated by self-interest, are rational actors and are risk adverse”. These authors mention that an agency problem occurs when a principal is unable to adequately monitor the agent behavior. This problem is also mentioned by Jonas et al. (2006) article in our literature review. In this article the authors mention that share-based payment plans is a way to solve the agency problem by monitoring employee performance.

### *Pay-performance relation:*

Pay-performance sensitivity arises from an extension of the standard principal-agent model and is also very helpful in terms of understanding the theories which predicts the role of SBC to reward top and middle management based performance. Based on this theory, an incentive plan should be the one that is effectively linked to the performance. In a much cited study by Jensen & Murphy (1990), stock ownership as compensation plan considers to be the most



effective way which can truly link pay and performance. This relation is especially very important in this case that for retention and satisfaction of the best employees and talented people the best way is to have an incentive plan which link pay and performance.

Many researchers have considered the connection between long-term compensation plans and the improvements of companies' performance. This fact has been mentioned by these studies that the primary objective of SBC arrangements is to achieve alignment between the goals of management and a company's stockholders. Therefore, it can help management achieve rewards by enhancing the performance of the company by increasing values for shareholders and consequently for themselves.

The motivation that ownership brings for employees to work toward company's goal and help firms enhance their performance has been considered by some studies like Kurse (1996) and Dunkan (2001). They suggest the same results with Murphy and Jensen (1990) that profit-sharing or employee ownership is the most effective incentive plans that can decrease employee shirking and bring good motivation for work. This idea is mentioned similarly by Itter et al., (2002). However they consider the expectations of the ones to be awarded.

According to John and John (1993), in an optimal compensation package we are faced with low pay-performance sensitivity. Therefore, some factors in the companies that may result in high pay-performance sensitivity can be negatively related to implementation of SBC. The factor that has been considered in their study is the leverage which leads to high pay-performance sensitivity and is negatively related to the use of SBC.

It is in agreement that the rising importance of stock option compensation for executives and employees is justified by the alignment of corporate officers' interests with those of shareholders. Besides, as stated by Simons (2000, p. 13), people strive to achieve and "work to capture extrinsic rewards such as money, promotion, praise and so on". For that reason, according to this author, it is always valuable to consider the design of reward and compensation systems to enhance firm's performance.

### **2.2.2 Opportunistic Perspective**

An alternative perspective is based on this idea that in choosing particular accounting methods there are other objectives which is driven by self-interest. Deegan c. & Unerman J. (2006), consider this perspective as a practice of "*creative accounting*". This means that a specific method is applied in the situation where accounting methods are selected based on the intention of the people who are responsible for the preparation of accounts. This perspective is referred as "*ex post perspective*" which means after the fact, because it considers opportunistic behavior, after all are arranged in a contractual arrangement. This perspective is clearly explained by Watts and Zimmerman (1990, p. 135). They state:

*When managers exercise this discretion it can be because (1) the exercised discretion increases the wealth of all contracting parties, or (2) the exercised discretion makes the manager better off at the expense of some other contracting party or parties. If managers elect to exercise discretion to their advantage ex post, and the discretion has wealth redistributive effects among the contracting parties, then we say the managers acted "opportunistically".*

Hence, some of the bonus plans including profit based compensation and SBC have been blamed for this opportunistic perspective. Advocates of this perspective believe that use of this method can attract managers to elect to adopt particular accounting methods whenever they believe that this will lead to an increase in their personal wealth. Furthermore, according to Faulkender et al. (2010), an effective pay package is not necessarily the one most laden with equity incentives, since too much equity exposure can cause excessive risk-taking, manipulation, and shift executive attention away from true value creation. This is why they state that based on this theory for choosing particular accounting methods management is opportunistic. The techniques that are known in accounting as opportunistic behavior are earning management and off balance sheet funding.

This perspective is studied by many authors in our survey and is based on the idea that the separation between ownership and management might give managers substantial power. This gain of power may result in side effects of such compensation plans. This issue is addressed for example by Alexander et al. (2007), Peng and Röell (2008), Blasi et al. (1996), Cheng and Warfield (2004), Core and Guay (2001), and Yermarck (1997). They all have the common argument that using SBC and thus addressing the agency problem by granting executives may induce managers to act in an inappropriate manner. Blasi et al. (1996) are against the empowerment of the executives, instead they prefer and defend that the workforce should be the ones included in such programs, acting like owners increase profitability performance and productivity. In a short overview, we may say that they consider the constraints of the use of such compensation schemes in a sense that it causes side effects such as manipulation. That is, high incentives compensations to executives may lead to earning management.

### ***2.3 Determinants of share-based compensation***

The determinants of SBC are those that can predict the SBC use. To assess which factors has the most important role for determining application of SBC, different studies have considered different issues. Some of the researchers in this area try to focus more on internal factors of the company what we can generalize as the companies' characteristics. These characteristics are including firm size, profitability, debt, ownership structure, growth and etc. In order to address the main determinants of SBC some authors look at external factors which we refer mainly as market development influence including increase in share price.

These determinants might be explained through the mentioned perspectives, related to the positive and negative role of SBC. The positive approach can be referred to here as the efficiency perspective. This is explained by the fact that drivers of SBC plans are those that can link pay and performance and align management and shareholder's interests (See, e.g., John and John; 1993, Jones, D.C. et al.; 2006, Frye M.B.; 2004, Zhiguo He; 2008, Kruse; 1996). Hence, a significant association between different factors, external and internal, with application of SBC is regarded as determinants of this kind of incentive plan which can be positively explained based on the important role of SBC. However, there is the possibility of linking the determinants of SBC with opportunistic perspective and consider the role of SBC negatively. Some of the authors (See, e.g., Jones et al.; 2006, Core and Guay; 2001, Bebchuk and Fried; 2003) examined more deeply the relation of this factors with application of SBC for selected group of people in different sample firms and they found some indications for managerial opportunism. Jones et al., (2006), for instance, found that the characteristic of previous performance measured by ROE was strongly connected to the application of SBC in

a selective scheme approach. The previous performance is found at the mentioned study to be a determinant of SBC and explained to be raised by the opportunistic perspective.

## **2.4 Empirical studies on determinants of Share-based compensation plan**

There is rich literature in different aspects of SBC plan including valuation of employee stock options, timing of announcement and managerial compensation. However, there are some studies that closely examine the factors which lead to implementation of SBC. The arguments in these studies are supported with the theories mentioned in previous perspectives. It is important to mention the main arguments of these studies which seek to relate the internal and external factors of the firms with the adoption of a SBC plan. Among these studies, articles by Jones, D.C. et al. (2006) and Frye M.B. (2004) examine a closely related topic, determinants of SBC. Analysis of these studies and their findings are very interesting to consider as we can further compare the results with these studies with different samples and time phases.

### ***2.4.1 Prior studies on the relation of companies' characteristics and the adoption of employee stock option plan***

Some of the researchers in this area try to focus more on internal factors of the company which we can specify as the companies' characteristics. These characteristics are for instance firm size, profitability, and ownership and leverage structure which can be considered as the main factors of use of SBC. These studies can help us to understand the particularities of the companies which may predict the use of SBC plans.

*Ownership structure:* The relation between ownership structure and SBC is studied in an article by Jonas et al. (2006). Jonas considers dispersed ownership as the reason for applying such plans, because ownership structure which is not concentrated needs this incentive plan in terms of monitoring management. Also, their results, consistent with previous outcomes, indicate that use of this plan in broad-based scheme is related to difficulties in monitoring employee performance. This finding can be related to efficiency perspective and agency theory. The general result in this study shows that selective and broad-based schemes are considered to solve different types of agency problem (JONES et al, 2006).

*Effect of Size of the company:* A study that warily evaluates the changing of firm size effect on generation of incentive plans is by Zhiguo He (2008). According to analysis in his model, growth in firm size which can be achieved by an agent's positive performance can be a reason for an increase in incentives required by an agent. These incentives can be provided by future performance-based stock grants if the agent is patient and therefore alleviates the agency problem. He also states that empirical evidence shows that grants compensation is largely based on CEO's historical performance. Therefore use of this plan is useful when it comes to the monitoring of management. Another study by Kruse (1996) closely looks at the relation of the size of the company as one of the productivity-related reasons for adopting ESOPs. In this study size of the company has been considered as the strongest variable which has a positive relation with SBC use. Frye M.B. (2004) has the same result regarding the positive association between the size of the company and application of SBC. In this study, SBC is regarded as a tool for monitoring agent in large companies with high total assets.

*Human capital intensity:* In recent years, more firms use SBC plans in broad-based scheme in order to attract key employees to their firms. The relation of the companies' characteristics in terms of human capital intensity also is an interesting issue that has been considered in some articles. The main idea here is that the human capital has emerged as an important firm asset in recent years and therefore for retention and satisfaction of this capital, firms use incentive plans linked to performance like SBC. Frye M. B. (2004) observe two different samples in two different periods of time in a research and in both periods there was strong evidence that the more companies were more human capital intensive the more reliant they became on SBC.

*Total Debt:* There is an interesting study by John and John (1993) which suggests that optimal compensation plan not only should be linked to the shareholder interests and minimizes agency cost but also, should minimize the costs of debt. In fact they argue that design and mix of external claims in capital structure is concerned for determining management compensation structure. In this study the negative relation between leverage ratio and pay-performance sensitivity is observed. In the recent study by Frye M. B. (2004), the findings are consistent with the study by John and John (1993) and shows that leverage is negatively related to the percentage of share-based compensation.

*Previous Share Return Performance:* Relation between past financial results of the company and implementation of SBC has been in focus by different authors. The financial factors that were concerned in the articles at this research are including, share returns from the past year Jonas et al., (2006) higher prior stock return, more investment opportunities and cash balances (BERGMAN AND JENTER, 2007). These authors argue that positive past financial results can bring more optimistic expectations between employees regarding SBC plan.

#### **2.4.2 Relevant theses on share-based compensation plan in Sweden**

Two theses have been closely studied in this research and both of them are conducted in Sweden in different time horizon and therefore, will help us to understand SBC better.

- *Share-based payments-- Depending on company's characteristics?*<sup>3</sup>
- *Share-Based Payments--Utilization of share-based payments and the affects of the IFRS 2 on the Swedish A-list companies*<sup>4</sup>

The former is written by Jakobsson and Karlsson, (2009) and explores the question of whether companies that are different in nature have different propensity to use equity compensation. The purpose of this study is to demonstrate whether there are differences in the use of share-based payments between enterprises of different characteristics and to explain the use of equity compensation. This study is limited to the listed Swedish companies in 2009 on both the NASDAQ OMX Stockholm Stock Exchange's Large Cap and Mid Cap. The research question

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<sup>3</sup> Jakobsson A., and Karlsson T., 2009. *Share-based payments-- Depending on company's characteristics?* Published at Göteborgs University.

<sup>4</sup> Robert, A. L., and Adan, N. 2005 *Share-Based Payments--Utilization of share-based payments and the affects of the IFRS 2 on the Swedish A-list companies.* Published at Jönköping University.

is investigated by means of statistical hypothesis testing to ascertain whether there is any difference in the use of equity compensation, depending on industry, company size and ownership structure. Company size is measured as turnover in each financial year and the ownership structure is measured by the percentage of voting rights the owner has.

The results of this study show that there are clear differences in the use of equity compensation depending on a company's specific characteristics. For example, when it comes to industry, companies within particular industries, such as energy, healthcare and IT tend to use equity compensation significantly more frequent than companies in other industries. The opposite could be stated for particular financial sector, which show a significantly lower use of equity compensation than the other sectors. Another finding is the significant difference in the use of equity compensation depending on the differences in corporate ownership structure. The Study's strongest finding proves that the difference in the use of equity benefits differ between the studied ownership structure of firms. The conclusion is therefore that there is a very strong correlation between the use of equity compensation and what kind of ownership structure a company had in 2008. Finally, in the case of a company's size, it is concluded that there is no correlation between turnover and the use of equity compensation.

The latter mentioned study written by Adam and Robert, (2005) investigates the use of share-based compensation considering the effects of the implementation of IFRS 2 in 2005. Since potential investors must have the possibility to compare the financial statements between different time periods the purpose with their thesis is to cover what are the effects that the companies' on the Swedish A-list should have had if the IFRS 2 was already implemented in 2004. In addition, the authors examine the utilization of share-based programs among these companies and explain how they are affected by the new regulation. They conduct their studies making a quantitative analysis based on annual reports of the selected companies.

Their conclusions state that the majority of the A-listed companies use some kind of share-based programs. The most frequently used option type is the subscription option. In addition, there was a decrease utilization of share-based payments due to IFRS 2. Their study also indicates that the companies using call options should have experienced the greatest result decrease due to the IFRS 2. Finally, another interesting conclusion is that the larger companies are most likely to involve all the employees' in the share-based programs while the smaller companies prefer to only involve executives and other leading personnel.

### 3. METHODOLOGY

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*Chapter 3 is intended to present the methodology used in our research and provide a presentation of the research strategy. It shows the study's statistical methods and how the collection of data was completed.*

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In this section the methodological choice is presented as well as the methods or techniques that are intended to be used in this thesis. As with other accounting research, this study has a scientific method. Therefore, the actual process of research starts with theories derived from previous academic literature. Having this as a starting point, a structured procedure to collect the intended data and to analyze the relationship between dependent and independent variables is made. This process is analyzed by mathematical and statistical techniques. The final stage is to generalize the results. Thus, the methodology used in this research reflects the investigation strategy in order to support the trustworthiness and validity of this study.

#### 3.1 Research Design

The research design represents a plan for the collection, measurement, and analysis of data. According to Blumberg et al., (2008) p. 195, "research design is the plan and structure of investigation conceived to obtain answers to research questions". The plan is the overall scheme or outline of what the investigator will do and their implications to the final analysis of the data. Research methods can be associated with different kinds of research design and represents the structure that guides the execution of a research method and the analysis of the subsequent data (BRYMAN AND BELL, 2007).

Our plan for the method of data collection is considered *monitoring* which includes studies where the researcher examines the nature of some matter without attempting to obtain feedback or response from anyone. In addition, according to the examination of the variables, this study presents an *ex-post facto design*, in which investigators have no control over the variables, i.e., without the ability to manipulate them. Therefore, the researcher is limited to holding in factors according to strict sampling procedures and by the statistical manipulations of the findings.

The method of reasoning is through a *deductive* approach where we intend to explore our findings. Besides this, according to the purpose of the study, a *descriptive* study was made. This reveals the patterns found in our statistical data. At this point, the descriptive study reveals the objective's profiles, patterns or situations. If the research is concerned with finding out who, where, what, when or how much, then the study is descriptive. Thus, since our research intends to identify how companies' characteristics are associated with the application and use of the SBC, a descriptive account of the current situation is required involving analytical procedures and data source specification.

The outline of the study can be categorized as a *formal study* where the aim is to explain the reason for the findings and help with the analysis of the results. Therefore, we can say this research is a formalized study that contains some elements of exploratory study.

Considering the broad sample in this research, *statistical* approach is used here with the intention of finding out the population's characteristics. As already mentioned, the research question is tested *quantitatively* and generalizations about findings are presented based on representativeness of the sample and the validity of the design. Regarding time dimension, this study is considered *longitudinal* since it covers an extended period which can track changes over time and verify differences in results over the time. The research environment is regarded as *field setting* as it is developed in an actual environmental condition.

<b>Degree of Research question Crystallization</b>	Formal Study	Provide valid presentation to answer the research questions
<b>Method of Data-collection</b>	Monitoring SBC-Nominal	Observation of a group of companies characteristics
<b>Researcher Control of variables</b>	Ex-post facto	No control over the variables
<b>The purpose of the study</b>	Descriptive	The aim is to find out how are the firms' characteristics related to the use of SBC.
<b>The time dimension</b>	Longitudinal Study	The research covers the period of 2007-2008
<b>The topical scope</b>	Statistical study	Research questions are tested quantitatively.
<b>Research environment</b>	Field setting	The companies listed at the Stockholm Stock Exchange

Table 1: Summary of Research Design Categories

### 3.2 Collection of Data

In an empirical research the aim is to test main assumptions which are raised based on the theoretical part in a deductive reasoning approach (theory to findings). In this approach it is very common to use data collection and analysis. The method which is used in empirical study should be consistent with both theory and literature. Most importantly, in this approach research method has been developed through the process rather than being selected first. The data collection process is one of the most crucial parts of the research. The data can be gathered from different sources. The main sources in this study are the official documents from companies such as annual reports. All the information we require can be gathered from annual reports by hand-collection. However, there are also some databases available in the library that helped us in relation to time efficiency and increasing accuracy. The main databases that we used in this study are AMADEUS, AnnualReports.info, and DataStream.

According to Bryman and Bell (2007), there are two distinctive methods that can be employed in data collection process: *quantitative* and *qualitative* method. A quantitative research as its name suggests, emphasizes on quantification in collection and analysis of data, whereas a qualitative research refers to the meaning and definition or why something has happened. Most researchers tend to employ one of the two paradigms. Choice of qualitative or quantitative study is based on the research problem, type of information that is needed and the outcome of the research. In this study we believe that quantitative approach would be more appropriate as it provides a view of the relationship between theory and quantitative information in a deductive study.

In a quantitative research there are two main steps which involve selection of a research site or sites and selection of documents. Regarding the decision in relation to the site or setting, we need to have a community which is appropriate for the answers to our main research question. Therefore, we have selected all the companies listed in Stockholm Stock Exchange (NASDAQ OMX) as our sample. This sample comprises of 286 companies in four types of Large cap, Medium cap, Small cap, and NGM Equity. These companies are supposed to be listed in the European Union. There are different variables that are observed in this research for understanding the relation of firms' particularities with the use of SBC. The required information needed for the measurement of these variables has been conducted from the annual report and the investor relation website of these companies. Data is edited to ensure consistency and reduce errors. It is then put into a form that makes analysis possible. Codes are used to make it manageable in order to assist with sorting, tabulation and analyzing.

### **3.3 Empirical study methods**

In this section the aim is to develop an adequate and appropriate way for analysis of the data based on our variables to find their relationship. To have a better view, the methods which have been used in previous research are studied closely. This can give us some guidance as to which method better reflects the relation between the variables. Hence, the method which is used here is not identical, but it is close to previous studies. Following statistical methods step by step help us to understand basic relation and correlation of variables and furthermore have true insight and better analysis.

#### ***3.3.1 The variable selection***

Before discussing different statistical methods, it is necessary to understand the basis and origin of the variables. The reason for this is that, choosing the appropriate method of testing and analysis in statistics depends on the characteristics and qualities of the variables involved in the study. In general we can divide variables to the main categories of nominal, ordinal, and interval. Nominal variables are those of categories with qualitative patterns. They are also known as "qualitative and categorical variables". Ordinal variables are based on the natural ordering of them, where the distance between the values does not have exact numerical meaning. The last category of data is Interval variables which are also involved with ranking but there is specific distance between different levels. In statistical studies, for the nominal variables a coding system is used which gives each category a specific code. This classification and encoding is necessary for efficient analysis. Based on the characteristics of the companies that we want to study in this research the variables are selected and defined. In following part of each variable is explained separately and also represented in the table 2.

*Share-based compensation:* The basic approach in this study is to consider the decision of the company in terms of SBC use. Therefore, the key focus and the only dependent variable in this research is the *use* of SBC. This variable is nominal and it has two levels in the statistical analysis: "0" is represented for the firm which did not apply SBC and "1" stands for the firms which used SBC plan.

*Sectors:* The first approach that we can use for categorizing companies in this sample is based on the industry sector that they belong. This variable is simple to study but at the same time helpful in terms of observing companies' attitude for using long-term incentive plan. This



variable is also nominal and we use specific codes for each sector. (1=Industry, 2=energy, 3=Health Service, 4=Consumer Discretionary, 5= Finance, 6= IT, 7=Consumer Staples, 8=Material, 9=Telecommunication).

*Ownership structure:* How the ownership structure looks like is another interesting characteristic where we aim to find its relation with the application of SBC. This variable is measured by looking at the largest owner of the companies based on the percentage of their proportion in companies' shares. This interval variable which can be observed from the annual reports of the companies reveals how much companies are under the authority of the main owner.

*Size of the company:* As it is mentioned before, the size of the companies as a determinant of SBC has been studied in several research. The variables that have been used in some similar articles to study the size of a company and its relation include, total sales and total assets of the companies. In this study we also examine these variables to see whether the results would be similar with them or not. Furthermore, as the companies in the sample studied are categorized as large, medium, small cap and NGM equity, we study the relation of these market capitalizations with SBC use as another factor for measuring the effect of companies' size.

*Human capital intensity*<sup>5</sup>: Human capital is more and more in focus in recent years and this is considered as the most critical firm asset. This is why companies may use SBC, because in parallel with monitoring employees they attract and retain key employees. Jonas et al. (2006) use the ratio of intangible assets on total assets and Frye M. B. (2004) applied almost the same approach for assessing this variable by using the measure of assets in place which shows the company is less human capital intensive. In this study we follow Jonas et al. (2006) and use the ratio of intangible assets to total assets.

*Total Debt:* Leverage ratio is considered in this part, which can be achieved by total debts on total assets. This variable shows how the amount of claims and debts has effect on the use of a share-based incentive plan.

*Previous Share Return Performance:* Previous performance of the companies can also be considered as a determinant for using option plans. This is why we looked at this ratio in all the under-studied companies. It is important to mention that, for studying this variable we observe the relation of the application of SBC in one year with share return performance of the previous year. For example, for the year 2008 we look at this ratio in 2007 and then observe the relation between this year (2007) performance and SBC use in 2008.

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<sup>5</sup> To understand which measurement is better to find the relation between human capital intensity and SBC use different proxies have used in previous studies. All these studies found positive and strong relation between these proxies and SBC use. Therefore, the intangible assets ratio is chosen here following evidences made by Jones et. al, (2006).

<b>Characteristics</b>	<b>Value label</b>	<b>Variables</b>	<b>Measurement</b>
Use of SBC	SBC-Nominal	SBC 2007 and SBC 2008	0=there is no SBC 1=there is SBC
Ownership structure	OWNER-Interval	Largest owner	The % of the largest shareholder's stock in the company
Size of the company	SIZE- Interval	Total Sale	Net sale
		Total Assets	Total assets
		Market capitalization	Large cap, Mid cap, small cap, NGM equity
Human capital intensity	HC-Interval	Intangible assets ratio	Intangible Ratio=Intangible assets/total assets
Total Debt	DEBT-Interval	Leverage ratio	Leverage Ratio= total debt/ total asset
Previous share-return performance	ROE-Interval	ROE	Return on equity=Net Income/shareholders equity
Industrial categories	SECTOR-Nominal	Industry	Type of Sector

Table 2: Summary Definition of Selected Variables

### 3.3.2 Univariate Analysis

Univariate analysis is assumed as the foundation in statistical analysis which can facilitate more complicated analysis such as multivariate analysis. In fact, a complicated analysis like multivariate analysis and regression analysis cannot be conducted without these analyses. There are two main steps here that should be considered. Using the guidelines of the book "Business Research Method" by Blumberg B. et al (2008), the main statistical methods which are useful in this research are presented here as Exploratory Data Analysis (EDA) and Correlation analysis.

#### *Exploratory data analysis (EDA)*

In order to better understand the association between the variables especially when we are faced with a huge amount of data in the sample, there is a need to summarize data and shape it in an understandable way. The techniques that are used in the EDA as the preliminary analysis are very useful once it helps us to learn about the data as much as possible. In addition to numerical summaries of location, spread and shape, EDA uses visual displays to provide a complete and accurate impression of variable relationships. Application of some of these techniques including tables and graphs in parallel with discussion, simplifies our work of analyzing by providing a perspective and set of tools to search for clues and patterns.

The most common method in this analysis is frequency tables. Frequency distribution is a listing of possible categories of values for a variable, together with a tabulation of the number of observations in each category. For a better understanding of the relation of the variables

through tables, there is another table named Cross-tabulation which is used for comparing two classification variables. This table has the ability to present the relation of data in percentage form which simplifies the data by reducing all numbers and translate data into standard form. Applying these methods is necessary for understanding the data but they can have a better impact if we can present them visually. This is why applying graphs like bar charts, and/or histograms are useful for our work as our study is involved with interval data.

### ***3.3.3 Correlation Analysis***

In attempt to understand and explain the nature of causal relations between phenomena, relationships are observed or tested. Hence, correlations serve as empirical indications of possible relationships between variables. As it was mentioned before, choice of appropriate statistical methods depends upon the research objectives and understanding of the nature of data and the correlation that exists between the variables. Correlation analysis as part of bivariate analysis is useful for describing the direction and strength between two variables. In this study a useful method should be the one that can illustrate the relation between explanatory variables which is mostly interval variables and the nominal dependent variable.

Since we deal with both nominal and interval variables in this study, the most appropriate method of correlation analysis is through non-parametric tests. Some of the non-parametric tests that can be applied in this study, as useful methods of assessing the correlation between variables, are Mann-Whitney U test and Chi-square together with Carmer's V index. Performing these tests is also useful in the understanding of the differences that exist between the companies which apply and do not apply SBC. Mann-Whitney U test is the most commonly used method as an alternative for the t-test. The Chi-square test also is helpful for finding the association of two nominal variables which can be the relation between market capitalizations and SBC in this study.

### ***3.3.4 Multivariate Analysis***

Multivariate analysis as an advanced topic in statistical analysis is required in finding the relation between three or more variables. According to Blumberg B. et al (2008), applying this kind of analysis is increasing now because of the complex relation that exists between, not only two variables but, the combination of a family. For this study, use of this method of analysis can be very helpful for answering the research question based on better analysis. An appropriate model depends on the quality of variables involved in the study.

In this research, it is intended to explain the particular choices for application of SBC and the factors which enter to the decision process. Furthermore, it is useful to know how much each factor affects the outcome. There are two possibilities of "Yes" or "No" in this study and the aim is to predict the probabilities between 0 and 1. Therefore a model which shows the relation of categorical dependent variable with continuous explanatory variables is needed. According to Field A. (2010), binary logistic regression can be a useful tool when we are trying to predict membership of only two categorical outcomes. Logistic regression, as one of the common methods in this analysis, is useful in telling us how well a set of variables is able to predict a particular outcome as well as explaining the relative contribution of each of the variables.

In this approach, all predictor variables are tested in one block to assess their predictive ability, while controlling for the effects of other predictors in the model. Since in logistic regression we predict the probability of Y (dependent variable), the equation in our model can be illustrated as follows:

$$P(\text{SBC}) = 1 / (1 + \exp(-(\beta_0 + \beta_1 \text{Intangible} + \beta_2 \text{loglev} + \beta_3 \text{logsale} + \beta_4 \text{ROE} + \beta_5 \text{owner} + \beta_6 \text{yr2008})))^6$$

### 3.3.5 The method for analyzing the relation of the variables with the use of share-based compensation

Initially in the analysis section, Mann-Whitney U test and, Chi-square test of association are used. With these tests the first thing that we can assess is the direction. This means that we can see whether there are positive or negative relations between the examined variables. Furthermore, we can understand the strength of this relationship. After doing this as the first step of analysis, we are able to conduct regression analysis to observe how much the dependent variable (application of SBC) is affected by changing explanatory variables. Furthermore, regression analysis also can show us the significance and direction of the relation between the variables. Hence, the second stage of analysis involved a multivariate analysis using SPSS. The results from both correlation and multivariate analysis are considered for conducting findings and consequently a conclusion. The figure 1 gives the analysis disposition as a summary of the method for analyzing the relation of the variables.

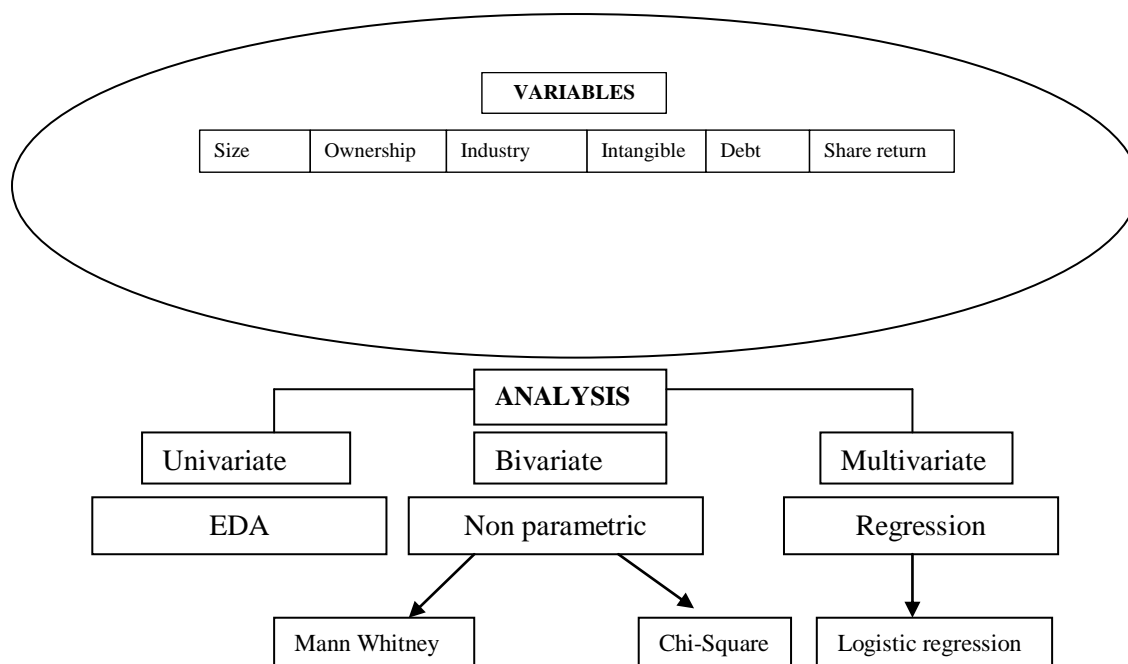


Figure 1: Analysis disposition

6 The dependent variable (Y) is SBC, and explanatory variables are from left to right, intangible assets to total assets ratio, logarithm of leverage ratio, logarithm of total sale, ROE, largest owner, and the year 2008

### **3.4 Reliability and validity**

A reliable research is achieved when there is consistency in terms of results. That means stability over time of measurement. Inexact measures made by researchers might come from random inattentiveness, guessing, differential perception, recording errors, etc. The question of good reliability of measures is necessary to be sure that the measures are stable and adequate. Awareness of those issues, in this research, allows these mentioned problems to be avoided as much as possible through double checking the data input process and subjective self-perception.

Furthermore, a reliable research indicates that the measurement process has similar results in other studies. Therefore, results can be replicated and performed in the same method. As our analysis and results are based, mainly, on annual reports, our hand collected data can be reached by readers at any time for further verification, in order to enhance reliability of the study. Another source of data such as articles, academic literatures and published academic journals are chosen by reliable sources.

Another quality which needs to be pointed out is validity. This quality indicates that the research is valid when it correctly measures the data used in the study. In the research process then, it is essential to observe the risk of errors in the analysis through measuring inaccuracies. In the present thesis, applying some databases (e.g. AMADEUS) for measuring variables and use of stable distributions of the variables in the analysis (e.g. logarithm value) provide much more accurate and reliable research process. Furthermore, we consider that there is sufficient validity and reliability to draw conclusions on data, since the sample size is equal to the whole population (Stockholm Stock Exchange) avoiding the possibility of sampling error.

### **3.5 Criticism of the chosen method**

In the present study a quantitative approach takes place. Over the years, quantitative research, as a research strategy, has been the focus of a great deal of criticism. The main criticism includes the failure to distinguish social institutions from “the world of nature”. This means according to Bryan and Bell, (2007) p. 174, “ignoring and riding roughshod over the fact that people interpret the world around them, whereas this capacity for self-reflection cannot be found among the objects of the natural sciences”. Yet, this criticism relating to the statistical studies reflects a disregard to the “figures” behind the numbers. There may be qualitative factors influencing the results or the reasons for the numbers to be analyzed, which the quantitative approach may ignore. This is very connected to what Bryan and Bell, (2007) refers to in the criticism of calling a quantitative research “an artificial and spurious sense of precision and accuracy”.

## 4. FINDINGS AND DISCUSSION REGARDING THE USE OF SBC

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*In this chapter our data collected is explored, displayed and examined. This includes description of share-based compensation and the relation of that with companies' characteristics. In the appendix the basic data that was collected in our research is presented.*

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### 4.1 The use of share-based compensation plan

As mentioned before in this study, all the companies listed in OMX Stockholm Stock Exchange have been considered as the sample. This involves 286 companies in different categories and industry sectors. For evaluating whether these companies have adopted SBC, annual reports for all these companies have been observed. According to Swedish code of corporate governance, information about SBC should be disclosed in management or/and director and governance report besides disclosing in financial notes. Therefore, it was not difficult to find out which companies use SBC. This involves different categories including stock option plan, stock matching plan, restricted stock plan, call option plan, performance share program, share-saving program, etc. Some keywords<sup>7</sup> in annual reports were used to assess which companies have been applying this kind of incentive plan. It is also important to mention that, the use of SBC plan should have a dilution effect on the equity of companies. This point has been considered in the evaluation of “Yes” or “No” for the use of this plan. The summary results of the use of SBC are presented in the frequency table 3.

The use of share-based compensation					
		2007		2008	
		Number of Companies	Percent	Number of Companies	Percent
Valid	0 No	136	47,6	126	44,1
	1 Yes Selective	95	33,2	100	35
	2 Yes Broad-Based	53	18,5	60	21
	Total	284	99,3	286	100
Missing	System	2	0,7		
Total		286	100		+93

Table 3: The use of Share-Based Compensation in 2007 and 2008

The purpose of the study is to evaluate the application of SBC at the Swedish public market companies. Hence, before any kind of analysis, it is good to investigate as to what extent this kind of incentive plan has been used in these companies during the year 2007 and 2008. As we observe in table 3, the number of companies that applied SBC is higher than the

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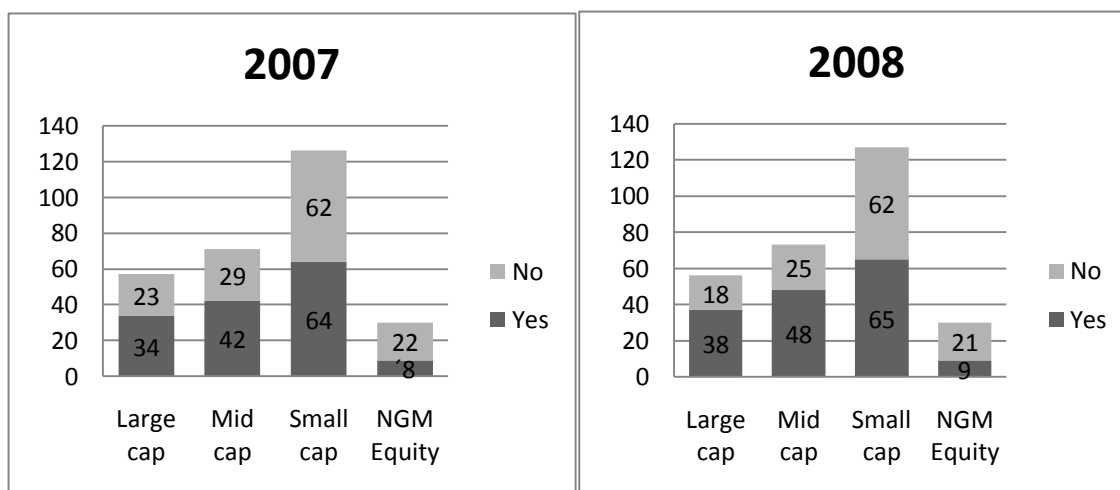
<sup>7</sup> The keywords that we used in the annual report are including, share based compensation, remuneration, incentive plan, warrant, option.

companies that did not have any kind of stock-based incentive plan. However, this distinction is not considerable and companies which used this plan are 52% of all the companies in 2007 (56% in 2008). Furthermore, differences between two years for use of SBC are not significant. In 2008, 12 companies used new schemes and granted new options out of which 5 companies used a selective scheme and 7 companies made use for all their employees.

In 2007, from the 148 companies (52.2%) that used SBC plan, 95 companies (33.5%) used this kind of incentive plan in a selective scheme and 53 companies (18.5%) used a broad-based scheme for all the employees. In fact, we can say the use of SBC in the case of selective plans is approximately 2 times more than the use of SBC in broad-based plans. In 2008, as it is clear in the table, 35% of total “Yes” companies involving 100 companies used this plan in selective schemes and 21% of them, 60 companies, had broad-based plans. This significant difference between these two schemes reflects that for both years there is more of an attitude between companies in this market to implement SBC for executives and key employees.

#### 4.1.1 The use of share-based compensation plan sorted by market capitalization

At OMX Stockholm stock exchange, companies are categorized based on average market value to Large, Mid, and Small Cap. Companies that have market value more than one billion EUR are classified as “Large Cap”, if less than 150 million EUR they are in “Small Cap” group and between these ranges are categorized as “Mid Cap”. Another group at Stockholm Exchange market which is used as sample in this study is the NGM Equity. NGM is the exchange which represents the market at the Nordic Growth Companies. NGM Stock Exchange is the second-largest market place for equities. This involves 30 listed companies that we add in our sample.



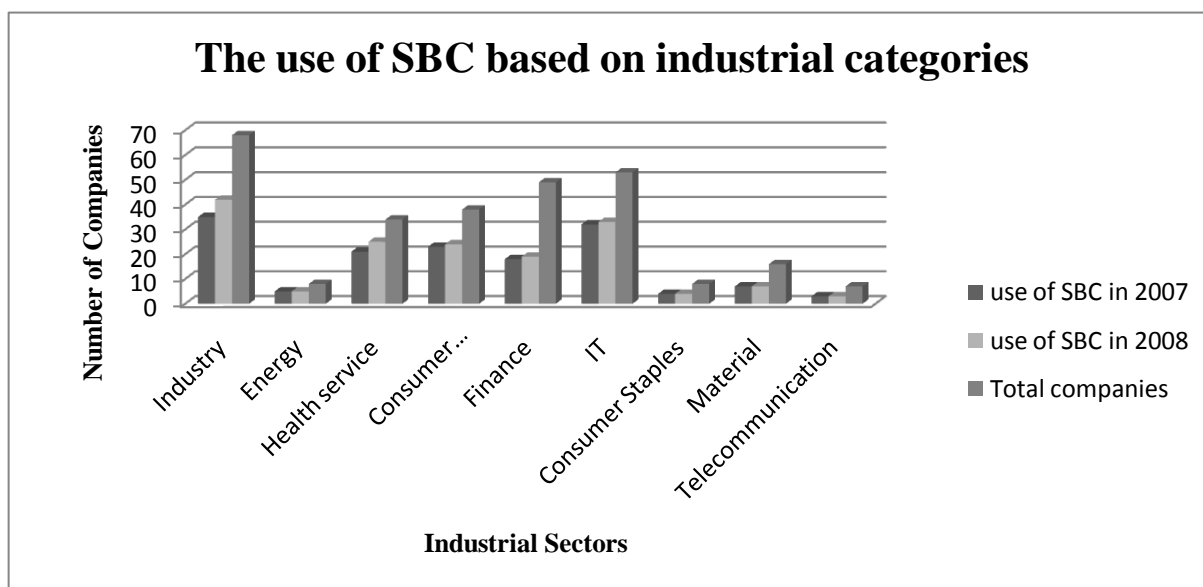
Graphs 1 and 2: The use of share-based compensation for 2007 and 2008 based on market value categories

The graphs 1 and 2 were developed to show the number of applications of SBC in different market categories at Stockholm Stock Exchange. The dark color “Yes” represents the number of companies using SBC and the light color “No” represents the number of companies which do not apply SBC. As it is clear in the graphs, most of the companies in this market are listed as Small Cap in both years. The number of companies that apply SBC in Large Cap, Mid Cap, and Small Cap groups are higher than the number of “No” companies. However, in the years

2007 and 2008, both Large and Mid Cap have considerably more companies using SBC. In Small Cap the difference between number of firms that apply and do not apply SBC, is not significant and there are only 2 companies in 2007 and 3 companies in 2008. These numbers reflect the fact that the use of SBC plan is more common between the Large and Mid. cap companies compared to Small Cap and NGM Equity.

#### 4.1.2 The use of share-based compensation plan sorted by GICS

How the use of SBC varies among companies with different industrial sectors has been observed in this section. Based on global industry classification standard (GICS), companies are divided into nine different categories involving, *Industry, Energy, Health service, Consumer discretionary, Finance, IT, Consumer Staples, Material, Telecommunication*. As we can see in the graph 3, use of long-term incentive plans in different sectors is significantly diverse.



Graph 3: The use of share-based compensation based on industrial sectors

In the majority of the industrial categories the number of companies which apply SBC is higher. However, the percentage of the “Yes” companies to total companies varies between different branches. In 2007, sectors involving, Industry, Energy, IT, Health Service, and Consumer Discretionary have more “Yes” companies. The percentages of “Yes” companies to total companies for these sectors are 51%, 63%, 60%, 62%, 61% for the mentioned industries respectively. Even though, the largest sector is Industry, 51% of the companies in this sector use SBC. The other branches that are standing out are Finance, Material and Telecommunication. In 2008, most of the industrial sectors had higher numbers of companies which used SBC. This is similar to the previous year, but with a higher percentage. These companies include: Industry (62%), Energy (63%), Health Service (74%), Consumer discretionary (63%), and IT (63%). The high interest for this kind of plan is obvious for important sectors, including Energy, Health service, and IT where it deals with professional and key employees.



## 4.2 The use of share-based compensation and companies' characteristics

This study involves interval variables such as Total Sale, Total assets, Largest owner, Leverage ratio, Intangible assets ratio and ROE, which we used to find their relationship with the nominal variable SBC use. For simplifying our analysis we split the whole range of these variables into different groups. All these groups are completed based on the statistic percentage of 12.5%. Therefore, for each variable we have 8 groups which are involved in the same number of cases. Yet, in order to better understand this, the classification of these groups is used in this section. Therefore, the development of some graphs better visualizes the differences between various ranges of variables with the use of SBC plan. The values of these groups are decreasing from group 1 to 8. Different range groups for different variables are presented in table 4 as follows below:

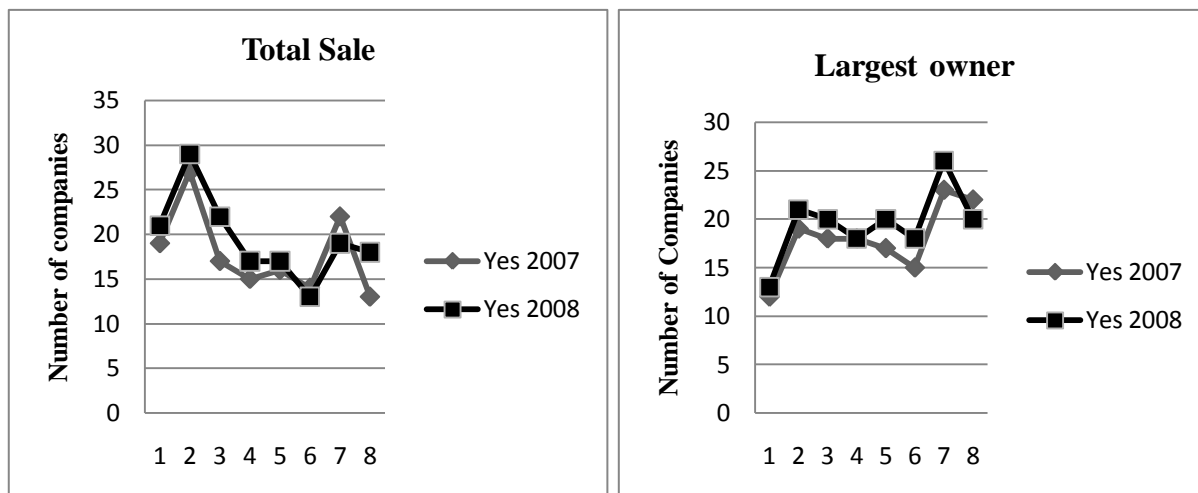
	Total Sale (MSEK)		Largest owner (%)		Total Asset (MSEK)		Leverage Ratio		Intangible assets ratio		Share-Return performance	
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2006	2007
<b>Group 1</b>	More than 19,152	More than 22,350	More than 55%	More than 55%	More than 29,334	More than 33,032	More than 0.74	More than 0.77	More than 0.49	More than 0.5	More than 0.43	More than 0.43
<b>Group 2</b>	19,152-5,403	22,350-5,523	55%-39%	55%-39%	29,334-6,716	33,032-6,873	0.74-0.66	0.77-0.68	0.49-0.34	0.5-0.39	0.43-0.31	0.43-0.33
<b>Group 3</b>	5,403-2,066	5,523-1,855	39%-30%	39%-30%	6,716-2,850	6,873-3,058	0.66-0.61	0.68-0.61	0.34-0.25	0.39-0.28	0.31-0.24	0.33-0.25
<b>Group 4</b>	2,066-1,035	1,855-1,038	30%-25%	30%-26%	2,850-1,388	3,058-1,295	0.61-0.54	0.61-0.54	0.25-0.17	0.28-0.20	0.24-0.19	0.25-0.19
<b>Group 5</b>	1,035-525	1,038-562	25%-20%	26%-21%	1,388-624	1,295-765	0.54-0.44	0.54-0.45	0.17-0.07	0.20-0.10	0.19-0.12	0.19-0.11
<b>Group 6</b>	525-250	562-274	20%-15%	21%-15%	624-349	765-372	0.44-0.32	0.45-0.34	0.07-0.03	0.10-0.03	0.12-0.03	0.11-0.04
<b>Group 7</b>	250-54	274 -69	15%-11%	15%-11%	349-118	372-142	0.32-0.18	0.34-0.23	0.03-0.00	0.03-0.00	0.03-(0.2)	0.04-(0.18)
<b>Group 8</b>	less than 54	less than 69	less than 11%	less than 11%	less than 118	less than 142	less than 0.18	less than 0.23	0.00	0.00	less than (0.2)	less than (0.18)

Table 4: Grouping explanatory variables with 12.5%

### 4.2.1 Size and ownership structure of the companies

To see the differences between the companies' characteristics in terms of size and ownership structure, the graphs 4 and 5, presented here, are very useful. In these graphs, there are 8 different categories (in horizontal Axis in the graphs) of total sale (left graph) and largest owner (right graph) and the use of SBC in these groups. For the years 2007 and 2008, there are some minor differences. In the ownership structure graph, there are some oscillations in the different range of groups. However, we can notice the whole trend is increasing. It shows that with a decrease in the largest owner's proportion in company's shares, the use of SBC

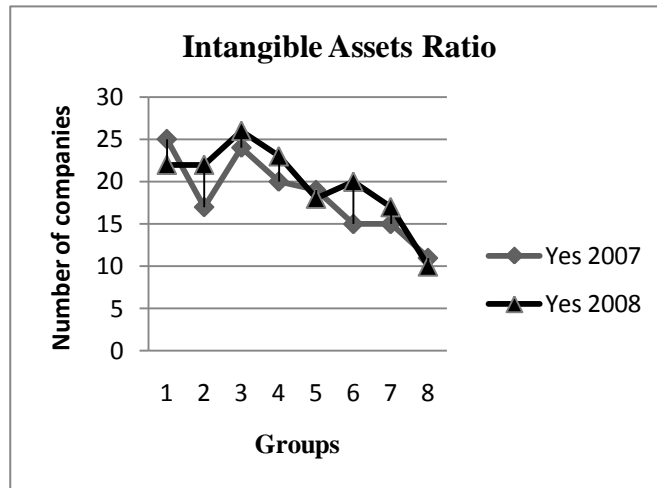
increases. As we can see the highest number of application is related to the groups 7 and 8 where the percentage of shares is less than 15%. From the Total sale graph, it is obvious that the group of companies which present the highest number of option plans is related to group 2. It has the range of 6,034 to 17,740 (MSEK) in 2007 and 6,536 to 22,454 (MSEK) in 2008. The decreasing trend in this graph reflects that there are fewer attitudes towards SBC application between the companies with fewer sales.



Graph 4, 5: The use of share-based compensation based on different range of sale and ownership structure

#### 4.2.2 Human capital intensity

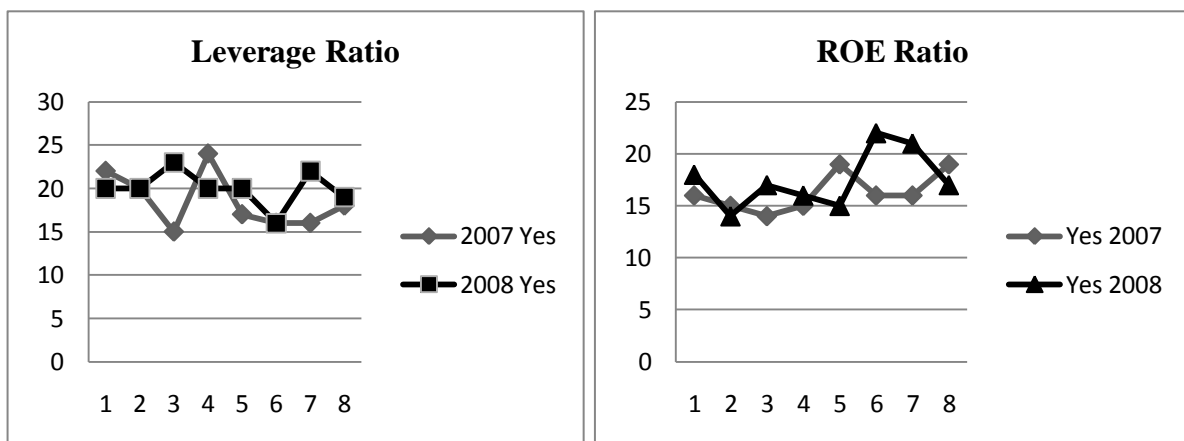
Human Capital intensity is another characteristic which its relation with use of SBC studied in this research. Human capital is an intangible asset regarded by firms as the most valuable held asset. Yet further, Grant, R. M., (2008, p. 132) affirms that for most companies, intangible resources are more valuable than tangible resources. A company's human capital is a collective sum of attributes such as life experience, knowledge, enthusiasm, etc. A company's human capital asset is the collective sum of the attributes, life experience, knowledge, inventiveness, energy, and enthusiasm that its people choose to invest in their work. It is measured, in the present research, by intangible assets ratio. In order to investigate the relation between this selected variable and the level of SBC use, we have developed the graph 6. This graph shows the movement of intangible assets ratio for the companies which apply SBC for the years 2007 and 2008. This is interesting to notice that by a decrease in the ratio value the number of companies which use this plan also decreases. In fact, the lowest application of SBC is related to the companies classified in the last group which has the least intangible assets ratio in both years (0% intangible assets in both years).



Graph 6: The use of share-based compensation based on Intangible Assets ratio

#### 4.2.3 Leverage ratio and Share-return performance

The graphs 7 and 8 below show the relation of leverage ratio and ROE ratio with the application of SBC. Similar to previous variables, the first group is related to the companies with high ratio and the last one has the least values. By looking at these graphs we can see, even though, there are some differences between the groups, the whole trend does not give us insight regarding the relationship between these variables and application of SBC. Hence, no significant association is observed between two characteristics of total debt and past share return performance with application of SBC.



Graph 7, 8: The use of share-based compensation based on leverage ratio and ROE

## 5. STATISTICAL RESULTS AND ANALYSIS

*Chapter 5 is built upon the findings of the previous chapter. At this point, the findings are analyzed through statistical analysis to help us achieve reliable conclusions.*

### 5.1 Descriptive statistics

Before conducting any kind of statistical tests on the variables, it is critical to understand the characteristics of variables. This is even more important when we are involved in a study where we want to understand differences between groups. Descriptive statistics help to describe the basic feature of the data and this is including sample summaries together with graphic analysis. Furthermore, according to Pallant J. (2007) p. 53, descriptive statistics are used to check the variables for any significant violation of the assumptions underlying the selected statistical techniques. In this part, descriptive statistics are done separately for the sample group of companies that applied SBC and the other group that had no SBC plans. The items which have been used as descriptive statistics for all the variables include Maximum, Minimum, Mean and Std. Deviation. The table 5 shows descriptive statistics of explanatory variables for the year 2007 and 2008.

	Intangible / Total assets Ratio		Leverage Ratio		Largest owner		ROE		Total Sale		Total Assets	
	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2007	2008
<b>Sample Group that applied SBC</b>												
Minimum	0	0	0,02	0,05	0,02	0,05	-4,23	-1,1	0	0	27	18
Maximum	0,86	0,86	2,9	8,78	0,89	0,89	8,45	3,7	285405	303667	3668779	5200117
Mean	0,2481	0,2596	0,5293	0,5756	0,2619	0,2726	0,1141	0,1474	15171,85	16227,17	58992,74	67931,39
Std. Deviation	0,20922	0,20478	0,3039	0,69256	0,16949	0,16722	0,9365	0,42879	40444,86	44953,58	358191,85	456648,57
<b>Sample Group that did not apply SBC</b>												
Minimum	0	0	0	0,02	0,05	0,05	-2,59	-4,29	0	0	9	6
Maximum	0,86	0,92	0,96	0,97	0,89	0,89	2,48	0,96	96344	103585	1859382	2158784
Mean	0,1765	0,1945	0,4779	0,5079	0,3277	0,3327	0,1119	0,0961	6747,95	7271,09	33829,65	39705,35
Std. Deviation	0,20359	0,22551	0,22296	0,22944	0,20859	0,21399	0,52878	0,53674	16925,637	18495,7	210348,25	250521,97

*Table 5: Summary table for descriptive statistics of financial variable 2007 and 2008*

Comparing the values of two sample groups, especially Mean and Maximum, reveals that there are significant differences for some of the variables. As we see in table 5, the sample

group which applied SBC has more than two times higher average total sales, compared to the total sales in the group of companies with no SBC in both years 2007 and 2008 (15172/6748 in 2007, 16227/7271 in 2008). Comparing Total assets mean, we can also observe significant differences between two groups (58993/33830 in 2007, 67931/39705 in 2008). Intangible assets to total assets ratio is also significantly higher for the group that has SBC compared to the other group (0.25/0.18 in 2007 and 0.26/0.19 in 2008). Another interesting difference relates to the largest owner which shows the group of firms that do not use SBC has a higher percentage of shares owned by the largest investor compared to the group of firms using SBC, (0.26/0.33 in 2007 and 0.27/0.33 in 2008). However, considering ROE and leverage ratio values in two groups, no significant differences are observed.

The standard deviation allows us to reach some conclusions about specific scores in our distribution. According to Field (2010, p. 38), when standard deviations are small it means it is close to the mean, while the large standard deviation indicates that the data points are distant from the mean. However, the best way to identify the distribution of the data for a specific variable is through a histogram. If we look at the distribution of variables in a histogram (provided in Appendix A), we see variables involving size, leverage ratio and total assets with non-stable distribution as they are positively skewed. For these variables we need to transform their values to a stable condition. Therefore, they are transformed to their logarithm value by using panel data in STATA. Taking the Logarithm of a set of numbers is a good way to reduce positive skew. Another advantage of using logarithm of this non-stable data is that we can also cover the outliers and bring all the data in the constant distribution.

## **5.2 Non-parametric tests results and analysis**

As it is mentioned before, correlation analysis helps to understand the strength and direction of a relation between two variables. Depending on the nature and the quality of the data in the study there are different statistical tests. As this study involves both continuous and categorical variables, some relevant tests have been conducted. Non parametric tests are used here as a relevant statistical test since we are dealing with some categorical variables as well. In this test the median value of the variables is usually compared.

### ***5.2.1 Mann-Whitney U test results and analysis***

Non-parametric tests are usually used when there is a lack of appropriate assumptions for conducting parametric tests or when there is some categorical data in the analysis. For the mentioned two reasons, some of the non-parametric tests have been applied here. The Mann-Whitney U test is useful for this study as it can show the differences between two independent choices. The logic behind this theory arises from the fact that by comparing the high and low ranks in each groups of sample, we are able to identify differences between groups.

**Summary table of Mann-Whitney U test**

	Total sale	Total assets	Return on Equity Ratio	Intangible assets to total assets ratio	Leverage ratio	largest owner
Mann-Whitney U 2007	7958	8729	7990	7490	9179	7512
Sig. (2-tailed)2007	0.032*	0.054	0.518	0.001**	0.2	0.011*
Z	-2.150	-1.93	-0.646	- 3.308	- 1.280	- 2.534
Mann-Whitney U 2008	7711	8539	8128	7477,5	9721	8205
Sig. (2-tailed)2008	0.008**	0.026*	0.694	0.000**	0.605	0.038*
Z	-2.635	-2.219	-0.394	-3.518	-0.517	-2.076

\*Correlation is significant at the 0.05 level (2-tailed)

\*\*Correlation is significant at the 0.01 level (2-tailed).

*Table 6: Summary result of Mann-Whitney U test of significance level*

Table 6 shows the variables in this study examined by Mann-Whitney U test. This table shows that Intangible assets, largest owner, total sales and total assets are significantly different between two independent sample groups, including the group of companies that applied SBC and the other group of companies that had no SBC.

	Intangible / Total assets Ratio		Total Sale		Total Assets		Largest owner	
	2007	2008	2007	2008	2007	2008	2007	2008
<b>Sample Group that applied SBC</b>								
Median	0,225	0,25	1344	1536	1735	1824	0,222	0,248
N	146	158	143	155	148	160	144	156
<b>Sample Group that do not apply SBC</b>								
Median	0,07	0,11	740	744	922	136	0,27	0,2742
N	133	125	131	122	1025	120	127	123

*Table 7: Summary result of Mann-Whitney U test of Median ranks*

The second summary table of results from Mann-Whitney U test, named as ranks table, describes the direction of differences. As it is observed from table 7, the medians of the groups are presented. According to Pallant J. (2007) p.222, in this test it would be better to present the median values of the groups. In observing differences between median values in this table, we can see similar results by comparing means in descriptive statistics. Total sale, total assets and Intangible assets to total assets ratio has higher median value for the sample

group that applied SBC. In contrast, for the largest owner the median of the second group which had no SBC is higher.

### 5.2.2 Chi-square test results and analysis

This study also involves some categorical explanatory variables. In order to find the relation of these variables with the categorical dependent variable (application of SBC), the appropriate test is the Chi-square test. Pallant J. (2007, P214) states “This test compares the frequency of cases found in the various categories of one variable across the different categories of another variable.” There are 2 categorical variables in our study including market capitalization and also industry sectors. This test has been conducted for both variables, however, the use of sectors in this test violate one of the assumptions in this test<sup>8</sup>. Therefore, this is omitted from the correlation analysis. Market capitalization, including 3 levels of large cap, mid cap and small cap in addition to the other market, NGM equity, is one categorical variable in this study that relates to the application of SBC and has been examined here by means of the Chi-square test.

**Chi-Square Tests**

	Value	df	Asymp. Sig. (2-sided)	Value	df	Asymp. Sig. (2-sided)
	2007			2008		
Pearson Chi-Square	10,648 <sup>a1</sup>	3	,014	15,437 <sup>a2</sup>	3	,001
Likelihood Ratio	10,919	3	,012	15,631	3	,001
Linear-by-Linear Association	7,787	1	,005	13,313	1	,000
N of Valid Cases	284			286		

a 1 cells (, 0%) have expected count less than 5. The minimum expected count is 14, 37.

a 2. 0 cells (, 0%) have expected count less than 5. The minimum expected count is 13, 22.

*Table 8: Summary result of Chi-square test*

**Symmetric Measures**

	Value	Approx. Sig.	Value	Approx. Sig.
	2007		2008	
Nominal by Nominal	Phi	,194	,232	,001
	Cramer's V	,194	,232	,001
N of Valid Cases	284		286	

*Table 9: Phi and Carmer's V coefficient*

<sup>8</sup> According to Pallant (2007), the main assumption in chi-square test is that, At least 80% of the cells in cross tabulation table should have minimum frequency of 5 or greater. By doing the test for industry sectors in Chi-square we found 8 cells means 40% of the cells has the frequency less than 5 which violate the assumption of Chi-Square test.

Two above tables (8 and 9) are the summary results of the Chi-square test for years 2007 and 2008. It is important to first check the test for its assumptions. One of the main assumptions for this test is that at least 80% of the cells should have frequencies of more than five. In this test, as we see in the footnote of the first table, 100% of the cells have a frequency more than five. Another important thing is that we look at the significance level to see whether it is less than 0.05. In this test the significance level is 0.01 which shows that the differences between market capitalizations are significant.

The cross-tabulation table shows us the differences between large cap, mid cap, small cap and NGM equity by presenting the percentage of each group using SBC. The whole table is presented in Appendix B. A glance at the table reveals that the percentages of “Yes” companies (using SBC) decrease from large cap to NGM equity in both years 2007 and 2008. The percentages of “Yes” companies for the large cap, mid cap, small cap and NGM equity are 60.7% (67.9%), 58.3% (65.8%), 50.8% (51.2%) ,and 26.7% (30%) respectively.<sup>9</sup> Cramer’s V presented in the table 9 can show us the effect size. This takes in to account the degree of freedom<sup>10</sup>(df) which is three in this test. According to Pallant J. (2007), by this degree of freedom the effect size is almost large when it is between the ranges of (0.17-0.29). In this test the Carmer’s V is 0.19 (0.23) which shows a large effect.

### 5.3 Summary of correlation Analysis Results

The summary of the different tests that have been conducted for assessing the relation of explanatory variables with SBC is provided in the figure 2. As we see in this figure the relation of Intangible assets, Total sales, and Ownership structure in descriptive statistics by comparing means and in Mann-Whitney U test by comparing medians give the same results regarding the significance and direction of the associations. In these tests we see that the relation of Total sale, Total assets and intangible assets ratio are positive and the largest owner is negatively correlated with the application of SBC. The Chi-square test, conducted only for categorical variables, shows the positive significant relation of market capitalization with SBC. However, for ROE and Leverage ratio, no significant relation is found in any test.

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9 The numbers in parentheses show the percentages for the year 2008

10  $df=(r-1)(c-1)$  or number of row minus one multiple by number of columns minus one



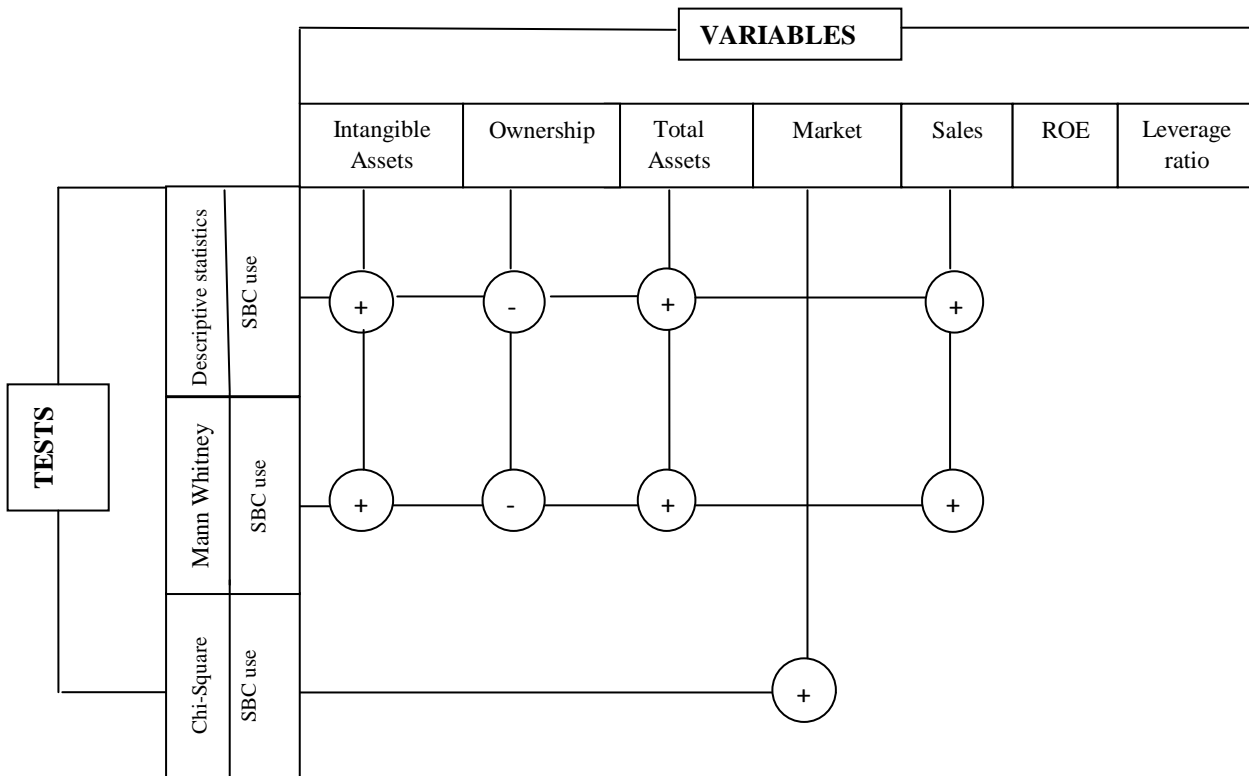


Figure 2. The relation of variables and SBC through correlation tests

## 5.4 Logistic regression results and analysis

Application of regression in this research is very useful as it helps to predict an outcome. Logistic regression is applied when we are dealing with categorical data (SBC application). Binary (or binomial) logistic regression is a form of regression which is used when the dependent variable is a dichotomy and the independents one are of any type. In fact, this model is used to describe the predictor variables for predicting categorical dependent variables. In this study, these variables are coded as “Yes” or “No” for the application of SBC.

### 5.4.1 Assumptions of Binary Logistic regression

One of the main assumptions of conducting regression tests is that there should not be a high correlation between two predictors. This is usually referred to as a multicollinearity problem. One way to assess the multicollinearity problem is to do a correlation analysis for the explanatory variables and see if they are correlated very highly. Field (2010, p. 199) considers the high correlation by a correlation coefficient more than 0.80 or 0.90. The correlation is assessed by using the Pearson test. The results from this test shows that only total sales and

total assets are in high correlation<sup>11</sup>. As these variables are both the proxies for one characteristic which is the size of the company, two models are used where one model explains the relation of the total sales with the application of SBC and the other one is used for assessing the relation of total assets.

Another important assumption for conducting logistic regression is assessing appropriateness of the model. In doing logistic regression in SPSS we have the possibility to have some of the diagnostic methods. The results of these tests are also provided in Appendix C. The tests tell us that the model is appropriate for predicting the outcome. For example, the Chi-square test, Under Omnibus Tests of Model Coefficients table in Block 1, shows that the latest model is significantly better than a model with only the intercept (the significant level is 0.00).

#### ***5.4.2 Binary Logistic regression results and analysis***

As it is mentioned in descriptive statistics, some of the variables including total sales, total assets and leverage ratio have skewed distribution. For the controlling process and to have more accurate results for regression, we transformed these values to their logarithm value to reach a stable distribution. Furthermore, the regression test has been conducted through different methods in SPSS including, Enter, Forward Stepwise<sup>12</sup>, Backward Stepwise (conditional and Likelihood Ratio). Enter is the method that brings all the variables in the model and measures their relation. Between the variables in the Enter method, those that are significant should be considered as the variables which are good predictors of the binary choice. On the other hand, in the Stepwise methods only the variables that are significant and good predictors for the dependent variable is reported. The last results of the regression test are presented here. Table 10 shows the first model including total sale and other variables. This table is the result from the Enter method. Table 11 shows the result of the regression test, the forward method, which presents the relation of all variables including total assets and excluding total sale.

If we look at both methods, we can see the same variables with  $p$  less than 0.05 in both the Enter and Stepwise methods. These results are reported in the “*variables in the Equation*” table. The last important point that we should mention here is regarding year 2008 (yr2008 as stated in the tables). This year is also considered as one variable which relates with the SBC use for the previous year<sup>13</sup>. This variable is coded as “0” for 2007 and “1” for the year of 2008. As we can see in the tables (10 and 11), there is not any significant result change between these two years. Therefore the same interpretation can be also applied for the year 2008.

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<sup>11</sup> The results of Pearson test is presented in the Appendix F

<sup>12</sup> The results are presented in Appendix D

<sup>13</sup> Yr 2008 relation with 2007 is included all variables.

**Variables in the Equation**

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Step 1 <sup>a</sup> Intangible assets Ratio	1,943	,490	15,759	1	,000	6,983	2,675	18,230
Log leverage Ratio	-,206	,183	1,269	1	,260	,814	,568	1,165
Largest owner ROE	-1,548	,514	9,057	1	,003	,213	,078	,583
Log total sale yr2008(1)	,177	,050	12,693	1	,000	1,193	1,083	1,315
Constant	-1,153	,485	5,642	1	,018	,316		

a. Variable(s) entered on step 1: Intangible, loglev, owners, ROE, logsize and yr2008.

*Table 10: Variables in the Equation, results from logistic regression, Enter method*

**Variables in the Equation**

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Step 4 <sup>a</sup> Intangible assets Ratio	2,394	,503	22,671	1	,000	10,954	4,089	29,342
Log total assets	,181	,046	15,426	1	,000	1,199	1,095	1,312
Largest owner	-1,463	,499	8,590	1	,003	,232	,087	,616
Constant	-1,284	,415	9,590	1	,002	,277		

*Table 11: Variables in the Equation with total assets, results from logistic regression, Stepwise Forward method*

In table 10 and 11, contribution and importance of each predictor variables are presented. The test that is used here is the Wald test, as we can see the value of the statistic for each predictor in the column labeled **Wald**. First and foremost, we should scan down the column labeled **Sig.** and look for the values less than 0.05. These are the variables that significantly contribute to the predictive ability of the model. Table 10 presents among all the variables: the largest owner, intangible assets, and the logarithm of total sales, contributing significantly to the prediction of using of SBC. Table 11 reflects total assets, intangible assets ratio and the

largest owner as significant associated variables with the application of SBC. The **B** value, in the first column, tells us about the direction of the relation between dependent and independent variables. This direction is indicated by a negative or positive value in this column. In fact, the negative “B” value means that an increase in the independent variable score results in a decreased probability of the dependent variable and vice-versa for the positive value. The last column of this table shows the range results with 95% confidence. This confidence gives us accurate representation of the true value which is dependent on the size of the sample. In this study the percentage of confident interval varies for log total sale (1.08-1.31), intangible assets (2.67-18.23), ownership (0.078-0.58), and log total assets in table 11 (1.095-1.312). These ranges mean that we can be 95% confident that the actual value of OR in the population lies somewhere between those mentioned numbers.

Looking at “Largest owner” variable, the relation is negative, meaning that with an increase in the percentage of largest owner shares, the application of SBC decreases. “Intangible assets” and “log of total sale” have a positive relation which means by increasing the value of these ratios the use of SBC also increases. These results are in line with the previous statistical tests in the correlation analysis. Therefore, it makes us more reliant on the results. However, in regression tests as is mentioned before, besides finding significance and direction of the variables effect, we are able to understand the amount of change in dependent variables raised from the effect of explanatory variables. This is achieved from the column labeled as **Exp (B)**. The values provided in this column (in “Variables in the Equation” table), are the odds ratios (OR) for each independent variable. These values are crucial for the interpretation of the regression results which explain how much effect the predictor variables have on dependent variables by one unit change.

### *Intangible Assets*

The odds ratio (OR) for the intangible assets ratio, as it is observed from table 10, is 6.98. This OR means that companies which own more intangible assets have 6.98 % higher probability of SBC use. This ratio is almost 7% which shows that this variable is a good predictor of SBC. This is in coherence with earlier research that shows human capital intensity in the companies should be an important determinant of option plans (see, e.g., Core and Guay 2001; Frye M, 2004; Jonas et al., 2006). The purpose of this variable being studied is to find out the relation between human capital intensity with the SBC use. Consequently, defining whether human capital intensity is a determinant of SBC. A high level of intangible assets ratio indicates that the production is human capital intensive. The positive relation between the use of SBC and intangible assets ratio reflects that companies with more human capital intensity are more likely to use SBC. This result is in line with the study by Jonas et al (2006), who suggests that the more human capital intensive the firms are, the more difficult to monitor employee performance. In firms where human capital is more valuable, the need to retain high quality employees and motivate them to work is higher. Another point is that losing valuable human capital can be very costly to firms. Yet, according to Frye M. B. (2004), for retaining high-quality employees, self-monitoring schemes are an important factor. Therefore, SBC as a motivation incentive plan can help firms with human capital intensive, to overcome the difficulties in monitoring employees. Companies with a high level of intangible assets are most likely to use SBC as a way to motivate employees as monitoring is difficult. Basically it is related to the pay-performance relation theory which explains the role of SBC to motivate employees to work towards the company’s goal and help firms to enhance their performance. Therefore, one can assume that the efficiency perspective is very suitably

related to determinants of SBC as this is a tool of self-monitoring and motivating humans in companies.

### *Largest Owner*

Another significant variable in this study is “largest owner” which has an odds ratio of less than 1, (0.213). This indicates that the larger the ownership structure the less SBC is predicted. This OR means that for each extra percentage in the shares of the companies belonging to the largest owner, the probability of the companies reporting application of SBC decrease by 0.21%. In other words, dividing 1 to the odds ratio, which equals to 4.69 % ( $1/0.213=4.69$ ), suggests that for each less percentage of the largest owner’s shares in the company, the probability of application of SBC increases 4.69%. Therefore, the likelihood of SBC decreases with more concentrated equity ownership. This result is also consistently showed in the graph “Largest owner” at 4.2.1 topic and in the correlation analysis at topic 5.2.1. This negative relation between SBC and the ownership concentration has an explanation based on principal-agent theory and the key word in this context is monitoring. In the principal-agent theory, as mentioned on topic 2.2.1 with more detail, the problem of agents and principals pursuing different goals does not play a role when ownership is concentrated in firms. Duncan J. p. 4, (2001) affirms that “agency theory assumes that the organization form with the lowest agency cost is one where employees own 100% of the firm”. The author continues his rationalization arguing that when employees are not owners, they are agents. Agents tend to not act in favor of owner interest, consequently, monitoring is required. However, that is not the case when companies possess large blocks of shareholders, where ownership is concentrated. In this case monitoring is less required. As large shareholders have the alternative means of monitoring the management (JONES et al. 2006), SBC is unnecessary and not often used. This fact is also in accordance with Ittner et al., (2003), p. 15 who states “holders of large blocks of stock have greater incentive to monitor the actions of managers and greater power to force managers to allow monitoring to occur”. This mentioned author relies on corporate governance mechanisms as alternative explanations to the use of SBC. The opposite is applied when ownership is highly dispersed though. Firms with a large number of small owners will have problems with monitoring management, consequently the need for self-enforcing incentive schemes (by SBC) are stronger. Jakobsson and Karlsson, (2009) present the same track of reasoning, and thus, concluding that there is a very strong correlation between the use of SBC and the kind of firm’s ownership structure. Thus, our results reveal and confirm the prediction exists in the literature in which there is an expectation that ownership concentration has a negative relation to the use of stock options. Consequently, the use of equity-based incentives should be lower, when possible monitoring alternatives are greater.

### *Size*

One of the main determinants of the SBC, which is considered in many studies, is the size of the company (Jonas, et al., 2006; Bergman and Jenter, 2007; Frye M., 2004; Kruse, 1996). While the most studies found positive correlation between firm’s size and SBC use, in the study made by Jakobsson and Karlsson, (2009) no correlation between those variables were observed. In our study the different variables, including total sales and total assets were used as the proxies for assessing the relation between the SBC and size of the company. The significant association is observed through different tests. The statistical tests in this study (non-parametric tests and regression test) have given us the same results concerning significance and direction of the relation between size and SBC. The direction is positive

which means that with increase in the size of the firm (total sale or total assets) the SBC use increases. This can be explained better with the regression test result which indicates that with one unit increase in total sales of the company, the probability of use of SBC increase by the 1.193% (see table 10). The same interpretation can be applied for the total assets effect on SBC. The odds ratio of 1.199, in this variable illustrates that the probability of the application of SBC grows by 1.2% when total assets of the company change for one unit (see table 11). These positive significant relations can be explained by both agency theory and pay-performance relation. The fact that in large companies monitoring is more difficult is one way to explain why larger companies use more SBC as an incentive plan. In fact, as it mentioned before, the SBC in large companies, where monitoring is difficult, can be used as less costly alternative way. Furthermore, the positive relation of company size and application of SBC can be interpreted by considering this characteristic as the outcome of positive performance of firms. In this argument the use of SBC is connected to pay-performance. This idea is consistent with the study by Kruse (1996), who considers the size of the company as the strongest “*productivity-related*” variable influencing the use of SBC. Bergman and Jenter (2007), explain that this kind of incentive plan is used when employees have optimistic views about the performance of a company. However, this result is contrary with the study by Frye M., (2004). In this study the negative relation between SBC and size of company (using total assets as the variable) is concluded. Frye M., (2004, p. 35) mentioned that “firm size captures the importance of human capital at the firm (....) smaller firms may be more entrepreneurial in nature and thus rely more on human capital.”

#### *Past Share Return Performance*

In terms of share return performance characteristic, the association between SBC uses is observed with the previous year. That is, measured by ROE of 2006 and its relation with the SBC application in 2007 and ROE of 2007 and its relation with SBC in 2008. Based on a couple of studies which have made similar investigation, these variables were expected to present a significant relation. However, in our regression results and other statistical tests such as Mann-Whitney U test, the relation shows no significant association of ROE and the SBC application for the following year. No significant association was found (see figure 2: The relation of variables and SBC use), meaning that our results present contrary evidences from some previous studies. This relation between a companies’ performance and SBC use has been focused on by different authors. Positive relation between the SBC and ROE was found by Bergman and Jenter, (2007). They, suggest that by increasing the annual return, the probability of observing a broad based scheme increases. This is based on the fact that employees would be more optimistic when companies are doing well. There is, in this case, a leverage of willingness to work harder motivated by a good previous years return and consequently increase their equity remunerations, as the firm launches a new grant in the coming year. Even though, we possibly agree upon this reasoning, which seems very convincing, we have to consider the actual context in which we are situated. The year 2007 was characterized by a financial down turn, which may have affected this relationship somehow. Furthermore, the difference in the use of SBC between the years of 2007 and 2008 was only an increase of 8 companies which is not a significant change. However, we are not able to blame the financial crisis as it was not part of the scope of our thesis. If one could say that in general in a period of crisis, companies tend to have worse performance than in years with normal financial situations, one could suppose that a sense of worry by employees may interfere on the motivation towards SBC remuneration. Nevertheless, our periods of study do not provide us with enough information in order to provide this kind of analysis.

### *Total Debt*

The amount of debt inside the company is another characteristic in this study in which its relation with the application of SBC is observed. Leverage ratio, is used as the variable for this characteristic and shows no significant association with SBC use for both the studied years. This is in sharp contrast with previous studies for example by John and John (1993) and Frye M. (2004), who found that leverage ratio is negatively related to SBC use for a selective group. They suggest that the amount of debt can affect the adoption of SBC as it is negatively related to pay-performance. The logic used to explain the negative relation between these mentioned variables is that with high debt companies' performance lower is the likelihood of the amount of SBC issued. As it is clearly explained in the chapter 2, section 2.2.1, the pay-performance relation explains the utilization of SBC as the linkage between incentive plan and performance especially for the management. This lack of consistency with previous research can be due to many reasons regarding limitations in our study, such as a short period of study (only two years) or study of the SBC in general and not separated for selective groups or all the employees in the firms. It is also important to mention that, the lack of significant relationship between leverage ratio and SBC use is observed in some earlier studies<sup>14</sup> which show that interpretation of this variable should be treated with some prudence.

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<sup>14</sup> e.g. in the study by Frye M. (2004), one of the sample (1994) shows no significant relation with adoption of SBC.

## 6. CONCLUSION AND SUGGESTIONS FOR FURTHER RESEARCH

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*In the final chapter we present the answer to the research's purpose and research questions based on the findings made, and the statistical results and analysis. Lastly, suggestions for further research are presented.*

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### 6.1 Conclusion

The present thesis intention was to address in which way specific firm's characteristics are correlated to SBC use. This intention sought after the determinants of SBC use and their most likely motivation of its use. The determinants of SBC are those characteristics which are found to have a significant relation in the linkage between companies' characteristics and the application of this kind of incentive plan. The evidence is provided from the OMX Stockholm Stock Exchange from the years of 2007 and 2008. Our sample includes 286 companies categorized in different market capitalization groups.

In general, we found that, the number of companies that applied SBC is higher compared to the companies that did not apply this kind of incentive plan in both years. However, this difference is not significant in order to conclude the popularity of this plan in the Swedish public market. Studying the SBC and particularities in these companies shows that the SBC use differs between companies with different particularities. This, in fact, shows that there are similarities with previous studies proving that there are clear differences in the use of equity based compensation depending on a company's specific characteristics.

As the intention of this study is to find out the determinants of SBC, we have selected some different characteristics. These characteristics were closely studied and the significant relation between some of them and SBC use was found through different kinds of analysis. In the preliminary analysis eight different groups were used in order to find out the differences between them. The findings achieved from these analyses illustrate basically that there are some obvious relations between some of the variables and the SBC utilization.

As stated in the literature review, the "*competing theories*" brought by Zimmerman (1986) suggests that there are different ways to explain SBC role. Furthermore, according to Duncan (2001), there are basically two perspectives for explaining SBC use. We have found evidences towards one of these perspectives. The "positive approach" is suited well to predict the use of SBC. Some characteristics present significant relations which are explained by efficiency perspective. Based on this perspective the use of SBC is considered as an effective method to solve the principal-agent problem and link pay and performance.

In the studied market (OMX), selective schemes are two times more used than a broad-based scheme. This indicates that, this kind of incentive plan is more used for key employees, as attraction and retention of these people is considered to be more important for the companies. Additionally, the use of SBC differs between various market capitalizations and it is more common in Large and Mid. cap. There is a high interest in SBC plans in some sectors including, Energy, Health care and IT, as it deals with highly-qualified employees.



Furthermore, the results from correlation analysis indicate a significant relation between some of the characteristics including, size of the company, ownership structure and human capital intensity with SBC use. Different tests reflect the same results also in terms of direction of the relation between the mentioned characteristics and the application of SBC. While the association between firm size and human capital intensity is positive, the concentrated ownership structure is negatively related with SBC. In addition, the differences of companies using SBC in different market capitalization groups observed are significant. The largest number of companies using SBC is related to Large cap and this decreases to Mid, Small cap and finally NGM equity. However, for two other variables, including past share return performance and total debt, no significant relation is found in any test.

The main analysis in this study has been conducted through regression analysis which indicates the same results with previous analysis. Among the significant characteristics as predictors of determinants of SBC, the intangible assets have the strongest relation. The explanation behind this strong relation is that, companies with high levels of intangible assets are more likely to use SBC as a way to motivate employees and as monitoring is difficult. This is in line with the theories that mention the use of SBC as the most effective tool in pay-performance relation. According to this view, the role of SBC is to motivate employees to work towards a company's goal and help firms to enhance their performance. Therefore, one can assume that the efficiency perspective is very suitable related to the determinants of SBC as this is a tool of self-monitoring and motivating employees in the companies.

In addition, the positive association between the size of the firms and the SBC can be another explanation for the important role of SBC. In fact, this is highly connected to the pay-performance relation by considering this characteristic as the outcome of positive performance of firms. Besides the optimistic view for the use of this plan as an incentive plan, which arises from the positive performance of the companies, it is also possible to explain with the fact that in large companies the monitoring is more difficult and therefore is more common to use SBC as a monitoring tool.

To understand better how the use of SBC can be a very important method for monitoring employees and decreasing the asymmetry of interest between agent and principal, the relation of ownership structure and SBC has been studied. The negative relation between SBC and the largest owner indicates that if the ownership is concentrated, the monitoring can be completed with corporate governance. However, dispersed ownership needs this kind of plan as an alternative tool for monitoring. In contrast, when companies possess large blocks of shareholders, where ownership is concentrated, monitoring is less required.

The characteristics which show no significant relation with the application of SBC in our study are share return performance and total debt. An explanation of the lack of significant correlation between these two and SBC can be related to some limitations in our study. As the period of our study is two years and does not consider the financial crisis effect on the study. Furthermore, there is no separation analysis for selective and broad-based schemes.

## **6.2 Implications of the study**

When SBC is implemented, a firm has an opportunity to align the interests of owners with managers and employees. This is considered as the important role of SBC. However, together with this mentioned advantage there might be some disadvantages which are related to the

opportunistic actions (mentioned in topic 2.2.2). Therefore, the use of SBC represents an issue of concern in many firms. One should be aware of the circumstances in which its use is worthwhile. Assessing the application of SBC in different companies with different particularities helps to understand the conditions when the use of SBC brings a possibility of more pros than cons for companies. This study, thus, shows the special situations where SBC is used to enhance performance. These special cases are regarded in our overall results as companies with larger size, more intangible assets, and less concentrated ownership structure. Those characteristics are found to be the determinants of SBC, since they presented strong relation with the application of the mentioned incentive plan. These determinants are explained to be raised based on the principle-agent conflict. For instance, in the large companies there is a necessity for having SBC, since this kind of compensation plan exercises as a control mechanism through motivating and monitoring employees. The same explanation is asserted for dispersed ownership structure and high human capital intensity.

In fact, with the evidences from the mentioned determinants of SBC, owners and managers can evaluate when SBC use is strongly linked to effectiveness and in what circumstances these plans bring positive cost-benefit advantages. To contribute with managers this study shows that application of SBC is more in human capital intensive firms as in these firms human capital is the major asset and losing this valuable capital can be very costly for the firm. Therefore, managers can use this kind of incentive plan to not only retain key employees, but also motivate them to enhance the performance and try to achieve firm's goals. From investor perspective this study explains that, in the conditions where monitoring is an important issue, for example in the companies with large size and/or dispersed ownership structure, this kind of incentive plan is more used as it leads managers to seek for the same interests with owners. In sum, this study presents a special contribution to owners and managers of firms which usually struggle to assess the role of SBC since they may be suspicious to implement SBC due to its possible disadvantages brought and known as opportunistic behavior that may be provided to the agents.

### **6.3 Suggestions for further research**

As mentioned along this paper there are the necessity of exploring, even further, the determinants of the SBC and that is due to the lack of research in the present studied area. Therefore, the amount of suggestions for further research is vast. This kind of research is very flexible and open to different approaches depending on what is intended and classified as a firm's characteristics. And so, the possibility of conducting a similar research method, but with different independent variables, is relevant. There are some other firms' characteristics which can be studied besides the ones selected in this paper. Since the characteristics to be investigated can be differently determined, other determinants may be studied and added to this research. Also it is interesting to consider separately the effect of the determinant for broad based and selective schemes and see if there are any differences in terms of the use of SBC between these two groups.

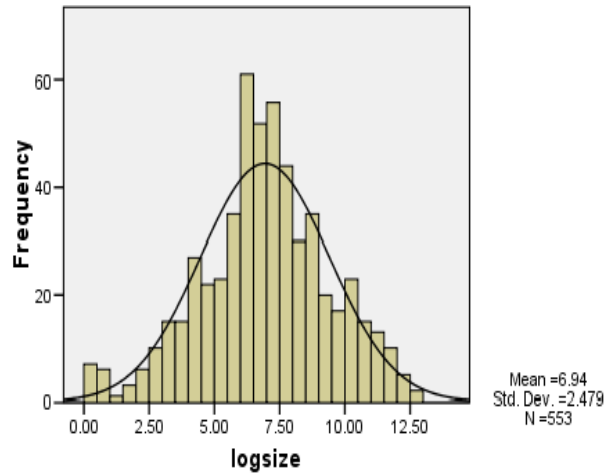
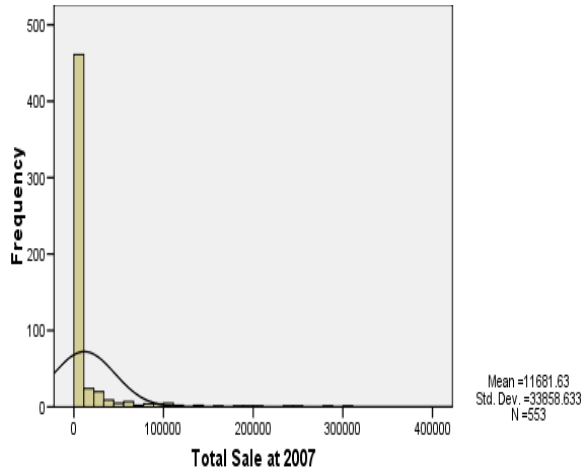
Additionally, as in any longitudinal research, this research provides the opportunity to apply the same kind of study in different periods of time. It would be interesting to investigate the determinants for the utilization of SBC for a longer period of time, in order to analyze the historical development of a firm's adoption characteristics and differences through the years. Moreover, it could be added in the data the years in which the economic downturn took place.

Hence, an investigation of financial crisis effects on the use of SBC is an interesting study idea. One could investigate, for instance, the stock market fluctuations and observe if there is any relation with the SBC implementation.

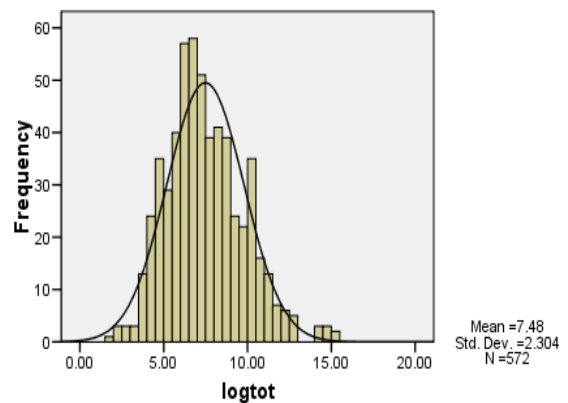
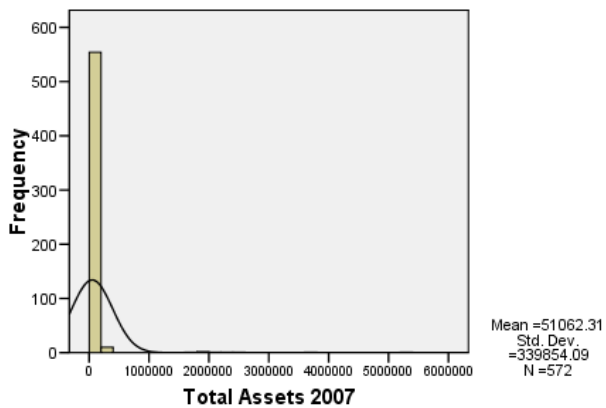
Last but not least, the current study examines the determinants of SBC by considering the association between companies' characteristics with the application of SBC. However, in understanding the role of this kind of incentive plan in an efficiency point of view, it is interesting to complete this research by studying the effect of SBC in the long-term performance of the companies. This involves considering the cost-benefit issues for applying this kind of incentive plan and observing the differences between companies with same characteristics but have different trends in applying SBC.

## APPENDIX A: The histogram of the variables

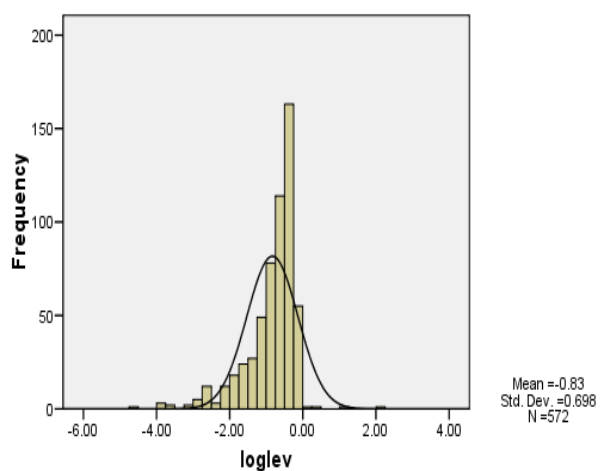
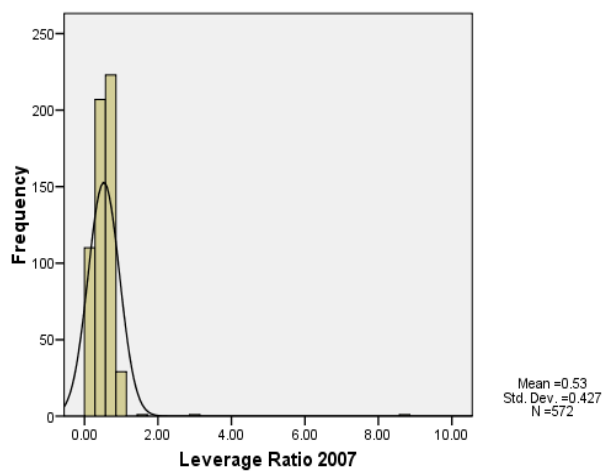
### Histogram of Total Sale and Total Sale Logarithm



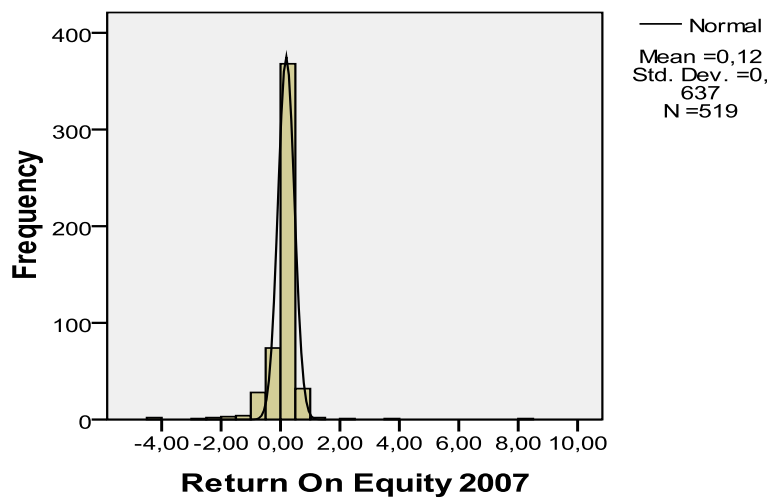
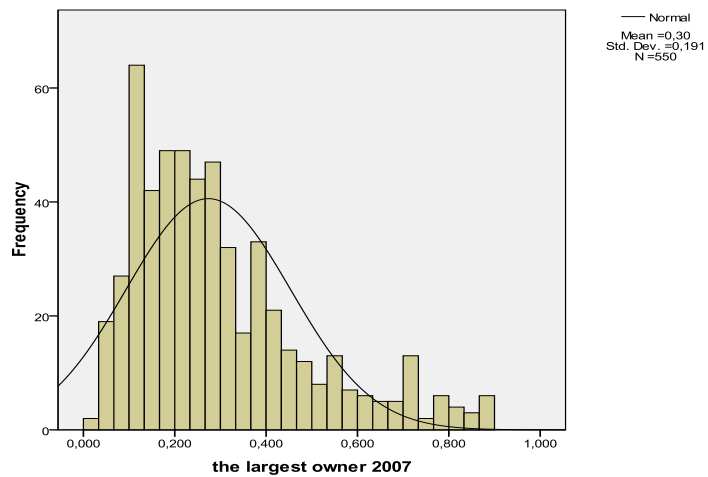
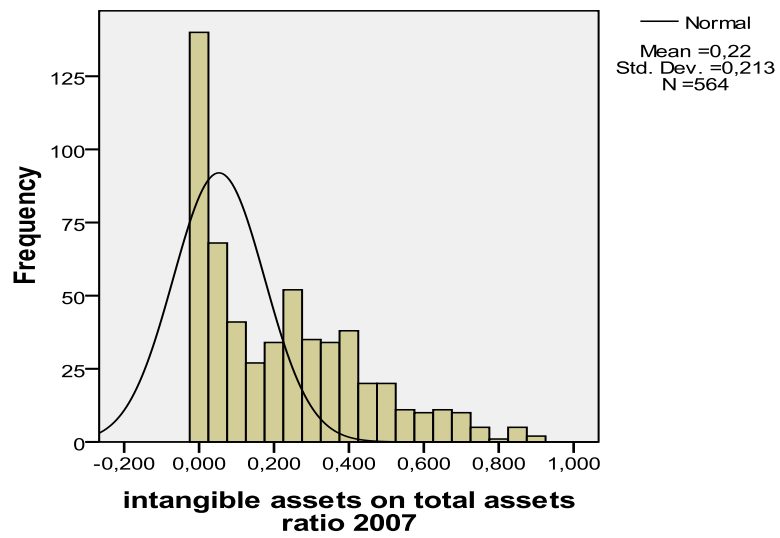
### Histogram of Total Assets and Total Assets Logarithm



### Histogram of Leverage Ratio and Leverage Ratio Logarithm



## Histogram for Intangible Assets, Largest owner and ROE



**APPENDIX B: Crosstab for market capitalization and SBC use**

			SBC2007		Total	SBC2008		Total
			0 No	1 Yes		0	1	
Market	1 largecap	Count	22	34	56	18	38	56
		% within Market	39,3%	60,7%	100,0%	32,1%	67,9%	100,0%
		% within SBC2007	16,2%	23,0%	19,7%	14,3%	23,8%	19,6%
		% of Total	7,7%	12,0%	19,7%	6,3%	13,3%	19,6%
	2 midcap	Count	30	42	72	25	48	73
		% within Market	41,7%	58,3%	100,0%	34,2%	65,8%	100,0%
		% within SBC2007	22,1%	28,4%	25,4%	19,8%	30,0%	25,5%
		% of Total	10,6%	14,8%	25,4%	8,7%	16,8%	25,5%
	3 smallcap	Count	62	64	126	62	65	127
		% within Market	49,2%	50,8%	100,0%	48,8%	51,2%	100,0%
		% within SBC2007	45,6%	43,2%	44,4%	49,2%	40,6%	44,4%
		% of Total	21,8%	22,5%	44,4%	21,7%	22,7%	44,4%
4 NGMe	Count	22	8	30	21	9	30	
	% within Market	73,3%	26,7%	100,0%	70,0%	30,0%	100,0%	
	% within SBC2007	16,2%	5,4%	10,6%	16,7%	5,6%	10,5%	
	% of Total	7,7%	2,8%	10,6%	7,3%	3,1%	10,5%	
Total	Count	136	148	284	126	160	286	
	% within Market	47,9%	52,1%	100,0%	44,1%	55,9%	100,0%	
	% within SBC2007	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	
	% of Total	47,9%	52,1%	100,0%	44,1%	55,9%	100,0%	

## APPENDIX C: Regression Model results from SPSS

### Block 0: Beginning Block

Case Processing Summary

Unweighted Cases <sup>a</sup>		N	Percent
Selected Cases	Included in Analysis	490	85,7
	Missing Cases	82	14,3
	Total	572	100,0
Unselected Cases		0	,0
Total		572	100,0

a. If weight is in effect, see classification table for the total number of cases.

Classification Table<sup>a,b</sup>

Observed			Predicted		Percentage Correct
			share based compensation 07		
			0 No	1 yes	
Step 0	share based compensation 07	0 No	0	223	,0
		1 yes	0	267	100,0
Overall Percentage					54,5

a. Constant is included in the model.

b. The cut value is ,500

### Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	41,365	6	,000
	Block	41,365	6	,000
	Model	41,365	6	,000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	633,963 <sup>a</sup>	,081	,108

**Model Summary**

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	633,963 <sup>a</sup>	,081	,108

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than ,001.

**Classification Table<sup>a</sup>**

Observed			Predicted		
			share based compensation 07		Percentage Correct
			0 No	1 yes	
Step 1	share based compensation 07	0 No	115	108	51,6
		1 yes	72	195	73,0
Overall Percentage					63,3

a. The cut value is ,500

## APPENDIX D: The last Result of Regression test by Stepwise method

**Variables in the Equation**

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Step 4 <sup>a</sup> Intangible	1,895	,485	15,241	1	,000	6,653	2,569	17,227
owners	-1,525	,512	8,858	1	,003	,218	,080	,594
logsize	,141	,041	11,599	1	,001	1,151	1,062	1,248
Constant	-,776	,354	4,802	1	,028	,460		

a. Variable(s) entered on step 3: owners.



## APPENDIX E: Results of Mann-Whitney U test

### Report 2007

share based compensation 07	intangible assets on total assets ratio 2007	Leverage Ratio 2007	the largest owner 2007	Return On Equity 2006	Total Sale at 2007	Total Assets 2007
0 No Median	,0700	,5100	,2700	,2000	740,00	922,00
N	133	136	127	126	131	136
1 yes Median	,2250	,5500	,2220	,1800	1344,00	1735,00
N	146	148	144	133	143	148
Total Median	,1700	,5400	,2493	,1800	978,00	1395,50
N	279	284	271	259	274	284

### Report 2008

share based compensation 08	intangible assets on total assets ratio 2008	Leverage Ratio 2008	the largest owner 2008	Return On Equity 2007	Total Sale at 2008	Total Assets 2008
0 No Median	,1100	,5150	,2742	,1900	744,00	1025,50
N	125	126	123	117	122	126
1 yes Median	,2500	,5550	,2480	,1700	1536,00	1824,50
N	158	160	156	143	155	160
Total Median	,2000	,5400	,2560	,1800	1066,00	1297,00
N	283	286	279	260	277	286

## APPENDIX F: Results of Pearson test of correlation of assessing Multicollinearity problem

Correlations

		logsize	logtot	Return On Equity 2007	the largest owner 2007	loglev	intangible assets on total assets ratio 2007
logsize	Pearson Correlation	1	,846**	,335**	,106*	,444**	-,112**
	Sig. (2-tailed)		,000	,000	,014	,000	,009
	N	553	553	505	532	553	545
logtot	Pearson Correlation	,846**	1	,248**	,066	,312**	-,210**
	Sig. (2-tailed)	,000		,000	,121	,000	,000
	N	553	572	518	550	572	564
Return On Equity 2007	Pearson Correlation	,335**	,248**	1	,067	,167**	,015
	Sig. (2-tailed)	,000	,000		,131	,000	,733
	N	505	518	518	504	518	517
the largest owner 2007	Pearson Correlation	,106*	,066	,067	1	,025	-,215**
	Sig. (2-tailed)	,014	,121	,131		,554	,000
	N	532	550	504	550	550	544
loglev	Pearson Correlation	,444**	,312**	,167**	,025	1	,004
	Sig. (2-tailed)	,000	,000	,000	,554		,919
	N	553	572	518	550	572	564
intangible assets on total assets ratio 2007	Pearson Correlation	-,112**	-,210**	,015	-,215**	,004	1
	Sig. (2-tailed)	,009	,000	,733	,000	,919	
	N	545	564	517	544	564	564

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

## APPENDIX G: The complete table of companies' information

Company	list	Sector	Sale(MSEK)		Ownership Structure		Total Aseets (MSEK)		Leverage ratio		Intangible assets ratio		Return on equity(%)			Share-based Payment	
			2007	2008	2007	2008	2007	2008	2007	2008	2007	2008	2006	2007	2008	2007	2008
ABB Ltd*	Larg cap	Industry	160,261	234,075	39.26%	39.26%	200,204	261,466	0.63	0.65	0.09	0.10	0.23	0.34	0.28	Yes	Yes
Alfa laval	Larg cap	Industry	24,849	27,850	7.60%	7.20%	23,238	29,032	0.66	0.64	0.25	0.25	0.34	0.57	0.51	No	No
Alliance Oil *	Larg cap	Energy	10,450	21,447	39.00%	27.63%	9,617	18,840	0.59	0.52	0.00	0.01	0.06	0.05	0.04	Yes	Yes
Assa Abloy	Larg cap	Industry	33,550	34,918	16.10%	16.10%	37,732	44,960	0.58	0.58	0.50	0.50	0.19	0.29	0.19	Yes	Yes
Astra Zeneca*	Larg cap	Health service	190,892	249,016	4.89%	4.92%	309,706	368,658	0.69	0.66	0.45	0.47	0.13	0.10	0.12	Yes	Yes
Atlas Copco	Larg cap	Industry	63,355	74,177	21.21%	22.27%	56,659	75,394	0.91	0.56	0.08	0.17	0.36	0.27	0.55	Yes	Yes
Autoliv *	Larg cap	Discretionary	43,714	51,007	11.80%	12.20%	34,260	41,023	0.55	0.58	0.33	0.34	0.24	0.19	0.12	Yes	Yes
Axfood	Larg cap	Consumer Staples	29,189	31,663	46.30%	46.30%	6,608	7,350	0.67	0.69	0.23	0.28	0.49	0.50	0.45	No	No
Boliden	Larg cap	Material	33,204	30,987	6.30%	7.50%	27,231	30,252	0.53	0.47	0.12	0.11	0.52	0.40	0.04	No	No
Castellum	Larg cap	Finance	2,259	2,501	6.70%	6.10%	27,891	29,404	0.60	0.66	0.00	0.00	0.22	0.17	-0.13	Yes	Yes
Electrolux	Larg cap	Consumer Discretionary	104,732	104,792	28.20%	28.80%	66,089	73,323	0.76	0.78	0.06	0.07	0.38	0.25	0.04	Yes	Yes
Elekta	Larg cap	Health service	4,525	5,081	30.30%	30.60%	5,356	6,322	0.45	0.46	0.50	0.50	0.27	0.34	0.30	Yes	Yes
Ericsson	Larg cap	IT	187,780	208,930	19.49%	19.42%	245,117	285,684	0.45	0.50	0.21	0.17	0.30	0.23	0.12	Yes	Yes
Fabege	Larg cap	Finance	2,066	2,214	13.60%	13.80%	31,755	30,542	0.64	0.68	0.00	0.00	0.15	0.18	-0.14	No	No
Getinge	Larg cap	Health service	16,445	19,272	48.80%	48.90%	22,970	33,032	0.71	0.68	0.45	0.48	0.29	0.27	0.20	Yes	Yes
H&M(Hennes & Mauritz )	Larg cap	Consumer Discretionary	78,346	88,532	69.10%	69.30%	41,734	51,243	0.23	0.28	0.01	0.03	0.57	0.60	0.57	No	No
Hakon Invest	Larg cap	Consumer Staples	1,075	1,184	67.41%	67.35%	10,379	10,021	0.06	0.05	0.04	0.04	0.13	0.10	0.02	Yes	Yes
Hexagon	Larg cap	Industry	14,587	14,479	45.40%	49.80%	24,940	27,501	0.60	0.56	0.57	0.61	0.19	0.20	0.18	No	Yes
Holmen	Larg cap	Material	19,159	19,334	51.80%	52.00%	33,243	34,602	0.49	0.55	0.02	0.00	0.11	0.12	0.15	No	No
Hufvudstaden	Larg cap	Finance	1,276	1,347	88.00%	88.00%	20,949	19,584	0.44	0.44	0.00	0.00	0.27	0.28	-0.09	No	No
Husqvarna	Larg cap	Consumer Discretionary	33,284	32,342	27.50%	28.70%	28,803	34,337	0.74	0.74	0.33	0.34	0.44	0.39	0.17	Yes	Yes

Industrivärden	Larg cap	Finance	2,249	2,987	15.00%	15.00%	66,293	35,975	0.17	0.34	0.00	0.00	0.20	-0.04	-1.23	No	Yes
Investor	Larg cap	Finance	446	417	40.00%	40.00%	177,231	140,659	0.12	0.18	0.00	0.00	0.18	0.00	-0.32	Yes	Yes
Kinnevik	Larg cap	Finance	7,673	7,719	31.70%	32.80%	62,818	35,871	0.20	0.34	0.01	0.02	0.20	0.32	-1.10	No	Yes
latour	Larg cap	Finance	6,730	7,071	79.80%	79.90%	13,553	10,807	0.25	0.27	0.05	0.09	0.11	0.10	0.20	No	No
Lindab International	Larg cap	Industry	9,280	9,840	22.49%	22.49%	7,700	8,625	0.61	0.61	0.33	0.31	0.08	0.17	0.36	No	Yes
Lundbergföretagen	Larg cap	Finance	23,049	22,350	89.40%	89.40%	76,704	71,065	0.41	0.47	0.00	0.00	0.18	0.13	-0.07	Yes	Yes
Lundin Mining *	Larg cap	Material	6,843	6,582	15.94%		30,423	29,191	0.25	0.30	0.11	0.07	-0.55	-0.15	-0.94	Yes	Yes
Lundin Petroleum	Larg cap	Energy	5,484	6,394	24.20%	24.01%	20,331	25,281	0.46	0.49	0.04	0.04	0.17	0.16	0.07	Yes	Yes
Meda	Larg cap	Health service	8,145	10,675	25.90%	26.00%	28,649	35,815	0.67	0.63	0.84	0.83	0.28	0.12	0.11	Yes	Yes
Melker Schörling	Larg cap	Finance	279	335	84.76%	85.37%	15,045	7,893	0.01	0.17	0.00	0.00	0.59	0.04	-1.26	No	No
Millicom *	Larg cap	Telecommunication	16,945	26,890			28,504	41,140	0.69	0.68	0.11	0.19	0.62	0.40	0.43	Yes	Yes
MTG (Modern Time Group)	Larg cap	Consumer Discretionary	11,351	13,166	47.70%	47.80%	10,958	19,232	0.46	0.53	0.33	0.54	0.40	0.34	0.40	Yes	Yes
NCC	Larg cap	Industry	58,397	57,465	54.60%	55.10%	34,069	36,247	0.79	0.81	0.05	0.05	0.33	0.36	0.35	No	No
Nordea Bank **	Larg cap	Finance	74,365	89,946	19.90%	19.90%	3,668,779	5,200,117	0.96	0.96	0.01	0.01	0.23	0.19	0.15	Yes	Yes
Oriflame **	Larg cap	Consumer Staples	10,462	14,579	13.80%	10.70%	4,866	6,364	0.82	0.78	0.02	0.02	0.43	0.49	0.51	Yes	Yes
Ratos	Larg cap	Finance	16,156	26,836	46.30%	46.70%	36,782	42,750	0.62	0.60	0.28	0.46	0.23	0.27	0.33	Yes	Yes
Saab	Larg cap	Industry	23,021	23,796	38.30%	38.00%	33,801	32,890	0.67	0.72	0.23	0.23	0.17	0.22	-0.04	Yes	Yes
Sandvik	Larg cap	Industry	86,338	92,654	11.50%	11.50%	85,435	103,227	0.65	0.64	0.13	0.12	0.41	0.44	0.29	Yes	Yes
SCA	Larg cap	Material	105,913	110,449	29.50%	29.80%	145,050	158,968	0.56	0.58	0.15	0.15	0.11	0.13	0.09	Yes	Yes
Scania	Larg cap	Industry	88,839	93,749	37.44%	68.60%	91,454	110,035	0.73	0.80	0.03	0.02	0.33	0.47	0.51	No	No
SEB	Larg cap	Finance	40,440	41,140	20.30%	21.10%	2,344,462	2,510,702	0.97	0.97	0.01	0.01				Yes	Yes
Seco Tools	Larg cap	Industry	6,034	6,536	89.30%	89.30%	5,271	6,412	0.54	0.59	0.05	0.05	0.55	0.60	0.48	No	No
Securitas	Larg cap	Industry	62,908	56,572	17.40%	30.00%	39,185	35,719	0.78	0.76	0.37	0.42	0.90	0.15	0.31	No	No
SHB (HandelsBanken)	Larg cap	Finance	27,126	29,890	11.00%	10.80%	1,859,382	2,158,784	0.96	0.97						No	No
Skanska	Larg cap	Industry	138,781	143,674	27.10%	26.80%	78,941	83,478	0.74	0.77	0.07	0.06	0.26	0.27	0.23	Yes	Yes

SKF	cap Larg cap	Industry	58,559	63,361	28.70%	28.82%	46,331	56,281	0.60	0.63	0.08	0.08	0.33	0.39	0.33	Yes	Yes
SSAB	Larg cap	Material	47,651	54,329	22.70%	21.20%	91,706	69,255	0.68	0.49	0.44	0.40	0.39	0.22	0.25	No	No
Stora Enso **	Larg cap	Material	111,727	120,975	26.60%	26.70%	144,381	134,271	0.50	0.54	0.04	0.02				Yes	Yes
Swedbank	Larg cap	Finance	32,924	36,463	21.60%	19.30%	1,607,984	1,811,690	0.96	0.95	0.00	0.00				No	No
Swedish Match	Larg cap	Consumer Staples	12,551	13,162	10.30%	10.60%	16,467	18,355	0.96	0.92	0.27	0.26	1.38	3.70	1.90	Yes	Yes
Tele2	Larg cap	Telecommunication	43,420	39,505	45.30%	45.40%	48,648	47,133	0.45	0.40	0.30	0.29	-0.07	0.03	0.06	Yes	Yes
TeliaSonera	Larg cap	Telecommunication	96,344	103,585	37.30%	37.30%	216,702	264,286	0.41	0.46	0.39	0.38	0.20	0.20	0.19	No	No
Tieto Corporation **	Larg cap	IT	16,710	20,468	3.20%	5.20%	12,096	13,760	0.63	0.61	0.38	0.35	-0.45	-0.06	0.18	Yes	Yes
Trelleborg	Larg cap	Industry	30,810	31,263	55.50%	55.60%	29,334	33,763	0.66	0.70	0.34	0.35	0.12	0.13	-0.02	No	No
Volvo	Larg cap	Industry	285,405	303,667	20.50%	21.30%	321,647	372,419	0.74	0.77	0.11	0.12	0.23	0.26	0.17	Yes	Yes
AarhusKarlshamn	Mid cap	Consumer Staples	13,005	17,207	39.26%	39.26%	8,857	11,078	0.72	0.78	0.08	0.07	0.12	0.18	-0.06	No	No
Active Biotech	Mid cap	Health service	12	54	30.00%	30.00%	490	473	0.61	0.65	0.00	0.00	-2.34	-1.10	-1.10	Yes	Yes
Addtech	Mid cap	Industry	4,198	4,445	12.10%	12.20%	2,009	2,120	0.66	0.61	0.26	0.29	0.63	0.59	0.44	Yes	Yes
Atrium Ljungberg	Mid cap	Finance	1,850	1,855	31.10%	30.60%	20,418	20,125	0.55	0.58	0.02	0.02	0.28	0.22	0.06	Yes	Yes
Avanza Bank Holding	Mid cap	Finance	557	509	22.20%	21.90%	14,449	15,597	0.96	0.96						Yes	Yes
Axis	Mid cap	IT	1,671	1,975	19.90%	19.90%	914	859	0.40	0.49	0.07	0.07	0.31	0.44	0.67	No	No
B&B TOOLS	Mid cap	Industry	6,823	9,133	10.80%	10.80%	5,857	6,020	0.73	0.71	0.30	0.32	0.33	0.38	0.23	Yes	Yes
BE Group	Mid cap	Industry	7,650	7,713	20.60%	20.60%	2,850	3,408	0.70	0.68	0.19	0.21	0.81	0.57	0.46	Yes	Yes
Beijer	Mid cap	Industry	3,136	3,357	21.90%	21.90%	1,985	2,219	0.63	0.55	0.24	0.26	0.29	0.39	0.32	No	No
Beijer Alma	Mid cap	Industry	1,654	1,836	37.00%	37.07%	1,349	1,461	0.37	0.34	0.09	0.09	0.35	0.33	0.31	No	No
Betsson	Mid cap	Consumer Discretionary	645	1,038	21.30%	21.30%	844	1,148	0.26	0.37	0.48	0.39	0.12	0.33	0.39	No	Yes
Billerud	Mid cap	Material	7,758	7,792	17.60%	20.80%	9,202	9,021	0.69	0.71	0.00	0.01	0.17	0.16	0.05	Yes	Yes
BioInvent	Mid cap	Health service	143	252	8.00%	9.30%	271	295	0.21	0.22	0.05	0.04	-0.99	-0.07	0.07	No	Yes
Biovitrum	Mid cap	Health service	1,256	1,141	20.80%	18.90%	1,948	2,579	0.25	0.50	0.26	0.40	0.07	0.05	-0.29	Yes	Yes

Björn Borg	Mid cap	Consumer Discretionary	494	527	7.00%	8.40%	509	600	0.33	0.31	0.40	0.34	0.59	0.41	0.33	Yes	Yes
Black Earth Farming *	Mid cap	Consumer Discretionary	84	189			2,645	3,364	0.19	0.20						Yes	Yes
Brinova	Mid cap	Finance	380	381	28.20%	29.52%	6,087	6,298	0.60	0.76	0.00	0.00	0.16	0.16	0.16	No	No
Bure Equity	Mid cap	Finance	2,648	1,097	17.60%	19.90%	3,747	2,995	0.26	0.17	0.21	0.15	0.06	0.14	0.06	No	No
Cardo	Mid cap	Industry	9,308	9,810	36.00%	41.30%	6,437	6,781	0.54	0.55	0.15	0.16	0.19	0.12	0.27	Yes	Yes
Clas Ohlson	Mid cap	Consumer Discretionary	4,101	4,662	33.40%	33.40%	1,938	2,192	0.29	0.32	0.00	0.00	0.39	0.39	0.34	No	No
Duni	Mid cap	Consumer Discretionary	3,985	4,099	38.85%	29.99%	3,514	3,811	0.60	0.59	0.35	0.32	0.03	0.12	0.16	No	No
East Capital Explorer **	Mid cap	Finance	n.a.	n.a.	6.60%	6.60%	4,085	3,086	0.02	0.02	0.00	0.00	-0.27	0.01	-0.54	No	No
Eniro	Mid cap	Consumer Discretionary	6,508	6,689	8.20%	10.30%	18,467	16,620	0.78	0.87	0.86	0.86	0.22	0.34	-0.12	Yes	Yes
Fagerhult	Mid cap	Industry	2,527	2,770	31.70%	31.70%	1,714	1,720	0.65	0.59	0.27	0.25	0.15	0.32	0.37	Yes	Yes
Fast Partner	Mid cap	Finance	381	488	75.00%	75.40%	4,583	4,706	0.63	0.67	0.00	0.00	0.22	0.28	-0.07	No	No
Gunnebo	Mid cap	Industry	7,025	6,903	24.93%	25.39%	4,837	5,262	0.76	0.80	0.25	0.26	-0.11	0.22	0.17	Yes	Yes
H&Q AB	Mid cap	Finance	1,131	816	22.20%	24.80%	9,238	11,867	0.87	0.90	0.06	0.05	0.57	0.60	0.57	Yes	Yes
Haldex	Mid cap	Industry	7,940	8,403	14.08%	6.46%	5,082	6,290	0.63	0.71	0.14	0.28	0.17	0.12	-0.03	Yes	Yes
Heba	Mid cap	Finance	184	197	19.30%	19.30%	3,131	3,058	0.39	0.39	0.00	0.00	0.23	0.19	n.a.	No	No
Hemtex	Mid cap	Consumer Discretionary	1,471	1,608	9.20%	14.20%	797	885	0.38	0.47	0.41	0.38	0.45	0.45	n.a.	Yes	Yes
HEXPOL	Mid cap	Industry	2,730	3,190	***	47.75%	2,795	3,201	0.63	0.64	0.00	0.40			0.22	n.a.	Yes
HiQ International	Mid cap	IT	974	1,182	5.60%	8.30%	613	872	0.30	0.34	0.36	0.42	0.41	0.43	0.34	No	Yes
Höganäs	Mid cap	Material	5,838	6,103	37.80%	37.80%	5,191	5,642	0.47	0.57	0.03	0.04	0.20	0.20	0.20	Yes	Yes
IFS(international financial system)	Mid cap	IT	2,356	2,518	17.50%	17.40%	2,311	2,471	0.52	0.50	0.31	0.29	0.09	0.11	0.13	No	Yes
Indutrade	Mid cap	Industry	5,673	6,778	36.89%	36.89%	3,271	4,411	0.64	0.64	0.23	0.27	0.47	0.49	0.43	Yes	Yes
Intrum Justitia	Mid cap	Industry	3,225	3,678	11.50%	11.50%	5,393	6,710	0.66	0.65	0.33	0.34	0.35	0.32	0.24	Yes	Yes
ITAB Shop Conc	Mid cap	Industry	2,430	3,412	54.60%	53.80%	1,551	2,243	0.75	0.77	0.17	0.21	0.32	0.33	0.28	Yes	Yes
JM	Mid cap	Consumer Discretionary	12,731	12,229	9.40%	9.60%	9,916	10,055	0.69	0.60	0.01	0.01	0.52	0.59	0.32	Yes	Yes
KappAhl	Mid cap	Consumer	4,473	4,622	30.00%	30.00%	3,212	3,249	0.72	0.84	0.42	0.41	1.02	0.61	1.12	No	No

	cap	Discretionary															
Klövern	Mid cap	Finance	2,313	1,220	10.50%	10.50%	13,009	12,497	0.63	0.68	0.00	0.00	0.15	0.32	-0.14	No	No
Kungsleden	cap	Finance	2,612	2,897	2.10%	5.80%	32,781	30,722	0.72	0.77	0.00	0.00	0.37			Yes	Yes
LBI International	Mid cap	IT	1,429	1,541	41.40%	46.70%	2,928	3,323	0.31	0.36	0.53	0.54	0.04	0.04	0.04	Yes	Yes
Loomis	cap	Unclassified	11,106	10,899	****	17.40%	8,360	8,913	0.82	0.67	0.37	0.35	0.39	-0.25	-0.38	No	No
Mekonomen	Mid cap	Consumer	2,530	2,646	29.00%	29.00%	1,481	1,423	0.33	0.40	0.14	0.18	0.21	0.42	0.31	No	No
Munters	cap	Discretionary	6,262	6,570	14.80%	14.80%	3,862	4,614	0.69	0.72	0.23	0.24	0.34	0.44	0.22	Yes	Yes
Neonet	Mid cap	Industry	669	723	17.20%	18.30%	1,379	834	0.70	0.54	0.01	0.01	0.22	0.22	0.13	No	No
Net Insight	cap	Finance	229	274	9.80%	9.60%	261	358	0.31	0.23	0.28	0.20	-0.07	0.19	0.15	Yes	Yes
New Wave Group	Mid cap	IT	4,194	4,604	81.10%	81.70%	4,810	5,371	0.70	0.66	0.32	0.24	0.22	0.22	0.13	Yes	Yes
NIBE	cap	Consumer	5,403	5,811	21.59%	52.83%	4,524	5,147	0.66	0.63	0.16	0.18	0.39	0.29	0.27	No	No
Niscayah Group	Mid cap	Discretionary	7,260	8,009	17.40%	30.22%	6,704	6,873	0.63	0.72	0.45	0.39	0.22	0.24	-0.19	Yes	Yes
Nobia	cap	Industry	16,134	15,991	10.80%	11.80%	10,290	11,338	0.60	0.37	0.28	0.28	0.32	0.30	0.19	Yes	Yes
Nordnet	Mid cap	Consumer	786	703	30.90%	30.89%	14,652	12,881	0.94	0.93	0.02	0.02				Yes	Yes
Orc Software	cap	Discretionary	481	552	25.25%	25.25%	603	619	0.44	0.46	0.45	0.43	0.26	0.42	0.29	Yes	Yes
PA Resources	Mid cap	IT	2,794	2,420	9.40%	8.00%	6,716	10,452	0.50	0.54	0.11	0.11	0.17	0.46	0.17	Yes	Yes
Peab	cap	Energy	31,977	34,132	23.10%	23.50%	15,352	25,692	0.77	0.75	0.03	0.07	0.43	0.32	0.16	No	No
Q-Med	Mid cap	Industry	1,318	1,272	47.50%	47.50%	1,747	1,698	0.21	0.25	0.04	0.05	0.25	0.27	0.05	No	No
Rezidor Hotel Group **	cap	Health service	7,405	8,609	41.74%	44.40%	3,891	4,212	0.51	0.52	0.19	0.20	0.18	0.32	0.24	Yes	Yes
SAS	Mid cap	Consumer	50,598	53,195	21.40%	21.40%	48,770	43,364	0.65	0.80	0.03	0.03	0.02	0.06	-0.12	No	No
Sectra	cap	Discretionary	673	743	16.90%	16.90%	986	1,008	0.43	0.41	0.22	0.23	0.14	0.14	0.12	Yes	Yes
Skanditek	Mid cap	Industry	680	744	29.80%	28.00%	1,560	1,490	0.08	0.13	0.06	0.08				Yes	Yes
SkiStar	cap	Consumer	1,259	1,483	42.22%	42.87%	3,187	3,571	0.61	0.64	0.07	0.06	0.22	0.14	0.16	Yes	Yes
Sweco	Mid cap	Discretionary	4,570	5,523	34.70%	34.30%	2,438	3,013	0.61	0.53	0.18	0.28	0.40	0.44	0.42	Yes	Yes
Systemair	cap	Industry	2,664	3,092	63.40%	42.10%	2,169	2,410	0.63	0.56	0.06	0.07	0.49	0.43	0.29	No	No

Säkl	Mid cap	Finance			79.90%	79.90%	3,371	2,352	0.34	0.37	0.00	0.00	0.39	0.26	0.05	No	No
TradeDoubler	Mid cap	IT	2,664	3,457	14.60%	14.87%	2,237	1,551	0.84	0.81	0.33	0.41	0.57	0.58	0.44	Yes	Yes
Transcom **	Mid cap	Industry	5,651	6,931	34.60%	34.50%	3,842	4,311	0.61	0.63	0.36	0.41	0.10	0.06	0.19	Yes	Yes
Unibet Group plc***	Mid cap	Consumer Discretionary	1,043	1,422	12.10%	11.90%	2,713	2,619	0.55	0.56	0.68	0.68	0.86	-0.02		Yes	Yes
Wallenstam	Mid cap	Finance	2,135	1,350	56.00%	57.80%	19,747	20,249	0.58	0.60	0.00	0.00	0.25	0.13	-0.01	Yes	Yes
VBG GROUP	Mid cap	Industry	1,323	1,378	32.98%	32.98%	946	1,188	0.44	0.44	0.30	0.35	0.41	0.38	0.16	No	No
Wihlborgs	Mid cap	Finance	1,035	1,168	11.00%	10.70%	13,722	14,040	0.67	0.71	0.00	0.00	0.23	0.34	-0.05	No	No
Vostok Nafta Investment *	Mid cap	Finance	n.a.	n.a.	30.42%	30.42%	5,549	2,578	0.06	0.24	0.00	0.00				Yes	Yes
ÅF	Mid cap	Industry	3,862	4,569	36.86%	36.97%	2,713	2,619	0.55	0.56	0.40	0.52	0.15	0.24	0.27	No	Yes
Öresund	Mid cap	Finance	344	433	18.00%	17.80%	9,622	5,102	0.07	0.16	0.00	0.00	0.27	-0.05	-0.84	No	No
AcadeMedia	Small cap	Consumer Discretionary	841	1,313	49.73%	13.9%	416	1,294	0.58	0.64	0.00	0.63	0.11	0.15	0.19	Yes	Yes
Acando	Small cap	IT	1,344	1,611	12.6%	12.4%	1,096	1,159	0.40	0.36	0.43	0.40	0.13	0.15	0.21	Yes	Yes
ACAP Invest	Small cap	Industry	831	926	31.8%	31.8%	691	658	0.47	0.49	0.21	0.20	0.25	0.47	0.23	No	No
A-Com	Small cap	Consumer Discretionary	588	879	10.57%	15.1%	544	481	0.56	0.52	0.52	0.56	0.03	0.10	0.03	Yes	Yes
Addnode	Small cap	IT	795	1,025	14.8%	22.7%	860	973	0.41	0.40	0.45	0.47	0.21	0.09	0.18	No	No
Aerocrine	Small cap	Health service	76	82	26.1%	27%	170	151	0.20	0.29	0.01	0.01	-4.23	-0.84	-1.20	Yes	Yes
Affärsstrategerna	Small cap	Finance	94	85	40.3%	48.7%	193	191	0.31	0.37	0.25	0.26	-0.02	-0.16	-0.10	Yes	Yes
AllTele Allmänna Svenska Telefonab	Small cap	Telecommunication	41	169		11.1%	103	178	0.84	0.60	0.68	0.72	0.47	-0.96	0.03	No	No
Anoto Group	Small cap	IT	169	254	17.6%	11.1%	565	601	0.19	0.19	0.60	0.61	-0.29	-0.01	0.06	Yes	Yes
Artimplant	Small cap	Health service	16	12	9.03%	8.27%	70	47	0.08	0.11	0.11	0.11	-0.72	-0.21	-0.54	Yes	Yes
Aspiro	Small cap	IT	405	426	42.92%	42.92%	607	413	0.18	0.29	0.64	0.44	0.04	0.02	-0.79	Yes	Yes
Beijer Elec	Small cap	IT	964	1,275		29.7%	588	997	0.62	0.69	0.29	0.41	0.55	0.38	0.31	No	Yes
Bergs Timber	Small cap	Material	740	860	25.7%	25.7%	769	729	0.62	0.62	0.02	0.00	0.21	0.49	-0.02	No	No
Bilia	Small cap	Consumer Discretionary	15,402	14,280	25%	26.5%	7,043	5,414	0.79	0.77	0.04	0.04	0.07	0.09	-0.11	Yes	Yes
BioGaia	Small	Health service	107	145	39.4%	39.4%	111	154	0.14	0.14	0.07	0.03	0.04	0.11	0.18	<b>Yes</b>	<b>Yes</b>



Biolin Scientific	cap Small cap	Health service	77	109	36.5%	36.5%	194	185	0.34	0.33	0.63	0.58	-0.15	-0.21	-0.23	Yes	Yes
BioPhausia	cap Small cap	Health service	465	580	12%	13.7%	526	1,173	0.58	0.54	0.66	0.73	0.08	0.11	0.03	No	No
Biotage	cap Small cap	Health service	398	385	14.2%	14.2%	989	1,299	0.19	0.13	0.57	0.42	0.01	0.06	0.02	Yes	Yes
Bong Ljungdahl	cap Small cap	Industry Consumer	1,991	1,937	25%	29.9%	1,756	1,873	0.67	0.66	0.20	0.23	0.00	0.02	0.03	Yes	Yes
Borås Wäfveri	cap Small cap	Discretionary	525	399	29.3%	29.3%	362	249	0.62	0.81	0.00	0.00	-0.25	-0.71	-1.86	Yes	Yes
BTS Group	cap Small cap	Industry	523.2	548.4	43.88%	44.8%	396	452	0.50	0.44	0.45	0.42	0.35	0.37	0.27	Yes	Yes
Catena	cap Small cap	Finance	180	189	29.1%	29.1%	2,543	2,419	0.60	0.67	0.00	0.00	0.43	0.28	0.11	Yes	Yes
Cision	cap Small cap	Industry	1,861	1,783	9.79%	12.9%	2,723	2,729	0.53	0.60	0.74	0.72	-0.54	0.09	-0.20	Yes	Yes
Cloetta	cap Small cap	Consumer Staples	1,368	838			1,192	1,162	0.35	0.39	0.00	0.12			-0.11	n.a.	No
Concordia	cap Small cap	Energy	457.2	560.0	72.7%	72.7%	2,810	3,487	0.42	0.44	0.00	0.00	0.03	0.03	0.04	No	No
Connecta	cap Small cap	IT	722	765	21.74%	10.5%	358	349	0.58	0.56	0.13	0.14	0.47	0.65	0.67	No	No
Consilium	cap Small cap	Industry	756	945		66.5%	615	792	0.60	0.65	0.16	0.18	0.09	0.21	0.21	Yes	Yes
Corem Property Group	cap Small cap	Finance	54	391	38%	38%	3,614	4,692	0.63	0.75	0.00	0.00	-1.55	0.10	-0.27	No	No
CTT System	cap Small cap	Industry	13	38	14.4%	16.2%	97	91	0.38	0.68	0.24	0.25			-1.07	Yes	Yes
Cybercom	cap Small cap	IT	1,100	1,781	41.37%	37.67%	1,388	2,028	0.49	0.51	0.59	0.67	0.18	0.13	0.12	Yes	Yes
Dagon	cap Small cap	Finance	383	458	22.1%	22.3%	4,984	5,238	0.70	0.75	0.00	0.00	-0.41	0.14	-0.08	Yes	No
DGC One	cap Small cap	Telecommunication	223	238	84%	64.36%	139	187	0.77	0.49	0.29	0.23	0.11	0.45	0.28	Yes	Yes
Diamyd Med	cap Small cap	Health service	2	5	39.31%	36.59%	114	131	0.08	0.08	0.14	0.12	-0.51	-0.53	-1.15	Yes	Yes
Digital Vision	cap Small cap	IT	115	59	55%	33.22%	118	83	0.91	1.48	0.41	0.44	n.s	0.09	n.a.	Yes	Yes
Din Bostad Sverige	cap Small cap	Finance	492	570	39.9%	39.9%	5,494	5,891	0.77	0.81	0.00	0.00	0.05	0.16	-0.27	No	No
Diös Fastigheter	cap Small cap	Finance	372	470	19.1%	19.1%	4,292	4,112	0.68	0.74	0.00	0.00	0.20	0.10	-0.16	No	No
DORO	cap Small cap	IT	346	363	14.9%	14.9%	161	170	0.76	0.82	0.07	0.08	-2.59	0.20	-0.34	No	No
Duroc	cap Small cap	Material Consumer	560	698	24%	26%	464	449	0.44	0.44		0.21	0.17	0.09	0.03	No	No
Elanders	cap	Discretionary	2,036	2,191	45.01%	50%	2,224	2,387	0.61	0.63	0.39	0.40	-0.06	0.21	-0.04	No	No

Electra Gruppen	Small cap	Consumer Discretionary	1,285	1,066	20.9%	20.9%	439	305	0.55	0.38	0.03	0.02	0.24	0.23	0.15	No	No
ElektronikGruppen	Small cap	IT	838	935	28.2%	28.4%	442	501	0.51	0.59	0.24	0.21	0.20	0.09	-0.07	No	No
Elos	Small cap	Health service	433	499	24.8%	24.8%	519	571	0.66	0.65	0.10	0.10	-0.11	0.22	0.19	No	Yes
Enea	Small cap	IT	821	918	13.5%	17%	624	767	0.30	0.28	0.28	0.36	0.18	0.18	0.15	Yes	Yes
EpiCept *	Small cap	Health service	2	2	10%	10%	48	18	2.90	8.78	0.04	0.11				Yes	Yes
Fastighets Balder	Small cap	Finance	1,322	654	60.2%	60.2%	7,582	7,946	0.70	0.77	0.00	0.00	0.25	0.40	-0.26	No	No
Feelgood Svenska	Small cap	Health service	475	553	28.55%	23.05%	274	380	0.69	0.66	0.38	0.48	0.00	0.13	0.10	No	No
Fenix Outdoor	Small cap	Consumer Discretionary	845	961	81.3%	81.3%	588	640	0.44	0.35	0.17	0.16	0.32	0.37	0.35	No	No
Fingerprint	Small cap	IT	21	28	20.2%	20.2%	74	69	0.09	0.16	0.22	0.29	-0.20	-0.51	-0.40	Yes	Yes
Geveko	Small cap	Finance	1,079	1,428	31.9%	32.7%	1,277	1,295	0.63	0.69	0.06	0.10	0.15	-0.04	-0.15	No	No
Global Health Partner	Small cap	Health service	276	400	17.88%	15.3%	711	785	0.34	0.30		0.50			-0.07	No	No
Havsfrun Investment	Small cap	Finance		86	35.49%	35.73%	892	602	0.29	0.35	0.00	0.00	0.10	0.07	-0.55	<b>No</b>	<b>No</b>
HL Display	Small cap	Industry	1,571	1,536	59.2%	59.1%	892	946	0.47	0.43	0.04	0.05	0.24	0.33	0.25	Yes	Yes
HMS Networks	Small cap	IT	270	317	15%	15%	352	390	0.48	0.42	0.71	0.64	0.30	0.23	0.36	Yes	Yes
Intellecta	Small cap	Industry	463	562	18.5%	18.5%	314	525	0.51	0.64	0.31	0.42	-0.08	0.26	0.25	<b>No</b>	<b>No</b>
Intoi	Small cap	IT	519	571	7%	9.6%	717	758	0.17	0.21	0.49	0.44	0.09	0.09	0.05	Yes	Yes
Jeeves	Small cap	IT	130.1	158.3	16.2%	17.1%	126	163	0.66	0.68	0.30	0.39	0.30	0.47	0.38	Yes	Yes
Kabe	Small cap	Industry	1,431	1,353		73%	696	786	0.47	0.51	0.00	0.00	0.30	0.30	0.16	No	No
Karo Bio	Small cap	Health service	8	11	4.9%	5.6%	454	263	0.13	0.17	0.00	0.00	-0.60	-0.52	-0.80	Yes	Yes
know IT	Small cap	IT	982	1,308	7.1%	5.5%	815	1,173	0.59	0.61	0.51	0.63	<b>8.45</b>	0.30	0.29	Yes	<b>No</b>
Lagercrantz	Small cap	IT	2	2	11.9%	13.1%	1,055	1,049	0.56	0.51	0.23	0.29	0.21	0.19	0.18	Yes	Yes
Lammhults Design Group	Small cap	Industry	829	901	25.8%	25.8%	662	791	0.48	0.50	0.23	0.25	0.24	0.18	0.19	No	<b>Yes</b>
Ledstiernan	Small cap	Finance	564	619	10.49%	10%	930	843	0.33	0.26	0.11	0.12	0.01	0.07	0.01	No	No
LinkMed	Small cap	Finance	70	35	18.8%	18.7%	283	725	0.02	0.30	0.00	0.30			0.02	Yes	Yes
Luxonen *	Small cap	Finance	28	16			1,504	938	0.00	0.03	0.00	0.00				No	No

Malmbergs	cap Small cap	Industry	575	553	71.2%	71.2%	352	349	0.49	0.45	0.02	0.02	0.28	0.32	0.25	No	No
Medivir	cap Small cap	Health service Consumer	250	97	11.9%	11.9%	459	372	0.16	0.23	0.00	0.00	-1.31	-0.08	-0.34	Yes	Yes
Metro **	cap Small cap	Discretionary	3,123	3,236	39.2%	39.2%	1,449	1,512	0.92	0.88	0.11	0.16				Yes	Yes
Micronic Laser Systems	cap Small cap	IT	523	587	10%	12.5%	1,507	1,376	0.40	0.35	0.06	0.09	0.11	-0.32	-0.04	Yes	Yes
Midelfart Sonesson	cap Small cap	Consumer Staples	1,659	1,458	26.6%	26.6%	1,538	1,430	0.68	0.65	0.00	0.00	-0.08	-0.69	0.00	No	No
Midway Holding	cap Small cap	Industry	2,450	2,356	52.5%	52.5%	1,403	1,225	0.44	0.45	0.04	0.05	0.43	0.24	0.04	No	No
Mobyson	cap Small cap	IT	135	206	25.3%	24.4%	324	215	0.31	0.29	0.32	0.55	-0.50	-0.34	-0.11	No	No
Modul 1 Data	cap Small cap	IT	185	186	5.62%	5.62%	109	93	0.44	0.31	0.22	0.23	0.05	0.19	0.09	Yes	Yes
Morphic	cap Small cap	Industry	357	310	11.4%	10.9%	947	1,212	0.34	0.29	0.37	0.36	-0.15	-0.16	-0.39	Yes	Yes
MSC	cap Small cap	IT	37	51	57.3%	57.3%	48	40	0.47	0.48	0.33	0.40	0.11	0.00	-0.11	No	No
MultiQ International	cap Small cap	IT	106	147	20.22%	14.87%	114	105	0.55	0.47	0.34	0.24	0.08	0.08	0.09	Yes	Yes
Nederman Holding	cap Small cap	Industry	1,041	1,272	23.2%	26.5%	910	1,058	0.50	0.50	0.43	0.40	0.21	0.22	0.24	No	No
Net Entertainment NE	cap Small cap	IT Consumer	131	205	18.55%	20.9%	85	162	0.38	0.28	0.28	0.19	2.48	0.96	0.74	No	No
Netonnet	cap Small cap	Discretionary	662	674	17.2%	18.3%	1,379	834	0.70	0.54	0.01	0.01	0.12	0.30	0.34	No	No
Nolato	cap Small cap	IT	2,421	2,824	20.66%	20.66%	1,918	2,126	0.54	0.50	0.20	0.18	0.09	0.20	0.20	Yes	Yes
Nordic Mines	cap Small cap	Material			19.32%	25.6%	180	282	0.06	0.07	0.68	0.44			0.00	Yes	Yes
Note	cap Small cap	IT	1,744	1,710	12.22%	25%	948	948	0.65	0.69	0.06	0.08	0.36	0.32	-0.05	Yes	Yes
NovaCast Technologies	cap Small cap	Industry	66	105	52%	51.77%	128	226	0.28	0.62	0.25	0.17	-0.04	-0.06	-0.30	No	No
Novestra	cap Small cap	Finance	17	8	23.7%	28.6%	480	402	0.12	0.18	0.00	0.00	-0.18	-0.01	-0.27	No	No
Novotek	cap Small cap	IT Consumer	263	292	61.48%	59.51%	169	190	0.43	0.46	0.23	0.22	0.22	0.18	0.16	No	No
NSP(Nordik Service Partner) Holding	cap Small cap	Discretionary	567	661	15.27%	18.76%	403	435	0.75	0.78	0.50	0.51	0.11	0.03	-0.37	Yes	Yes
OEM Internatioal	cap Small cap	Industry	1,482	1,660	28.9%	28.9%	900	1,002	0.41	0.41	0.05	0.11	-2.00	0.26	0.27	No	No
Opcon	cap Small cap	Industry	336	418	23.5%	23.5%	454	605	0.44	0.44	0.34	0.30	0.31	0.05	0.03	Yes	Yes
Orexo	cap	Health service	77	233	31%	31%	802	702	0.16	0.19	0.49	0.56	-0.10	-0.26	-0.18	Yes	Yes

Ortivus	Small cap	Health service	102	83	19.1%	19.1%	253	181	0.36	0.41	0.49	0.41	-0.57	-0.33	-0.41	Yes	Yes
Oxigene Inc. *	Small cap	Health service				11.9%	194	276	0.18	0.18	0.00	0.00				Yes	Yes
PartnerTech	Small cap	IT	2,644	2,529	35.8%	43%	1,454	1,390	0.62	0.60	0.10	0.10	0.27	-0.06	0.02	Yes	Yes
Phonera	Small cap	Telecommunication	297	359	59.64%	27.42%	228	181	0.69	0.53	0.24	0.24	0.17	0.35	0.32	No	No
Poolia	Small cap	Industry	1,340	1,438	70.22%	70.22%	501	502	0.41	0.44	0.24	0.23	0.28	0.25	0.39	No	No
Precise Biometrics	Small cap	IT	25	46	4.9%	5.2%	86	34	0.17	0.53	0.12	0.26	-0.96	-0.50	-3.38	Yes	Yes
Prevas	Small cap	IT	471	616	23.67%	23.36%	278	320	0.54	0.43	0.44	0.41	0.19	0.13	0.38	Yes	Yes
Pricer	Small cap	IT	432	427	11.1%	11.1%	533	659	0.33	0.23	0.50	0.45	-0.14	0.00	0.13	Yes	Yes
Proact	Small cap	IT	517	642	11.8%	15.6%	516	644	0.69	0.75	0.16	0.16	0.11	0.26	0.31	No	No
Probi	Small cap	Health service	44	68	13%	13%	104	112	0.08	0.07	0.22	0.20	-0.07	0.07	0.12	No	No
Proffice	Small cap	Industry	3,791	4,266	44.2%	44.2%	1,432	1,500	0.68	0.65	0.31	0.28	0.10	0.30	0.25	Yes	Yes
ProfilGruppen	Small cap	Material	1,179	1,086	14.1%	14.4%	616	564	0.72	0.75	0.02	0.02	0.13	0.33	0.07	No	No
PSI Group ****	Small cap	IT	622	548	25.10%	13.3%	422	1,049	0.66	0.48	0.05	0.56	0.14	0.19	0.30	No	No
RaySearch	Small cap	Health service	65	63	42.7%	42.7%	99	106	0.29	0.27	0.63	0.76	0.30	0.20	0.16	Yes	Yes
ReadSoft	Small cap	IT	525	593	21.2%	21.2%	566	615	0.54	0.56	0.32	0.26	0.20	0.09	0.03	Yes	Yes
Rejlerkoncernen	Small cap	Industry	649	795	42.9%	43.5%	318	409	0.44	0.43	0.27	0.25	0.35	0.39	0.42	No	No
RETAIL AND BRANDS	Small cap	Consumer Discretionary	3,468	3,426	7.7%	10.2%	2,993	3,328	0.48	0.58	0.62	0.59	0.02	0.20	-0.04	No	No
Rottneros	Small cap	Material	2,927	2,663	27.26%	27.26%	2,309	2,032	0.55	0.60	0.01	0.01	-0.02	-0.37	-0.48	No	No
Rörvik Timber	Small cap	Material	2,642	2,390	73%	73%	1,775	1,601	0.74	0.87	0.07	0.09	0.29	0.51	1.37	No	No
Sagax	Small cap	Finance	356	491	19.2%	19.2%	5,681	6,482	0.74	0.81	0.00	0.00	0.31	0.44	-0.34	No	No
Semcon	Small cap	IT	2,497	3,299	29.91%	29.36%	2,104	1,776	0.77	0.66	0.25	0.33	0.28	-0.07	0.21	Yes	Yes
Sensys Traffic	Small cap	IT	64	127	6.23%	7.82%	144	306	0.13	0.52	0.01	0.00	0.61	-0.03	0.21	No	No
Sigma	Small cap	IT	1,375	1,355	30.9%	30.9%	760	716	0.54	0.48	0.40	0.42	0.25	0.05	0.16	No	No
SinterCast	Small cap	Industry	23	25	12.14%	11.9%	27	41	0.44	0.35	0.15	0.07	-0.41	-0.23	-0.16	Yes	Yes
Softronic	Small cap	IT	307	435	?	35.1%	190	274	0.28	0.41	0.19	0.27	0.27	0.41	0.41	No	No

Studsvik	cap Small cap	Industry	1,315	1,286	19.3%	20.7%	1,346	1,511	0.58	0.60	0.27	0.28	0.10	0.08	0.00	No	No
Svedbergs	cap Small cap	Industry	527	514	55.3%	55.3%	370	368	0.29	0.27	0.11	0.13	0.39	0.41	0.36	Yes	Yes
Swedol	cap Small cap	Consumer Discretionary	720	849	78.7%	78.7%	355	459	0.37	0.41	0.00	0.00	0.37	0.44	0.29	No	No
Svolder	cap Small cap	Finance	39	32	27%	27%	1,489	964	0.20	0.04	0.00	0.00	0.25	-0.18	-0.16	No	No
Technology Nexus	cap Small cap	IT Consumer	69	69	54.8%	62.2%	136	133	0.32	0.27	0.00	0.00				No	No
Ticket	cap Small cap	Discretionary	507	419	29.26%	29.26%	478	395	0.74	0.86	0.36	0.47	0.23	0.38	-1.18	No	No
Tilgin	cap Small cap	IT	138	157	28.3%	30.5%	173	168	0.43	0.41	0.25	0.11	-0.23	-0.52	0.15	Yes	No
Traction	cap Small cap	Finance	282	355	28.2%	24.2%	1,503	1,246	0.10	0.08	0.00	0.00	0.14	0.06	-0.15	No	No
Transatlantic	cap Small cap	Industry	1,957	2,121	28.5%	29.8%	3,124	3,348	0.61	0.58	0.00	0.00	0.19	0.23	0.17	No	No
Tricorona	cap Small cap	Industry	217	698	11%	14.5%	370	765	0.15	0.33	0.06	0.03	-0.02	-0.12	0.44	No	Yes
Uniflex	cap Small cap	Industry Consumer	804	916	70.28%	70.28%	237	207	0.70	0.71	0.00	0.00	0.44	0.60	0.96	Yes	Yes
Venue Retail Group	cap Small cap	Discretionary	664	889	13.45%	21.71%	412	578	0.54	0.69	0.21	0.38	-0.61	-0.26	-0.26	Yes	Yes
Vitrolife	cap Small cap	Health service	189	225	25.1%	25.1%	299	343	0.15	0.15	0.36	0.34	0.07	0.07	0.09	Yes	Yes
XANO Industri	cap NGM equity	Industry	1,361	1,402	55.2%	55.1%	1,191	1,258	0.68	0.67	0.18	0.17	0.26	0.27	0.14	Yes	Yes
AIK Fotboll	NGM equity		121	100		10.1%	66	53	0.53	0.62	0.23	0.21	0.74	0.43	-0.81	No	No
Arcam	NGM equity	Industry	76	58	24.85%	24.8%	84	60	0.32	0.39	0.18	0.22	-0.17	n.a.	-0.57	Yes	Yes
Avalon Enterp	NGM equity	IT	170	214	13.16%	14.53%	132	142	0.31	0.28	0.38	0.40	0.12	0.12	0.02	Yes	Yes
Benchmark OIL/GAS	NGM equity	Energy	20	31	4.88%	4.9%	130	123	0.12	0.22	0.81	0.92	-0.16	-0.23	-0.37	No	No
Betting Primotion SE	NGM equity	Consumer Discretionary	72	69	42.7%	31.71%	123	146	0.18	0.20	0.07	0.07	0.64	0.52	0.29	No	Yes
Brio	NGM equity	Consumer Discretionary	930	893	60.94%	61.47%	696	721	0.86	0.99	0.23	0.22	-0.90	-0.78	-8.54	Yes	Yes
C2SAT Holding	NGM equity	IT	5	5	20.68%	18.95%	92	78	0.17	0.48	0.60	0.69	-0.57	-0.32	-0.90	No	No
Central Asia GOLD	NGM equity	Material Consumer	181	171	29.48%	63.64%	614	360	0.28	0.29	0.35	0.29	-0.04	0.02	-0.38	Yes	Yes
Chemel	NGM equity	Discretionary	1	0	19.1%	19.1%	10	6	0.08	0.06	0.4	0.3	-0.24	-0.46	-0.61	No	No
Confidence	NGM equity	IT	131	112	7.3%	7.3%	117	79	0.62	0.84	0.50	0.53	-0.61	-0.62	-3.58	Yes	Yes

Countermine	NGM equity	Consumer Discretionary	29	53	17.1%	17.55%	67	245	0.64	0.12	0.03	0.58	-1.48	-0.61	-0.02	No	No
Gexco	NGM equity	Material	0	3			198	52	0.07	0.07	0.67	0.73	-0.22	-0.13	-2.70	No	No
Ginger OIL	NGM equity	Energy	9	15	15.3%	14.7%	90	119	0.12	0.33	0.00	0.00	-0.07	-0.06	-0.23	Yes	Yes
Glycorex	NGM equity	Health service	25	30	23.2%	22.43%	55	82	0.13	0.14	0.24	0.77			0.00	No	No
Guideline	NGM equity	Energy	0	60	11%	9.4%	90	111	0.15	0.27	0.11	0.16	-0.63	-0.24	-0.09	No	No
Hebi Health Care KV4B	NGM equity	Health service	89	125	42.5%	42.5%	637	819	0.64	0.73	0.00	0.00	-0.46	-0.88	-0.17	No	No
Lifeassays	NGM equity	Health service			13.4%	13.4%	15	8	0.03	0.04	0.07	0.25	-0.48	-0.42	-1.00	No	No
Megacon	NGM equity	?	106	122	33.4%	33.5%	52	48	0.51	0.45	0.04	0.06	0.18	0.20	0.12	No	No
Micro Systemation	NGM equity		50	64	37.6%	37.6%	52	61	0.22	0.24	0.00	0.00			0.52	No	No
NGS Group	NGM equity	Health service	18	81	28.5%	29.9%	33	67	0.32	0.67	0.42	0.61	n.a.	-0.03	0.03	No	No
Oasmia Pharm	NGM equity	Health service	22	71	72.4%	72%	89	88	0.21	0.26	0.67	0.36	-0.09	-0.08	-0.12	No	No
Obducat	NGM equity	IT	33	72	13.65%	12.7%	118	149	0.27	0.62	0.34	0.28	-0.97	-0.56	-0.50	No	No
Panaxia Security	NGM equity	Industry	385	515	42.3%	33.6%	515	915	0.83	0.86	0.04	0.17	0.17	0.11	0.18	No	No
Paynova	NGM equity	Telecommunication	23	20	10.7%	11.1%	67	51	0.57	0.90	0.36	0.49	n.s	-1.65	-8.41	No	No
Petrosibir(TEMPORÄR FÖRVALTNING I STOCKHOLM)	NGM equity	Energy	0	0	25.3%	25.26%	98	86	0.12	0.09	0.68	0.51				Yes	Yes
Polyplank	NGM equity		15	21	45.5%	43.2%	15	36	0.68	0.83	0.07	0.03			-0.57	No	No
SBC(SVERIGES BOSTADSRÖTTSCENTRUM)	NGM equity	Finance	422	390	39.34%	39.6%	668	687	0.54	0.90	0.00	0.00	0.27	0.16	-4.67	No	No
Scandinavian Clinical Nutrition	NGM equity	Consumer Staples	16	47	12.66%	12%	127	109	0.54	0.88	0.55	0.72	-2.13	-1.05	-5.75	Yes	Yes
Servage	NGM equity	IT	51	37	?	23.24%	74	72	0.46	0.19	0.86	0.90	-0.04	0.09	0.05	No	No
Sharpview	NGM equity	Health service	0	2	23.91%	21.6%	9	31	0.78	0.33	0.67	0.23	-1.00	-4.29	-0.88	No	No

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### **Annual and quarterly reports from 2008**

The documents were obtained from the companies (listed in Appendix G) investors' relations website.