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Master thesis
Spring 2011

Diversity in board of directors in Swedish Large Cap firms
—
does it increase firms' financial performance?

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Acknowledgements

We would like to thank our advisor, Matts Kärreman, for his support and valuable inputs throughout the work with this thesis. He has always encouraged us and supported us in areas where our knowledge was deficient.

Pleasant reading,

Lund, May 2010

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Abstract

- Title:** Diversity in board of directors in Swedish Large Cap firms – does it increase firms’ financial performance?
- Seminar date:** 2011-05-31
- Course:** BUSM36, Degree Project Master level in Corporate and Financial Management, Business Administration Master level, 15 University Credits Points (15 ECTS)
- Authors:** Filip Elgstedt and Jakob Janerheim
- Advisor:** Matts Kärreman
- Key words:** Diversity, board of directors, performance, return on assets, market-to-book value
- Purpose:** The purpose with this thesis is to study whether diversity in board of directors in Swedish Large Cap firms will create better financial performance in the company.
- Methodology:** The study applies a deductive approach and a quantitative investigation where the level of diversity in the board of directors of 54 Swedish Large Cap firms is studied relative to the company performance.
- Theoretical perspectives:** Resource dependence theory, agency theory, theories about team work and previous studies about diversity and company performance. The institutional perspectives the Swedish corporate governance code and the Folksam kompetensindex 2010 report have been regarded.
- Empirical foundation:** The empirical foundation consists of data for 54 Swedish Large Cap firms during the years 2005 to 2010.
- Conclusions:** The study could not show any results of statistical significance when comparing the Folksam diversity index with the performance measures return on assets and market-to-book value. Throughout the study weaknesses in the construction of the diversity index have been identified

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1. Introduction

The following chapter presents the background to the study and why the study is up to date. In addition, it presents the problem statement and purpose, limitations and target audience. The chapter ends with a description of the disposition of the thesis.

1.1 Background

In the mid-19th century a core concept of the corporations we see today were created. The concept was the incorporation of a legal entity separated from the owners of the firm. This legal entity had many of the rights of a real person such as to enter into contracts, to sue and be sued and to own property. The corporations had a life of their own and the owners' liability for the company was limited to their equity investment. Still, ownership was the basis of power. To exercise their power shareholders elected directors for the company's board who reported to them.¹

In the early years of the 20th century the history of corporations saw another major development in the process of becoming what they are today. In economically advancing countries the stock of many corporations were now listed on stock exchanges. This resulted in more shareholders for each specific company and shareholders that were spread geographically. The links between management and owners became remote and power was shifted from the owners to the managers.²

During the second half of the 20th century several things changed the way corporations and boards are looked upon. The importance of independent outside directors rose in the 1970s. In the same time audit committees were introduced and the debate increased about board duties to other stakeholders than shareholders. During the 1980s the directors' responsibility to increase shareholder-value grew strong but several failures made the downsides with this thinking

¹ Tricker (2009)

² Tricker (2009)

apparent in the later part of the 1980s. This was also the time when the concept of corporate governance came into focus. In the 1990s major institutional investors changed their way of thinking and became pro-active in their contact with the corporations which led to an increased focus on the share price performance. The first corporate governance reports were produced around the world and put a lot of focus on the potential abuse of corporate power. However, one Australian report broadened the focus to include both performance and conformance stating that: *“the board’s key role is to ensure that corporate management is continuously and effectively striving for above-average performance, taking account for risk”* and *“this is not to deny the board’s additional role with respect to shareholder protection”*.³

In the last decade we have seen an increased focus on the diversity of the top tiers in corporations and especially the distribution between the genders. This discussion has often been loud. In some countries, such as Norway, the distribution between the genders in the board of directors has even been legislated⁴. The question is, does diversity in board of directors really matter?

1.2 Problem discussion

In our education at Lund University we have studied organizations from many different aspects. During the Master studies at the Corporate and Financial Management programme our key field of interest has become how to create good performance in corporations. Performance is a broad word and we have, during our studies, got many different aspects on what good performance is and how to achieve it. We have found particular interest in how the boards of directors influence the company and how they could be one of the key factors to good performance. What has struck us during our studies is the high level of homogeneity in the boards of directors. From what we have seen they consist of men in the fifties with an exam in economics or engineering and most of the time they seem to have the same cultural background.

During 2010 the Swedish mutual insurance company Folksam released a competence report that investigated the diversity in board of directors and top management in listed Swedish firms and

³ Tricker (2009) p 10-14

⁴ Svenska Dagbladet, Norsk jämställdhet, www.svd.se

ranked these after the level of diversity. What was found interesting in this report is that the competence ranking is made after how diversified the boards and top management are, insinuating that the competence was only dependent on the level of diversity. The author Lundberg Markow argues that corporations must understand the norms and values in society and adapt the operations to fit these norms and values to be fully successful. Further, she argues that, to be successful in this work, companies cannot limit the competence and ignore the benefits of diversity.⁵ This leads to the question if a board of directors with a low level of diversity can be as competent as a board with a very high level of diversity.

Many factors come into play when talking about success in companies but the intention here is to narrow the perspective to diversity in board of directors, more specifically the four variables; age, tenure, education and gender. The usual factor to look at in these kind of studies are gender, a topic that has been discussed, investigated and even legislated in some countries. We intend to take diversity one step further and use the Folksam index, which is looking at the variables stated above, and compare it to financial performance. Our hope is that this will give a better picture of how diversified the board is.

The result of the diversity index will be compared with key financial ratios to see if diversified boards perform better than less diversified boards. There are many ratios to look at when evaluating the financial success of firms. One could look at cash flow measures, balance sheet measures or profitability measures. All come with benefits and disadvantages and many of them demand adjustments. For this study the performance measures return on assets and market-to-book value have been chosen because they are easy to replicate and require few adjustments.

1.3 Problem statement

Does diversity regarding gender, age, education and tenure in board of directors in Swedish Large Cap companies create better financial performance in terms of market-to-book value and return on assets?

⁵ Lundberg Markow (2010)

1.4 Purpose

The intention with this thesis is to study whether diversity in board of directors in Swedish Large Cap firms will create better financial performance in the company and hence better results. To achieve this, the diversity index is compared with the key financial ratios return on assets and market-to-book value. The aim is to provide a guide to whether diversity is something to strive for in terms of financial performance.

1.5 Limitation and demarcation

The study focuses on Swedish firms listed on the NASDAQ OMX Nordic Large Cap (54 firms) as these companies, to a larger extent, are in stable growth and can give good historical information about themselves. This improves the accuracy of the study and will give a more comparable result. It should be noted that this is also a limitation since the sample size is decreased.

The study is also limited in the number of parameters to look at when it comes to diversity. The parameters are age, gender, education and tenure. The parameters have been limited to these four for two reasons; to be able to compare the results with the Folksam index and due to limitations in finding accurate information on other parameters. This is a limitation in the study; the index does not capture the full level of diversity of the boards. The study will for example, totally disregard the cultural aspects of diversification that could create both benefits but also problems within an organization and a board. As an example, Millicom got a very low education score because the only academic studies undertaken was economics. On the other hand, Millicom's board has representation from several nationalities and cultural background which is a kind of diversity that is not captured in this study.

In the study there is also a demarcation regarding the performance parameters looked at and thus it could fail to cover the full spectrum of the word performance. A company may very well perform extraordinary when it comes to capture market shares and selling their product but still perform very poor financials. As an example, a high-tech start-up would probably bleed financially but could show very good growth on the market and good future financials. This start-

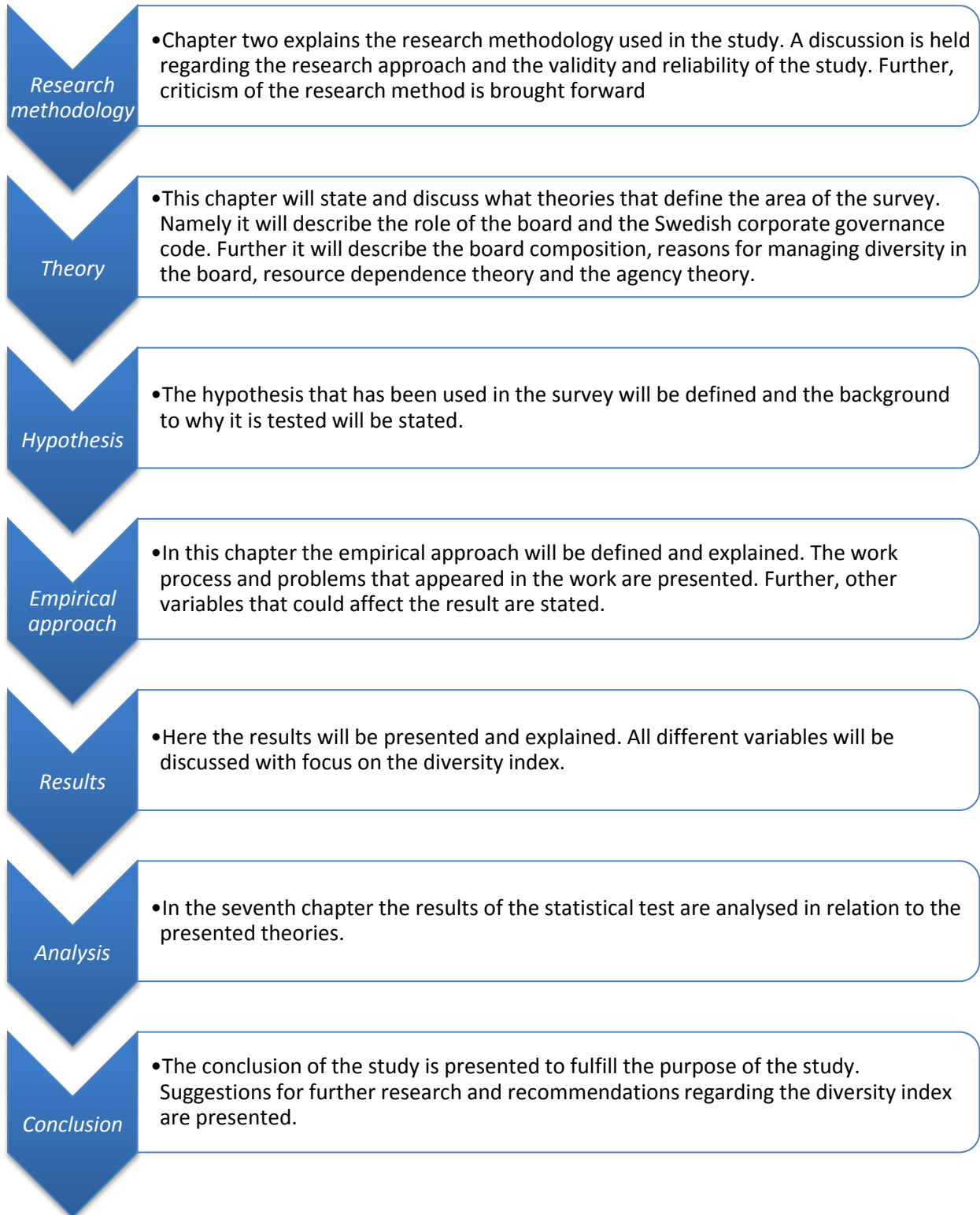
up would show up as a poor performing company in the study due to the fact that performance is narrowed down to return on assets and market-to-book value. To limit this problem the study only focuses on Swedish firms on the NASDAQ OMX Nordic Large Cap where there are few young, high growth companies and thus the findings in our study should be comparable.

In the study the top management has been disregarded, thus the study only looks at the board of directors. It is a limitation in the study as the top management is often the ones that take the managerial decisions in a company. On the other hand the strategic decisions are made in the board of directors or at least in conjunction with the board of directors and thus the study should be able to capture if a diversified board does better strategic decision making than less diversified boards. To only make a study on the board of directors is a demarcation chosen because of the blurry information on which people that are actually included in the top management. What people that sit in the board of directors is clear and this demarcation should thus make the study easier to replicate.

1.6 Target audience

The target group of the study is those with basic knowledge and interest within corporate finance and corporate governance. Previous studies within the field is beneficial to fully take capture in the meaning of the result but one might just as well read this study and get a basic understanding of it without great academic knowledge.

1.7 Disposition



2. Research methodology

The following chapter describes the research method and approach used in the paper. Further, the data collection process is described and the structure of the survey is presented. The chapter includes a description of both the performance measures and the diversity index used in the study. Finally, the statistical method is presented followed by criticism against the methodology.

2.1 Perspective

The perspective with this study is to show what impact diversity in the boards of directors has on the performance of a company. It is important to know that the study is intended to show whether diversified board of directors perform better than less diversified boards and will thus *not* be a guide on how to assemble a diversified board. This is important to say as it may have an impact on the outcome of the study. The intention is that this study should provide valuable insights whether diversity in board of directors increases firm performance.⁶

2.2 Decision data

2.2.1 Research approach

Two different approaches could be used when implementing research studies, either through inductive theory or deductive theory. With an inductive approach, theory is the outcome of the observations and the research that has been done. In the deductive approach the relationship is reverse and theory precedes the observations and findings. To meet the purpose of this study the approach will be the deductive theory where theory leads to a hypothesis followed by data collection, findings and a confirmed or rejected hypothesis. Existing theory regarding diversity in companies will be used to create hypothesis and analyze the outcome of the research.

The deductive process is fundamentally very linear as the steps follow each other. However, there are circumstances that may change the view of the theory during the process. These

⁶ Bryman & Bell (2007)

circumstances are that new theoretical ideas or findings may be published before this study is finished, the relevance of the collected data may become apparent only after the data have been collected or the data may not at all fit the original hypotheses. One downside with the deductive theory is that the findings may be limited and it is hard to find anything else than what the researcher is looking for. The intention is to keep an open mind towards all possible outcomes in order to fairly implement a proper study.⁷

2.2.2 Research philosophy

Research philosophy is the way people look upon knowledge and the two main ways to do this are positivism and interpretivism. With a positivistic research philosophy knowledge is seen as something objective with a sharp distinction between theory and research. The purpose of the research is to test the theory and only phenomenon's that can be confirmed is considered to be real knowledge. Contrary to positivism, interpretivism states that the view of the writer influences the result. Knowledge is created through interaction between people and the answer becomes subjective.⁸

The intention is to make a study that is possible to replicate. By using theories we will construct a hypothesis that can be tested. The results are presented without any interpretation and hence they are objective. Finally we will make a clear distinction between those statements that are scientific and those that are normative. Hence, our intention is to execute this study with a positivistic research philosophy.

2.2.3 Research method

Quantitative studies are generally empirical, in our case a statistical study. Qualitative studies, on the other hand, are often characterized by being more in-depth and thus good for explorative problems.⁹ The positive thing with the qualitative research method is that it is very flexible and can be used to get findings in a plethora of problems. The negative thing is that it often yields

⁷ IBID.

⁸ IBID.

⁹ Jacobsen (2009)

results that are hard to replicate, have a large variance and are subject to the researchers own values and could thus give an inaccurate result.¹⁰

The quantitative approach that has been used yields a more replicable result than a qualitative approach would have done in this subject; we have thus chosen a quantitative approach for this study.

2.3 Data collection

To answer the problem statement in this study, whether increased diversity does create better financial performance, secondary data is collected. The data is the base for the statistical test which is used to answer the hypothesis.

2.3.1 Secondary- and primary data

This study will solely be based on secondary data. The secondary data will mainly be our own study done on 54 companies on the Swedish stock exchange, OMX Nordic Large Cap. The performance data has been gathered via the Thomson Reuters Datastream database. The information about company board of directors has been gathered from the annual report on each company. Other secondary resources has been Bloomberg Businessweek's executive profiles, this has been used to get complementary data that could not be found in the annual report. The database has mainly been used to gather education on the different directors when this has not been mentioned in the annual report.

2.3.2 Secondary data criticism

The Thomson Reuters Datastream database has flaws, the most obvious we have encountered is the problem to see what kind of adjustments that has been done to the balance sheet and income statement. In appendix L a test sample of five companies is found. This test shows that the performance measures, calculated with numbers from the annual report by the authors, do not differ significantly from the data provided by Datastream. The adjustments that cause the

¹⁰ IBID.

difference have not been identified but due to the minor differences the data provided by Datastream is considered to be trustworthy.

2.3.3 Validity

A study with a high validity is a study where the empiric measurements are measured in an accurate way.¹¹ In our study we have used annual reports to get an independent source of information. Due to requirements by law, the annual reports have been reviewed by independent auditors which should give us an unbiased view of the variables we have chosen. The data we have gathered from other sources has been taken from well-known companies covering the financial markets and should thus have a high standard.

All sources of information used to build our theoretical framework have been gathered from well-known researchers and writers. We have tried to use sources that are as close to present time as possible to get the latest information and breakthroughs within the field. This should ensure a high standard on the material used.

To strengthen the validity even more, statistical tests have been used to see if some variables in the index have more influence than others, see appendix K. These tests give a good measurement on how well the index is built and if there is any biases in the index. It is shown that age and tenure is more correlated to the index than gender and education. Hence the gender and education variables could be argued to add more to the index than age and tenure. It should be mentioned though that building an index for diversity is notoriously hard as there are many variables that could influence how diversified a board is. To increase the validity in the study the index is built on variables that can easily be accessed.

2.3.4 Reliability

A study with a high reliability is a study that can be replicated and still show the exact same result.¹² Since the study is a replica study of an earlier study made by Folksam the reliability is measured by comparing the calculated index with the Folksam index, this has been done in

¹¹ Bryman & Bell (2005)

¹² Bryman & Bell (2005)

appendix D. There are some problems here. Due to the fact that we have only replicated the index for NASDAQ OMX Large Cap the median values used in this study is different from the median used in the original study. This is because the median used in the original study is for all different markets and not only for the Large Cap. If some data were missing in the annual reports, Folksam decided to exclude that from the survey while we have tried to collect the data from other sources as far as possible. The reliability report (appendix D) shows that the differences are only minor between the index calculated in this study and the index calculated by Folksam.

In a quantitative study as this one there is always a risk that, due to errors in the gathering, we end up with a different result than earlier studies. To minimize the risk of doing errors during the gathering we have followed a strict process, found in appendix E. During the data gathering we have also tried to be as careful as possible when it comes to the registration of the data. As said, errors could be made and thus be a source to problem if the study is going to be replicated. The fact that two different individuals have been gathering the data could also have an impact on the reliability. To solve this problem we have put a lot of effort in to discussing the different variables with each other to define a common definition on all variables.

2.4 The survey

2.4.1 Survey structure

We have looked at four different parameters (the same as Folksam); gender, education, age and tenure. The survey has been conducted by reading the annual report from each Swedish company on the NASDAQ OMX Nordic Large Cap, this information has then been compiled into the different parameters mentioned above.

The information gathered has been used to compile an index. This index has been built in the same way as the Folksam released index which will be described in the sub-section *2.4.3 The Folksam index*.

2.4.2 Definition of diversity

The definition of diversity is broad and can be used in a plethora of fields, from biodiversity that is the variation of life forms within a given ecosystem to things like diversity training that has the purpose of increasing the participants' cultural awareness, for example.¹³ In between these you can find diversification in the fields of finance, business, marketing and politics, to name a few. The one thing that all these different definitions have in common is that they show some sort of variety in the group of things studied.

Diversification in finance is used when risk is reduced by investing in different assets. The variety of different assets with uncorrelated movement on the stock exchange will give a portfolio that has lower risk than a portfolio with only one asset. This thinking can also be applied on business as shown in the article "The multicultural organization"¹⁴ where the author describes how a diversified workforce creates benefits when it comes to decision making, creativity and innovation but also to marketing to different customers. The marketing to different customers, for example, will get better due to the fact that your workforce better re-assembles the people outside your organization and in that way you know your surrounding better.

To study if diversity in the terms argued by Lundberg Markow in the Folksam report does lead to better performance, the selected definition of diversity is the same here as in Lundberg Markow's study. This includes the variables age, gender, education and tenure.

2.4.3 Selection of companies

The first conditions when choosing companies for the survey was that they had to be listed on a stock exchange. Due to regulations Swedish listed firms must disclose information about the variables used in this survey and this was a crucial factor to be able to carry out the work.¹⁵ Hence, non-listed firms were not relevant for the survey due to lack of information about the board of directors. The total number of firms listed on NASDAQ OMX Nordic was 562 on

¹³ Vaughn (2007)

¹⁴ Taylor (1991)

¹⁵ The Swedish corporate governance code (2010)

March 18, 2011. Excluding the Finnish, Danish and Icelandic firms leaves 250 Swedish large, medium and small cap firms.¹⁶

To increase the accuracy of the survey only Swedish Large Cap firms have been studied. Large Cap firms are those with a market value of €1 billion or more.¹⁷ A larger set of companies would give a broader and more reliable study. However, the limitations in time did not make it possible to include a larger set of companies. By choosing Large Cap firms the intention is to exclude highly volatile firms where the effects of changes in board composition could be hard to capture. Therefore, mid and small cap firms are excluded in the survey and it has been made on Swedish firms listed on NASDAQ OMX Nordic Large Cap at March 18, 2011.

2.4.4 The Folksam index

Folksam's index is based on the diversity in 255 Swedish listed firms. Folksam have studied both the board of directors and top management in the companies, since this thesis only studies the diversity in the boards the following description will focus on the index of board of directors.¹⁸

The variables used to define diversity are gender, age, education and tenure. To construct an index of these variables the measures need to be translated into numbers. For the variables age and tenure a median is calculated and the index is then constructed with the median as a base.

When calculating the age variable the lowest number of directors above or under median is divided by the higher to create the index. The tenure variable is calculated in the same way by dividing the lowest number of directors that have tenure either above or below median. This number of directors is divided by the number of directors belonging to the majority group. In the example below Alliance Oil have three directors below the median age and four directors above the median age, hence, the lowest number is divided by the higher number, three divided by four. The same principle is applied for the tenure variable.

¹⁶ NASDAQ OMX Nordic Share list, www.nasdaqomxnordic.com

¹⁷ NASDAQ OMX Nordic Market Model 1.6, www.nasdaqomxbaltic.com

¹⁸ Lundberg Markow (2010)

To calculate the gender variable the number of directors belonging to the minority gender is divided by the number of directors belonging to the majority gender, in most cases this means dividing the number of women by the number of men.

All directors' education have been studied and classified into six categories; Business/Economics, Engineering/Natural Science, Medicine, Law, Social science and Humanities. To maintain quality and the possibility to replicate the study, only directors with degrees from higher education in one or more orientation has been included in the study. The education variable is then constructed by dividing the number of different orientations within the board with the total number of orientations, six. The underlying thought is that an index number close to one represents a high level of diversity in the board of directors.¹⁹ Attached in appendix A-C is the calculated diversity index and underlying variables for the companies during the years 2005, 2007 and 2009.

Table 1. Example calculation of the Alliance Oil index 2009

Variable	Calculation	Score
Age	3 Below median / 4 Above median	0,75
Gender	0 Women / 7 Men	0
Education	Business, engineering, social science, 3/6	0,5
Tenure	3 Above median / 4 Below median	0,75
	Sum	2,00
	Index	0,50

2.5 Performance measures

To fulfill the aim of the study the calculated diversity index have been compared to selected performance measures to see if board diversity can have any effect on corporate performance. When analyzing firms performance through ratios there are five main aspects to look at. These are profitability, asset turnover, financial leverage, liquidity and market value.²⁰ In this survey

¹⁹ Lundberg Markow (2010)

²⁰ Bodie & Merton (2000)

return on assets and market-to-book value have been chosen to indicate the performance of the company. The authors view is that the ordinary investor care about these two ratios more and that they are simpler to compare between firms. Also, if diversity in corporate boards has any effect on the performance of the company it should have effect on both profitability and market value. Asset turnover can vary a lot between industries and individual companies and could be hard for the board to affect in some specific companies. Financial leverage does not need to be related to the success of the company and thus it should not be relevant for this study. The liquidity level of the company should not be affected by the level of diversity and hence it is excluded from this study.

2.5.1 Return on assets

To capture the performance measured by the profitability ratio this study uses return on assets, below written as ROA. This is a ratio that is commonly used in similar survey's which increases the comparability to other studies. ROA is calculated by dividing earnings before interest and tax, EBIT, with total assets.²¹ EBIT excludes financial expenses and thus the ROA measure is a measure of how effectively the company uses its assets whether they are financed with equity or debt. ROA does not say anything about how the assets have been financed which is why it is a good measure to use when comparing firms between different years, companies within the same industry or companies within different industries with equivalent capital structure.²² Return on equity could have been used but this ratio changes as the leverage change and thus it makes it harder to benchmark between firms and over time.²³

2.5.2 Market-to-book value

The study will also capture the value of the firm as a mean to capture the expectations by investors at the stock market. The Folksam competence report implies that a company needs diversity to be successful, and thus this should be reflected in the market value of the company²⁴. To capture changes in market value and thus the expectations on the company the study uses the market-to-book value, below written as MTBV, of the individual companies. MTBV is one of

²¹ IBID.

²² Hanson et al. (2006)

²³ Bodie & Merton (2000)

²⁴ Lundberg Markow (2010)

many ratios used to evaluate firms. For successful firms this ratio substantially exceeds 1, meaning that the value of the firm's assets when put to use exceeds their liquidation value. Variations in this value reflect changes in fundamental firm characteristics as well as value added by the board of directors and management.²⁵

2.5.3 Performance measures criticism

All performance measures have their weaknesses and by being aware of them the intention is to increase the quality of this study. ROA is based on the book value of the company's assets and thus it is sensitive to the age of the assets as well as the company's replacement strategy of the assets. A company with older assets will have a higher ROA than a company with new assets with high book value. Due to depreciation a company's assets could have a book value of zero but still be usable in the operations, a factor that can bias the results. Further, the performance measure is sensitive to the firm's source of financing in terms of purchases or leases. A company that purchases all their assets will have a lower ROA than a firm that leases all assets. The performance measures are not adjusted for leases in this study.

Since MTBV is calculated by dividing the market value of assets with the book value of assets this ratio is influenced by the same issues regarding new and old assets as ROA is. As the assets are depreciated the book value will reduce and MTBV increase as long as no new assets are purchased and the output level remains in the old assets. Further, using MTBV as a measure for firm value might be questioned since the expectations from the stock market and behavioral reactions from shareholders have a huge influence of the MTBV ratio. However, it provides a picture of how the firm is valued by investors and thus tells something about how the company and the board of directors perform.

²⁵ Berk & DeMarzo (2007)

2.6 Statistical method

In the following section (section 2.6) all information is gathered from Körner and Wahlgren²⁶ if other source is not explicitly stated. To fulfill the aim of this study, and to show if there is any correlation between diversity in boards and the companies' financial performance, statistical tests in the computer programme SPSS have been done. To determine which test are most suitable for this study it is important to clarify what kind of data that are used. This is done by assigning the data to different scales. The diversity index constructed for this study makes it possible to rank the companies after the level of diversity but it does not give the possibility to objectively measure the difference between the companies, hence the index is classified as ordinal scale.²⁷ Both performance measures used in this study, ROA and MTBV, are arithmetic values on an interval scale.²⁸ For samples in an ordinal scale, non-parametric tests are suitable to use. Non-parametric methods possess lower strength and efficiency than parametric but, since the conditions for parametric tests are not fulfilled, non-parametric test are used in this survey. The tests that are used are the Mann-Whitney U test and Kolmogorov-Smirnov test, these are appropriate when the sample is small and the variables are not normally distributed.

To deepen the knowledge within diversity in relation to financial performance, each variable behind diversity is tested against the performance measures of the companies. Here, the nominal and ordinal values for gender, education, age and tenure are transformed into a relative scale. For these variables the number that is calculated for the index is used in the test to make it possible to construct a meaningful test.

When carrying through the statistical test of the hypothesis one must be careful not to create a type I error which means that the test shows that diversity has an effect on a company's financial performance when it actually has no effect at all. The test can also result in a type II error meaning that it shows that diversity has no effect on board financial performance when it actually has an effect on the financial performance.

²⁶ Körner & Wahlgren (1996)

²⁷ Nationalencyklopedin Ordinalskala, www.ne.se

²⁸ Nationalencyklopedin Intervallskala, www.ne.se

2.6.1 The Mann-Whitney U test

The Mann-Whitney U test tests two independent populations. To test any relationship between these two populations a hypothesis and a counter hypothesis is constructed. The advantage with the Mann-Whitney U test is that the samples do not need to be normally distributed as long as they are independent from each other. In this study the Mann-Whitney U test is used to test if there is any relationship between diversity in corporate boards and corporate financial performance.

2.6.2 The Kolmogorov-Smirnov test

The purpose of the Kolmogorov-Smirnov test is to see if two independent populations differ significantly or not. An advantage with the Kolmogorov-Smirnov test is that the test makes no assumption about the distribution of the data; it does not need to be normally distributed.²⁹ The Kolmogorov-Smirnov test has been used to identify any relationship between diversity in corporate boards and the companies' financial performance.

2.7 Theories

A wide theoretical base will help to understand and explain the statistical results and relationships between diversity and financial performance. Theories about resource dependence and agency dilemmas are presented to help the understanding of what the board of directors contributes to the company. These theories were chosen after a thorough review of existing theories within the field. They are seen as the best fit to explain the relationship between board diversity and financial performance according to the authors. Previous research will provide knowledge and empirical findings about this relationship and will further extend the theoretical framework in the study. These studies have carefully been selected as they match the purpose and focus of this study regarding both diversity and performance.

The board of directors is below argued to work as a team. To help understand what benefits and difficulties a diversified board might face, theories regarding teamwork are given place.

²⁹ Kolmogorov-Smirnov Test, www.physics.csbsju.edu/

2.8 Criticism against the methodology

The study has, as mentioned, been done on 54 Swedish firms on the NASDAQ OMX Large Cap. A greater amount of companies would give the study a more conclusive picture on how diversified boards perform. Due to the fact that we have only looked at the NASDAQ OMX Large Cap the information on how different sectors perform is limited, this could also have been improved with a larger sample of firms.

The Folksam index gives a more comprehensive view on diversification than what is usually seen in similar studies where often only the gender perspective has been looked at. In our study, as well as in the Folksam study, we have looked at four different parameters for diversification which will increase the likeliness of capturing how diversified the board is. To make the study even more comprehensive we could have added more parameters to the diversification index.

Criticism against the chosen performance measures includes the vague definition of performance. In today's society it is not obvious what good performance is in a company. Many argue that company's should take into consideration not just financial measures but also how the company contributes to society as a whole, commonly known as the stakeholder theory. In this survey only the financial measures are taken into consideration and if the company behaves responsible against its stakeholders is excluded.

A major downside with this study is that it excludes all other factors except the board of directors when it comes to company performance. It is not guaranteed that the actual composition of the board is the most important factor behind any change in company performance or success. Other factors that are relevant for drastic changes in performance are changes in the top-management team, increased or decreased competition or macroeconomic factors.

3. Theory

In the following chapter the theoretical framework of the study will be explained. It will bring forward the theories and perspectives needed to fully understand the analysis. The theories will also get criticized.

3.1 Theoretical framework

In the following section academic theories and previous studies linked to diversity in corporate board and the relationship to the companies' financial performance is presented. The purpose is to provide a knowledge base that makes it easier to grasp and explain the relationship between diversity and financial performance as well as explaining the results of the statistical tests. Theories that deal with the corporate governance system and specifically the composition and work of the board are necessary for understanding the basic concept of the role of the board and its effect on company performance. Further, previous studies provide knowledge about the experiences and results made by researchers within the area of diversity and performance. Theories that focus on reasons for managing diversity and on the linkage between different team members is presented as a mean to explain the effect of diversity in terms of specific variables. This will make it easier to understand what benefits or disadvantages that might come with increased level of diversity and if diversity regarding any of the underlying variables are more important than others.

3.2 Board of directors

3.2.1 The role of the board

Tricker states that the board has two roles, one is the performance role and the other is conformance. The performance role consist of strategy formulation and policy making, the first is about creating the long term strategy for the corporation and the latter is about turning the strategy's into operational plans. These two roles are future focused while the conformance roles

are past and present focused. They consist of providing accountability to external parties and monitoring and supervising the company and its employees.³⁰

According to Tricker, directors in corporate boards believe that they should spend a majority of their time on future oriented tasks and less on the past and present. In reality this has proven to be the opposite and directors spend more time on providing accountability and monitoring.³¹ The view given by Tricker is that the board of directors should put most of their effort and time in the performance role and hence focusing on generating success for the company.

3.2.2 The Swedish corporate governance code

Listing rules on NASDAQ OMX Nordic states that listed firms should conduct its business in line with common accepted market practices and indirectly refers to the Swedish corporate governance code.³² The Swedish corporate governance code is not mandatory to follow but if a company does not follow some parts of the code they must explain why. The code states that the task of the board of directors is to manage the company's affairs in the interest of the company and all its shareholders. This includes setting the goals and strategy for the company as well as controlling the company's operations.³³

Hence, the view given is that the board of directors possesses a major responsibility for the financial performance of the company.

3.3 Does the board affect company performance

In the following section (section 3.3) all information is gathered from Zahra and Pearce³⁴. Zahra and Pearce provide an extensive work on the effect of board composition on companies' financial performance. Through a review and analysis of previous studies on the area they investigate if

³⁰ Tricker (2009)

³¹ IBID.

³² NASDAQ OMX Nordic Rules & Regulations, <http://nasdaqomx.com>

³³ The Swedish corporate governance code

³⁴ Zahra & Pearce (1989)

the board affects company performance. They study the importance and effect of four different attributes, namely; board composition, characteristics, structure and process.

According to Zahra and Pearce, board composition is argued to have an impact on director's characteristics but further research is needed to conclude any effect on company performance. Zahra and Pearce's review concludes that board characteristics, although a wide concept, are important for effective corporate financial performance. Board structure also seems to influence board performance although the authors are careful to draw any conclusions due to the very few studies conducted regarding board structure and company performance. Finally the authors studied if board processes had any effect on company performance. There were relatively few studies in the topic but the conclusion is that the length, quality and frequency of board meetings as well as how active the directors are in their board-related activities affect how well the board performs its strategic role and ultimately the company performance.

The conclusion to draw from the study made by Zahra and Pearce is that good and effective work of the board of directors can and do have effect on company performance. The tricky thing is to determine which factors that have the most effect.

3.4 Board composition

3.4.1 Resource dependence theory

The resource dependence theory has its origins in the organization theory and sees the board of directors as a link between the company and the resources the company needs to operate and achieve its goals. The different resources can be everything from access to capital to specific know-how and technology.³⁵ In the article "Size and Composition of Boards of Directors: The organization and its environment"³⁶ the author states that it is important to absorb even the institutions that cannot be absorbed directly by the company such as regulatory bodies. It is, to quote the author, "[...] important to obtain a favorable regulatory climate [...]"³⁷ to be able to

³⁵ Tricker (2009)

³⁶ Pfeffer (1972)

³⁷ Pfeffer (1972) p 222

operate the company with success. Due to the fact that you cannot absorb these kinds of bodies directly you need to have a connection with people that in turn possess the power to influence the regulatory body.³⁸ As such the resource does not need to be directly connected to the board but can also be a connection to someone that possesses the resource.

Firms in different businesses can have different needs when it comes to resources, a firm with a great need of capital could gain from having easy access to the capital markets. Due to their specific need they could, for example, need directors with close links to the financial institutions to get easier access to the same institutions. A firm that has great need of legal advice on the other hand could need attorneys in their board; this would give them the specific know-how of how to deal with legal problems. In short, the company should have a structure of their top management that is consistent with the environment around the organization.³⁹

The board size and composition in a company has been shown to not be random variables. Findings by Pfeffer show that organisations actively deal with different external factors by changing the structure of their board. That is, they choose different kind of resources depending on their need.⁴⁰ Many studies has shown that altering the board of directors in different ways, for example increasing the size of the boards of directors, gives a better financial performance.⁴¹

Zahra and Pearce argue that directors are a key linkage between executives and external information. With their connections to society and other corporations, directors are extracting resources which results in enhanced firm legitimacy in society, higher efficiency and improved company performance. These linkages do not only provide information and legitimacy but they result in favorable transactions with lower transaction costs. Hence, the directors' connections to external parties improve access to vital information, enhance company performance and reduce transaction costs. As mentioned above, companies need different kind of resources in different situations. Zahra and Pearce argue that the external environment is important when constructing a board. In a highly volatile and hostile environment it is important to create favorable links with

³⁸ Pfeffer (1972)

³⁹ Lawrence & Lorsch (1967)

⁴⁰ Pfeffer (1972)

⁴¹ Hillman & Dalziel (2003); Dalton et al. (1999); Goodstein, Gautam & Boeker (1994)

external parties and hence directors with a large network are valuable. Further, what stage the firm is in also affects the kind of resources necessary in the board, small entrepreneurial firms needs a different amount of monitoring than a multinational corporation as an example. Finally, what type of firm it is also affect what role the board should focus on.⁴²

3.4.2 Criticism against resource dependence theory

One limitation with the resource dependence theory is that it does not define how directors actually work to link the firm with the surrounding environment. Further, it ignores the characteristics of the individuals and dynamic powers in the board, suggesting that it is a simple task to design an effective board. Also, no research has been able to show the linkage between the board variables and the company's social performance, a link that is suggested by resource dependence theory.⁴³

Donaldson criticizes the resource dependence theory for its lack of justification when it comes to how organizations should be viewed. According to Donaldson the resource dependence theory fails to justify why you should see the organization as a political system and not as a technical or economic system that is usually the case. As an example Donaldson looks at the studies done on mergers within the resource dependence theory. He states that these neglect or fail to capture the economic factors behind a merger. Further, he states that the empirical studies done within the resource dependence field simply captures the exchange of goods and thus the economic power and not the political power that they try to capture.⁴⁴

3.4.3 Agency theory

According to the agency theory the role of the board is to resolve agency problems between managers and shareholders. Independent directors are here a critical factor for the board to function in the best interest of shareholders. The question is therefore if diversity increases the independence of the board of directors and their ability to monitor managers. An argument that this is the case is that people with different backgrounds than the traditional directors ask

⁴² Zahra & Pearce (1989)

⁴³ IBID.

⁴⁴ Donaldson (1995)

different questions due to different experiences and values. This, however, might not at all be the case since the minority director can be marginalized in the group.⁴⁵

Zahra and Pearce argue about the agency theory relative to company performance. According to the authors the board's contribution to company performance lies in minimizing agency costs caused by executives that do not comply with stated goals and procedures.⁴⁶ They state that agency theory adopts three major roles for the board in performing this task. The most important is control of management and the other two are to provide service and strategy for the company.⁴⁷ Hence, good and effective board work affects the performance of the company through putting pressure and controlling management while in the same time having a major responsibility over the long term strategy. A relevant question for this thesis is whether a diversified board is better suited to perform these tasks.

The composition of the board is one way to mitigate the agency problem. To bring external members to the board, that has their reputation at stake, might be one way to alter the composition of the board to better solve the agency problem. To bring in external members might also mitigate the “group think” behavior that an otherwise homogeneous group would be prone to. The re-composition of the board to better mitigate the agency problem will, in theory, ensure that the managements decisions are consistent with the boards, namely to increase shareholder value and thus corporate performance.⁴⁸ Bathala and Rao conclude in their article from 1995 that board composition is related to agency costs. With Zahra and Pearce conclusions in mind a better composed board should lead to better corporate performance. The results by Bathala and Rao points in the direction that companies choose composition of their board depending on what other types of devices to mitigate the agency problem they have in use. Such devices can for example be dividend policies and inside equity ownership according to Bathala and Rao.⁴⁹

3.4.4 Criticism against the agency theory

⁴⁵ Carter et al. (2003)

⁴⁶ Zahra & Pearce (1989)

⁴⁷ IBID.

⁴⁸ Bathala & Rao (1995)

⁴⁹ IBID.

Agency theory does not stand without criticism. One critique is that the theory's assumptions regarding top management's values, and the lack of interest to maximize shareholder value, may not be as bad as one might first think. In a time where companies' responsibility to society is getting more important, short-time deviation from maximization of shareholder-value might be good for the long-term profitability. Another criticism is that researchers have found it hard to document how well directors perform their task and hence to which extent they do a credible job in monitoring managers. A third shortcoming is that agency theory emphasizes the board's strategic role but critics argue that the board's contribution to the strategic work is too infrequent to make any difference in the strategic work. Some critics argue that CEOs do not want directors to do the strategic work which they think are their domain.⁵⁰

Other critics argue that agency theory is a narrow theoretical scope which simplifies corporate governance to a contract between principals and agents. According to these critics agency theory focuses too much on quantitative measures such as board structure and misses the interpersonal behavior, group dynamics and political intrigue. Further, many argue that the model is simplistic in practice as the ownership structures of today are very complicated. With large ownership stakes belonging to international hedge funds or pension funds which in their turn are owned by some other fund, it can get very hard to know which owners' interest to take into account.⁵¹

3.4.5 Previous studies

Carter and his colleagues are some of the researchers that have studied the importance of board diversity. In their study they examined the level of diversity in terms of number of women and ethnic minorities (African Americans, Asian and Hispanics) in the board of directors and the relationship between this measure of diversity and firm value. The study was made on 638 traded Fortune 1000 firms that provided the necessary information to be able to carry through the study. The authors control their statistical results for size, industry and other measures and can show, contrary to their hypothesis, a statistically significant relationship between diversity in terms of women or minorities on the board and firm value measured as Tobin's Q.⁵²

⁵⁰ Zahra & Pearce (1989)

⁵¹ Tricker (2009)

⁵² Carter et al. (2003)

Erhart, Werbel and Schrader also study the effect of board composition with diversity defined as the representation of both ethnic and gender differences among directors.⁵³ They put diversity in relation to the financial performance of the companies, measured as ROA and ROI. They present literature suggesting that diversity results in higher creativity, innovation and quality decision-making. Erhart, Werbel and Schrader argue that this is applicable to the board of directors as well. Therefore the following hypothesis is proposed in their paper: “Greater demographic diversity among board members increases organizational performance”⁵⁴. The data for the analysis included 112 large public US companies in various industries and both regression analysis and correlation were used to illustrate any relationship between diversity and ROI or ROA. The results from the analysis supported the hypothesis that increased diversity in boards increased company performance, measured both as ROI and ROA.⁵⁵

Most of the previous research on board diversity focuses on the gender of the directors. Adams and Ferreira took this point in their paper from 2009 where they studied the effect of female directors in 1939 firms for the period 1996-2003. They examined the governance characteristics of the board of directors in terms of attendance to meetings and committee assignments for female directors as well as the impact of gender diversity on performance. Their conclusions are that women attend board meetings more frequently than men and that this also has an impact on the attendance of men which increases. They further show that women are more likely than men to sit on committees with monitoring functions and less likely to sit in the compensation committee. Further they conclude that there is no significant correlation between gender diversity in boards and company performance measured as ROA and Tobin’s Q, if any, the relation seems to be negative. One reason may be that if firms have otherwise strong governance, a tough board could lead to over monitoring which harms the firm. As said, the authors state that female directors are more likely to be members of monitoring committees and they are tougher in their monitoring of management.⁵⁶

⁵³ Erhardt et al. (2003)

⁵⁴ Erhardt et al. (2003) p 105

⁵⁵ Erhardt et al. (2003)

⁵⁶ Adams & Ferreira (2009)

Campbell and Vera studied the relationship between female directors and firm value in a sample of 68 firms. The authors present both ethical and economic arguments as motivations why the presence of female directors is positively related to firm value and proposes a hypothesis that the stock market will react positively to female board appointments.⁵⁷ Through statistical test the authors concludes that the appointment of female directors is positively viewed by investors which confirms the hypothesis and also matches previous research within the field.⁵⁸

3.5 Reasons for managing diversity in companies

In the following section (section 3.5) all information is gathered from Robinson and Dechant⁵⁹ if not other source is explicitly stated. Robinson and Dechant argues that diversity in corporations of today is a broad concept and that companies tend to favor a definition that includes gender, ethnicity, age, physical abilities, qualities, and sexual orientation as well as difference in attitudes, perspectives and background.

The authors state three arguments for managing diversity in firms. The first is related to the higher cost associated with a mismatch in diversity. In USA, the turnover among women and Afro-American people is higher than the turnover among white men and a costly problem for companies. A major reason for the high turnover rates among women is lack of opportunity for career growth. Managing diversity will help companies save costs and retain competent staff. Argument number two is to win the competition for talent. As women and other minorities becomes a larger part of the workforce, companies are competing to hire and retain the most competent employees from the minority groups. Companies cited to be the best places to work for women and minorities get more applications and thus get a better chance to hire the best individuals. The third argument states that a diversified firm is a powerful tool to drive business growth, first of all through better understanding of the marketplace, as customers and markets are becoming more diversified. Further, a diversified workforce stimulates creativity and innovation. It also creates higher quality problem-solving as research shows that teams produce more

⁵⁷ Campbell & Vera (2009)

⁵⁸ IBID.

⁵⁹ Robinson & Dechant (1997)

innovative solutions to problems. Leadership effectiveness is improved with increased demographic composition and ethno-cultural diversity leads to better global relations.

Cox and Blake have a similar discussion regarding benefits of managing diversity in firms; they state six different arguments why diversity is an issue to work with. First, the cost argument is about reducing costs of integrating increasingly diversified personnel. Second, resource acquisition is about attracting the best employees and the third argument is that a multi-national staff will improve the firms marketing efforts in domestic and foreign operations. Fourth, the creativity argument is based on increased creativity in more diversified teams, and fifth, the problem-solving arguments are motivated by better decision making in heterogeneous groups. These five arguments are very similar to the ones presented by Robinson and Dechant above, what Cox and Blake also add is a system flexibility argument. This last argument is based on the idea that the system will become less standardized and instead more fluid due to increased diversity, this gives the company a flexibility to react to environmental changes faster and at lower costs.⁶⁰

3.6 The board as a team

"A team is a small number of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they are mutually accountable."⁶¹ With this definition of a team the board of directors could be seen as one. In the study made in this thesis the average board had eight people in it, this must be seen as a small number of people. The diversity measured shows that most of the boards seem to have complementary skills in it and to be able to sit in a board the individual has most probably showed that it is committed to the company's goal. With this in mind the board of directors could be seen as a team and thus follow the basic theories regarding what makes teams successful.

Belbin identifies six key factors in successful teams regarding the attributes of the members and the structure of the work. First of all the person in the chair is important, this person must work together with the other directors and not against, although having the ability to take critical

⁶⁰ Cox & Blake (1991)

⁶¹ Katzenbach and Smith (1993) p 92

decisions. The second factor is the presence of one strong plant, which is a very creative and clever person, this proved to be an advantage for the company. Boards must also have a spread in mental abilities, one director can be the clever person whilst another might be the coordinator of the team, and the third might be the visionary director. A spread in personal attributes is the fourth factor. Successful teams seem to have members with different attributes such as one person that is good at implementing projects while another is good at finishing projects. Next, a good match between these personal attributes and the person's responsibility in the team is a success factor. Winning teams reduce their reliance on a member for a critical function until that person show that it can handle the responsibility in a good manner. The final factors identified by Belbin are the ability to adjust to the realization of imbalance. That is, if a team lacks some competencies or abilities it can better handle the situation if it is aware of it shortage.⁶²

Lind and Skärvad draw similar conclusions as Belbin through a review of research within the field. They state three conditions that must be fulfilled to achieve successful teamwork. Teams must know what they are expected to achieve and have clear task to perform. Further, teams must get meaningful tasks to maintain stimulation and motivation among the team members. Finally, the members must be able to work together as a whole in good group dynamics.⁶³

⁶² Belbin (2010)

⁶³ Lind & Skärvad (2004)

4. Hypothesis

In the following chapter the hypothesis of the study is motivated and presented.

In a quantitative study, such as this one, a hypothesis formulation is an appropriate way to work with the material gained through the statistical results. With the use of a null hypothesis (H0) and a hypothesis that rejects the null hypothesis (H1) we can determine if the null hypothesis holds or not.⁶⁴ If the statistical material shows a confidence level of 5% we can accept the null hypothesis (H0) and so reject H1. If we cannot get a 5% confidence level we cannot reject the hypothesis stated.⁶⁵ With the use of the earlier studies and theory surrounding the field we will formulate our hypothesis below.

As the study is based on the thought that the boards of directors can affect the firm performance this hypothesis will not be tested here. This has been tested and shown to be the case by other studies as stated earlier. The hypothesis is based upon the resource dependence theory and agency theory, namely that a more diversified board will give more resources and better monitoring and thus better firm performance. Robinson and Dechant also states that a more diversified board could better understand the marketplace and thus give better firm performance. The hypothesis will use the Folksam diversity index replicated for the years 2005, 2007 and 2009 to see if a more diversified firm will yield a better firm performance. The hypothesis will be formulated in the following way.

H0: A more diversified board of directors will yield a higher financial performance.

And so H1 will be the opposite.

H1: A more diversified board of directors will *not* yield a higher financial performance.

⁶⁴ Körner & Wahlgren (2006)

⁶⁵ Jacobsen (2009)

5. Empirical approach

The chapter will explain the process of creating the index; the problems encountered and bring forward what could affect the performance variables.

5.1 The work process

The companies listed on Large Cap all provide good and useful information for this study. However, some data were missing which forced the authors to make decisions how to handle the data. Information needed to construct the diversity index was missing for Hufvudstaden AB, Husqvarna AB and Melker Schörling AB for the year 2005. We chose to exclude these companies from the statistical test this year. The alternative would have been to give them an average index score or use the same index score as for 2007 but that would harm the study.

Two companies did not provide information about the education of their directors; these companies were ABB Ltd. and AstraZeneca Plc. This information was gathered by reading about the directors in other companies' financial reports and by using the Bloomberg Businessweek's executive profiles database.

In performing the statistical test the companies were divided into two groups. One group representing the companies with the best measure of the specific variable or index score, the other group included those companies with the worst variable or index score. To answer the hypothesis, statistical methods were used to see if the companies in the group with the best score also had the best financial performance measures.

For each variable a separate breakdown into two groups were made. This was done to test if any variable is more important for the financial performance of the firms than the other variables. As an example, when testing the index 2005 against the financial performance the companies were divided into one group of companies with an index lower than 0,5. Group 1 and group 2 consisted of companies with an index of 0,5 or more. Group 1 should then represent the companies with the lowest level of diversity while group 2 represented the highest level of

diversity firms. If the hypothesis holds, group 2 should perform better financial results. Table 2 shows how the companies were separated into two groups for each variable each separate year. For each variable the intention was to keep the groups at approximately the same size, this is why not all groups are divided at the level 0,5

Table 2. Groups for statistical test

	Group 1 Low diversity	Group 2 High diversity	Group 1 Sample size	Group 2 Sample size
2005				
Index	0-0,47	0,48-1	25	25-26*
Gender	0-0,14	0,17-1	30	21
Education	0-0,33	0,5-1	18	33
Age	0-0,14	0,17-1	30	21
Tenure	0-0,5	0,6-1	22	29
2007				
Index	0-0,46	0,47-1	27	27
Gender	0-0,25	0,29-1	26	28
Education	0-0,49	0,5-1	21	33
Age	0-0,6	0,67-1	29	25
Tenure	0-0,5	0,57	28	26
2009				
Index	0-0,47	0,48-1	26	28
Gender	0-0,29	0,33-1	29	25
Education	0-0,33	0,5-1	17	37
Age	0-0,60	0,67-1	26	28
Tenure	0-0,43	0,5-1	24	30

*Differs because of missing performance measures for one company.

The variable that have been hardest to break down into two groups is the education variable. This is because the majority of the companies have three education orientations represented in the board and it is a quite large step between the different companies. Due to the construction of the index there are only seven levels for which the education variable can be divided into, 0; 0,17; 0,33; 0,5; 0,67; 0,83 or 1.

When making an analysis of the effect of board diversity on the companies' financial performance one must determine when the effect of the board work is seen in the financial

results. The effect on the financial performance of the company is due to the performance role of the board, explained above. This performance role is future oriented and the results of a good work are not seen immediately. Rather than affecting the results the current year it is likely that some decisions have impact after two years while some long-term strategic decisions affect the financial results in even more years. To capture this issue the study have been conducted so that the diversity measures of a specific year is analyses against the performance measures of the same year but also the following years. Taking the diversity variable age for the year of 2007, it have been analyzed i relation to ROA 2007, 2008, 2009 and 2010 as well as MTBV 2007, 2008, 2009 and 2010. In that way the intention is to capture the importance of a well composed board on a few years sight.

5.2 Variables affecting the financial performance

What must be noticed is that the financial performance of companies is affected by so many other things than the performance of the board and the level of the diversity in the board.

To begin with we have disturbance on the macro level to take into account. A sudden earthquake with a following tsunami as the one that could be seen in Japan during 2011 can cause major volatility in a company's financial performance. Such a drop or raise would not be caused by the board of directors and are not in their control, thus such financial volatility would cause the statistical study to show skewed results. Other things on the macro level that causes problems are, for example, volatile exchange rates and volatile international trade to name a few. There are a plethora of other variables, some that can be measured other that cannot.

To continue our exploration of variables that affects the financial performance we can look at the micro level. A sudden drop or raise in the demand of wood for a company like Stora Enso AB could cause volatility in their financial performance, a volatility not accounted for by the boards of directors. Sudden volatility in the supplies could also cause financial volatility that is not accounted for by the boards of directors. Although the boards of directors can work with strategies to keep the volatility of the supply down it is very hard to know if it is actually the

strategy that the company uses, or other variables, that causes the company to get a better financial performance.

Even inside the company there are variables that are outside the control of the board of directors, such as mistakes done by employees. A variable such as mistakes are notoriously hard to quantify but can cause significant volatility in the financial performance. As can be seen there are variables in the macro level and all the way down to the individual firm and employee level that can cause volatility in the financial performance. It is thus very hard to say if the variables that have been used in this study are actually the variables that are causing significant changes in the financial performance. The variables used here should therefore be seen as a part in a larger picture.

6. Results

The chapter begins with a review of the results of the statistical test of diversity in relation to ROA and MTBV. Then follows a review of each individual variable compared to the performance measures.

6.1 Diversity effect on companies' financial performance

To show the relationship between the level of diversity in the board of directors and companies' financial performance this study applies the statistical tests Mann-Whitney U test and Kolmogorov-Smirnov. The constructed diversity index as well as the underlying variables for the three years 2005, 2007 and 2009 has been put in relation to ROA and MTBV for the years 2005-2010. The results showed to be inconclusive and only in a few cases showed to be of any statistical significance. Below the different tests will be commented. The statistical results for the diversity index are shown in table 3 while the results for the underlying variables each separate year as well as the complete test of the index are found in appendix F-J.

6.1.1 Index

The relationship between the index as a measure of diversity and the financial performance was the first thing to study. The results from the Mann-Whitney U test are inconclusive. Index for each year in relation to ROA the years that follow does not result in any significant differences. Contrary to the hypothesis however, it looks as high diversity boards show a slightly lower mean rank the following years but it is not on the significance level and could therefore be random. Looking at the final sample from 2009 the pattern looks similar and it is hard to show any relationship. Hence, the statistical results provided by the Mann-Whitney U test do not support the hypothesis and could be random. The test results from Kolmogorov-Smirnov show a significance above the 5% level at all of the measured points and years meaning that the two samples, low and high diversity, does not differ in distribution when it comes to financial performance.

To identify if diversity in the board of directors leads to a higher firm value the relationship between the index and firms' market-to-book value is presented below. Only one significant result could be shown in the results of 2005; that is, a low diversity 2005 is connected to high MTBV 2009 with significance at the 5% level. It is not possible to show any other relationship for the statistical tests of the diversity during 2007. Looking at the tests for 2009 the results did not show any significance for the Mann-Whitney U test. The Kolmogorov-Smirnov test for 2005 shows that the significance is above the 5% level for all years following, thus the two samples does not differ in distribution. The same results are shown for 2007 and 2009, meaning that the samples do not differ in distribution.

The table below shows the statistical results for the testing of the diversity index compared to ROA and MTBV. The only significant result is commented as negative, meaning that it is a low level of diversity that has a significant relationship to the performance measure. In appendix F the complete statistical test of the index can be found.

Table 3. Significance level for the testing of the diversity index

Diversity variable	Year	Tested against	Mann-Whitney Significance	Positive or negative relationship	Kolmogorov-Smirnov Significance
Index	2005	MTBV 2005	0,327		0,155
Index	2005	MTBV 2006	0,239		0,541
Index	2005	MTBV 2007	0,346		0,559
Index	2005	MTBV 2008	0,160		0,126
Index	2005	MTBV 2009	0,038	Negative	0,058
Index	2005	MTBV 2010	0,101		0,117
Index	2005	ROA 2005	0,869		0,906
Index	2005	ROA 2006	0,854		0,155
Index	2005	ROA 2007	0,158		0,206
Index	2005	ROA 2008	0,187		0,123
Index	2005	ROA 2009	0,407		0,623
Index	2005	ROA 2010	0,221		0,111
Index	2007	MTBV 2007	0,860		0,744
Index	2007	MTBV 2008	0,197		0,324
Index	2007	MTBV 2009	0,822		0,744
Index	2007	MTBV 2010	0,505		0,324
Index	2007	ROA 2007	0,586		0,518
Index	2007	ROA 2008	0,517		0,518
Index	2007	ROA 2009	0,320		0,518
Index	2007	ROA 2010	0,355		0,518
Index	2009	MTBV 2009	0,373		0,549
Index	2009	MTBV 2010	0,166		0,424
Index	2009	ROA 2009	0,604		0,667
Index	2009	ROA 2010	0,083		0,097

6.1.2 Age

The first underlying variable looked at was the age variable. The Mann-Whitney U test showed no significance in the relationship between age and MTBV except for age 2009 in relation to MTBV 2010. The Kolmogorov-Smirnov test shows that the significance levels are low, only with the 2009 data a significance level at 5% can be measured when looking at MTBV. When looking at the ROA variable the results are, more or less, the same. That is, the significance level is not at the 5% level any of the measured years, with the exception of MTBV 2009. The complete test results are found in appendix G.

6.1.3 Education

The education variable showed the same symptom as the other variables, namely that the results are a bit different from year to year and, most of the years, cannot reach the desired significant level. Only during one year, when the data for education 2005 was compared to MTBV 2007, the Mann-Whitney U test showed a significance level at the 5% level. The Kolmogorov-Smirnov test showed no significance at the 5% level for any years. The significance level measured by the Kolmogorov-Smirnov test showed no significance any of the years for the ROA variable. Significance at the 5% level could only be found in one case, see appendix H.

6.1.4 Gender

Studying the results from the Mann-Whitney test it does not support the null hypothesis. The Mann-Whitney test can only show one significant relationship between gender and ROA, that is for the data from 2005, as seen in appendix I. Mann-Whitney show no significant relationship between gender and MTBV any of the years. The Kolmogorov-Smirnov test indicates the same thing as the Mann-Whitney U test, namely that no significant relationship between gender and ROA could be found. For the test statistics of 2007 two significant relationships appear as seen in appendix I. Further, one significant relationship between gender and ROA is found when looking at the results from 2005. Testing the relationship between gender and MTBV cannot show significance any of the years. This holds for both the Mann-Whitney U test and Kolmogorov-Smirnov.

6.1.5 Tenure

Regarding tenure the measurement point 2007 shows that low diversity could be better for the financial performance. The relationship between low diversity 2007 and high ROA the same year is at a significant level. 2009 seems to be a turnaround for the importance of diversity regarding tenure, a high ROA 2010 is significantly related to high diversity regarding tenure the year before, at the 5% level. The Kolmogorov-Smirnov test is not able to show any results at the 5% level, for ROA, any of the tested years. For detailed statistical data regarding the tenure variable see appendix J.

Testing for MTBV and tenure 2005 with the Mann-Whitney U test shows mixed results, at some points low diversity is better than high diversity. When tenure is measured against MTVB, it reaches a significant level three out of six years following the sample of 2005. Low diversity firms also have a higher MTBV when looking at the 2007 year sample but these points are not at a significant level and are thus seen as random. Kolmogorov-Smirnov provides us with test results that show no significance except for one measured point, which is the relationship between tenure 2005 and MTBV 2009.

Putting all these data together show that the results are inconclusive and some years provide significance levels that indicate that more diversified boards are beneficial for the financial results of the company while other years indicate the opposite.

7. Analysis

Below is the analysis of the study in which empirical data are interwoven with the theory in a narrative form. First an analytical review of the statistical test is presented, followed by an increased focus on academic theories and a deeper analysis of the diversity index and its meaning.

7.1 Introduction

The statistical test of this study show some interesting results regarding diversity in corporate boards and firms' financial performance. The statistical test, covering 6 years of financial performance measures and 54 companies, could not show any major significance in the results. The few results that had significance showed both positive and negative relation between diversity and financial performance and thus it is hard to draw any statistical conclusions.

Previous studies have shown a positive relationship between both diversity and firm value as well as between diversity and financial performance. However, other studies have not been able to show any relationship at all between board diversity and financial performance. The topic is thus divided into different groups where some can show significant relationship and others cannot. One major reason why researchers come to different results is that a common ground for the definition of diversity is missing. Depending on what variables to include and which performance measures to study the results will vary between different studies. This study can give further insight in how complex this topic is and how hard it actually is to create a working index of diversity but also connecting this index to performance measures.

7.2 The statistical tests

The statistical tests provide inconclusive numbers when testing the diversity index against ROA and MTBV. As the main focus of this study is the effects of diversity in terms of the constructed index, this is the first thing to analyze. Previous studies and academic theories indicate that there should be an advantage with having a diversified board of directors. However, the statistics did

not provide any significant result that supported this view. Instead, one measurement point indicated that the low diversity firms had higher MTBV value than the high diversity firms. To start with it could be good to note that all corporations face pressure from their shareholders to perform good results. As stated by Tricker the board of directors has both a conformance role and a performance role, of which the latter should be in focus. Whether it is a homogeneous or heterogeneous board of directors they have the task to manage the company's affairs in the interest of the shareholders, as declared by the Swedish corporate governance code. The results from this study cannot support the hypothesis that a more diversified board is better in performing its task. However, it does provide important inputs regarding the lack of a proper way to measure diversity.

Zahra and Pearce declared that the length, quality and frequency of board meetings ultimately affect the company performance. Some authors argue that directors with different backgrounds or experiences provide the board with higher creativity, innovation and quality decision making. Due to the insignificance in the statistical test this study cannot confirm nor reject that this is the case.

Another factor influencing the performance of the board is how active the directors are in their work, as mentioned by Zahra and Pearce. One might argue that directors belonging to a minority group, for example belonging to the minority gender or with an educational background that no other director have, would be more active in the board meetings than the average directors. This would be since the minority director would have different inputs to share with the board and simply because these directors want to assert him or herself against other board members. On the other hand, this could be countered by the other directors fighting against this upcoming competitor within the board. Since the statistical results in the majority of cases show no significance the latter argument ought to be closer to reality.

This study cannot prove that more diversity in the board of directors increases the financial performance of firms and thus it provides no support for the argument that increased performance is an outcome of diversity in boards. It should be stressed though that the limitations in the study also makes it hard to argue against such a statement.

Testing the individual variables against the selected performance measures did not give any major differences to the results. Most of the testing ended up without significance at the 5% level. One testing stood out and that was the directors' tenure on the board. The sample from 2005 versus MTBV the following years provided a result that indicated a negative relationship between diversification regarding tenure and firms' MTBV, for several years under the 5% significance level. Next sample from 2007 and 2009 did not result in the same significant relationship. Still, what factors in a homogeneous board, regarding directors' tenure, might have positive impact on the MTBV of firms? One could argue that a firms' MTBV is ultimately affected by the expectations from the stock market and thus the important factors would be those that are clearly visible for the shareholders. The agency theory, as stated above, focus on putting pressure and controlling management to minimize the agency costs. If we argue that a homogeneous board in terms of tenure is a board where the majority of the directors have spent many years in the board room, they could be better in their monitoring function than a board with several directors with less experience. However, long time service on the board could build up a relationship between directors and the top management which could influence their independence. Tighter monitoring is not automatically better, as stated by Adams and Ferreira. Too much monitoring could harm the firm.

Previous studies have shown that female directors are more likely to be in monitoring functions of the board. However, the statistical test of the gender variable show few significant relationships between diversity regarding gender and either ROA or MTBV. Thus the statistical results cannot tell if directors belonging to the minority gender add anything to the performance of the board but it cannot tell the opposite either. The results can neither support nor reject the conclusion presented by Campbell and Vera who found a relationship between gender diversity and firm value. However, it supports the study made by Adams and Ferreira who could not find any statistical significance in the relationship between gender diversity and company performance measured as ROA and Tobin's Q. Thus, the research within the area is inconclusive.

The statistical test of the age variable did not provide the study with more than one significant result out of the twenty-four points measured. From a resource dependence perspective, diversity

regarding age can at a first glance not seem very important. A person's connections and network should grow as the person is getting older and hence an age diverse set of directors may provide fewer resources to external parties than a less diverse but with higher mean age board. Hence, the resource dependence theory ought to support these statistical tests.

Only one significant positive relationship between education and MTBV can be found. Education is a factor that indicates what kind of competence and interests the directors possesses. We argue that education tells something about what knowledge the directors bring to the board work. The more represented educational orientations brought to the board, the more suited the board is to adapting to changes in the external environment. One possible reason that the results show only one significant relationship is that the majority of the boards had two or three different educational orientations resulting in an index of 0,33 or 0,50. The construction of the index made it hard to capture small differences in education and it is hard to separate the companies from each other. This proves to be a limitation in the diversity index. A more sensitive construction of the index and its variables would be beneficial for the results and better capture the differences in educational orientations and knowledge within the boards. Reconstructing the education variable could improve the accuracy of the index and maybe come to a result that supports the conclusion provided by Erhart, Werbel and Schrader that greater diversity increases company performance measured as return on investment and ROA.

It has become clear during the analysis of the study that the Folksam diversity index might be biased or at least not an obvious measure of the diversity in the corporate boards. The variables age and tenure are constructed with the median of the total number of directors as a base, throughout the work of this study this way of quantifying diversity have showed limitations. The median age of the directors 2009 is 58 years old. A board with three members younger than 58 and three members older than 58 years would generate a score of 1. This would be the case both if the members have scattered ages of 30, 40, 50, 60, 70 and 80 years old and if the members ages are very concentrated around 58 years, say three members that are 56 years old and tree members that are 60 years old. Hence, the construction of the scoring variables makes it hard to capture the real level of diversity in the board of directors both for the age and tenure variables and one could ask if this is a good measure of diversity.

These identified weaknesses in the underlying variables are likely reasons why this study has not come to the same conclusion as many other studies. For example Erhart, Werbel and Schrader concluded that increased diversity in boards increases company performance and Campbell and Vera concluded that the appointment of female directors to the board is positively related with firm value.

The arguments put forward by Robinson and Dechant does not seem to have a major influence on the firms' financial performance. Both the cost saving and the competition for talent argument as well as the argument that diversity is a tool to drive business growth are fully reasonable arguments. The latter argument is also very similar to the arguments stressed by Lundberg Markow, perhaps because business growth is considered to be important and a viable argument for managing diversity. Due to the low significance levels in the testing any of these reasons cannot be supported. Cox and Blake provided similar arguments as presented above and the terminology is even here similar to the one provided by Lundberg Markow. Their arguments, as well as the argumentation by Lundberg Markow, are very reasonable and possess logic thinking. However, none of their arguments finds support in this study as no statistical significance can be reached.

7.3 What can theories explain?

Regarding the resource dependence theory, earlier studies can show that alterations in the board, for example increasing the size and in that way get more resources into the board, is related to better financial performance.

This study gives some indications that a more diversified board should be able to perform better financially than a less diversified board but the findings are inconclusive and the significant results are few in numbers. The results can thus be seen as random and cannot confirm or reject the hypothesis stated. Further the study cannot disclose what kind of connections different directors have to the outside and so cannot verify or reject if the explanation made by the

resource dependence theory to the impact on financial performance is true or false. This is something that could be tested in future studies.

Although the statistical results cannot verify or reject the resource dependence theory, the theory could give one explanation to why some measure points are at a significant level. The theory states that a more diversified board should have more resources connected to the company. The more resources connected, the better the financial performance. Weaknesses in the index could be a reason to why the significant points are few. A larger sample with an improved diversity measure could lead to a more clear relationship between resource dependence theory and the statistical findings.

The agency theory states that independent board of directors is a critical factor for the board function. The more independent directors you have, the better the monitoring will be. Earlier studies (e.g. Carter et al. 2003) indicate that people with different backgrounds than traditional directors ask different questions due to their experiences and values and should thus increase the monitoring. Our study cannot show that better diversification should give better financial performance and thus not provide support to the view that that a diversified board increases the monitoring.

Further, Adams and Ferreira states that more women in the board should lead to more monitoring as women often sit in the monitoring committees and thus decrease the agency costs. Decreased agency costs should lead to overall lower costs in the company and thus boost the financial performance. The measure points that provide a significant relationship between gender and ROA could be due to decreased agency costs. However, many measure points do not provide significant results and thus the study can indicate that this field needs more research. Thus, the results in this study can neither confirm nor reject the conclusion made by Bathala and Rao that board composition is related to agency costs.

By looking at the board of directors as teams we can get even more pointers to why the results are showing what it does. Belbin states that a spread of personal attributes is a key to successful teams. With a diversified board it should be easier to get different personal attributes into the

team. If the team manages to work together in a good way, as Lind and Skärvad argues is a need to get a well performing team, the diversified team should be able to perform better than a non-diversified team. Diversity might very well be an important factor for the financial performance of companies but if the diversified board of directors do not manage to work as a team the results may be counteractive. This could explain why our statistics, most often, is pointing in different direction regarding the significance level.

To conclude the topic this study confirms the complexity within the field as showed by the various results in previous studies. Some studies manage to show a relationship between different diversity measures and firms' performance while others do not manage to show this relationship. Reasons that some studies show a relationship between diversity and performance is that the more different kinds of knowledge, attributes and experiences you get into your board the better it should perform. This is if you get it all to work together and manage to extract the synergies. Why studies sometimes show that it is worse to have a more diversified board could be due to this, that the team cannot extract all synergies.

7.4 What is giving birth to what?

Many theories and studies, such as the resource dependence theory and agency theory states that the boards work could influence the financial performance. What is very hard to determine is if the better financial performance is due to better board work or the other way around.

Diversity proponents such as Lundberg Markow argue that increased diversity in top layers of corporate hierarchies is related to financial success. They say that with increased diversity the results will follow. The results in this study do not show a significant relationship between diversity in corporate boards and financial performance so one might ask if the diversity proponents may be wrong. It is not possible to say that they are wrong with this amount of information. Further, the level of board diversity might be so low that it does not provide any effect on the financial performance. For example, with only one female director the level of board diversity is higher than a board with only men. It could be that the board might need 50% women to achieve a substantial effect since the women might be marginalized. The problem is to

determine what amount of diversity that is considered as a good level of diversity. This creates a validity problem in the study. Future case studies would be a way to provide information about what variables that are important for the level of diversity and how much diversity that is needed. This could improve the validity in future studies.

This study does not explain whether diversity leads to increased financial performance or if it is the contrary. We argue though, that a company and a board that is delivering great results will be more comfortable in their roles and more willing to bring in more minority directors such as females, young individuals or persons with different educational background. A company that performs bad results might be more reluctant to bring in untested individuals that they do not know very well. Hence, if a firm is delivering bad results the risk may be that they elect directors that are familiar to the existing management and board and that may be persons with similar education, background and age.

The belief that people are afraid to try new thing during bad times make the authors believe that it is more common that diversified board is due to good performance and not the other way around.

7.5 What about the time horizon?

When looking over time the results from our study is hard to interpret. Since there are few significant results in the statistical test it is also hard to see any changes in the financial performance over time, neither positive nor negative. Further, it is not possible to identify any pattern in what time horizon the performance measures are better than average. Taking this perspective into account, the statistical results look even more random.

The reasons for the problem in finding clear conclusions in this matter could be that the index used is insensitive to change. Extensive changes in the composition of the board are needed for any significant change in the index to occur and thus the changes can be hard to measure with this index. Further, since the study have had a hard time to show any significance at all it has also been hard to show any changes over time.

7.6 Is the Folksam index a good measure?

Lundberg Markow emphasizes the importance of diversity in top layers of corporations, she does this with support from arguments such as, more diverse groups provide different perspectives, experiences and angles and thus creating a more open attitude. These are arguments that frequently occur in the academic literature and are, according to us, reasonable and hard to argue against. However, with the desire to highlight the importance of diversity in the top layers of corporations, Folksam and Lundberg Markow construct a diversity index that is supposed to rank Swedish corporations after the level of diversity. Folksam does this with a base in the fundamental arguments presented above.

As concluded above, the index simplifies the meaning of age and tenure by using the median level as a base for the score. It has shown during the analysis that this makes it hard to actually grasp the level of diversity regarding age and tenure more than concluding how many directors that are above or below the median value. Further, the education variable is not enough to grasp the competences that the directors possess and the index misses several important diversity and competence factors such as earlier experiences. We argue that a score for previous work experience would increase the accuracy of the index. This would include in which areas, industries or positions the director has had before. However, it is easy to understand why this is excluded since it is hard to construct a replicable method to score work experience.

Earlier studies have shown that an ethical mixture in a group can improve the performance of the group and so a good idea would be to somehow measure this in a diversity index. It could be hard to determine what ethical background a director has without making individual interviews. Thus, as in many other cases, it could be hard and cumbersome to get good data on a large amount of companies.

It should here also be stated that the Folksam report could be biased which should be taken into consideration when looking at the index. As a major institutional investor Folksam could have a hidden agenda, trying to show that a more diversified board is better as that could be better in

line with their viewpoint. When using the Folksam index one should therefore be careful when drawing conclusions from the index.

These limitations in the index may have affected the statistical results negatively, making it harder to grasp the actual diversity level in the board of directors. Further, to capture diversity differences over time is hard due to the limited sensitivity in the construction of the scoring system of the variables which also adds to the limitations of the index.

8. Conclusion

The purpose with this thesis is to study whether diversity in board of directors in Swedish Large Cap firms' will create better financial performance in companies. In the following chapter the conclusions that have been drawn is presented, followed by suggestions for further research and recommendations regarding the Folksam report.

This study has been trying to answer the complex question if diversity creates better financial performance in a company. To be able to answer this question a replica study of the Folksam competence report has been made. On top of this, the replicated Folksam index has been compared to financial performance measures to see if better diversity creates better performance. This has shown to be very hard to fully grasp. The initial question in this study was as follows:

“Does diversity regarding gender, age, education and tenure in board of directors in Swedish Large Cap companies create better financial performance in terms of market-to-book value and return on assets?”

The statistical test that has been conducted to try to answer this question has not been able to give any results at a significant level. The study has therefore not been able to give any statistically proved results to the questions if diversity gives better financial performance.

The study has shown the complexity of the field, the problems in creating a good index and weaknesses in the Folksam diversity index. In collecting the data for the statistical test we have been able to get a diversity score that is similar to the one presented by Folksam, as seen in appendix D. However there are always judgments involved when quantifying data, such as education, which reduce the reliability of the study. Below the different aspects this study can answer will be highlighted.

To carry through the study a null hypothesis was formulated as follows: “A more diversified board of directors will yield a higher financial performance”. The statistical test did not end up in any statistical significant results. The few significant results that could be found provided no

pattern regarding distribution in time or in different variables. Instead the conclusion is that the few significant results identified in the Mann-Whitney and Kolmogorov-Smirnov tests are random in their distribution and frequency. The insignificance in the statistical test does not make it possible to reject the hypothesis. Thus, it is not proven to be false and it could be true. The risk of making a type I error, that is rejecting a true hypothesis, means that we cannot reject the null hypothesis. By not rejecting the hypothesis the study is left with the risk of making a type II error, meaning that the statistical tests fails to reject a null hypothesis that is false. To reduce the risk of making a type I and a type II error, further research investigating the relationship between a broad diversity measure and financial performance is needed. This research should consist of a larger sample and a longer time horizon. The field would also benefit from case studies, providing a more accurate diversity measure.

Due to the limited amount of statistically significant results in this study it has not been possible to draw any empirical conclusions regarding the causality of diversity in board of directors. It is argued in the analysis that financially successful firms would be more comfortable and more willing to let in minority directors in the board of directors. However, this view does not find any support in the statistical tests. Further statistical test should be made to see if financially successful firms have a higher level of diversity in their board of directors.

The theoretical field of corporate governance and more specific the field of diversity within corporate governance has shown to be very complex. Not only because the theories are often only focused on one specific part of the whole corporate governance painting but the painting also lack parts that needs to be seen to get the whole picture. This study has *not* been able to paint the parts that are missing with great precision but it has been able to show that the painting is not very detailed and needs a lot of work before it can be exhibited and consumed.

The major part that is adding to the complexity in this painting is the information needed to actually create the possibility to paint the picture. The field has been working with only one color for a long time, namely the diversity expressed as the proportion of women relative to men. In later stages other, single, measures of diversity has been tested and in some rare cases the painters has even began to mix the different colors to get a richer color scheme to work with.

This study has made a try to mix even more colors into the blend to get a richer palette to work with. Although it has failed to get any statistical results with significance out of the mixture, the study can help further researchers to get a glance of how the field can be taken to the next level.

Further, this study has not been able to answer if the board composition affects the companies' performance at all. Earlier studies, such as Zahra and Pearce, can show that there is a connection between good and effective work in the board room and firm performance. What cannot be shown are what factors that actually create good and effective work in the board room. Here is a problem with the picture again, the field has the canvas but the picture is blurry and needs sharpness. This study has given the field a richer palette to work with although it cannot give any definite conclusion to the question it tries to answer.

The many aspects of diversity that are declared in the academic literature provide a wide concept that is hard to get into an index. As discussed throughout this thesis the diversity index provided by Folksam is a good attempt to put the aspects of diversity into numbers but clearly it has its limitations. These limitations reduce the validity in this study as well as the study made by Folksam. What is especially hard to achieve is the mix of different variables that are to be transformed into a numeric value that can be ranked. A majority of the previous research focuses on the distribution of men and women, this is understandable since it is easy to replicate and quantify. Other factors are harder to quantify in a replicable way in an objective manner. This affects the statistical results as the companies are hard to separate from each other.

A better index construction would be more sensitive and capture more variables of diversity such as ethnicity and work experience. Further, by calculating diversity score with the median value as base the scoring might become biased and skewed as has been discussed earlier. The conclusion is that the scoring of individual variables must be more accurate.

8.1 General sightings within the field

During the study the authors has been able to find some interesting sightings, these will be presented below.

The first is connected to the general society. During the early gathering of information to the background a clear pressure from the society to increase the diversity in corporate boards could be found. The majority of the findings were pointing on the fact that there, to a large extent, only exist men in the fifties in the boards. Some countries, for example Norway, took legislation as a measure to increase the number of women in the board of directors. In this study the authors want to take the focus away from the women/men quota discussion and try to expand the definition of diversity to incorporate more variables. This study indicate that there are more to diversity than just men/women, thus the society should not be blinded by this discussion but instead develop it.

What has also been noted is the fact that when women enters the board room it is often in addition to the men or women that already is in the board. That is, the board is extended to add women and thus the men/women ratio does not increase as much as it could have done. This is not a problem in itself but it gives an explanation to why we do not see any major changes in the relative board composition when it comes to men and women.

8.2 Suggestions for further research

This study has clearly shown that there is a lot to be done within the field of diversity and board of directors, it has stretched the limits in the field but has not been able to confirm its hypothesis.

To identify which variables that is important for the level of diversity the authors suggest future case studies on the conditions in the board of directors. Further, the authors hope is that a larger study can be done, that would give a better chance to confirm or reject the hypothesis of this study. Larger studies could also group companies into different industries and in that way identify any differences between different industries. Other groupings that could be of interest are for example large/small companies. This would give an answer to the questions if large companies are more restrictive to change in the board rooms than small agile companies.

A study covering more performance measures would also be a suggestion for future studies in the field. Return on assets and market-to-book value cannot show the full performance of the firm and both measures are also subject to earnings management. This is a problem when comparing a large amount of firms as the ones working with earnings management will have a higher ROA and MTBV than the ones that are not. Thus, with more performance measures a study would get better accuracy and be less fragile to things like earnings management.

As stated above this study has not been able to conclude if financial performance leads to a higher level of diversity in the board of directors or if the relationship is contrary. Further research could consist of statistical studies investigating if financially successful firms have a more diversified board of directors.

8.3 Recommendations

Throughout the work with this thesis the authors have observed weaknesses in the Folksam report and the diversity index it provides. By the following recommendations the authors hope that those concerned can benefit from this study and improve the index in the future.

The Folksam report shows that there is more to diversity than just gender but even though it has four different variables there is even more hidden in the term diversity. The most obvious things the authors has found missing are variables measuring the cultural differences in the board room, ethnicity and work experience. An index with these variables added would give a sharper picture of the word diversity and could better explain why a well-diversified board performs as it does. The problems in creating such a large index is of course many but with more time it is not impossible in any way.

Further, by using the median value when calculating the diversity score the index misses a deeper knowledge about the level of diversity, as explained above. The authors see a possibility to construct an index with the absolute differences in age to better capture the level of diversity.

To benefit fully from the Folksam report requires the reader to have a critical approach to the information provided. The reader must be aware of the limitations in the construction of the index and that the results could be biased. Further one must recognize a political agenda from the author and Folksam that is a large institutional owner with origin of the cooperative federation.

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10. Appendix

10.1 Appendix A - The diversity index 2005

Company	Age	Gender	Education	Tenure	Index
ABB	1,00	0,00	0,33	0,00	0,33
Alfa Laval	0,60	0,33	0,33	0,60	0,47
Alliance Oil	0,67	0,00	0,50	0,00	0,29
Assa Abloy	0,60	0,14	0,67	0,33	0,44
Astra Zeneca	0,71	0,40	0,83	1,00	0,74
Atlas Copco	0,50	0,29	0,50	0,80	0,52
Autoliv	0,10	0,00	0,33	0,83	0,32
Axfood	1,00	0,60	0,50	0,33	0,61
Boliden	0,60	0,33	0,67	0,60	0,55
Castellum	0,40	0,40	0,33	0,40	0,38
Electrolux	0,25	0,67	0,33	0,67	0,48
Elekta	0,75	0,17	0,50	0,40	0,45
Ericsson	0,80	0,13	0,50	0,50	0,48
Fabege	0,17	0,17	0,50	0,75	0,40
Getinge	0,00	0,40	0,50	0,75	0,41
Hakon Invest	1,00	0,14	0,50	0,60	0,56
Hennes & Mauritz	0,17	0,17	0,50	0,00	0,21
Hexagon	0,50	0,20	0,33	0,20	0,31
Holmen	0,80	0,13	0,67	0,50	0,52
Hufvudstaden	N/A	N/A	N/A	N/A	N/A
Husqvarna	N/A	N/A	N/A	N/A	N/A
Industrivärden	0,60	0,14	0,33	1,00	0,52
Investor	0,33	0,14	0,33	1,00	0,45
Kinnevik	1,00	0,20	0,50	1,00	0,68
Latour	1,00	0,33	0,33	0,60	0,57
Lundbergföretagen	0,60	0,14	0,33	0,33	0,35
Lundin Mining	0,80	0,00	0,50	0,80	0,53
Lundin Petroleum	0,80	0,13	0,50	0,13	0,39
Meda	0,00	0,00	0,67	0,00	0,17
Melker Schörling	N/A	N/A	N/A	N/A	N/A
Millicom	0,50	0,29	0,50	0,29	0,39
MTG	0,33	0,14	0,33	1,00	0,45
NCC	0,75	0,17	0,50	0,75	0,54

Appendix A - Continued

Company	Age	Gender	Education	Tenure	Index
Nordea Bank	0,38	0,57	0,50	0,83	0,57
Oriflame	0,60	0,33	0,50	0,60	0,51
Peab	1,00	0,20	0,50	0,50	0,55
Ratos	0,60	0,14	0,50	0,14	0,35
SAAB	0,80	0,13	0,50	0,80	0,56
Sandvik	0,60	0,14	0,50	0,60	0,46
SCA	0,75	0,17	0,33	0,75	0,50
Scania	0,50	0,13	0,33	0,50	0,36
SEB	1,00	0,43	0,50	0,43	0,59
Seco Tools	1,00	0,14	0,50	0,33	0,49
Securitas	0,80	0,29	0,50	0,50	0,52
Skanska	0,50	0,29	0,50	0,80	0,52
SKF	0,60	0,33	0,33	0,60	0,47
SSAB	0,33	0,14	0,33	0,60	0,35
Stora Enso	0,43	0,11	0,50	1,00	0,51
Sv. Handelsbanken	0,33	0,33	0,50	0,71	0,47
Swedbank	0,29	0,80	0,50	0,80	0,60
Tele2	0,75	0,17	0,33	0,75	0,50
Telia Sonera	0,60	0,33	0,33	0,33	0,40
Tieto Oyj	0,75	0,17	0,33	0,75	0,50
Volvo	0,14	0,33	0,50	0,14	0,28

10.2 Appendix B - The diversity index 2007

Company	Age	Gender	Education	Tenure	Index
ABB	0,60	0,00	0,33	0,14	0,27
Alfa Laval	0,60	0,33	0,33	0,60	0,47
Alliance Oil	0,50	0,00	0,50	0,00	0,25
Assa Abloy	1,00	0,14	0,67	0,60	0,60
Astra Zeneca	1,00	0,33	0,83	0,83	0,75
Atlas Copco	0,75	0,29	0,33	0,17	0,38
Autoliv	0,20	0,00	0,33	0,71	0,31
Axfood	0,00	0,75	0,50	0,00	0,31
Boliden	1,00	0,33	0,50	0,60	0,61
Castellum	0,75	0,40	0,33	0,75	0,56
Electrolux	0,50	0,50	0,50	0,50	0,50
Elekta	0,75	0,17	0,50	0,17	0,40
Ericsson	1,00	0,25	0,50	1,00	0,69
Fabege	1,00	0,33	0,33	1,00	0,67
Getinge	0,17	0,40	0,50	0,75	0,45
Hakon Invest	0,75	0,17	0,50	0,40	0,45
Hennes & Mauritz	0,60	0,33	0,67	0,33	0,48
Hexagon	0,67	0,00	0,33	0,67	0,42
Holmen	0,80	0,13	0,67	0,80	0,60
Hufvudstaden	0,50	0,29	0,67	0,50	0,49
Husqvarna	0,80	0,29	0,33	0,13	0,39
Industrivärden	0,60	0,14	0,50	0,33	0,39
Investor	0,67	0,43	0,33	1,00	0,61
Kinnevik	0,50	0,20	0,33	0,50	0,38
Latour	1,00	0,33	0,33	0,14	0,45
Lundbergföretagen	0,60	0,14	0,33	0,33	0,35
Lundin Mining	0,50	0,00	0,50	0,80	0,45
Lundin Petroleum	0,67	0,17	0,50	0,00	0,33
Meda	0,00	0,20	0,50	0,50	0,30
Melker Schörling	0,75	0,17	0,50	0,40	0,45
Millicom	1,00	1,00	0,17	0,50	0,67
MTG	0,14	0,33	0,33	0,60	0,35
NCC	0,50	0,20	0,50	0,20	0,35
Nordea Bank	0,38	0,38	0,33	0,57	0,41
Oriflame	0,50	0,50	0,33	0,50	0,46
Peab	1,00	0,20	0,50	0,50	0,55

Appendix B - Continued

Company	Age	Gender	Education	Tenure	Index
Ratos	0,60	0,14	0,50	0,33	0,39
SAAB	0,80	0,13	0,50	0,80	0,56
Sandvik	0,60	0,33	0,50	0,33	0,44
SCA	0,75	0,17	0,33	0,40	0,41
Scania	0,80	0,13	0,33	0,29	0,39
SEB	1,00	0,43	0,50	0,43	0,59
Seco Tools	1,00	0,33	0,50	0,29	0,53
Securitas	1,00	0,43	0,50	0,67	0,65
Skanska	0,29	0,13	0,50	0,80	0,43
SKF	0,43	0,43	0,33	1,00	0,55
SSAB	0,60	0,14	0,33	1,00	0,52
Stora Enso	0,29	0,29	0,67	0,80	0,51
Sv. Handelsbanken	0,50	0,30	0,50	0,20	0,38
Swedbank	0,29	0,80	0,50	0,80	0,60
Tele2	0,50	0,50	0,50	1,00	0,63
Telia Sonera	0,75	0,40	0,50	0,40	0,51
Tieto Oyj	0,40	0,17	0,33	0,75	0,41
Volvo	0,29	0,13	0,67	0,80	0,47

10.3 Appendix C - The diversity index 2009

Company	Age	Gender	Education	Tenure	Index
ABB	0,33	0,00	0,33	0,14	0,20
Alfa Laval	1,00	0,33	0,33	1,00	0,67
Alliance Oil	0,75	0,00	0,50	0,75	0,50
Assa Abloy	0,80	0,29	0,67	0,50	0,56
Astra Zeneca	1,00	0,33	0,83	1,00	0,79
Atlas Copco	0,50	0,29	0,33	0,80	0,48
Autoliv	0,10	0,00	0,33	0,57	0,25
Axfood	0,17	0,75	0,50	0,40	0,45
Boliden	1,00	0,33	0,50	0,33	0,54
Castellum	0,60	0,33	0,50	1,00	0,61
Electrolux	0,80	0,50	0,50	0,80	0,65
Elekta	1,00	0,33	0,67	0,40	0,60
Ericsson	0,67	0,25	0,50	0,43	0,46
Fabege	0,75	0,17	0,33	0,40	0,41
Getinge	0,75	0,40	0,50	0,17	0,45
Hakon Invest	0,75	0,17	0,50	0,40	0,45
Hennes & Mauritz	0,80	0,50	0,67	0,50	0,62
Hexagon	0,67	0,25	0,33	0,67	0,48
Holmen	0,50	0,13	0,67	0,29	0,39
Hufvudstaden	0,80	0,29	0,67	0,50	0,56
Husqvarna	0,80	0,29	0,33	0,00	0,35
Industrivärden	0,60	0,14	0,50	0,33	0,39
Investor	0,67	0,43	0,33	1,00	0,61
Kinnevik	0,40	0,17	0,50	0,75	0,45
Latour	0,40	0,40	0,50	0,17	0,37
Lundbergföretagen	0,33	0,14	0,33	0,33	0,29
Lundin Mining	0,43	0,00	0,50	1,00	0,48
Lundin Petroleum	0,75	0,17	0,50	0,40	0,45
Meda	0,40	0,40	0,50	0,75	0,51
Melker Schörling	0,75	0,17	0,50	0,40	0,45
Millicom	0,75	0,40	0,17	0,75	0,52
MTG	0,33	0,33	0,33	1,00	0,50
NCC	0,50	0,50	0,50	0,20	0,43
Nordea Bank	1,00	0,43	0,50	0,43	0,59
Oriflame	0,50	0,50	0,33	0,50	0,46
Peab	0,75	0,17	0,50	0,33	0,44

Appendix C - Continued

Company	Age	Gender	Education	Tenure	Index
Ratos	1,00	0,33	0,67	0,33	0,58
SAAB	1,00	0,11	0,50	0,43	0,51
Sandvik	1,00	0,14	0,50	0,60	0,56
SCA	0,60	0,14	0,50	0,60	0,46
Scania	0,43	0,11	0,33	0,67	0,38
SEB	0,57	0,57	0,50	0,22	0,47
Seco Tools	1,00	0,14	0,50	0,29	0,48
Securitas	0,50	0,50	0,33	0,50	0,46
Skanska	0,60	0,00	0,50	0,33	0,36
SKF	0,80	0,50	0,33	0,80	0,61
SSAB	0,29	0,13	0,33	0,50	0,31
Stora Enso	0,50	0,29	0,67	0,50	0,49
Sv. Handelsbanken	0,50	0,33	0,50	0,33	0,42
Swedbank	0,60	1,00	0,50	0,60	0,68
Tele2	0,33	0,33	0,67	1,00	0,58
Telia Sonera	1,00	0,33	0,50	0,60	0,61
Tieto Oyj	0,75	0,17	0,33	0,75	0,50
Volvo	0,29	0,13	0,67	0,50	0,39

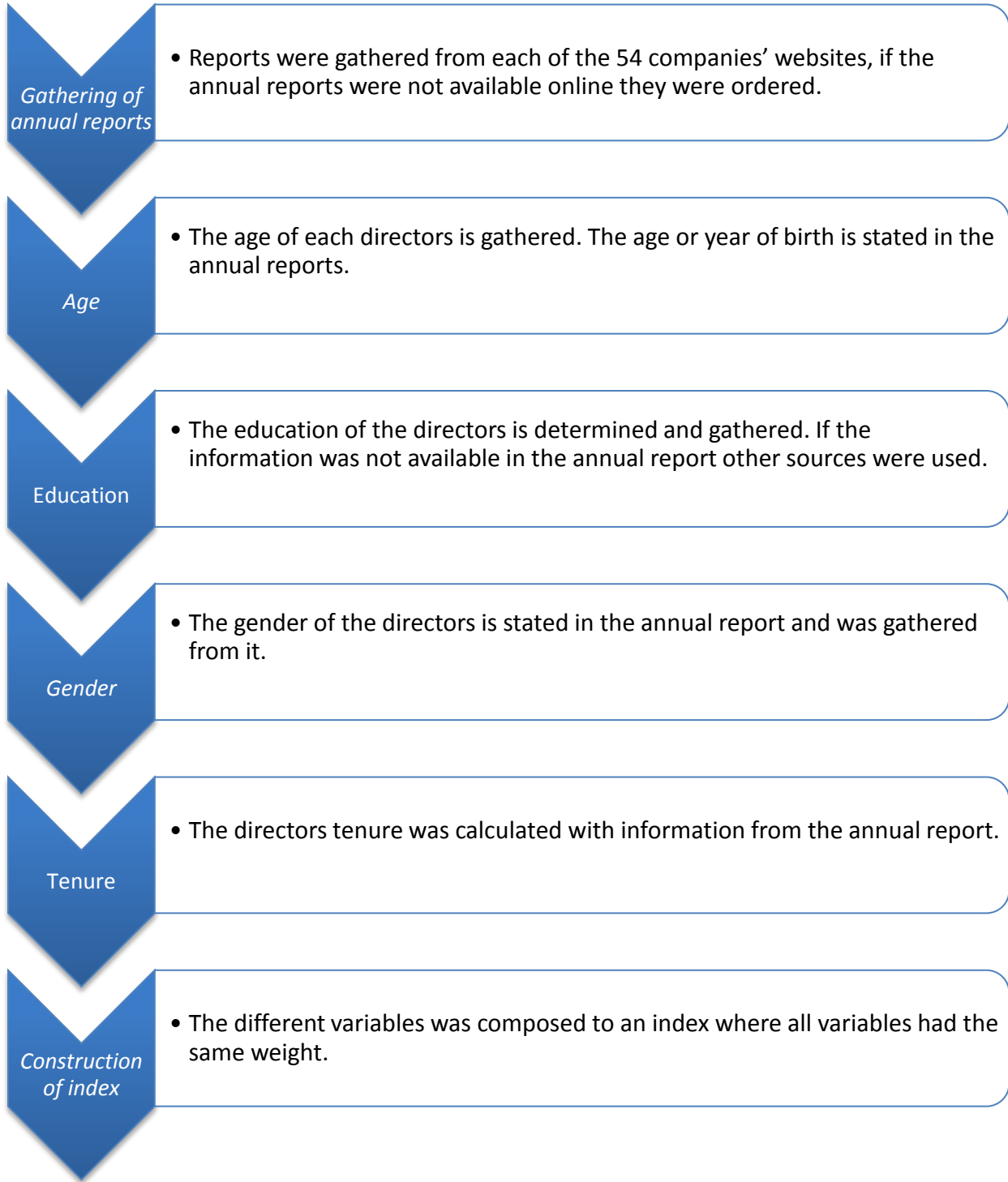
10.4 Appendix D - Reliability report

Company	Index 2009	Folksam index 2009	Difference
ABB	0,20	0,22	-0,02
Alfa Laval	0,67	0,73	-0,06
Alliance Oil	0,50	0,46	0,04
Assa Abloy	0,56	0,48	0,08
Astra Zeneca	0,79	0,67	0,12
Atlas Copco	0,48	0,46	0,02
Autoliv	0,25	0,32	-0,07
Axfood	0,45	0,45	0,00
Boliden	0,54	0,44	0,10
Castellum	0,61	0,56	0,05
Electrolux	0,65	0,67	-0,02
Elekta	0,60	0,55	0,05
Ericsson	0,46	0,60	-0,14
Fabege	0,41	0,46	-0,05
Getinge	0,45	0,54	-0,09
Hakon Invest	0,45	0,40	0,05
Hennes & Mauritz	0,62	0,68	-0,06
Hexagon	0,48	0,50	-0,02
Holmen	0,39	0,30	0,09
Hufvudstaden	0,56	0,52	0,04
Husqvarna	0,35	0,40	-0,05
Industrivärden	0,39	0,28	0,11
Investor	0,61	0,61	0,00
Kinnevik	0,45	0,45	0,00
Latour	0,37	0,47	-0,10
Lundbergföretagen	0,29	0,40	-0,11
Lundin Mining	0,48	0,39	0,09
Lundin Petroleum	0,45	0,45	0,00
Meda	0,51	0,51	0,00
Melker Schörling	0,45	0,43	0,02
Millicom	0,52	0,63	-0,11
MTG	0,50	0,50	0,00
NCC	0,43	0,43	-0,01
Nordea Bank	0,59	0,51	0,08
Oriflame	0,46	0,50	-0,04
Peab	0,44	0,45	-0,01

Appendix D - Continued

Company	Index 2009	Folksam index 2009	Difference
Ratos	0,58	0,61	-0,03
SAAB	0,51	0,47	0,04
Sandvik	0,56	0,56	0,00
SCA	0,46	0,46	0,00
Scania	0,38	0,28	0,10
SEB	0,47	0,42	0,05
Seco Tools	0,48	0,48	0,00
Securitas	0,46	0,49	-0,03
Skanska	0,36	0,36	0,00
SKF	0,61	0,53	0,08
SSAB	0,31	0,31	0,00
Stora Enso	0,49	0,43	0,06
Sv. Handelsbanken	0,42	0,42	0,00
Swedbank	0,68	0,71	-0,03
Tele2	0,58	0,48	0,10
Telia Sonera	0,61	0,51	0,10
Tieto Oyj	0,50	0,41	0,09
Volvo	0,39	0,54	-0,15

10.5 Appendix E - Gathering of data



10.6 Appendix F – Statistical tests of index

Index & MTBV 2005

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
MTBV_05	Low diversity	25	27,52	688,00
	High diversity	25	23,48	587,00
	Total	50		
MTBV_06	Low diversity	25	28,50	712,50
	High diversity	26	23,60	613,50
	Total	51		
MTBV_07	Low diversity	25	28,00	700,00
	High diversity	26	24,08	626,00
	Total	51		
MTBV_08	Low diversity	25	28,98	724,50
	High diversity	26	23,13	601,50
	Total	51		
MTBV_09	Low diversity	25	30,40	760,00
	High diversity	26	21,77	566,00
	Total	51		
MTBV_10	Low diversity	25	29,48	737,00
	High diversity	26	22,65	589,00
	Total	51		

Mann-Whitney U Test Statistics^a

	MTBV_05	MTBV_06	MTBV_07	MTBV_08	MTBV_09	MTBV_10
Mann-Whitney U	262,000	262,500	275,000	250,500	215,000	238,000
Wilcoxon W	587,000	613,500	626,000	601,500	566,000	589,000
Z	-,980	-1,178	-,942	-1,404	-2,073	-1,639
Asymp. Sig. (2-tailed)	,327	,239	,346	,160	,038	,101

Kolmogorov-Smirnov Test Statistics^a

		MTBV_05	MTBV_06	MTBV_07	MTBV_08	MTBV_09	MTBV_10
Most Extreme Differences	Absolute	,320	,225	,222	,329	,372	,334
	Positive	,080	,225	,222	,329	,372	,334
	Negative	-,320	-,038	-,077	-,083	-,114	-,038
Kolmogorov-Smirnov Z		1,131	,802	,791	1,175	1,329	1,192
Asymp. Sig. (2-tailed)		,155	,541	,559	,126	,058	,117

Index & ROA 2005

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
ROA_05	Low diversity	25	25,16	629,00
	High diversity	25	25,84	646,00
	Total	50		
ROA_06	Low diversity	25	25,88	647,00
	High diversity	25	25,12	628,00
	Total	50		
ROA_07	Low diversity	25	29,00	725,00
	High diversity	26	23,12	601,00
	Total	51		
ROA_08	Low diversity	25	28,80	720,00
	High diversity	26	23,31	606,00
	Total	51		
ROA_09	Low diversity	25	24,24	606,00
	High diversity	26	27,69	720,00
	Total	51		
ROA_10	Low diversity	25	28,60	715,00
	High diversity	26	23,50	611,00
	Total	51		

Mann-Whitney U Test Statistics^a

	ROA_05	ROA_06	ROA_07	ROA_08	ROA_09	ROA_10
Mann-Whitney U	304,000	303,000	250,000	255,000	281,000	260,000
Wilcoxon W	629,000	628,000	601,000	606,000	606,000	611,000
Z	-,165	-,184	-1,413	-1,319	-,829	-1,225
Asymp. Sig. (2-tailed)	,869	,854	,158	,187	,407	,221

Kolmogorov-Smirnov Test Statistics^a

		ROA_05	ROA_06	ROA_07	ROA_08	ROA_09	ROA_10
Most Extreme Differences	Absolute	,160	,320	,298	,331	,211	,337
	Positive	,160	,280	,298	,331	,052	,337
	Negative	-,120	-,320	-,109	-,035	-,211	-,106
Kolmogorov-Smirnov Z		,566	1,131	1,066	1,181	,752	1,203
Asymp. Sig. (2-tailed)		,906	,155	,206	,123	,623	,111

2007 Index & MTBV

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
MTBV07	Low diversity	27	27,85	752,00
	High diversity	27	27,15	733,00
	Total	54		
MTBV08	Low diversity	27	30,26	817,00
	High diversity	27	24,74	668,00
	Total	54		
MTBV09	Low diversity	27	27,98	755,50
	High diversity	27	27,02	729,50
	Total	54		
MTBV10	Low diversity	27	28,93	781,00
	High diversity	27	26,07	704,00
	Total	54		

Mann-Whitney U Test Statistics^a

	MTBV07	MTBV08	MTBV09	MTBV10
Mann-Whitney U	355,000	290,000	351,500	326,000
Wilcoxon W	733,000	668,000	729,500	704,000
Z	-,164	-1,289	-,225	-,666
Asymp. Sig. (2-tailed)	,869	,197	,822	,505

Kolmogorov-Smirnov Test Statistics^a

		MTBV07	MTBV08	MTBV09	MTBV10
Most Extreme Differences	Absolute	,185	,259	,185	,259
	Positive	,185	,037	,074	,111
	Negative	-,185	-,259	-,185	-,259
Kolmogorov-Smirnov Z		,680	,953	,680	,953
Asymp. Sig. (2-tailed)		,744	,324	,744	,324

2007 Index & ROA

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
ROA07	Low diversity	27	28,67	774,00
	High diversity	27	26,33	711,00
	Total	54		
ROA08	Low diversity	27	28,89	780,00
	High diversity	27	26,11	705,00
	Total	54		
ROA09	Low diversity	27	29,63	800,00
	High diversity	27	25,37	685,00
	Total	54		
ROA10	Low diversity	27	29,48	796,00
	High diversity	27	25,52	689,00
	Total	54		

Mann-Whitney U Test Statistics^a

	ROA07	ROA08	ROA09	ROA10
Mann-Whitney U	333,000	327,000	307,000	311,000
Wilcoxon W	711,000	705,000	685,000	689,000
Z	-,545	-,649	-,995	-,926
Asymp. Sig. (2-tailed)	,586	,517	,320	,355

Kolmogorov-Smirnov Test Statistics^a

		ROA07	ROA08	ROA09	ROA10
Most Extreme Differences	Absolute	,222	,222	,222	,222
	Positive	,111	,111	,074	,037
	Negative	-,222	-,222	-,222	-,222
Kolmogorov-Smirnov Z		,816	,816	,816	,816
Asymp. Sig. (2-tailed)		,518	,518	,518	,518

Index & MTBV 2009

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
MTBV_09	Low diversity	26	25,52	663,50
	High diversity	28	29,34	821,50
	Total	54		
MTBV_10	Low diversity	26	24,42	635,00
	High diversity	28	30,36	850,00
	Total	54		

Mann-Whitney U Test Statistics^a

	MTBV_09	MTBV_10
Mann-Whitney U	312,500	284,000
Wilcoxon W	663,500	635,000
Z	-,892	-1,385
Asymp. Sig. (2-tailed)	,373	,166

Kolmogorov-Smirnov Test Statistics^a

		MTBV_09	MTBV_10
Most Extreme Differences	Absolute	,217	,239
	Positive	,107	,038
	Negative	-,217	-,239
Kolmogorov-Smirnov Z		,797	,878
Asymp. Sig. (2-tailed)		,549	,424

Index & ROA 2009

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
ROA_09	Low diversity	26	26,46	688,00
	High diversity	28	28,46	797,00
	Total	54		
ROA_10	Low diversity	26	23,65	615,00
	High diversity	28	31,07	870,00
	Total	54		

Mann-Whitney U Test Statistics^a

	ROA_09	ROA_10
Mann-Whitney U	337,000	264,000
Wilcoxon W	688,000	615,000
Z	-,467	-1,731
Asymp. Sig. (2-tailed)	,640	,083

Kolmogorov-Smirnov Test Statistics^a

		ROA_09	ROA_10
Most Extreme Differences	Absolute	,198	,335
	Positive	,115	,049
	Negative	-,198	-,335
Kolmogorov-Smirnov Z		,726	1,231
Asymp. Sig. (2-tailed)		,667	,097

10.7 Appendix G - Statistical tests of age

Age & MTBV 2005

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
MTBV_05	Low diversity	30	24,00	720,00
	High diversity	20	27,75	555,00
	Total	50		
MTBV_06	Low diversity	30	25,25	757,50
	High diversity	21	27,07	568,50
	Total	51		
MTBV_07	Low diversity	30	25,38	761,50
	High diversity	21	26,88	564,50
	Total	51		
MTBV_08	Low diversity	30	25,27	758,00
	High diversity	21	27,05	568,00
	Total	51		
MTBV_09	Low diversity	30	25,63	769,00
	High diversity	21	26,52	557,00
	Total	51		
MTBV_10	Low diversity	30	25,93	778,00
	High diversity	21	26,10	548,00
	Total	51		

Mann-Whitney U Test Statistics^a

	MTBV_05	MTBV_06	MTBV_07	MTBV_08	MTBV_09	MTBV_10
Mann-Whitney U	255,000	292,500	296,500	293,000	304,000	313,000
Wilcoxon W	720,000	757,500	761,500	758,000	769,000	778,000
Z	-,891	-,431	-,354	-,421	-,211	-,038
Asymp. Sig. (2-tailed)	,373	,667	,723	,674	,833	,969

Kolmogorov-Smirnov Test Statistics^a

		MTBV_05	MTBV_06	MTBV_07	MTBV_08	MTBV_09	MTBV_10
Most Extreme Differences	Absolute	,267	,162	,143	,176	,152	,138
	Positive	,267	,162	,143	,176	,152	,138
	Negative	-,133	-,095	-,057	-,114	-,076	-,133
Kolmogorov-Smirnov Z		,924	,569	,502	,619	,536	,485
Asymp. Sig. (2-tailed)		,361	,902	,963	,838	,937	,973

Age & ROA 2005

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
ROA_05	Low diversity	30	25,40	762,00
	High diversity	20	25,65	513,00
	Total	50		
ROA_06	Low diversity	30	26,63	799,00
	High diversity	20	23,80	476,00
	Total	50		
ROA_07	Low diversity	30	27,40	822,00
	High diversity	21	24,00	504,00
	Total	51		
ROA_08	Low diversity	30	26,53	796,00
	High diversity	21	25,24	530,00
	Total	51		
ROA_09	Low diversity	30	24,30	729,00
	High diversity	21	28,43	597,00
	Total	51		
ROA_10	Low diversity	30	27,33	820,00
	High diversity	21	24,10	506,00
	Total	51		

Mann-Whitney U Test Statistics^a

	ROA_05	ROA_06	ROA_07	ROA_08	ROA_09	ROA_10
Mann-Whitney U	297,000	266,000	273,000	299,000	264,000	275,000
Wilcoxon W	762,000	476,000	504,000	530,000	729,000	506,000
Z	-,059	-,673	-,804	-,306	-,976	-,766
Asymp. Sig. (2-tailed)	,953	,501	,421	,759	,329	,444

Kolmogorov-Smirnov Test Statistics^a

		ROA_05	ROA_06	ROA_07	ROA_08	ROA_09	ROA_10
Most Extreme Differences	Absolute	,167	,217	,200	,195	,238	,210
	Positive	,167	,067	,038	,119	,238	,043
	Negative	-,133	-,217	-,200	-,195	-,119	-,210
Kolmogorov-Smirnov Z		,577	,751	,703	,686	,837	,736
Asymp. Sig. (2-tailed)		,893	,626	,706	,734	,486	,650

2007 Age & MTBV

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
MTBV07	Low diversity	29	26,66	773,00
	High diversity	25	28,48	712,00
	Total	54		
MTBV08	Low diversity	29	28,47	825,50
	High diversity	25	26,38	659,50
	Total	54		
MTBV09	Low diversity	29	27,74	804,50
	High diversity	25	27,22	680,50
	Total	54		
MTBV10	Low diversity	29	28,12	815,50
	High diversity	25	26,78	669,50
	Total	54		

Mann-Whitney U Test Statistics^a

	MTBV07	MTBV08	MTBV09	MTBV10
Mann-Whitney U	338,000	334,500	355,500	344,500
Wilcoxon W	773,000	659,500	680,500	669,500
Z	-,425	-,486	-,121	-,312
Asymp. Sig. (2-tailed)	,671	,627	,903	,755

Kolmogorov-Smirnov Test Statistics^a

		MTBV07	MTBV08	MTBV09	MTBV10
Most Extreme Differences	Absolute	,124	,177	,137	,156
	Positive	,124	,084	,137	,127
	Negative	-,077	-,177	-,130	-,156
Kolmogorov-Smirnov Z		,455	,647	,500	,571
Asymp. Sig. (2-tailed)		,986	,797	,964	,900

2007 Age & ROA

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
ROA07	Low diversity	29	25,79	748,00
	High diversity	25	29,48	737,00
	Total	54		
ROA08	Low diversity	29	27,34	793,00
	High diversity	25	27,68	692,00
	Total	54		
ROA09	Low diversity	29	25,90	751,00
	High diversity	25	29,36	734,00
	Total	54		
ROA10	Low diversity	29	27,52	798,00
	High diversity	25	27,48	687,00
	Total	54		

Mann-Whitney U Test Statistics^a

	ROA07	ROA08	ROA09	ROA10
Mann-Whitney U	313,000	358,000	316,000	362,000
Wilcoxon W	748,000	793,000	751,000	687,000
Z	-,859	-,078	-,807	-,009
Asymp. Sig. (2-tailed)	,391	,938	,420	,993

Kolmogorov-Smirnov Test Statistics^a

		ROA07	ROA08	ROA09	ROA10
Most Extreme Differences	Absolute	,225	,127	,230	,135
	Positive	,225	,127	,230	,135
	Negative	-,103	-,110	-,116	-,127
Kolmogorov-Smirnov Z		,824	,465	,844	,495
Asymp. Sig. (2-tailed)		,506	,982	,474	,967

Age & MTBV 2009

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
MTBV_09	Low diversity	26	23,75	617,50
	High diversity	28	30,98	867,50
	Total	54		
MTBV_10	Low diversity	26	22,62	588,00
	High diversity	28	32,04	897,00
	Total	54		

Mann-Whitney U Test Statistics^a

	MTBV_09	MTBV_10
Mann-Whitney U	266,500	237,000
Wilcoxon W	617,500	588,000
Z	-1,688	-2,199
Asymp. Sig. (2-tailed)	,091	,028

Kolmogorov-Smirnov Test Statistics^a

		MTBV_09	MTBV_10
Most Extreme Differences	Absolute	,332	,409
	Positive	,038	,038
	Negative	-,332	-,409
Kolmogorov-Smirnov Z		1,221	1,503
Asymp. Sig. (2-tailed)		,102	,022

Age & ROA 2009

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
ROA_09	Low diversity	26	24,69	642,00
	High diversity	28	30,11	843,00
	Total	54		
ROA_10	Low diversity	26	25,46	662,00
	High diversity	28	29,39	823,00
	Total	54		

Mann-Whitney U Test Statistics^a

	ROA_09	ROA_10
Mann-Whitney U	291,000	311,000
Wilcoxon W	642,000	662,000
Z	-1,264	-,918
Asymp. Sig. (2-tailed)	,206	,359

Kolmogorov-Smirnov Test Statistics^a

		ROA_09	ROA_10
Most Extreme Differences	Absolute	,245	,212
	Positive	,041	,085
	Negative	-,245	-,212
Kolmogorov-Smirnov Z		,898	,777
Asymp. Sig. (2-tailed)		,396	,582

10.8 Appendix H - Statistical tests of education

2005 Education & MTBV

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
MTBV_05	Low diversity	18	20,17	363,00
	High diversity	32	28,50	912,00
	Total	50		
MTBV_06	Low diversity	18	21,39	385,00
	High diversity	33	28,52	941,00
	Total	51		
MTBV_07	Low diversity	18	20,44	368,00
	High diversity	33	29,03	958,00
	Total	51		
MTBV_08	Low diversity	18	25,14	452,50
	High diversity	33	26,47	873,50
	Total	51		
MTBV_09	Low diversity	18	23,94	431,00
	High diversity	33	27,12	895,00
	Total	51		
MTBV_10	Low diversity	18	24,14	434,50
	High diversity	33	27,02	891,50
	Total	51		

Mann-Whitney U Test Statistics^a

	MTBV_05	MTBV_06	MTBV_07	MTBV_08	MTBV_09	MTBV_10
Mann-Whitney U	192,000	214,000	197,000	281,500	260,000	263,500
Wilcoxon W	363,000	385,000	368,000	452,500	431,000	434,500
Z	-1,940	-1,636	-1,971	-,306	-,729	-,660
Asymp. Sig. (2-tailed)	,052	,102	,049	,760	,466	,509

Kolmogorov-Smirnov Test Statistics^a

		MTBV_05	MTBV_06	MTBV_07	MTBV_08	MTBV_09	MTBV_10
Most Extreme Differences	Absolute	,358	,253	,298	,177	,268	,202
	Positive	,000	,061	,030	,177	,182	,045
	Negative	-,358	-,253	-,298	-,146	-,268	-,202
Kolmogorov-Smirnov Z		1,214	,862	1,017	,603	,914	,689
Asymp. Sig. (2-tailed)		,105	,448	,252	,860	,374	,729

Education & ROA 2005

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
ROA_05	Low diversity	18	25,39	457,00
	High diversity	32	25,56	818,00
	Total	50		
ROA_06	Low diversity	18	25,94	467,00
	High diversity	32	25,25	808,00
	Total	50		
ROA_07	Low diversity	18	23,89	430,00
	High diversity	33	27,15	896,00
	Total	51		
ROA_08	Low diversity	18	27,22	490,00
	High diversity	33	25,33	836,00
	Total	51		
ROA_09	Low diversity	18	26,11	470,00
	High diversity	33	25,94	856,00
	Total	51		
ROA_10	Low diversity	18	27,67	498,00
	High diversity	33	25,09	828,00
	Total	51		

Mann-Whitney U Test Statistics^a

	ROA_05	ROA_06	ROA_07	ROA_08	ROA_09	ROA_10
Mann-Whitney U	286,000	280,000	259,000	275,000	295,000	267,000
Wilcoxon W	457,000	808,000	430,000	836,000	856,000	828,000
Z	-,040	-,162	-,749	-,434	-,039	-,591
Asymp. Sig. (2-tailed)	,968	,872	,454	,665	,969	,554

Kolmogorov-Smirnov Test Statistics^a

		ROA_05	ROA_06	ROA_07	ROA_08	ROA_09	ROA_10
Most Extreme Differences	Absolute	,205	,219	,172	,283	,152	,157
	Positive	,156	,184	,121	,283	,121	,157
	Negative	-,205	-,219	-,172	-,131	-,152	-,061
Kolmogorov-Smirnov Z		,695	,742	,586	,965	,517	,534
Asymp. Sig. (2-tailed)		,719	,640	,882	,309	,952	,938

2007 Education & MTBV

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
MTBV07	Low diversity	21	24,83	521,50
	High diversity	33	29,20	963,50
	Total	54		
MTBV08	Low diversity	21	26,43	555,00
	High diversity	33	28,18	930,00
	Total	54		
MTBV09	Low diversity	21	25,43	534,00
	High diversity	33	28,82	951,00
	Total	54		
MTBV10	Low diversity	21	26,31	552,50
	High diversity	33	28,26	932,50
	Total	54		

Mann-Whitney U Test Statistics^a

	MTBV07	MTBV08	MTBV09	MTBV10
Mann-Whitney U	290,500	324,000	303,000	321,500
Wilcoxon W	521,500	555,000	534,000	552,500
Z	-,994	-,399	-,772	-,444
Asymp. Sig. (2-tailed)	,320	,690	,440	,657

Kolmogorov-Smirnov Test Statistics^a

		MTBV07	MTBV08	MTBV09	MTBV10
Most Extreme Differences	Absolute	,221	,225	,251	,173
	Positive	,048	,139	,104	,065
	Negative	-,221	-,225	-,251	-,173
Kolmogorov-Smirnov Z		,791	,806	,899	,620
Asymp. Sig. (2-tailed)		,559	,534	,393	,836

2007 Education & ROA

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
ROA07	Low diversity	21	31,81	668,00
	High diversity	33	24,76	817,00
	Total	54		
ROA08	Low diversity	21	30,90	649,00
	High diversity	33	25,33	836,00
	Total	54		
ROA09	Low diversity	21	27,52	578,00
	High diversity	33	27,48	907,00
	Total	54		
ROA10	Low diversity	21	29,00	609,00
	High diversity	33	26,55	876,00
	Total	54		

Mann-Whitney U Test Statistics^a

	ROA07	ROA08	ROA09	ROA10
Mann-Whitney U	256,000	275,000	346,000	315,000
Wilcoxon W	817,000	836,000	907,000	876,000
Z	-1,606	-1,269	-,009	-,559
Asymp. Sig. (2-tailed)	,108	,205	,993	,576

Kolmogorov-Smirnov Test Statistics^a

		ROA07	ROA08	ROA09	ROA10
Most Extreme Differences	Absolute	,325	,312	,152	,143
	Positive	,325	,312	,121	,143
	Negative	-,030	-,056	-,152	-,061
Kolmogorov-Smirnov Z		1,163	1,117	,543	,512
Asymp. Sig. (2-tailed)		,134	,165	,930	,956

Education & MTBV 2009

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
MTBV_09	Low diversity	17	29,97	509,50
	High diversity	37	26,36	975,50
	Total	54		
MTBV_10	Low diversity	17	31,32	532,50
	High diversity	37	25,74	952,50
	Total	54		

Mann-Whitney U Test Statistics^a

	MTBV_09	MTBV_10
Mann-Whitney U	272,500	249,500
Wilcoxon W	975,500	952,500
Z	-,782	-1,211
Asymp. Sig. (2-tailed)	,434	,226

Kolmogorov-Smirnov Test Statistics^a

		MTBV_09	MTBV_10
Most Extreme Differences	Absolute	,281	,291
	Positive	,281	,291
	Negative	-,103	-,095
Kolmogorov-Smirnov Z		,960	,993
Asymp. Sig. (2-tailed)		,315	,278

Education & ROA 2009

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
ROA_09	Low diversity	17	28,35	482,00
	High diversity	37	27,11	1003,00
	Total	54		
ROA_10	Low diversity	17	31,06	528,00
	High diversity	37	25,86	957,00
	Total	54		

Mann-Whitney U Test Statistics^a

	ROA_09	ROA_10
Mann-Whitney U	300,000	254,000
Wilcoxon W	1003,000	957,000
Z	-,270	-1,127
Asymp. Sig. (2-tailed)	,787	,260

Kolmogorov-Smirnov Test Statistics^a

		ROA_09	ROA_10
Most Extreme Differences	Absolute	,137	,205
	Positive	,137	,205
	Negative	-,108	-,054
Kolmogorov-Smirnov Z		,467	,700
Asymp. Sig. (2-tailed)		,981	,711

10.9 Appendix I - Statistical tests of gender

Gender & MTBV 2005

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
MTBV_05	Low diversity	20	23,70	474,00
	High diversity	30	26,70	801,00
	Total	50		
MTBV_06	Low diversity	21	23,86	501,00
	High diversity	30	27,50	825,00
	Total	51		
MTBV_07	Low diversity	21	23,31	489,50
	High diversity	30	27,88	836,50
	Total	51		
MTBV_08	Low diversity	21	23,76	499,00
	High diversity	30	27,57	827,00
	Total	51		
MTBV_09	Low diversity	21	26,48	556,00
	High diversity	30	25,67	770,00
	Total	51		
MTBV_10	Low diversity	21	23,62	496,00
	High diversity	30	27,67	830,00
	Total	51		

Mann-Whitney U Test Statistics^a

	MTBV_05	MTBV_06	MTBV_07	MTBV_08	MTBV_09	MTBV_10
Mann-Whitney U	264,000	270,000	258,500	268,000	305,000	265,000
Wilcoxon W	474,000	501,000	489,500	499,000	770,000	496,000
Z	-,713	-,861	-1,081	-,900	-,191	-,957
Asymp. Sig. (2-tailed)	,476	,389	,280	,368	,848	,339

Kolmogorov-Smirnov Test Statistics^a

		MTBV_05	MTBV_06	MTBV_07	MTBV_08	MTBV_09	MTBV_10
Most Extreme Differences	Absolute	,200	,176	,210	,219	,138	,195
	Positive	,133	,043	,033	,033	,138	,043
	Negative	-,200	-,176	-,210	-,219	-,086	-,195
Kolmogorov-Smirnov Z		,693	,619	,736	,770	,485	,686
Asymp. Sig. (2-tailed)		,723	,838	,650	,594	,973	,734

Gender & ROA 2005

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
ROA_05	Low diversity	21	27,67	581,00
	High diversity	29	23,93	694,00
	Total	50		
ROA_06	Low diversity	21	25,76	541,00
	High diversity	29	25,31	734,00
	Total	50		
ROA_07	Low diversity	21	24,43	513,00
	High diversity	30	27,10	813,00
	Total	51		
ROA_08	Low diversity	21	22,95	482,00
	High diversity	30	28,13	844,00
	Total	51		
ROA_09	Low diversity	21	20,90	439,00
	High diversity	30	29,57	887,00
	Total	51		
ROA_10	Low diversity	21	26,10	548,00
	High diversity	30	25,93	778,00
	Total	51		

Mann-Whitney U Test Statistics^a

	ROA_05	ROA_06	ROA_07	ROA_08	ROA_09	ROA_10
Mann-Whitney U	259,000	299,000	282,000	251,000	208,000	313,000
Wilcoxon W	694,000	734,000	513,000	482,000	439,000	778,000
Z	-,894	-,108	-,632	-1,225	-2,048	-,038
Asymp. Sig. (2-tailed)	,371	,914	,528	,221	,041	,969

Kolmogorov-Smirnov Test Statistics^a

		ROA_05	ROA_06	ROA_07	ROA_08	ROA_09	ROA_10
Most Extreme Differences	Absolute	,269	,207	,186	,252	,433	,138
	Positive	,269	,172	,143	,010	,048	,138
	Negative	-,095	-,207	-,186	-,252	-,433	-,095
Kolmogorov-Smirnov Z		,940	,722	,653	,887	1,523	,485
Asymp. Sig. (2-tailed)		,340	,674	,788	,411	,019	,973

2007 Gender & MTBV

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
MTBV07	Low diversity	26	24,44	635,50
	High diversity	28	30,34	849,50
	Total	54		
MTBV08	Low diversity	26	26,33	684,50
	High diversity	28	28,59	800,50
	Total	54		
MTBV09	Low diversity	26	25,06	651,50
	High diversity	28	29,77	833,50
	Total	54		
MTBV10	Low diversity	26	24,40	634,50
	High diversity	28	30,38	850,50
	Total	54		

Mann-Whitney U Test Statistics^a

	MTBV07	MTBV08	MTBV09	MTBV10
Mann-Whitney U	284,500	333,500	300,500	283,500
Wilcoxon W	635,500	684,500	651,500	634,500
Z	-1,376	-,528	-1,099	-1,394
Asymp. Sig. (2-tailed)	,169	,597	,272	,163

Kolmogorov-Smirnov Test Statistics^a

		MTBV07	MTBV08	MTBV09	MTBV10
Most Extreme Differences	Absolute	,352	,313	,275	,313
	Positive	,121	,168	,033	,030
	Negative	-,352	-,313	-,275	-,313
Kolmogorov-Smirnov Z		1,291	1,150	1,009	1,150
Asymp. Sig. (2-tailed)		,071	,142	,261	,142

2007 Gender & ROA

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
ROA07	Low diversity	26	24,35	633,00
	High diversity	28	30,43	852,00
	Total	54		
ROA08	Low diversity	26	23,35	607,00
	High diversity	28	31,36	878,00
	Total	54		
ROA09	Low diversity	26	27,12	705,00
	High diversity	28	27,86	780,00
	Total	54		
ROA10	Low diversity	26	23,58	613,00
	High diversity	28	31,14	872,00
	Total	54		

Mann-Whitney U Test Statistics^a

	ROA07	ROA08	ROA09	ROA10
Mann-Whitney U	282,000	256,000	354,000	262,000
Wilcoxon W	633,000	607,000	705,000	613,000
Z	-1,420	-1,870	-,173	-1,766
Asymp. Sig. (2-tailed)	,156	,062	,863	,077

Kolmogorov-Smirnov Test Statistics^a

		ROA07	ROA08	ROA09	ROA10
Most Extreme Differences	Absolute	,385	,387	,168	,360
	Positive	,170	,091	,115	,104
	Negative	-,385	-,387	-,168	-,360
Kolmogorov-Smirnov Z		1,412	1,422	,615	1,321
Asymp. Sig. (2-tailed)		,037	,035	,843	,061

Gender & MTVB 2009

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
MTBV_09	Low diversity	29	24,95	723,50
	High diversity	25	30,46	761,50
	Total	54		
MTBV_10	Low diversity	29	23,74	688,50
	High diversity	25	31,86	796,50
	Total	54		

Mann-Whitney U Test Statistics^a

	MTBV_09	MTBV_10
Mann-Whitney U	288,500	253,500
Wilcoxon W	723,500	688,500
Z	-1,284	-1,891
Asymp. Sig. (2-tailed)	,199	,059

Kolmogorov-Smirnov Test Statistics^a

		MTBV_09	MTBV_10
Most Extreme Differences	Absolute	,268	,302
	Positive	,268	,302
	Negative	-,046	-,006
Kolmogorov-Smirnov Z		,980	1,107
Asymp. Sig. (2-tailed)		,292	,172

Gender & ROA 2009

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
ROA_09	Low diversity	29	24,28	704,00
	High diversity	25	31,24	781,00
	Total	54		
ROA_10	Low diversity	29	25,24	732,00
	High diversity	25	30,12	753,00
	Total	54		

Mann-Whitney U Test Statistics^a

	ROA_09	ROA_10
Mann-Whitney U	269,000	297,000
Wilcoxon W	704,000	732,000
Z	-1,622	-1,136
Asymp. Sig. (2-tailed)	,105	,256

Kolmogorov-Smirnov Test Statistics^a

		ROA_09	ROA_10
Most Extreme Differences	Absolute	,272	,254
	Positive	,272	,254
	Negative	-,103	-,126
Kolmogorov-Smirnov Z		,996	,930
Asymp. Sig. (2-tailed)		,275	,353

10.10 Appendix J - Statistical tests of tenure

Tenure & MTBV 2005

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
MTBV_05	Low diversity	22	29,27	644,00
	High diversity	28	22,54	631,00
	Total	50		
MTBV_06	Low diversity	22	31,43	691,50
	High diversity	29	21,88	634,50
	Total	51		
MTBV_07	Low diversity	22	30,84	678,50
	High diversity	29	22,33	647,50
	Total	51		
MTBV_08	Low diversity	22	30,09	662,00
	High diversity	29	22,90	664,00
	Total	51		
MTBV_09	Low diversity	22	32,95	725,00
	High diversity	29	20,72	601,00
	Total	51		
MTBV_10	Low diversity	22	30,55	672,00
	High diversity	29	22,55	654,00
	Total	51		

Mann-Whitney U Test Statistics^a

	MTBV_05	MTBV_06	MTBV_07	MTBV_08	MTBV_09	MTBV_10
Mann-Whitney U	225,000	199,500	212,500	229,000	166,000	219,000
Wilcoxon W	631,000	634,500	647,500	664,000	601,000	654,000
Z	-1,622	-2,273	-2,026	-1,712	-2,910	-1,902
Asymp. Sig. (2-tailed)	,105	,023	,043	,087	,004	,057

Kolmogorov-Smirnov Test Statistics^a

		MTBV_05	MTBV_06	MTBV_07	MTBV_08	MTBV_09	MTBV_10
Most Extreme Differences	Absolute	,321	,335	,370	,304	,426	,348
	Positive	,321	,335	,370	,304	,426	,348
	Negative	-,010	-,034	-,069	-,034	-,034	-,034
Kolmogorov-Smirnov Z		1,128	1,186	1,308	1,075	1,508	1,231
Asymp. Sig. (2-tailed)		,157	,120	,065	,198	,021	,097

Tenure & ROA 2005

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
ROA_05	Low diversity	21	23,57	495,00
	High diversity	29	26,90	780,00
	Total	50		
ROA_06	Low diversity	21	23,29	489,00
	High diversity	29	27,10	786,00
	Total	50		
ROA_07	Low diversity	22	27,45	604,00
	High diversity	29	24,90	722,00
	Total	51		
ROA_08	Low diversity	22	28,73	632,00
	High diversity	29	23,93	694,00
	Total	51		
ROA_09	Low diversity	22	26,36	580,00
	High diversity	29	25,72	746,00
	Total	51		
ROA_10	Low diversity	22	25,77	567,00
	High diversity	29	26,17	759,00
	Total	51		

Mann-Whitney U Test Statistics^a

	ROA_05	ROA_06	ROA_07	ROA_08	ROA_09	ROA_10
Mann-Whitney U	264,000	258,000	287,000	259,000	311,000	314,000
Wilcoxon W	495,000	489,000	722,000	694,000	746,000	567,000
Z	-,796	-,914	-,609	-1,141	-,152	-,095
Asymp. Sig. (2-tailed)	,426	,361	,543	,254	,879	,924

Kolmogorov-Smirnov Test Statistics^a

		ROA_05	ROA_06	ROA_07	ROA_08	ROA_09	ROA_10
Most Extreme Differences	Absolute	,279	,335	,265	,277	,132	,163
	Positive	,112	,194	,265	,277	,132	,161
	Negative	-,279	-,335	-,129	-,071	-,094	-,163
Kolmogorov-Smirnov Z		,974	1,169	,937	,981	,466	,577
Asymp. Sig. (2-tailed)		,299	,130	,344	,291	,982	,894

2007 Tenure & MTBV

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
MTBV07	Low diversity	28	28,86	808,00
	High diversity	26	26,04	677,00
	Total	54		
MTBV08	Low diversity	28	30,30	848,50
	High diversity	26	24,48	636,50
	Total	54		
MTBV09	Low diversity	28	30,02	840,50
	High diversity	26	24,79	644,50
	Total	54		
MTBV10	Low diversity	28	29,68	831,00
	High diversity	26	25,15	654,00
	Total	54		

Mann-Whitney U Test Statistics^a

	MTBV07	MTBV08	MTBV09	MTBV10
Mann-Whitney U	326,000	285,500	293,500	303,000
Wilcoxon W	677,000	636,500	644,500	654,000
Z	-,658	-1,359	-1,221	-1,056
Asymp. Sig. (2-tailed)	,511	,174	,222	,291

Kolmogorov-Smirnov Test Statistics^a

		MTBV07	MTBV08	MTBV09	MTBV10
Most Extreme Differences	Absolute	,179	,286	,258	,190
	Positive	,104	,036	,011	,055
	Negative	-,179	-,286	-,258	-,190
Kolmogorov-Smirnov Z		,656	1,049	,948	,696
Asymp. Sig. (2-tailed)		,783	,221	,330	,718

2007 Tenure & ROA

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
ROA07	Low diversity	28	31,79	890,00
	High diversity	26	22,88	595,00
	Total	54		
ROA08	Low diversity	28	29,71	832,00
	High diversity	26	25,12	653,00
	Total	54		
ROA09	Low diversity	28	31,50	882,00
	High diversity	26	23,19	603,00
	Total	54		
ROA10	Low diversity	28	30,61	857,00
	High diversity	26	24,15	628,00
	Total	54		

Mann-Whitney U Test Statistics^a

	ROA07	ROA08	ROA09	ROA10
Mann-Whitney U	244,000	302,000	252,000	277,000
Wilcoxon W	595,000	653,000	603,000	628,000
Z	-2,077	-1,073	-1,939	-1,506
Asymp. Sig. (2-tailed)	,038	,283	,053	,132

Kolmogorov-Smirnov Test Statistics^a

		ROA07	ROA08	ROA09	ROA10
Most Extreme Differences	Absolute	,275	,242	,321	,245
	Positive	,000	,107	,036	,071
	Negative	-,275	-,242	-,321	-,245
Kolmogorov-Smirnov Z		1,009	,888	1,180	,898
Asymp. Sig. (2-tailed)		,261	,410	,123	,396

Tenure & MTVB 2009

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
MTBV_09	Low diversity	24	25,17	604,00
	High diversity	30	29,37	881,00
	Total	54		
MTBV_10	Low diversity	24	25,50	612,00
	High diversity	30	29,10	873,00
	Total	54		

Mann-Whitney U Test Statistics^a

	MTBV_09	MTBV_10
Mann-Whitney U	304,000	312,000
Wilcoxon W	604,000	612,000
Z	-,975	-,836
Asymp. Sig. (2-tailed)	,330	,403

Kolmogorov-Smirnov Test Statistics^a

		MTBV_09	MTBV_10
Most Extreme Differences	Absolute	,208	,200
	Positive	,058	,067
	Negative	-,208	-,200
Kolmogorov-Smirnov Z		,761	,730
Asymp. Sig. (2-tailed)		,609	,660

Tenure & ROA 2009

Mann-Whitney U Test Ranks

	Group	N	Mean Rank	Sum of Ranks
ROA_09	Low diversity	24	26,83	644,00
	High diversity	30	28,03	841,00
	Total	54		
ROA_10	Low diversity	24	22,54	541,00
	High diversity	30	31,47	944,00
	Total	54		

Mann-Whitney U Test Statistics^a

	ROA_09	ROA_10
Mann-Whitney U	344,000	241,000
Wilcoxon W	644,000	541,000
Z	-,279	-2,072
Asymp. Sig. (2-tailed)	,781	,038

Kolmogorov-Smirnov Test Statistics^a

		ROA_09	ROA_10
Most Extreme Differences	Absolute	,208	,367
	Positive	,183	,042
	Negative	-,208	-,367
Kolmogorov-Smirnov Z		,761	1,339
Asymp. Sig. (2-tailed)		,609	,055

10.11 Appendix K - Index correlation

Correlations 2005

			Index	Age	Gender	Education	Tenure
Spearman's rho	Index	Correlation Coefficient	1,000	,518**	,385**	,287	,559**
		Sig. (2-tailed)	.	,000	,005	,041	,000
		N	51	51	51	51	51
Age	Age	Correlation Coefficient	,518**	1,000	-,132	,109	-,144
		Sig. (2-tailed)	,000	.	,356	,447	,312
		N	51	51	51	51	51
Gender	Gender	Correlation Coefficient	,385**	-,132	1,000	,006	,113
		Sig. (2-tailed)	,005	,356	.	,964	,430
		N	51	51	51	51	51
Education	Education	Correlation Coefficient	,287	,109	,006	1,000	-,111
		Sig. (2-tailed)	,041	,447	,964	.	,437
		N	51	51	51	51	51
Tenure	Tenure	Correlation Coefficient	,559**	-,144	,113	-,111	1,000
		Sig. (2-tailed)	,000	,312	,430	,437	.
		N	51	51	51	51	51

Correlations 2007

			Index	Age	Gender	Education	Tenure
Spearman's rho	Index	Correlation Coefficient	1,000	,390**	,488**	,207	,648**
		Sig. (2-tailed)	.	,004	,000	,133	,000
		N	54	54	54	54	54
Age	Age	Correlation Coefficient	,390**	1,000	,019	-,006	-,116
		Sig. (2-tailed)	,004	.	,889	,968	,402
		N	54	54	54	54	54
Gender	Gender	Correlation Coefficient	,488**	,019	1,000	-,082	,115
		Sig. (2-tailed)	,000	,889	.	,553	,406
		N	54	54	54	54	54
Education	Education	Correlation Coefficient	,207	-,006	-,082	1,000	,069
		Sig. (2-tailed)	,133	,968	,553	.	,618
		N	54	54	54	54	54
Tenure	Tenure	Correlation Coefficient	,648**	-,116	,115	,069	1,000
		Sig. (2-tailed)	,000	,402	,406	,618	.
		N	54	54	54	54	54

Correlations 2009

			Index	Age	Gender	Education	Tenure
Spearman's rho	Index	Correlation Coefficient	1,000	,595**	,516**	,279	,592**
		Sig. (2-tailed)	.	,000	,000	,041	,000
		N	54	54	54	54	54
Age	Age	Correlation Coefficient	,595**	1,000	,146	,229	-,026
		Sig. (2-tailed)	,000	.	,292	,096	,851
		N	54	54	54	54	54
Gender	Gender	Correlation Coefficient	,516**	,146	1,000	,039	,091
		Sig. (2-tailed)	,000	,292	.	,778	,513
		N	54	54	54	54	54
Education	Education	Correlation Coefficient	,279	,229	,039	1,000	-,151
		Sig. (2-tailed)	,041	,096	,778	.	,274
		N	54	54	54	54	54
Tenure	Tenure	Correlation Coefficient	,592**	-,026	,091	-,151	1,000
		Sig. (2-tailed)	,000	,851	,513	,274	.
		N	54	54	54	54	54

10.12 Appendix L - Validity test of performance measures

	Datastream ROA	Calculated ROA	Datastream MTBV	Calculated MTBV
ABB	9,29%	9,50%	2,53	2,84
Hennes & Mauritz	31,79%	31,96%	6,22	8,13
Hufvudstaden	-1,57%	-1,70%	1,14	0,95
NCC	4,90%	4,21%	0,66	1,16
Swedbank	0,73%	3,11%	0,31	0,78

