Board Structure in Swedish Mutual Funds Industry

Authors: Pavel Kolosov  
Shageldi Soltanmammedov

Supervisor: Catherine Lions
ACKNOWLEDGEMENT

We would like to thank our supervisor Catherine Lions for her guidance and patience that helped us to complete this study.

We also would like to express our gratitude to Barbara Cornelius, whose advice during the seminars were very helpful and provided our research with more quality.

Separate gratitude we would like to express to Fredrik Hård from Fondbolagens förening, Swedish Investment Fund Association for understanding and providing us with the asked data.

Pavel Kolosov

Shageldi Soltanmammedov

Umeå, May 2011
Mutual funds attracted great attention of both shareholders and academics in last few decades. Mutual funds provide benefits like diversification, professional managements and reduced costs for individual shareholders. Shareholders invest their assets into mutual funds managed by professionals. Managers may have an incentive to use those assets to satisfy their own interests. They can achieve this by charging excessive fees or spending more on the perquisites. These unmatched interests of shareholders and managers create so called principal-agent conflicts. Some researchers argue that market competition in mutual funds industry is strong enough to align interests of both shareholders and managers, thus mitigating principal-agent conflicts. Others believe there is need for internal governance to monitor managers’ behaviors. Board of directors as an internal governance mechanism is responsible for aligning shareholders and managers interests.

We collected data on board characteristics to find if they are related to funds attributes. Our sample of funds consists of 68 fund management companies with total of 603 mutual funds managed by those companies. Board characteristics include board size, age and gender of board members, and presence of CEO on the board. Fund attributes are total expense ratio, rate of return and management fees used as a measure of board effectiveness. We analyzed relationship of board characteristics and fund attributes separately on the company level and fund level.

On the company level we found no relationship between board size and board age with expense ratio and rate of returns. We found significant positive relationship between board gender and presence of CEO with expense ratio. These results indicate that with the increase of male members on the board and the presence of CEO on the board there is an increase in total expense ratio. On the fund level analysis we found different relations with various types of funds. This may indicate that depending on the type of the fund the structure of the board that is effective changes.

**Keywords:** principal-agent conflicts, mutual funds, board structure.
TABLE OF CONTENTS

ACKNOWLEDGEMENT........................................................................................................ i

ABSTRACT .......................................................................................................................... ii

TABLE OF CONTENTS ....................................................................................................... iii

LIST OF TABLES .................................................................................................................. vi

LIST OF FIGURES ............................................................................................................... vii

1. INTRODUCTION .............................................................................................................. 1

  1.1 Background.................................................................................................................... 1

  1.2 Research question........................................................................................................ 2

  1.3 Research purpose ....................................................................................................... 2

  1.4 Limitations................................................................................................................... 3

  1.5 Disposition.................................................................................................................. 4

  1.6 Definitions and Abbreviations..................................................................................... 4

2. METHODOLOGY ............................................................................................................. 5

  2.1 Choice of topic............................................................................................................. 5

  2.2 Preconceptions........................................................................................................... 5

  2.3 Perspective of the research ....................................................................................... 5

  2.4 Research philosophy................................................................................................ 6

  2.5 Research approach.................................................................................................... 7

  2.6 Research strategy....................................................................................................... 8

  2.7 Objectives of the research........................................................................................ 8

  2.8 Research design......................................................................................................... 9

  2.9 Selection of theory and hypothesis generation ....................................................... 10

  2.10 Data collection ........................................................................................................ 10

  2.11 Criticism of sources and data ............................................................................... 11

3. THEORETICAL FRAMEWORK .................................................................................. 13

  3.1 Mutual funds............................................................................................................. 13
3.2 Swedish and European mutual funds .......................................................... 13
3.3 Types of funds .......................................................................................... 14
3.4 Developments in mutual fund industries of US and Sweden ......................... 16
3.5 Benefits of mutual funds .......................................................................... 17
  3.5.1 Diversification ..................................................................................... 17
  3.5.2 Professional management ................................................................... 18
  3.5.3 Low expenses and fees: economies of scale ....................................... 20
3.6 Mutual funds governance ......................................................................... 22
  3.6.1 Agency costs ....................................................................................... 23
  3.6.2 Board of directors .............................................................................. 24
4. EMPIRICAL ANALYSIS .............................................................................. 30
  4.1 Data collection, conditions and sample composition ................................... 30
  4.2 Data description ....................................................................................... 31
    4.2.1 Funds classification ........................................................................... 31
    4.2.2 Result-based indicators .................................................................... 33
    4.2.3 Age representation ............................................................................ 34
    4.2.4 Descriptive statistics of independent variables .................................. 35
  4.3. Hypotheses testing and result discussion ................................................. 37
    4.3.1 Company level analysis .................................................................... 37
    4.3.2 Fund level analysis ............................................................................ 42
5. CONCLUSION ............................................................................................. 53
  5.1 Discussion of the results .......................................................................... 53
  5.3 Contribution to existing knowledge .......................................................... 55
  5.4 Quality criteria ......................................................................................... 55
    5.4.1 Validity ............................................................................................... 55
    5.4.2 Reliability ........................................................................................... 55
  5.5 Recommendations for further studies ....................................................... 56
APPENDIX A: List of 68 analyzed management companies.

APPENDIX B: Age representation different from classical average age and analysis results using this measure.

APPENDIX C: Descriptive statistics of the independent variables

APPENDIX D: Multicollinearity of the independent variables
LIST OF TABLES

Table 1: Fundamental differences between quantitative and qualitative research strategies .......................................................... 8

Table 2: Advantages and disadvantages of secondary data .......................................................... 11

Table 3: Number of Funds in Sweden, EU and US .......................................................... 15

Table 4: Total Expense Ratios for actively managed equity funds and bond funds in respective countries .......................................................... 21

Table 5: Chairperson and Managing Director in Swedish listed companies 2009–2010... .......................................................... 27

Table 6: Variables used in analysis ........................................................................... 34

Table 7: Descriptive statistics for the independent variables ........................................... 35

Table 8: Board size frequency ............................................................................. 35

Table 9: Percentage of men frequency .................................................................. 36

Table 10: Company level correlation coefficients between TER and independent variables ........................................................................... 37

Table 11: Company level correlation coefficients between RoR and independent variables ........................................................................... 39

Table 12: ANOVA test results for regression model with TER as dependent variable .......................................................... 40

Table 13: Regression coefficients for the independent variables .................................... 41

Table 14: Summary of company level regression test results ........................................ 42

Table 15: Equity funds correlation coefficients between board characteristics and fund attributes ........................................................................... 42

Table 16: ANOVA test results for equity funds regression model, TER as dependent variable ........................................................................... 44

Table 17: Coefficients for the independent variables for the TER model for the equity group of funds ........................................................................... 44

Table 18: ANOVA test results for equity funds regression model, Management fee as dependent variable ........................................................................... 45

Table 19: Coefficients for the independent variables for the fixed management fee model ........................................................................... 46

Table 20: Results of correlation analysis for five categories of funds ............................. 46

Table 21: Results of regression analysis for five categories of funds ............................. 48

Table 22: Summary of regression test results, fund level .............................................. 52
LIST OF FIGURES

Figure 1: The process of deduction ......................................................... 7

Figure 2: Total Net Assets and Number of Funds of the U.S. Mutual Fund Industry, 1980-2009 ................................................................. 16

Figure 3: Fund asset development in Sweden, 1959-2008, SEK billion .......... 17

Figure 4: Portfolio risk as a function of the number of stocks in the portfolio .... 18

Figure 5: Share of total assets under management by Swedish fund management companies, December 2009 .................................................. 19

Figure 6: Sample size compared to the whole population ............................ 31

Figure 7: Types of funds in the sample ..................................................... 32

Figure 8: The biggest management companies’ representation in the sample .... 33

Figure 9: Gender diversity ...................................................................... 36

Figure 10: Distribution of the board members age ...................................... 36

Figure 11: Representation of relation between TER and board gender, company level. 38

Figure 12: Relationship between TER and presence of CEO in a board of directors, company level ................................................................. 39

Figure 13: Distribution of TER .................................................................. 41

Figure 14: Relationship between TER and board age for the equity group of funds .... 45

Figure 15: Relation between TER and presence of CEO in boards of directors of the “special (equity)” group of funds ......................................................... 49

Figure 16: Relation between TER and average age for “special (equity)” group of funds .................................................................................. 50

Figure 17: Relation between TER and average age of boards of directors for the “special (mixed and others)” group of funds ...................................................... 51
1. INTRODUCTION

1.1 Background

Investing in mutual funds has become extremely popular among individual investors over the past few decades. Investment Company Institute (ICI, 2010, p. 80) shows that the percentage of US households owning mutual funds increased from 5.7% in 1980 to 43% in 2009. In Sweden in 2010, according to The Swedish Investment Fund Association, 82% (was 50% in mid 1990s) of people saved in funds excluding premium pension savings, making Sweden the world’s most fund saving country. Reasons for choosing mutual funds as an investment tool can be explained by the advantages of diversification mutual funds provide. Apart from diversification advantages, investors in mutual funds also benefit from lower costs associated with trading in securities and professional management of portfolios. Benefits provided by mutual funds have attracted large numbers of investors, along with the attention of academics.

Together with increasing total assets under management of mutual funds, the number of mutual funds also increased. For instance in US number of mutual funds exceeds number of companies traded on stock exchanges. The increasing popularity of mutual funds raises questions concerning their performance. Individual investors investing in mutual funds should want to evaluate expected performance of their investment. To answer these questions academics started to investigate whether mutual funds provide reasonable returns. Most significant feedbacks were provided by Treynor (1965), Sharpe (1966) and Jensen (1968). They proposed different ways of performance measures considering risks funds are affected by. There are also a lot of factors that may affect the performance of mutual funds on which investors may base in choosing particular fund for investment.

Scholars have been trying to explain the impact of different attributes like fees or expenses on the performance of funds (Dahlquist, Engström, & Söderlind, 2000; Blake, Elton, & Gruber, 1993). As the number of mutual funds grew some of them were actively managed and some of them were passively managed. Engström (2004), Wermers (2000), Baks (2003) studied the impact of management on funds’ performance. That brought about questions on the effectiveness of fund managers in generating good performance. Questions like, what would motivate managers to show better performance or how bad performance should be punished.

Khorana (2001), Chevalier and Ellison (1998), Ding and Wermers (2009) undertook research on the career development of fund managers. Their studies show that managers are vulnerable to be dismissed by company for bad performance. The board of directors here should be held responsible for dismissing managers. Punishing management for poor performance is the main task of the board of directors. In the United States, approving fees are also included on the list of boards’ duties. This brought to the importance of the board of directors in mutual funds (Tufano and Sevick (1997), Del Guercio, Dann, & Partch (2003)) for mitigating agency problems.

1 Review of academic research papers will be provided throughout the thesis.

2 World Federation of Exchanges reports a little more than 5,000 companies listed in NASDAQ OMX and NYSE Euronext (US) while Investment Company Institute reports that number of mutual funds in 2009 reached 7,691.
The increasing number of funds signs for an increasing tight competition among mutual funds in attracting investors. Coates IV & Hubbard (2007) believe that competition among mutual funds is strong enough, that there is no need for fund regulations to protect investors from excessive fees. Morley & Curtis (2007) agree with Coates IV & Hubbard (2007) but also suggest that boards would be a useful supplement to market competition.

Little empirical studies were found that analyzed the board structure of mutual funds. We found that only board size of mutual funds was investigated by several researchers (Tufano & Sevick (1997), Ferris & Yan (2007), Del Guercio, Dann, & Partch (2003)). Though these studies were conducted on United States mutual funds which have distinct governance structure than Swedish mutual funds. The only study we found on board age and board effectiveness was conducted by Khorana & Tufano (2006) which was again on US mutual funds. Sweden as having world’s highest percentage of population saving in funds deserves similar attention of academics.

1.2 Research question

In our research we are aiming to determine whether the boards of directors of fund management companies in Sweden are effective in aligning managers’ interests with shareholders’ interests. Specifically we will analyze and compare different board structures. Also we want to explain the relation, if any found, between the size of the board and the fees funds’ charged to shareholders. We want to find the impact of different board structures on the expenses of the funds. In general we formulate our research question as follow:

- Is there a relationship between board characteristics (size, age, gender and presence of CEO) and fund attributes (management fee, rate of return and expense ratio)?

1.3 Research purpose

By answering this question we hope to find the optimal board structure for Swedish mutual fund management companies. An optimal board structure is the one that will better align interests of both shareholders and managers. We want to find if it worth having females or older members in the board. We want to find if there is an optimal board size. Also we want to find if CEO that sits on board of directors has any impact. We hope that our findings will help investors in making decisions when selecting board members.

---

3 U.S. Securities and Exchange Commission (SEC) adopted a rule requiring mutual funds board of directors to be composed of at least 75% of independent directors.
1.4 Limitations

This study has several limitations. First one is the measure of effectiveness of board in monitoring managers. We use expense ratio, rate of return and management fees each as a measure of board effectiveness. However we understand that these variables maybe affected by other factors such as assets turnover of the fund or net flows. Due to the lack of central data for Swedish mutual funds we were unable to collect information on those variables so to include them as control variables in our statistical models.

Second and most significant limitation is that Swedish fund management companies have only one board to oversee all funds within the company. This type of governance structure of Swedish mutual funds makes difficult to measure the effectiveness of board. We tried to overcome these difficulties by analyzing board structures on company and fund levels. On company level we calculated averages of expense ratio and rate of returns weighted with Net Asset Value of each fund. Of course this approach has drawbacks. For instance it would have been more appropriate to calculate averages weighted to Total Assets under management of the fund. Again the lack of central data source and the time limits did not allow us to collect data on Total Assets.

On the fund level we assumed that each fund has its one board and duplicated variables on board of a management company for all funds within that company. For example a management company having ten funds under management is assumed to have ten boards of directors for each fund with the same board characteristics. Further to minimize the effect of having the same board characteristics for several funds, we split our sample into six fund types. We will compare board structure of all six groups and make conclusions based on our results.

Another limitation is the use of short period of time for our study. Again the lack of central data is to be blamed. Moreover the fund companies do not fully disclose information on the board members in their annual or semi-annual reports. Thus making us rely on other sources that have only recent data. We observed poor information disclosure of Swedish mutual funds. Our data on board characteristics is valid for February 2011, the month we were collecting all data for our study. We assume that these board characteristics were persistent during whole year of 2010. This brings up another limitation for our study.

We assume that during year 2010 no changes were made to the board structure of the company. We were not able to find data on the changes of boards which we could incorporate to our analysis. However we believe board changes that had occurred during 2010 would not have significant impact on our study.

Finally our last limitation that we identified is the language barrier. Most of the funds disclose information on their funds in Swedish language. As we do not know Swedish language we made use of online translation tool provided by Google Translate. Thus we rely on the translation tool which may not always give precise definition of what was meant in the original source. This limitation significantly influenced on the time we spent on gathering the needed data.
1.5 Disposition

Our paper consists of five following chapters:

Chapter 1 Introduction: In this chapter we will introduce the background of research topic, problem discussion, research question and the purpose of our study. We will also state limitations for our study.

Chapter 2 Methodology: In this chapter we will discuss research philosophy, research design and research approach we applied in our thesis. Also we will present the sources of our data.

Chapter 3 Theoretical Framework: This chapter we start with the background of mutual funds following with definition of different fund types and their benefits for shareholders. Further we will explain the agency conflicts and the board of directors’ role in mitigating those conflicts.

Chapter 4 Empirical Analysis: In this chapter we will start with presenting descriptive statistics on collected data. Further we will show our results and empirical findings from statistical analysis.

Chapter 5 Conclusion: In this chapter we will resume key findings to answer our research question, assess our research for consistence with the theory.

1.6 Definitions and Abbreviations

**TER**: total expense ratio. The indicator is calculated by dividing total cost of a company by its total assets and presented as a percentage. So, a TER discloses the amount a fund needed to cover all expenses of a portfolio (management fees, performance fees, starting and redemption fees, administration, audit and bank charges and others).

**RoR**: rate of return. This indicator presents gain or loss on an investment during year. Usually it is expressed as a percentage.

**Fixed management fee** is yearly compensation to the management team expressed as a percentage to the total assets of a company.

**NAV**: net asset value. According to the guide to understand of mutual funds issued by Investment Company Institute, NAV is the current market value of all the fund’s assets, minus liabilities, divided by the total number of outstanding shares.

**Principal-agent conflicts**: Conflicts of interests between principals (shareholders) and agents (managers).

**Board of directors**: An internal governance mechanism that monitors managers’ behaviors to mitigate principal-agent conflicts.

**Passively managed funds**: funds that build portfolio identically to a particular market index and change portfolio holdings when changes in index occurs.
2. METHODOLOGY

In this chapter we describe the way we came up with research topics and our experiences which contribute to the study we undertake. We state our research philosophy, approach and strategy we follow throughout this study. Research strategy and the data sources are presented at the end of this chapter.

2.1 Choice of topic

During our studies we heard a lot about mutual funds and their popularity from the Financial Markets, Institutions and Financial Planning course. We proved it ourselves when we started to work on this topic. The fact that number of funds in US exceeded number of listed company shares drove our interest in this study. We already mentioned that Sweden is a country with highest percentage of population saving in mutual funds. This fact raised in us concerns whether mutual fund managers act in the interest of their shareholders. Thus we chose to study structure of boards of directors of fund management companies in Sweden to understand its effectiveness in protecting shareholders’ interests.

2.2 Preconceptions

Researchers choice of research subject, methods used for research and even conclusions made at the end of research are likely to be influenced by author’s educational background, experiences and personal beliefs. This should not mean that research will be positively or negatively affected, as educational background and personal beliefs may help by preserving interest in the study chosen by researcher. However in conducting research it is important that authors remain as objective as possible and avoid overly subjective judgments.

We, authors, recognize that our beliefs and experiences played important role in our choice of research topic and will have impact throughout this study. Both authors are current master’s students, one majoring in accounting another in finance. Both authors attended Corporate Finance, Corporate Governance and Financial Markets, Institutions and Planning courses. One of the authors acquired knowledge on statistical models from the course Analysis of Financial Data. Acquired knowledge from those courses, we believe, will help and guide us in writing this thesis but keeping us from influencing the results of our study. Further, we will present our philosophical positions, research approach and research strategy to demonstrate our objectivist views in conducting this study.

2.3 Perspective of the research

Before starting discussion on research philosophy we would like to present the perspective we chose to perform this research. Our research question is concerned about what type of board structure in mutual funds that shows better performance. For managers board of directors is an obstacle to satisfy their own interests. Board members act as stewards to protect shareholders interests. Board structure is subject to change, and is usually selected by collective approval of shareholders, usually by voting at general annual meetings. Thus shareholders are the most interested party in setting board of directors whose main duty is to mitigate principal-agent conflicts. For this
reason we chose to undertake this research from the shareholders perspective and define the most effective board structure based on the results of this research.

2.4 Research philosophy

When undertaking research, it is important to consider different research paradigms and the matters of ontology and epistemology. The various research paradigms present different ways of making connections between ideas (theories, concepts), social experiences (social relationships, cultural practices) and social reality (materials and socially constructed world). To a large extent, this is expressed in the ontological and epistemological assumptions (Blaikie, 2007, p. 12).

Ontology describes our view on the nature of reality, whether it is an objective reality that really exists, or only a subjective reality, created in our minds. Though, objectivism states that social entities (like organizations, societies, teams) exist in reality that is separate from the social actors. On the other hand, subjectivism implies that reality is subjective, where perceptions and actions of social actors create the social phenomena under study (Saunders, Lewis, & Thornhill, 2009, p. 111).

Blaikie (2007, p. 18) describes epistemology as a theory of knowledge, “a theory or science of the method or grounds of knowledge”. It is a theory of how we know what we know; in other words how we acquired knowledge of the world around us (Blaikie, 2007, p. 18). Two important epistemological positions exist: positivism and interpretivism.

Positivist position states that social reality is studied with application of methods of natural sciences and involves empirical testing. Positivism asserts that ‘what is to count as knowledge must be based on what a researcher can perceive by his or her senses’ (Blaikie, 2007, p. 110). Positivist researcher is testing hypotheses generated from existing theories (hence deductive or theory testing), leading to further development of theory, by putting facts together to generate laws (Bryman, & Bell, 2007, p. 16). The research with positivist approach is merely based on collected data that is not possible to manipulate.

On the other hand, interpretivist argues that subjective ideas and thought are important and cannot be studied with application of natural methods. An interpretivist studies people to understand their differences (Saunders et al., 2009) in behaviors and the way they see the world around them. Thus interpretivism emphasizes that difference in people’s views result in multiple interpretations that create social reality. Given the subjective nature of interpretivism, it is associated with qualitative research methods (Eriksson and Kovalainen, 2008, p. 19), and hence is inductive or theory building (Bryman, & Bell, 2007, p. 21).

Philosophical positions we take to conduct this research may have significant influence on the way we undertake it, starting from design, up to conclusion. Thus it is essential for us to explain our philosophical assumptions that will further follow through this research. Our study is observed through objective position of ontological assumptions. Mutual funds have rules and regulations, and managers of mutual funds apply those rules. Board of directors has set of duties they have to follow. Shareholders apply and create rules for managers and board member. If either manager or board member fails, they get fired and new managers or board members appointed with the same rules and
regulations. Therefore, assume that mutual funds and board of directors are social entities that exist separately from the actors (shareholders, managers or board members) in them.

As of epistemological philosophy we take positivist point of view in our research. In our research we are going to test hypotheses generated from existing theories. We have no influence on the data collected for our research. We will use statistical methods to test our hypotheses.

2.5 Research approach

We have already mentioned terms, deductive and inductive, in previous section related to discussion of research philosophies. From previous section it can be understood that deductive approach is associated with the positivist epistemological position while inductive to the interpretivist position. However there is need to discuss differences in approaches and the ways they are used in research.

Deductive approach begins with producing hypothesis from a theory. Following generation of hypothesis the researcher will have to collect data or observations. Researcher applying deductive approach will proceed to testing of hypothesis by analyzing collected data. Depending on the test results of hypothesis researcher will proceed with revision of initial theory. Deductive approach usually called as top-down approach. Figure 1.1 shows the process of deductive research. Inductive approach follows opposite direction.

With an inductive approach theory is a final product of the research (Bryman & Bell, 2007, p. 14). Sometimes it is called bottom-up approach, starting from the observations and data collection. Further by analyzing observations or data researcher will finalize by developing some general conclusions or theories.

Figure 1: The process of deduction

Source: Bryman & Bell, 2007, p.11

From these two approaches that build connection between theory and research we will be following deductive approach. It is not only consistent with our philosophical
positions but also fits into our research strategy. Based on existing theoretical assumptions on corporate governance and mutual funds we will be deducing hypotheses and test them. Resulting from our findings we will make general conclusions that should help in further revision of theories.

2.6 Research strategy

Bryman & Bell (2007, p. 28) define research strategy as a general orientation to the conduct of business research. They suggest that qualitative and quantitative research can be taken as two different research strategies. In previous section, research approach, we related deductive and inductive approaches to different research philosophies. Same connection can be applied to qualitative and quantitative research strategies.

Qualitative research puts emphasis on the process and meanings through such techniques as an in-depth and focus group interviews and participant observations (Sale, Lohfeld, & Brazil, 2002, p. 45). Whereas, quantitative research is conducted to measure and analyze relationship between variables without influencing the data under study (Denzin & Lincoln, 2005). Statistical methods are generally used to analyze and measure data collected for quantitative research. Apart from these explanations, quantitative and qualitative research, as shown in table 1.1, differ with their relation to particular research philosophy (Sale et al., 2002, Bryman & Bell, 2007, Bryman, 2008).

Table 1: Fundamental differences between quantitative and qualitative research strategies

<table>
<thead>
<tr>
<th></th>
<th>Quantitative</th>
<th>Qualitative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal orientation to the role of theory in relation to research</td>
<td>Deductive; testing of theory</td>
<td>Inductive; generation of theory</td>
</tr>
<tr>
<td>Epistemological orientation</td>
<td>Natural sciences model, in particular positivism</td>
<td>Interpretivism</td>
</tr>
<tr>
<td>Ontological orientation</td>
<td>Objectivism</td>
<td>Subjectivism</td>
</tr>
</tbody>
</table>

Source: Bryman & Bell, 2007, p. 28

In this research we adopt statistical methods to measure and analyze the relationship between board characteristics and funds attributes. We are independent from the collected data, and there is no way for us to alter it. These facts influenced our choice of quantitative strategy for our research. Moreover, our philosophical positions and research approach prove that quantitative strategy is most appropriate for our study. Thus we conclude that for this study we choose positivistic and objectivist positions of epistemological and ontological philosophies respectively while our research approach and strategy are deductive and quantitative respectively.

2.7 Objectives of the research

After defining our research philosophy, approach and strategy it is time to introduce the objectives of this research and the design that we are going to implement for this research. Saunders et al. (2009) set research purposes in to three general classifications; exploratory, descriptive and explanatory. Exploratory studies seek to find “what is happening” and are similar to the activities of the traveller or explorer (Adams and Schwanveldt, 1991 as cited in Saunders et al., 2009). Descriptive studies seek to
describe characteristics of the phenomenon, organization or an individual. Explanatory studies, on other hand, seek to identify a cause-and-effect linkage among variables. Our research objectives fall into descriptive and explanatory groups.

We seek to identify the duties of boards of directors and their characteristics like age, size and gender which is consistent with descriptive studies. We also try to find relationship between those characteristics to the rate of return, expense ratio and fees funds charge to their shareholders which is consistent with explanatory studies. However in our study we do not and cannot prove that one variable is causing the other.

2.8 Research design

Bryman and Bell (2007, p. 39) terms research designs as a tool to organize data collection and analysis. Bryman (2008, p. 35) defines five different types of research designs: experimental design, cross-sectional design, longitudinal design, case study design and comparative design.

Experimental design is much related to experiments conducted in natural sciences. Experimental research provides confidence in the robustness and reliability of its findings (Bryman, 2008, p. 35). The purpose of the experiments is to find causal relationship between variables by applying changes to one of the variables. Difficulties arise with applying changes to variables in social studies. Unlike in natural sciences, in social sciences the manipulation of variables almost impossible (Bryman, 2008, p35). Moreover with experiments it is important to control other external factors that may affect variables in study which is hard to achieve in social or business studies.

Researchers employing cross-sectional design are interested in differences among people, organizations, or nation states. Bryman & Bell (2007, p. 55) outlined important elements of cross-sectional design. Researchers select more than one case to establish variations in variables among those cases. Data on variables for cross-sectional design research are collected more or less simultaneously. Those variables should be quantifiable to enable researcher to measure variations. With cross-sectional design researcher cannot manipulate any of those variables and is able to examine relationship between variable. But this relationship between variables does not represent causal relationship, because features of experimental design are not present (Bryman, 2008, p. 44).

Longitudinal studies are conducted to study changes and developments in research subjects throughout time. With longitudinal design researcher covers longer period of time and collects data on at least two occasions. With longitudinal design researcher observe changes that occur over time period which allows making causal inference between variables. Because of the time and cost involved in longitudinal design, it is relatively less-used design in social research (Bryman, 2008, p. 49).

Researchers employing case study design analyze a particular case in great details. Case studies can be made on a single community, a single school, a single organization or a single event (Bryman, 2008, p. 52). A case study design can also incorporate multiple cases, to find whether findings of the first case occur in other cases (Saunders et al., 2009, p. 146). Saunders et al. (2009) suggest that a well-constructed case study can enable a researcher to challenge an existing theory and provide some source of new
research questions. Case studies are mostly associated with qualitative data collection and analysis (Bryman, 2008, p. 53).

Comparative research design is the same as multiple-case study design. This research design entails to contrast two or more cases with identical methods (Bryman, 2008, p. 58). Comparing several cases allows research to generalize findings (Saunders, 2009, p. 147) by improving theory building (Bryman, 2008, p.60). Comparative design may be conducted with the use of either qualitative or quantitative research or the mix of both (Bryman, 2008, p.58).

From these different types of research design we find cross-sectional design as most appropriate to our research. We collect quantitative data on several variables (board size, age, gender, fees, expense ratio and NAV) to discover relationship between them by employing quantitative methods. These variables are collected from more than 600 mutual funds to find the variations in those variables. Data on all mutual funds is simultaneously collected for the year end 2010.

2.9 Selection of theory and hypothesis generation

Recall Figure 1.1 deductive research process from research approach section which we chose for our research. In this and following section (data collection) we will cover first three steps of deductive research process.

Agency theory (principal-agent problem) is a theory concerning the relationship between principal and the agents. In our case principals are shareholders of funds while agents are managers of those funds. The principal-agent conflicts arise when shareholders hire managers who behave in the manner that meet their own interest but not the shareholders’ ones. Board of directors is an entity that acts as a tool in mitigating these principal-agent conflicts. We will discuss more on the agency theory and the role of board of directors in the upcoming chapter of theoretical framework. In theoretical framework chapter we will generate hypotheses from the research question stated in introduction chapter. Hypotheses driven from theory will be tested with the use of statistical methods.

2.10 Data collection

Third step in deductive research process is data collection. Data collection was the most difficult and time consuming part in our study. Data is an important part of any research. Be it the responses to survey questions or the information derived from firms’ annual reports, data of this kind is vital to conduct a study. Generally data types are divided into primary data and secondary data.

Primary data is collected by the researcher observations. Observations involves; the systematic observations, recording, description, analysis and interpretation of people’s behaviors (Saunders et al., 2009, p. 289). This allows researcher to directly observe behaviors of the research objects by not merely observing what is happening but also feeling it (Gill and Johnson, 2002, p. 144, as cited in Saunders et al., 2009, p. 290). This type of data collection requires researcher to be on place when the action or phenomena take place. The time period for primary data collection thus should be long and needs researcher to put more efforts. It is not only time consuming but also can be more costly compared to secondary data collection. Secondary data is collected, more precisely
combined, from the primary sources. For instance, official country statistics would be considered as secondary data. This means that researcher collects already available information. This type of data collection reduces researchers’ time efforts and costs. Secondary data gives opportunity for researcher to commit more time on the analysis of data (Bryman, 2008, p. 297).

Primary information is usually collected by the government organizations, companies, other experienced researchers and research organizations. These organizations provide information through annual reports, surveys, government publications and censuses, industry statistics and reports, and many other sources. Information coming from these types of sources is believed to be of high-quality (Bryman, 2008, p. 297). This assumption may not always hold, particularly when the source of data is less famous. Researchers may need to put more time on familiarizing himself with the data, especially with coded variables or too complex data sets. Secondary data may not always have key variable needed to undertake the research, leaving it to the researcher to calculate needed variable. Below Table 2 briefly summarize advantages and disadvantages of using secondary data outlined by Bryman (2008, pp. 297-300).

Table 2: Advantages and disadvantages of secondary data

<table>
<thead>
<tr>
<th>Advantages of secondary data</th>
<th>Disadvantages of secondary data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost and time</td>
<td>Lack of familiarity with data</td>
</tr>
<tr>
<td>High-quality data</td>
<td>Complexity of the data</td>
</tr>
<tr>
<td>Opportunity for longitudinal analysis</td>
<td>No control over data quality</td>
</tr>
<tr>
<td>Subgroup analysis</td>
<td>Absence of key variables</td>
</tr>
<tr>
<td>Opportunity for cross-cultural analysis</td>
<td></td>
</tr>
<tr>
<td>More time for data analysis</td>
<td></td>
</tr>
<tr>
<td>Reanalysis may offer new interpretation</td>
<td></td>
</tr>
<tr>
<td>The wider obligations of the social researcher</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Social Research Methods, Bryman, 2008, pp. 297-300*

For this research we are going to use secondary data collected from different sources. Because of the absence of a central database for Swedish mutual funds with information needed to fulfill this study we had to collect data from several sources and cross check them.

For the financial variables (fees, NAV, expense ratio) of each fund our main source was annual reports of funds. For the information on board members (age, size and gender) main source was 121.nu website which was matched with annuals reports and official websites of each fund company. Not all fund companies provide information on their board members in annual reports only mentioning them in their websites, thus making us rely on 121.nu website. Rate of return and weighted average of rate of returns we calculated ourselves as these variables were not available from the sources. Details on the data sources and the variable we used for analysis will be provided in empirical analysis chapter of this paper.

2.11 Criticism of sources and data

As already stated secondary data collection has some disadvantages for the research. The quality and accuracy of the data is a concern in undertaking this kind of study. Data
of financial variables of mutual funds were collected from annual reports. Each fund’s annual reports are reviewed by funds auditors after what annual reports are made public. Because annual reports undergo several steps of approval, we believe they provide the most accurate information.

NAV of each fund were provided to us by Swedish Investment Funds Association. Swedish Investment Fund Association collects data on NAV directly from each fund on daily basis. Considering the reputation of Swedish Investment Funds Association we clear up our doubts on the accuracy of NAV data.

Data on board characteristics were taken from a web-page [www.121.nu](http://www.121.nu). We have little knowledge about that web site and its reputation in Sweden. However on their website they claim to be a leading firm that provides enterprise search services in Sweden. To make sure on accuracy of their data we cross checked data with annual reports and web sites of select funds. All of the data on both sources perfectly matched thus convincing us on correctness of 121.nu. For funds that do not provide information about their board members we relied on data provided by 121.nu.

For the better understanding of the subject under investigation it is necessary to have up to date developments in the field of study. We scrutinized the latest available academic articles related to our research question. Articles published on academic journals were accessed from well-known sources such as Business Source Premium (EBSCO), Social Science Research Network, and Google Scholar among others. We also made use of official statistics published by Investment Company Institute, Statistics Sweden and Swedish Investment Funds Association and others to familiarize ourselves and the readers with the current developments in mutual funds industry. We believe all these sources are of great quality and reflect the actual figures.

In overall we are confident that combination of selected literatures and data sources allows us to conduct this study in a relatively high level.
3. THEORETICAL FRAMEWORK

In this chapter we will explore theoretical framework under the mutual funds and the principal-agent problems. We start with explaining the history of mutual funds followed by the current trends in mutual funds industry. Further we will describe the principal-agent problems existent in mutual funds industry and explore some governance mechanisms that mitigate those problems.

3.1 Mutual funds

Mutual fund is basically a company that pools the money from a group of investors to buy financial securities building a less risky portfolio than an individual investor would do. Reduced risk of portfolio comes from the benefits of diversification mutual fund managers provide to investors. Managers charge small amount of fees for their services and to cover costs associated with trading securities. However these charges are smaller than those that individual investors would pay if they tried to build on their own similar portfolio of securities. This is because of the economies of scales in transaction costs (Howells & Bain, 2005, p. 63). Mutual funds providing such services are present for more than two centuries.

K. Geert Rouwenhorst (2004) tracking origins of the mutual funds found that first fund was created in 1774. In July of 1774, Abraham van Ketwich founded Eendragt Maakt Magt, which would most likely be classified today as closed-end funds. Mutual funds also defined as managed investment companies are classified in two general types: closed-end and open-ended funds. Closed-end funds issue fixed number of shares that are traded on stock exchanges. Investors in closed-end funds cannot purchase or redeem shares directly from the fund; instead they can sell shares to other investors on the organized market. Thus the market price of closed-end fund shares is generally determined by supply and demand forces therefore differ from NAV of the funds.

In contrast, open-ended funds are not traded on exchanges rather they can be bought from and sold to the fund at the price based on current NAV. Investors in open-ended funds can redeem shares at any time also open-ended funds can issue new shares on demand. In addition to managed investment companies, US Investment Company Act of 1940 also identifies unit investment trusts as another major type of investment company. US Investment Company Act of 1940 is designed to regulate investment companies based in United States. In Sweden mutual funds are regulated according to Swedish Investment Funds Act (SFS 2004:46) which is largely based on EU’s Undertakings for Collective Investment in Transferable Securities (UCITS) directive.

3.2 Swedish and European mutual funds

UCITS directive were first introduced in 1985 with an aim to allow funds to market freely across the EU member states. Once registered in any EU member state fund obtain “single license”, which allows them to freely operate in any other EU member state. UCITS directive primarily aims to regulate open-ended funds. The UCITS

---

4 "Unit investment trust" means an investment company which (A) is organized under a trust indenture, contract of custodianship or agency, or similar instrument, (B) does not have a board of directors, and (C) issues only redeemable securities, each of which represents an undivided interest in a unit of specified securities; but does not include a voting trust.
segment accounts for approximately 80% of the assets of the investment fund industry in Europe and covers all funds under the UCITS III Directives that implemented a “single license” regime. The remaining 20% of the market is represented by non-harmonized funds, which are regulated according to national laws and requirements (European Commission, 2008).

Non-harmonized funds are referred to as special funds in Swedish Investment Funds Act (SFS 2004:46). Those special funds are exempt from some rules that apply in case on UCITS funds. Thus marketing of special funds is not allowed outside of Sweden. Special funds may have limitations of redemption and acquisition of shares. Special funds have more powers to invest in different kinds of securities. For example, special funds can invest in unlisted companies to a greater extent than is allowed in case of UCTIS funds. Also special funds may be exempted from some rules. Special funds may seek to borrow assets from a bank or practice short selling. Special funds must invest their money in accordance with the principle of risk spreading. In contrast to the provisions for mutual funds, no percentage limits are specified for individual holdings. Instead, special funds are subject for more information disclosure. Special funds are required to provide information regarding the extent to which the fund deviates from provisions applicable to UCITSs. Special funds must specify the risk levels they seek to maintain and the manner in which risks are gauged. Considering these differences we decided to analyze UCITS and special fund separately, splitting our sample into two main categories. Further these two categories, UCITS and special funds, were divided into three types of funds.

3.3 Types of funds

Depending on the regulation of a country funds are grouped in different types to enable investor to compare funds and make sound investment decision. European Fund Classification (EFC) system groups funds in to four general types; equity, bond, money market and mixed funds.

EFC (2008) classifies the equity funds, possibly most popular type of funds, which invest at least 85 percent of their total assets in equities/stocks. There are equity funds with different investment strategy and risk that invest in particular country, region or an industry. Index funds are a type of equity funds that invest in equities included to particular index, for example S&P500. Index funds are considered passively managed funds because their investments in companies are fixed or rarely change. Index funds can also be created from other security indexes such as bond index.

Funds that invest more than 90 percent of its assets in bonds are classified as bond funds according to EFC. Bond funds are less popular than equity funds because they provide lower returns. Some bond funds concentrate their investments on corporate bonds while others may concentrate on municipal bonds or other bonds issuers. Bond funds may also specialize by the credit risk of the issuer, ranging from very safe to high-yield or “junk” bonds (Bodie, Kane, & Marcus, 2009, p. 93).

In contrast to bond funds, money market funds invest in debt securities with duration of less than one year. Money market funds considered to be safest funds because they invest in short term, more stable securities like Treasury Bills hence provide lower returns compared to bond funds (Mobius, 2007, p. 29).
Funds that hold both equities and fixed income securities in relatively stable proportions called **balanced** or **mixed** funds. Generation funds are one type of mixed funds that the proportion of equity holdings decrease as investors approach their retirement age. Below table shows the number of funds by categories in US, EU and Sweden.

Table 3: Number of Funds in Sweden, EU and US

<table>
<thead>
<tr>
<th></th>
<th>Sweden</th>
<th>EU (UCITS only)</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bond funds</strong></td>
<td>56</td>
<td>53</td>
<td>6219</td>
</tr>
<tr>
<td><strong>Money market funds</strong></td>
<td>28</td>
<td>29</td>
<td>1588</td>
</tr>
<tr>
<td><strong>Equity funds</strong></td>
<td>342</td>
<td>339</td>
<td>13146</td>
</tr>
<tr>
<td><strong>Mixed funds</strong></td>
<td>85</td>
<td>85</td>
<td>8215</td>
</tr>
<tr>
<td><strong>Funds of funds</strong></td>
<td>133</td>
<td>123</td>
<td>1025</td>
</tr>
<tr>
<td><strong>Other funds</strong></td>
<td>143</td>
<td>130</td>
<td>2763</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>787</td>
<td>759</td>
<td>32956</td>
</tr>
</tbody>
</table>


Along with these types of funds, Swedish Investment Fund Association also identifies hedge funds, funds-of-funds and exchange traded funds (ETFs).

**Hedge** funds differ from traditional mutual funds in that they attempt to produce profits even in times when stock prices decline. Hedge funds are usually subject to lighter regulations such as allowing them extensive usage of derivatives, to engage in short selling or employ leverage. Thus hedge funds are exposed to very high risks and may provide significant returns. Hedge funds typically are open to wealthy or institutional investors (Mobius, 2007, p. 28). One of the fastest-growing sectors in hedge fund universe has been in funds of funds (Bodie, Kane, & Marcus, 2009, p. 919).

Creator of the first hedge fund, Alfred W. Jones, in 1984 transformed his fund into a **fund of funds** (Lindgren, 2007). The idea that lies under fund of funds is to invest in other funds that already hold diversified portfolios. Hence fund of funds chooses funds with best performance that fulfill a specific investment objective freeing investors from making research on specific funds records. However fund of funds have one disadvantage. Investors in fund of funds could get fees charged twice, first for the management fees and other charges that the fund of funds requires, and second, the same expenses the underlying funds charge to fund of funds. Some companies avoid these double charges by creating a fund of funds using the funds in their own company’s family of funds. (Mobius, 2007, p. 25)

**Exchange-traded funds** (ETFs) like closed-end funds issue a fixed number of shares that can be traded on stock exchanges just like any other corporation stocks. ETFs though trading on exchanges have market price very close to NAV unlike closed-end funds. This is because arbitrage opportunities that keep market price close to NAV. ETFs are usually considered as passively managed funds because they usually replicate indices for a specific country or a sector.
Further funds can be classified in subsections within general groups. For instance some funds may focus on a particular country. Emerging market funds direct their investments into countries with emerging market economy. Some funds focus on particular sector such as IT, pharmaceutical or financial industry. Although funds focus on different securities, countries or sectors they all have same objectives of providing investors with satisfactory returns. Hence mutual funds have benefits for individual and/or institutional investors.

3.4 Developments in mutual fund industries of US and Sweden

Investing in mutual funds became very popular in recent years, especially among individual investors. Savings in mutual funds grow with a growing number of funds. Figure 2 shows the growth in fund numbers and the total net assets of U.S. Mutual Funds Industry over the 30 years.

Figure 2: Total Net Assets and Number of Funds of the U.S. Mutual Fund Industry, 1980-2009

Source: ICI Investment Company Fact Book 2010

In 1980 number of mutual funds was 564 while total net asset amounted to 134.76 billion dollars. Total net assets of U.S. mutual funds increased to 11,120.73 billion dollars and the number of funds increased to 7,691, which exceeded number of companies listed in US stock exchanges, NASDAQ and NYSE. Sweden had similar trends in mutual funds industry (Figure 3).

Swedish investment fund market currently consists of over 4,000 funds with total assets of close to SEK 2,000 billion. Most of these funds are UCITS funds registered in another EU member state. Introduction of UCITS directive in 1985 and its

---

5 World Federation of Exchanges reports a little more than 5,000 companies listed in NASDAQ OMX and NYSE Euronext (US).
implementation in Sweden via Investment Funds Act in 1991 may be held responsible for the growth in Swedish mutual funds industry.

Figure 3: Fund asset development in Sweden, 1959-2008, SEK billion

![Graph showing fund asset development in Sweden, 1959-2008, SEK billion.](image)

*Source: Swedish Investment Fund Association, Svensk Fondstatistik part of MoneyMate*

However the main cause for these developments can be described as the recognition of mutual funds benefits by the investors.

### 3.5 Benefits of mutual funds

We already mentioned that mutual funds provide some benefits which would be hard to achieve for an individual investor on their own. These main benefits are professional management of portfolios, diversification and low cost.

#### 3.5.1 Diversification

This idea of diversification and its benefits are part of Modern Portfolio Theory pioneered by Harry Markowitz (1952). Markowitz shared Nobel-prize with William F. Sharpe for their contribution to Modern Portfolio Theory.

Consider a portfolio with only one stock in it. That stock is exposed to two types of risks. One is the systematic risk, also called market risk, which comes from the whole market changes like interest rates, inflation and exchange rates. Another type of risk is unsystematic, which affects particular stock only and is firm-specific. This can occur from the bad earnings results or failures in research and developments of a particular firm and does not affect other firms. Let us come back to portfolio with one stock. An investor holding that portfolio will bear both risks of a stock.

Now consider portfolio with two stocks with equal proportions. The nonsystematic risk of one stock may offset nonsystematic risk of another stock. It is better to give example
of real company stocks. Suppose that those two stocks are one from Volvo AB and another from Ericsson. The increase in oil prices may decrease cars sales of Volvo AB while increasing demand for Ericsson’s telecommunication products. Thus both stocks offset each other’s risks and stabilize portfolio return. This effect is called diversification and can be achieved by holding combinations of stocks which are not perfectly positively correlated. Figure 4 illustrates how diversification works to reduce nonsystematic risk with an increase in number of stocks held in portfolio. Panel A shows the reduction of risks with no market risk. That is firms only exposed to firms specific risks and all risk sources are independent from each other. Panel B shows the market risk that is not diversifiable. It is because all firms are affected by same market changes.

An individual investor might easily form a portfolio with two stocks. But that may not reduce risk to necessary levels. Increasing number of stocks in portfolio will increase the possibility to reduce risk. However, individual investors might trying to increase number of stocks may incur costs that exceed the benefits of diversification. Here mutual funds come in to help. Mutual funds hold several stocks and/or bonds in their portfolios depending on the objectives of the fund. Though mutual funds then sell units of their portfolios to individual investors. Individual investors buying a unit in a fund therefore gets diversified portfolio for cheaper price. You might think of it like buying a unit is equal to buying a proportion of all securities in the portfolio.

Figure 4: Portfolio risk as a function of the number of stocks in the portfolio

![Figure 4: Portfolio risk as a function of the number of stocks in the portfolio](image)

Source: Bodie, Kane and Marcus, 2009, p. 196

This also gives opportunity for small investors who wish to invest small amount of money and hold less risky portfolio. For example young individuals may have less capital than older individuals.

### 3.5.2 Professional management

Mutual funds are mostly created by experienced and educated individuals who possess adequate knowledge in financial industry. Also big banks or other financial firms open new fund management companies. In Sweden at year-end of 2009 four major fund management companies is each part of four Swedish biggest bank groups (figure 5).
These management companies hire professional managers and provide all means for good portfolio management. Thus experienced portfolio managers with access to financial information should be able to make justified decisions that are consistent with funds risk tolerance and investment objectives. However this does not guarantee good performance of the funds. To find which managers perform better, researchers studied their educational backgrounds, trading skills and activities.

Fund managers ability to choose right investment on right time is an important factor in performance generation. Analyzing stock holdings of US mutual funds over the 1975 and 1994 period, Wermers (2000) show that funds hold stock that outperform a broad market index (the CRSP value-weighted index). He explains that manager’s stock-picking talent is an important factor of these outcomes. Wermers (2000) also found that funds with high level of trading held stocks with much higher average returns than low-turnover funds. At least a portion of this higher return level, Wermers (2000) concludes, is due to the better stock-picking skill of managers of high-turnover funds.

Chen, Jegadeesh, & Wermers (2000) in their study do not support Wermers (2000) findings that stocks held by mutual funds outperform the general population of stocks. However they find that stocks that the funds actively buy have significantly higher returns than stocks that they actively sell. Chen et. al. (2000) finding also support Wermers (2000) conclusion that high-turnover funds have better stock-picking skills than low turnover funds. High-turnover is a common occasion among actively managed funds. Whereas, passively managed funds usually have low-turnover due to the obvious reasons.
Similar results come from Engstrom (2004), who introduced new measures of the value of active portfolio management. He replicates a passive strategy of each of 112 actively managed Swedish equity funds using those replicated portfolios as benchmarks. Engstrom (2004) concludes that there is positive relation between fund performance and trading activity. These findings in favor of active management prove that fund managers play important role in generating performance.

Chevaliers and Ellison (1999) attempted to examine the relationship between performance and manager’s age, the average composite SAT (standardized test for college admission in US) score of the manager’s undergraduate institution, and whether the manager has an MBA. They find that younger managers show better performance than their older counterparts. So do MBA managers compared to non MBA managers. The most robust performance difference they identify is that managers from undergraduate institutions with higher average student SAT scores obtain higher returns.

Golec (1996) in his study finds that young managers (less than 46 years old) and managed funds for more than 7 years have better risk-adjusted performance. They also find that managers with MBAs perform better than those without. Golec (1996) suggest that investors should consider funds with high management fees (above 0.73%) because they perform better, as their large fees are paid to better skilled managers. We may assume that managers with good background and better skills demand more compensation for their services charging higher management fees.

3.5.3 Low expenses and fees: economies of scale

Costs related to buying shares in mutual funds are less than costs related to trading securities in order to build own diversified portfolio. This is because mutual funds distribute fixed costs associated from research and trading expenses among thousands of individual investors. This concept of spreading expenses called economies of scale (Mobius, 2007, p. 3)

Researchers had argued about the existence of economies of scale in mutual funds industry. Economies of scale in mutual funds industry may occur both on fund level and management company level. On funds level as funds’ assets under management grow, the benefits of scale economies should grow. As funds become larger, they may experience some operating efficiencies that may be passed on to investors in the form of lower costs (Dellva and Olson, 1998, p. 91).

Latzko (1999) in his study of 2,610 mutual funds supports the existence of economies of scales in mutual funds industry. His finding holds across all types of equity and bond mutual funds. The average cost curve of a typical mutual fund is downward sloping with the increase of fund assets. However Latzko (1999) shows that rapid decrease in average costs occur after a fund reaches $3.5 billion in total assets.

Fund management companies (fund family) share research, trading and client servicing costs across all funds under its management. Those costs are incurred by fund management company and distributed to all funds within that company. Thus, the increase in number of funds with the increase in assets of those funds may indicate for economies of scale.
Makadok (1999) studied management companies that offer money market funds to detect scale economies. He first finds that management companies have firm-specific production function, thus suggest estimating scale economies separately for each management company. Makadok (1999, as cited in Haslem, 2009, p. 37) in support to economies of scale find that weighted-average expense ratio of management company is negatively related to assets under management.

Dermine and Roller (1992) studied French mutual funds for presence of economies of scale and scope. They find optimal size for a diversified company in range of 2.9 billion French francs at that time, suggesting that total asset exceed this amount leads to diseconomies of scale and scope.

While existence of economies of scale lowers fees and expenses for individual investors, researchers questioned whether those low fees and expenses lead to good performance of the fund. Dellva and Olson (1998) found that funds that large in size (measured by total assets under management) are able to achieve economies of scale and thus lower their expense ratios. Moreover they found negative relation between expense ratio and performance of funds. Blake et. al. (1993) in their study of bond funds found that a percentage-point increases in expenses leads to a percentage-point decrease in returns.

Dahlquist et. al. (2000) in their study found negative relation between performance and fees. They show that high fee fund demonstrate lower performance, calculated using Jensens alpha measure, compared to low fee funds. However, they found that in some cases high fee funds able to perform better than low fee fund before fees are deducted. They conclude that high fees – or expensive management – may generate good performance but not enough to cover the fees. Dahlquist et. al. (2000) in their study focused on Swedish mutual funds from 1993 to 1997.

Table 4: Total Expense Ratios for actively managed equity funds and bond funds in respective countries

<table>
<thead>
<tr>
<th>Country</th>
<th>TER for Actively Managed Equity Funds</th>
<th>TER for Bond Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average (unweighted)</td>
<td>Average (weighted)</td>
</tr>
<tr>
<td><strong>Sweden</strong></td>
<td>1.21</td>
<td>1.31</td>
</tr>
<tr>
<td>Belgium</td>
<td>1.25</td>
<td>1.03</td>
</tr>
<tr>
<td>Germany</td>
<td>1.41</td>
<td>1.18</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1.50</td>
<td>1.46</td>
</tr>
<tr>
<td>France</td>
<td>1.58</td>
<td>1.33</td>
</tr>
<tr>
<td>Austria</td>
<td>1.60</td>
<td>1.42</td>
</tr>
<tr>
<td>UK</td>
<td>1.62</td>
<td>1.52</td>
</tr>
<tr>
<td>Italy</td>
<td>1.95</td>
<td>1.93</td>
</tr>
<tr>
<td>Ireland</td>
<td>1.98</td>
<td>1.63</td>
</tr>
<tr>
<td>Spain</td>
<td>2.12</td>
<td>2.12</td>
</tr>
<tr>
<td>Luxemburg</td>
<td>2.15</td>
<td>1.77</td>
</tr>
</tbody>
</table>

Source: Fitzrovia as in Fact and figures about funds and competition, Swedish Investment Fund Association
In Sweden funds charge management fees, sales and redemption fees, performance fees. Management fees are charged to cover costs associated with management and administration of funds. Performance fees are charged whenever fund reaches specific performance set by its rules. Sales and redemption fees are charged when investors wants to buy or redeem fund shares. Along with these fees funds are required to disclose Total Expense Ratio (TER) that includes all the costs incurred by the fund managers except trading costs. Unweighted average TER of Swedish actively managed equity funds is ranked lowest in the list of countries of Fitzrovia’s survey. The same survey ranks Sweden on top in the list of low fund TER for bond funds if unweighted, and second if TERs are weighted by fund size.

3.6 Mutual funds governance

Interesting, along with the growth in mutual fund industry around world the attention on corporate governance issues grew. Unfortunately corporate governance attention was attracted because of several corporate scandals. In US, probably most famous scandals in which involved corporations like Enron and WorldCom led to the introduction of Sarbanes-Oxley Act of 2002. Mutual fund industry was not exempt from such scandals. In September of 2003 several US mutual fund companies came under investigation for illegal trading practices (Houge and Wellman, 2005, p. 129).

In the United States, mutual fund NAVs is set once daily at 4:00 p.m. Late trading occurs when traders place orders for mutual fund shares after 4:00 p.m., the closing time of stock market, but still at the closing price of that day instead of closing price of the following day. Late trading is illegal, but mutual funds secretly allowed some investors to place orders after closing price. This trading practice gives advantage to some traders over the others.

Market timing is an investment strategy in which an investor rapidly trades in and out of the market to make profit from short-term market movements. This strategy is not itself illegal. Because open-ended funds stand ready to redeem shares at daily NAV, practice of market timing dilutes the returns to other shareholders. Short term profits of market timers come at the expense of other long term investors.

Discovery of late trading and market timing practices by mutual fund companies brought to major mutual funds scandal in 2003. However these scandals did not attract as much attention on mutual fund governance from regulators or shareholders as did corporate scandals.

Corporate governance can be defined as the set of laws, rules, policies and mechanism designed to mitigate the principal-agent problems. Principal-agent problems arise when managers (agents) seek to maximize their own wealth in expense of shareholders (principals) (Jensen and Meckling, 1976, p. 6). Shareholders as owners of the firm hire managers who supposed to act in shareholders’ interest. However managers may want to serve their own interest which may conflict with shareholders’ interests (Ogden, Jen, O’Connor, 2003, p. 72). For example managers may use excessive perquisites thus increasing costs of the firm and decreasing returns for the shareholders’. Also managers may not apply their skills to full extend. To mitigate these problems/conflicts shareholders are forced to incur some costs called agency costs. Agency costs include the monitoring expenditures by the shareholders (principals), managers (agents)
perquisites and other self-satisfying expenditure and the residual loss (Jensen and Meckling, 1976, p. 6).

### 3.6.1 Agency costs

Managers may want to increase the use of perquisites by using firm’s money (Ogden, Jen, O’Connor, 2003, p. 72). For example managers may order luxury cars, purchase special jets to travel, or make unnecessary trips to exotic places using money of the firm. These expenses may be hidden or undisclosed by managers from shareholders which decreases returns to shareholders. Agency costs may also occur when managers hire their own friends or spend less effort to work. In corporations to minimize these cost shareholders compensate managers based on the performance measures. In mutual funds managers charge fixed percentage of fees for their services. Mutual fund managers are interested in increasing assets under management while investors care about net returns. Consider marketing expenses that may increase total assets of the fund but reduce the net returns. This creates conflict of interest between managers and shareholders. To protect their interests shareholders hire board of directors, an internal governance mechanism. Cost may arise when shareholders implement different governance mechanisms to monitor manager’s behaviors.

Governance mechanisms are meant to keep management under control. For corporations several mechanisms exist. Auditors, as one of the mechanism, investigate accounting books of the firms to check if any accounting fraud or mistakes take place. Banks and/or creditors are main users of audit reports. This mechanism is not unique to corporations. Mutual funds are also required their accounts to be checked.

Other governance mechanisms in corporations are creditors and credit rating agencies. Creditors such as banks require more information access to firms operations. Banks closely monitor firms because of large amounts of credits. Unlike banks, bondholders may not have sufficient resources to monitor firms. Fortunately for bondholders, credit rating agencies rate bonds issued by firms. Bonds are given ratings according to the risks and the ability to pay debts by the firms. The lowest rated bonds, junk bonds, have a higher risk of default but pay higher yields than higher rated bonds. Mutual funds in contrast to corporations do not issue debt thus monitoring from banks is not existent. However there are agencies that rate mutual funds according to past performance and the risks of their holdings.

Martin and McConnell (1991) examined the hypothesis that corporate takeovers play an important role of disciplining managers of poorly performing target firms. They document that before the takeover target firms substantially underperform other firms in their industry. They also find that turnover rate for these managers of target firms significantly increase following completion of the takeovers. These findings suggest that managers with poor performance are likely to be replaced by bidding firm. Thus fearing to lose their jobs managers either have to work harder or engage in different defensive actions. This form of governance mechanism is almost inexistent in mutual funds industry as takeovers are very rare. Takeovers in mutual funds industry are a very rare occasion (Kong & Tang, 2008, p. 194), thus cannot be viewed as governance mechanism.

Corporations usually hold general annual meetings of shareholders. On this meetings shareholders vote for important decisions to be taken, like selection of board members.
With mutual funds shareholders do not need to be active to monitor managers. As investors in mutual funds can redeem shares with the fund at the NAV price, they may not want to be active in meetings managers (Morley and Curtis, 2010). Returns for managers decrease with the redemption of share which decreases the total assets under management. Redemption as a form of exit right Morley and Curtis (2010) suggest, undermines the investors’ incentive to use voting, fee liability and boards of directors as a disciplining and monitoring mechanism.

3.6.2 Board of directors

Morley and Curtis (2010) in their paper argue that shareholder voting, fee litigation and board of directors are less important in mutual funds industry than in corporations. Fees in mutual funds are set as a percentage of total assets under management; managers of funds have strong incentive to attract new investors and to keep current investors from redeeming shares. This incentive creates competition among mutual funds. Morley and Curtis (2010) call this the “market discipline” view of mutual fund governance. Investors can fire managers who charge high fees simply by redeeming their shares and switching to low fee fund or other instruments (Coates IV and Hubbard, 2007, p. 1). However presence of market discipline view only suggests that voting, fee litigation and board of directors is less important in mutual funds industry than in corporations and not that they are inappropriate. Therefore voting, fee litigation and board of directors are useful supplements to market discipline created by competition (Morley and Curtis, 2010, p. 99). Yet, shareholders seem to be ignoring fees they pay for mutual fund services (Capon et al., 1996, as cited in Turafo and Sevick, 1997). Additionally, capital gains tax and redemption fees may prevent shareholders from punishing managers by leaving the fund. These obstacles give opportunity to managers to charge excessive fees. For this reason US Investment Company Act of 1940 gives more power to board of directors specifically to independent board. Tufano and Sevick (1997) provide a description of board structure in US:

“Mutual funds are legal entities with no employees. Fund shareholders entrust their money to a fund. The fund is overseen by a board of directors (or trustees), which then outsources all management activities, including security selection (investment management), distribution, fund administration, custody, and accounting. This organizational structure, in which each fund has a separate, legally empowered board, differs from that of other corporations as well as from mutual funds in other countries. Were this practice applied to a firm like General Motors, there would be a different board of directors for each model of car GM sold, elected by the purchasers of that make of autos”. (p. 324)

In contrast, mutual funds in Sweden do not have board of directors, instead one board oversee all funds within a management company. This type of governance creates obstacles for to our research. Some management companies may have few funds while other may have tens of funds to manage. More problems occur when one management company that has few funds all of which are bond funds while those with tens of funds may manage different types. We seek to minimize effects of this problem by analyzing funds and management companies separately. For instance, on fund level, we split funds into groups according to their types. For the company level we calculate average of the expense ratio and rate of return weighted to their Net Asset Values.
This kind of governance structure where unitary board oversees all the funds within one funds family was examined by Kong and Tang (2010) in US mutual funds industry. They find strong evidence for unitary boards as an effective governance mechanism. Their results show that funds with unitary boards have lower fees, more likely to pass benefits of scale economies to investors, and are less likely to be involved in trading scandals. However their findings make more sense when funds in addition to unitary board have its own board which is not the case in Sweden. Swedish Investment Funds Act requires companies to have at least three members on board and at least half of them should be independent. No legal duties are set to board of directors in Sweden. However we assume that board’s fiduciary duties in Sweden are similar to those in US.

Tufano and Sevick (1997) give the list of the legal duties of fund’s directors as set out by the US Investment Company Act of 1940:

- approve the contracts with the fund sponsors and distributors,
- evaluate and approve fees paid to sponsors and their affiliates, including advisory and asset-based distribution fees,
- select the fund’s independent public accountants and set accounting fees,
- oversee securities transactions involving affiliates,
- review joint liability insurance policies,
- value certain portfolio securities,
- approve any merger,
- approve custody contracts, and
- approve the fund’s code of ethics (p. 325).

They note that from this list approving fees is the main role of the board of directors. Many studies were conducted to find the ability of boards to negotiate fees that is reasonable for shareholders. For instance, Tufano and Sevick (1997) studied the US open-ended mutual funds to find relationship between board structure and the fees charged. They analyzed board characteristics like number of members on the board, percentage of independent directors on the board, the number of boards on which individuals sit for a particular sponsor, and the compensation members receive for their services. They find that board structure is relevant and has impact on the fees charged by funds.

In this paper we examine three measures of board effectiveness. First one is total expense ratio which includes management fees and other costs associated with administration of the fund. Expense ratio does not include trading costs like brokerage commissions and bid-ask spreads. The low expense ratio should indicate that boards are effective in transferring benefits of scale economies to shareholders. Thus expense ratio considered to be most appropriate measure (Del Guervio et al., 2003) compared with management fee and rate of return of the funds that we also use. Low management fees may indicate boards’ ability to negotiate fees with managers. But these fees do not include fixed costs of the funds. We also measure board effectiveness with rate of return. However, we understand that rate of return does not reflect the effectiveness of the board. Instead, our objective is to find if board characteristics has any impact on the returns of the funds. Funds concentration on specific sector, its total assets under management, fees charged by management, portfolio holdings and other factors have more impact on the rate or return.
We observe four board characteristics (size, age, gender and CEO as board member) to find their relation to funds expense ratio, management fee and rate of return with the use of Pearson’s correlation test and the multiple linear regression model.

**Board size:**

Studies of board size in corporations largely argue that boards with fewer members are more effective. Large boards are believed to be less effective due to the coordination and process problems that occur in large team sizes (Lipton & Lorsch, 1992, and Jensen, 1993, as cited in Tufano & Sevick, 1997). Also with large board size some members may be inactive creating free-rider problems (Kenneth & Nofsinger, 2007, p. 47). Holthausen and Lercker (1993) find no relationship between board size and company performance, while Yermack (1996) finds that board size and firm value are inversely related (as cited in Tufano and Sevick, 1997). Del Guercio et al., 2003, confirm these findings for a sample of closed-end investment companies. They find that small boards are more effective in monitoring fund. Tufano and Sevick (1997) find that mutual funds with larger boards charge significantly higher fees. Each additional board member increases fees by 34-37 basis points. Ferris and Yan (2007) confirm this by finding positive relationship between board size and expense ratio.

Researchers ignored the governance of not only Swedish but also European mutual funds. As already mentioned Swedish mutual funds do not have separate board, instead only one board oversees all funds within a management company (fund family). Thus, it should be common to see large size of boards in management companies that have tens of funds under management. The need for large board size may be because of different fund types company manages. For example company managing only equity funds may need one expert in equities, whereas company managing bond and equity funds may need one expert in bonds and one in equities. Same can be if a company has funds that focus their investments in different markets. Yet, boards of such companies may be less effective due to the overwhelming work load with monitoring all funds. We hypothesize:

\( H_0: \) there is no significant relationship between board size and rate of return,

\( H_0: \) there is no significant relationship between board size and management fee,

\( H_0: \) there is no significant relationship between board size and expense ratio.

**Board age:**

“The calendar years accumulated by and individual are not as important as mental capacities, physical vigor, business judgment, or developed expertise” (Cochran, Wartick and Wook, 1984, p57). For some it may seem senseless to consider age as a factor of effectiveness. However several research papers on corporate governance did show that board members age plays important role in boards’ effectiveness. Older directors may be more experienced and more influential than their younger counterparts. In contrast younger directors may take more risks thus bringing greater return if justified. Usually mature and large corporations hire well educated and experienced individuals as board members. Best candidates meeting these requirements are retired executives of different firms. Also corporation may hire older retired executives to increase its reputation among stakeholders. Core, Holthausen, and Larcker (1999) find
CEOs of firms get higher compensation when outside directors are older than 69 which indicates weakness of boards monitoring. Cochran, Wartick and Wook (1984) find negative relationship between average age of board and the financial performance of the Fortune 500 firms. Khorana & Tufano (2006) find no relation between directors’ average age and the board effectiveness. We test for relationship between boards’ average age and funds characteristics as measures of board effectiveness. We generate following hypotheses:

H₀: there is no significant relationship between board age and rate of return,

H₀: there is no significant relationship between board age and management fee,

H₀: there is no significant relationship between board age and expense ratio.

**Board gender diversity:**

One may observe the raising debate over the gender diversity over the past few decades. Several countries started to implement rules to increase female representatives within government staffs. This so called gender quota system exists for political parties in France and Sweden (Kang, Cheng and Gray, 2007). While gender diversity may have positive effects on government decision, researchers argued whether it has positive effects on corporate governance. In 2010 only 20% of board members of Swedish listed companies were females (Table 5).

Table 5: Chairperson and Managing Director in Swedish listed companies 2009–2010

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Sex distribution %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Women</td>
<td>Men</td>
</tr>
<tr>
<td>Chairperson</td>
<td>10</td>
<td>259</td>
</tr>
<tr>
<td>Managing Director</td>
<td>8</td>
<td>261</td>
</tr>
<tr>
<td>Board members</td>
<td>332</td>
<td>1369</td>
</tr>
</tbody>
</table>

*Source: Fristedt & Sundqvist: Styrelser och revisorer i Sveriges börsföretag 2009–2010 SIS Ägarservice AB; Women and Men in Sweden, Fact and figures 2010, Statistics Sweden*

Female representative on corporate boards rapidly increased during past few decades (Bernardi, Bosco & Vassill, 2006, p. 244). But, does this increase lead to better corporate performance? Terjesen, Sealy & Singh (2009) reviewed literature on gender diversity on corporate boards. They find that gender diversity contributes to more effective corporate governance. Campbell & Minguez-Vera (2008) in their study of Spanish companies does not find evidence to presence of female on board affecting firms’ value. However they did find that gender diversity in other words the balance between males and females has positive impact on firm value. Francoeur, Labelle & Sinclair-Desgagne (2008) show that having more women than men on corporate boards do not generate significant excess returns. Eagly, Karau, & Makhijani (1995) research on gender differences suggests that women may behave differently than men and be more effective in the performance of certain tasks over others (as cited in Nielsen & Huse, 2010). Women directors are likely to be more independent than men directors (Simpson, Carter, & D’Souza, 2010, p. 30). Thus women directors may be viewed as outside directors. Directors’ independence is the challenge to firms’ management as they may experience difficulties with influencing the board. To our knowledge board
gender were not investigated for mutual funds industry. We want to find if female and male directors have different skills that may have impact on boards’ effectiveness. And if women viewed as more independent then men, we want to find whether bringing more women into board decreases expense ratio of the fund.

**H₀**: there is no significant relationship between board gender and rate of return,

**H₀**: there is no significant relationship between board gender and management fee,

**H₀**: there is no significant relationship between board gender and expense ratio.

**Presence of CEO on board of directors:**

Company CEOs usually would want to sit on board of directors to have more control over boards’ decisions. Sitting on the board CEO minimizes its possibility for dismissal or any punishment from the board by simply having at least one certain vote in his favor. Moreover CEO may have great influence on other members of the board significantly diminishing boards’ independence. Bliss (2011) find that CEO’s also holding boards chair constrains boards’ independence. In literature situations when CEOs also sit as board chairmen is called CEO duality. Tuggle, Sirmon, Reutzel, & Bierman (2010) suggest that CEO duality reduces the boards’ allocation of attention to monitoring responsibilities. In our sample none of the management companies has CEO as a board chair. However some companies have CEO as a regular board member.

We want to find if board of directors are less effective in aligning shareholders’ interests with managers’ interest when CEO has a seat on the board. Thus we think that boards with CEO as a member may approve higher management fees leading to high expense ratios and low rate of returns.

**H₀**: there is no significant relationship between presence of CEO in the board and rate of return,

**H₀**: there is no significant relationship between presence of CEO in the board and management fee,

**H₀**: there is no significant relationship between presence of CEO in the board and expense ratio.

All the above mentioned hypotheses will be tested on the fund level where each fund from our sample assumed to have separate board. For the company level analysis we will test only hypotheses related to rate of return and expense ratio. There is no possibility to create single unbiased indicator for all the management fees inside the management company, because of different types of funds that it may include.

The whole list of our hypotheses looks like:

**H₀₁**: There is no significant relation between total expense ratio and size of board of directors

**H₀₂**: There is no significant relation between total expense ratio and age of board of directors
H03: There is no significant relation between total expense ratio and gender of board of directors

H04: There is no significant relation between total expense ratio and presence CEO in a board of directors

H05: There is no significant relation between rate of return and size of board of directors

H06: There is no significant relation between rate of return and age of board of directors

H07: There is no significant relation between rate of return and gender of board of directors

H08: There is no significant relation between rate of return and presence CEO in a board of directors

H09: There is no significant relation between management fee and size of board of directors

H10: There is no significant relation between management fee and age of board of directors

H11: There is no significant relation between management fee and gender of board of directors

H12: There is no significant relation between management fee and presence CEO in a board of directors
4. EMPIRICAL ANALYSIS

4.1 Data collection, conditions and sample composition

In our data collection we started with defining the quantity of management companies officially registered in Sweden. For this purpose we used Finansinspektionen webpage\(^6\). Finansinspektionen is a central administrative authority which regulates, assesses and monitors financial health of individual companies, the various sectors and the financial market as a whole\(^7\). They also look after disclosure for all the necessary information for investors by financial entities. Thus, every company that is going to provide any types of financial services in Sweden needs to be registered at Finansinspektionen.

The whole list of registered companies divided into categories can be found under the tab “Authorisation”, then “Company register”. We were interested only in mutual funds, so we observed 82 management companies with the total sum of 914 funds as of April 11, 2011. According to the mutual report of Swedish statistics and Finansinspektionen for the fourth quarter of 2010\(^8\) there were registered 787 mutual funds at the end of the year.

For the information related to the board of directors we checked annual reports of each company to get data about size of boards of directors, age, gender of each member, and representation of CEOs in the boards of directors. Missing data we searched by means of www.121.nu web-page that is specialized on gathering these types of data. We also used social networks where we could observe age and gender of needed persons. We cross-checked all the data at least in three different sources, if it was not data from the annual report or official web-page of a company we were interested in. If we observed even one case of mismatching data we excluded that fund from our sample because of unreliability of information.

As we were conducting our research for only 2010\(^{th}\) year the single snapshot of age had been done. The age data is valid on the 14\(^{th}\) of February 2011. It corresponds to the idea of obtaining information from annual reports where it is presented on 31th of December.

The second part of data that we had to obtain was linked with final indicators of activity of the funds during 2010- total expense ratio and rate of return. We also got detailed information about the main expense of mutual funds – fixed management fee. Sources of all these figures except rate of return were annual reports, funds’ brochures, “faktablads” (Swedish word, means very short scope of necessary data for investors).

In order to get rate of returns of the mutual funds we asked help of Fonderbolagens förening\(^9\), the Swedish Investment Fund Association, which provided us with NAV and dividends data for calculating this indicator (detailed information about calculating rates of return presented in section 4.2.2).

\(^6\) http://www.fi.se/
\(^7\) http://www.fi.se/Folder-EN/Startpage/About-Fi/What-we-do/
\(^9\) http://fondbolagen.se/
Therefore, our final sample consists of 68 management companies (the list of all analyzed management companies can be viewed in Appendix A) which include 603 mutual funds. We took into consideration only funds with complete data satisfying our request. That means we did not put in the sample newly organized mutual funds (funds that started their activities after 1st of January 2010) and funds with missing data for other reasons such as unavailable annual reports and poor disclosure of information.

4.2 Data description

As you can observe our final sample consists of 77% of all funds. We think that this sample size will allow us to create good analysis and spread the results on the left funds without significant bias.

Figure 6: Sample size compared to the whole population

4.2.1 Funds classification

In Sweden there are some huge companies like Swedbank Robur, Nordea or SEB banks that own quite imposing market share related to mutual funds. That creates bias because these huge enterprises have great number of funds and only one board of directors to run them. Solving this problem we decided to categorize our funds into groups. First, we founded two extensive clusters: mutual funds regulated by UCITS and special funds. Each cluster includes 3 groups according to the instruments used by funds to invest in: Equity funds, Fixed-income funds, Mixed and other funds.

The equity group of funds includes as pure equity funds as emerging markets funds and Index funds. These entities also mostly invest in equities and simultaneously have their own pros and cons. We totally understand that, for example, emerging markets funds can cause greater expenses because of unknown economic environment, such as investing in fast-developing countries like Russia, India or Brazil can lead to extremely high gains. Or, in case of Index funds, we observe the opposite, the funds are traded passively what decreases or even terminates management and transaction fees. But the
The population of these funds is so small that in event of exceptional distinctiveness will not affect the result of the group.

The “fixed-income” group of funds consists of funds that provide more or less precise income for their investors: funds investing in bonds and money markets.

And the last Mixed and others group comprises of balanced, hedge, pension funds, funds investing in other mutual funds and other funds usually specified on putting their capital only in energy, oil or, for example, corn-producing enterprises.

This division in three main groups is valid both for UCITS regulated mutual funds and special funds.

Figure 7: Types of funds in the sample

As it was mentioned before several management companies represent significant part of the sample. So, we can see that 8 entities run 57% of the total amount of registered funds in Sweden (Figure 8).
Actually, we could not do anything with this state of things. We had to accept the fact that there were some huge corporations in the market that perform really well. So well, that completion with them was almost impossible. People invested more in these funds, mostly because majority was launched by large banks, and, in our opinion, there is nothing that could influence this situation in the near future. Mainly because of this obstacle we performed our analysis first on fund level considering 603 mutual funds and then company level studying only 68 management companies.

4.2.2 Result-based indicators

If total expense ratio we took directly from annual reports or other official financial statements, rate of returns needed to be calculated. According to Guidelines for Key Ratio Accounting of Investment Funds\(^\text{10}\), issued by Fondbolagens förening, the Swedish Investment Fund Association we created our own assessment of total return ratios. Dividends that were paid during 2010 had been taken into account. As it was recommended we used the next formulas:

For funds not paying dividends:

\[
\text{Rate of return for 2010 year} = \frac{\text{Net asset value at the end of 2010}}{\text{Net asset value at the beginning of 2010}} - 1
\]

For funds paying dividends:

\[\text{Rate of return for 2010 year} = \left(1 + \frac{\text{Dividends paid during 2010}}{\text{Net asset value at the end of 2010}}\right) \times \left(1 + \frac{\text{Net asset value at the end of 2010}}{\text{Net asset value at the beginning of 2010}}\right)^{-1} - 1\]

\(^{10}\) http://www.fondbolagen.se/Documents/Fondbolagen/English/Regulations/Guidelines/pdf/080723%20Guidelines%20for%20Key%20Ratio%20Accounting.pdf
Rate of return for 2010 year \[= \frac{\sum_{i=1}^{n} \text{Dividends}_{n}}{\text{NAV}_{f}} \]  
\[= \text{NAV}_{i} \times \left(1 + \frac{\sum_{i=1}^{n} \text{Dividends}_{n}}{\text{NAV}_{f}}\right) - 1\]

Where: \(\text{NAV}_{i}\) = Net asset value at the beginning of 2010  
\(\text{Dividends}_{n}\) = Dividends paid at time “n”  
\(\text{NAV}_{d_{n}}\) = Net asset value after paying dividends at time “n”  
\(\text{NAV}_{f}\) = Net asset value at the end of the year

After completing calculation we randomly compared some of our results with the data provided by selected funds and received absolutely identical figures.

For the company level data we used weighted-average total expense ratios and rates of returns based on net asset value distribution.

**4.2.3 Age representation**

Average age of company board members was used as the age measure in our analysis. We also tried to create more independent way of measuring age by dividing all the members in four age categories with defined coefficients to each category. And then set a single age coefficient to every management company and every mutual fund. Detailed description and main results of analysis with this coefficient can be observed in Appendix B.

Summing up all the above said we organized our set of variables as it is shown in the table:

**Table 6: Variables used in analysis**

**Company level analysis**

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Independent variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>TER per company</td>
<td>Size of a board of directors</td>
</tr>
<tr>
<td>RoR per company</td>
<td>Age of a board of directors</td>
</tr>
<tr>
<td></td>
<td>Gender of a board of directors</td>
</tr>
<tr>
<td></td>
<td>Presence of CEO in a board of directors</td>
</tr>
</tbody>
</table>

**Fund level analysis**

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Independent variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>TER</td>
<td>Size of a board of directors</td>
</tr>
<tr>
<td>RoR</td>
<td>Age of a board of directors</td>
</tr>
<tr>
<td>Fixed management fee</td>
<td>Gender of a board of directors</td>
</tr>
<tr>
<td></td>
<td>Presence of CEO in a board of directors</td>
</tr>
</tbody>
</table>
Where: TER = Total Expense Ratio; RoR = Rate of Return.

4.2.4 Descriptive statistics of independent variables

This section serves for presenting descriptive statistics and frequencies of our independent variables we used for analysis. Table 7 shows mean values, minimum and maximum values and other statistical indicators for each variable.

Table 7: Descriptive statistics for the independent variables

<table>
<thead>
<tr>
<th></th>
<th>Number of board members</th>
<th>Presence of CEO in a board of directors</th>
<th>Percentage of men (%)</th>
<th>Average age</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Valid</td>
<td>68</td>
<td>68</td>
<td>68</td>
<td>68</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>4.49</td>
<td>.56</td>
<td>89.0294</td>
<td>50.9171</td>
</tr>
<tr>
<td>Median</td>
<td>4.00</td>
<td>1.00</td>
<td>100.0000</td>
<td>51.5000</td>
</tr>
<tr>
<td>Mode</td>
<td>4</td>
<td>1</td>
<td>100.00</td>
<td>55.00</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>1.044</td>
<td>.500</td>
<td>17.11940</td>
<td>4.82034</td>
</tr>
<tr>
<td>Range</td>
<td>4</td>
<td>1</td>
<td>60.00</td>
<td>19.39</td>
</tr>
<tr>
<td>Minimum</td>
<td>3</td>
<td>0</td>
<td>40.00</td>
<td>40.75</td>
</tr>
<tr>
<td>Maximum</td>
<td>7</td>
<td>1</td>
<td>100.00</td>
<td>60.14</td>
</tr>
</tbody>
</table>

The mean value of board size is 4.49 ranging from three members to maximum of seven members. The mean value for CEO presence on board equals to 0.56 which says that companies are almost identically distributed on this variable. Thirty eight companies out of 68 have CEO as a member on their board of directors. Mean values for percentage of men and average age are equal 89.03 and 50.92 respectively.

Table 8: Board size frequency

<table>
<thead>
<tr>
<th>Board size</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>12</td>
<td>17.6</td>
</tr>
<tr>
<td>4</td>
<td>25</td>
<td>36.8</td>
</tr>
<tr>
<td>5</td>
<td>19</td>
<td>27.9</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td>14.7</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>2.9</td>
</tr>
<tr>
<td>Total</td>
<td>68</td>
<td>100.0</td>
</tr>
</tbody>
</table>

In Table 8 we can observe that the board of directors consisting of 4 members is met more frequently. At the same time boards with the maximum, seven members on the board are only in two management companies. The graphical representation of board members distribution can be viewed in Appendix C, Figure 1.

Table 9 shows that in 45 companies, which are more than half, all the board members are men (see Appendix C: Figure 2). In only one company we observe that majority of members are women directors. In total there are 38 women directors in our sample of
companies. And only five companies have equal numbers of men and women directors on their board. Thus 62 companies have majority men representatives on the board of directors in our sample companies.

Table 9: Percentage of men frequency

<table>
<thead>
<tr>
<th>Percentage of men</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>40.00</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>50.00</td>
<td>5</td>
<td>7.4</td>
</tr>
<tr>
<td>66.00</td>
<td>4</td>
<td>5.9</td>
</tr>
<tr>
<td>71.00</td>
<td>2</td>
<td>2.9</td>
</tr>
<tr>
<td>75.00</td>
<td>5</td>
<td>7.4</td>
</tr>
<tr>
<td>80.00</td>
<td>5</td>
<td>7.4</td>
</tr>
<tr>
<td>83.00</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>100.00</td>
<td>45</td>
<td>66.2</td>
</tr>
<tr>
<td>Total</td>
<td>68</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 9: Gender diversity

Average age for all the board members in our sample is close to 51 years. The standard deviation of members’ age is equal to 9.23. Adding and subtracting standard deviation from the mean age we get 42 and 60 years. Thus in our sample 63 members are younger than 43 years and 57 members are older than 60 years old. All other 185 members are in the range of 43 and 60 years old.

Figure 10: Distribution of the board members age
4.3. Hypotheses testing and result discussion

For testing our hypotheses we employed multiple regression analysis in order to understand how our independent variables influence dependent ones. But before using this model we check if it is appropriate by looking at correlation among our variables and scatter plots of each of our independent variables with the dependent variables. So, first, we define how all the independent variables can influence indicators of performance (and the size of fixed management fee) of mutual funds separately, then, we observe the role of each of them in general impact of all the independent variables.

We also check multicollinearity of our independent variables. The results show that all of four our independent variables are independent from each other (detailed results can be viewed in Appendix D).

Serving the purpose of correlation findings we employed one of the most famous and widely -spread correlation tests, the Pearson correlation coefficient. It can lie between -1 and 1 depending on positive or negative relation. The closer the coefficient is to zero the weaker the relationship (Bryman & Bell, 2007, p. 362).

Significance level

In order to define rejection of our zero hypotheses, we applied for one of the most popular 5% significance level. So, we accepted or rejected our hypotheses we did it with the probability of 95%.

4.3.1 Company level analysis

In this section we provided the results of our company level analysis consisted of 68 management firms. The analysis had been divided in two parts: correlation analysis and regression analysis. Based on the results of the regression analysis we either accepted or rejected our hypotheses.

Company level correlation analysis

First, we took a look at correlation coefficients between total expense ratio per company and our independent variables (size, age and gender of board of directors and presence CEO in boards of directors).

Table 10: Company level correlation coefficients between TER and independent variables

<table>
<thead>
<tr>
<th>TER per company, %</th>
<th>Number of board members</th>
<th>Average age</th>
<th>Percentage of men in a company (%)</th>
<th>Presence CEO in a board of directors</th>
</tr>
</thead>
<tbody>
<tr>
<td>TER per company, %</td>
<td>Pearson Correlation</td>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>-.012</td>
<td>-.013</td>
<td>.337</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.925</td>
<td>.919</td>
<td>.005</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>68</td>
<td>68</td>
<td>68</td>
</tr>
</tbody>
</table>

As we can observe from the table total expense ratio on the company level had no significant correlation with the size and age of board of directors. Their Pearson
coefficients were slightly negative and close to zero and significance (2-tailed) numbers were much higher than 0.05, significance level we settled.

From the other hand, there was positive correlation between TER and gender of board of directors and TER and presence CEO in the board of directors. It is approved by significant (2-tailed) numbers which less than 0.05.

Figure 11: Representation of relation between TER and board gender, company level.

![Graph showing relation between TER and board gender.](image)

Really, on this scatter plot we are able to see that the more men are represented in the board of directors of mutual funds in Sweden the more the possibility of increase their total expense ratio.
Figure 12: Relationship between TER and presence of CEO in a board of directors, company level

Figure 12 convinced us that presence of CEO in the board of directors led to a possible increase in total expense ratio of a company.

Further we were going to look at relationship between our second dependent variable (rate of return) and the same list of independent variables (size, age and gender of board of directors and presence of CEO in boards of directors)

Table 11: Company level correlation coefficients between RoR and independent variables

<table>
<thead>
<tr>
<th></th>
<th>RoR per company, %</th>
<th>Number of board members</th>
<th>Average age</th>
<th>Percentage of men (%)</th>
<th>Presence CEO in a board of directors</th>
</tr>
</thead>
<tbody>
<tr>
<td>RoR per company, %</td>
<td>Pearson Correlation 1</td>
<td>0.202</td>
<td>0.068</td>
<td>-0.083</td>
<td>0.045</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>0.098</td>
<td>0.636</td>
<td>0.501</td>
<td>0.714</td>
</tr>
<tr>
<td>N</td>
<td>68</td>
<td>68</td>
<td>68</td>
<td>68</td>
<td>68</td>
</tr>
</tbody>
</table>

Here we saw weak positive relationship between rate of return of a company and its board. But the level of error for it was pretty high (9.8%) and exceeded our significance level of 5%.
Therefore, there was no significant relation between rate of return and each of independent variables (size, age, gender of boards of directors and presence CEO in it) on the company level analysis.

Company level regression analysis

Results of correlation analysis had shown that there is relation between total expense ratio of a company with separately gender of its board of directors and presence CEO in its board of directors. Then we were going to check will this relationship change under the influence of other variables at the same time.

In this way our model looked like:

\[ \text{TER per company} = \beta_0 + \beta_1 \times G + \beta_2 \times \text{POCEO} + \beta_3 \times \text{BS} + \beta_4 \times A \]

Where: \( \beta_0 = \) the constant;

\( G = \) Gender (measured as the percentage of men in a board structure);

\( \text{POCEO} = \) Presence of CEO in a board of directors variable (measured as: 0-“Not a board member”, 1-“A board member”);

\( \text{BS} = \) Size of a board of directors;

\( A = \) Age (measured as average age of board members of each management company separately).

TER per company measured as weighted average (based on NAV distribution) of TER of funds owned by given company.

Table 12: ANOVA test results for regression model with TER as dependent variable

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>21,257</td>
<td>4</td>
<td>5,314</td>
<td>3,974</td>
<td>0.006</td>
</tr>
<tr>
<td>Residual</td>
<td>84,257</td>
<td>63</td>
<td>1,337</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>105,514</td>
<td>67</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Average age, Percentage of men (%), Presence of CEO in a board of directors, Number of board members

b. Dependent Variable: TER per company, %

The p-value shown in the table above was equal to 0.006. And it is less than settled significance level. That meant at least one of our \( \beta \) was not equal to zero and there was relationship between TER and independent variables, as we already convinced during correlation analysis. So, the model was considered to be useful.
Table 13: Regression coefficients for the independent variables

<table>
<thead>
<tr>
<th>Model</th>
<th>Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unstandardized Coefficients</td>
<td>Standardized Coefficients</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td>t</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>-3.102</td>
<td>2.040</td>
<td>-1.521</td>
<td>.133</td>
</tr>
<tr>
<td>Percentage of men (%)</td>
<td>.024</td>
<td>.009</td>
<td>.322</td>
<td>2.493</td>
</tr>
<tr>
<td>Presence of CEO in a board of directors</td>
<td>.721</td>
<td>.311</td>
<td>.287</td>
<td>2.315</td>
</tr>
<tr>
<td>Number of board members</td>
<td>.175</td>
<td>.149</td>
<td>.146</td>
<td>1.178</td>
</tr>
<tr>
<td>Average age</td>
<td>.031</td>
<td>.031</td>
<td>.118</td>
<td>.982</td>
</tr>
</tbody>
</table>

a. Dependent Variable: TER per company, %

This table approved the significant relation between gender of boards of directors, presence CEO in boards of directors and total expense ratio per company. The levels of error were 1.5% and 2.4% (respectively) lower than level of significance of 5%.

Interpreting these figures we received that increasing the percentage of men in a board of directors by 1% led to an increase in total expense ratio by 0.024 points on average while all the other variables are held constant. That is not so small amount as it seems. Usually there are no more 7 people in a board of director and replacing woman to a man will get us 14.28% increase in the percentage of men coefficient. This, in turn, provides 0.343 points increase in total expense ratio of a company. On the graph to the left we observe that total expense ratio for majority of management companies varies from 0 to 2. So, 0.343 points change can be considered as significant.

Same situation is with the presence CEO in a board of directors. If he was, the total expense ratio of a company increased by 0.721 points on average while all other variables were held constant.

So, we rejected our third and fourth hypotheses with the level of confidence of 95%, however the first and second hypotheses were accepted.
In case of unexpected relationships we also conducted regression analysis of the same type for the rate of return. But the model was considered to be useless with the p-value of 61.1% that was much higher of settled significance level of 5%. Thus, the fifth, sixth, seventh and eighth hypotheses were accepted.

Table 14: Summary of company level regression test results

<table>
<thead>
<tr>
<th>Null hypotheses</th>
<th>Tests results</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is no significant relation between total expense ratio and size of board of directors</td>
<td>accepted</td>
</tr>
<tr>
<td>There is no significant relation between total expense ratio and age of board of directors</td>
<td>accepted</td>
</tr>
<tr>
<td>There is no significant relation between total expense ratio and gender of board of directors</td>
<td>rejected</td>
</tr>
<tr>
<td>There is no significant relation between total expense ratio and presence CEO in a board of directors</td>
<td>rejected</td>
</tr>
<tr>
<td>There is no significant relation between rate of return and size of board of directors</td>
<td>accepted</td>
</tr>
<tr>
<td>There is no significant relation between rate of return and age of board of directors</td>
<td>accepted</td>
</tr>
<tr>
<td>There is no significant relation between rate of return and gender of board of directors</td>
<td>accepted</td>
</tr>
<tr>
<td>There is no significant relation between rate of return and presence CEO in a board of directors</td>
<td>accepted</td>
</tr>
</tbody>
</table>

4.3.2 Fund level analysis

Here we provided the results of our fund level analysis consisted of 603 mutual funds. Like it was introduced in the company the analysis had been divided in two parts: correlation analysis and regression analysis. Based on the results of the regression analysis we either accepted or rejected our hypotheses.

Fund level correlation analysis

We conducted our fund level analysis considering not the whole sample of funds at the same time, but separate groups of funds divided according to classification presented in section 4.2.

Correlation analysis for the equity mutual funds group

Table 15: Equity funds correlation coefficients between board characteristics and fund attributes

<table>
<thead>
<tr>
<th></th>
<th>Number of board members</th>
<th>Average age</th>
<th>Percentage of men (%)</th>
<th>Presence of CEO in a board of directors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TER, %</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>-.030</td>
<td>-.102</td>
<td>.169</td>
<td>.092</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.633</td>
<td>.099</td>
<td>.006</td>
<td>.135</td>
</tr>
<tr>
<td>N</td>
<td>264</td>
<td>264</td>
<td>264</td>
<td>264</td>
</tr>
<tr>
<td><strong>Rate of return</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>-.111</td>
<td>-.019</td>
<td>.111</td>
<td>.052</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.073</td>
<td>.761</td>
<td>.072</td>
<td>.400</td>
</tr>
<tr>
<td>N</td>
<td>264</td>
<td>264</td>
<td>264</td>
<td>264</td>
</tr>
<tr>
<td><strong>Fixed management fee, %</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.011</td>
<td>-.102</td>
<td>.122</td>
<td>.061</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.861</td>
<td>.097</td>
<td>.048</td>
<td>.321</td>
</tr>
<tr>
<td>N</td>
<td>264</td>
<td>264</td>
<td>264</td>
<td>264</td>
</tr>
</tbody>
</table>
Here we observed that there was only one variable, percentage of men in a fund that had significant relation to dependent variables, total expense ratio and fixed management fee of funds.

With regard to TER, Pearson correlation number was quite close to zero and was equal to 0.169 and significance (2-tailed) figure, 0.6% was less than settled significance level of 5%. The relation between presence of CEO in a board of directors and fixed management fee of a fund was also positively significant (Pearson correlation figure is 0.122) with the level of error of 4.8% what corresponded to our condition.

There was no relation detected between rate of return of a fund and our independent variables.

In the last part of the test, we checked relation between management fees and all the independent variables. And again we got only gender to have significant relation to independent variable, management fee, with the level of error equals to 4.8%. This figure was smaller than our significance level of 5%.

Other results for management fee variable showed that there was neither significant relation nor even correlation between given dependent variable and all the independent ones.

_Regression analysis for the equity group mutual funds_

By means of regression analysis we defined how did gender of a board of directors affect total expense ratio and management fee of a fund simultaneously with the other independent variables.

In this way our models looked like:

\[
\text{TER} = \beta_0 + \beta_1 \times G + \beta_2 \times \text{POCEO} + \beta_3 \times \text{BS} + \beta_4 \times A;
\]

\[
\text{Management fee} = \beta_0 + \beta_1 \times G + \beta_2 \times \text{POCEO} + \beta_3 \times \text{BS} + \beta_4 \times A.
\]

Where: \( \beta_0 \) = the constant;

\( G \) = Gender;

\( \text{POCEO} \) = Presence of CEO in a board of directors variable (measured as: 0-“Not a board member”, 1- “A board member”);

\( \text{BS} \) = Size of a board of directors;

\( A \) = Age coefficient.

All the independent variables were measured as it was introduced during company level analyses.
Table 16: ANOVA test results for equity funds regression model, TER as dependent variable

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
<td>5,452</td>
<td>4</td>
<td>1,363</td>
<td>4,450</td>
<td>.002</td>
</tr>
<tr>
<td>Residual</td>
<td>79,339</td>
<td>259</td>
<td>.306</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>84,792</td>
<td>263</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Presence of CEO in a board of directors, Percentage of men (%), Average age, Number of board members

b. Dependent Variable: TER, %

The p-value shown in the table above was equal to 0.002. And it was less than settled significance level. That means at least one of our $\beta$ was not equal to zero and there was relationship between TER and independent variables. Thus, we did not accept the null hypothesis that the regression parameters are zero at significance level 0.05 and the model is considered to be useful.

Table 17: Coefficients for the independent variables for the TER model for the equity group of funds

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>1.362</td>
<td>.500</td>
<td>.500</td>
<td>2.721</td>
</tr>
<tr>
<td>Number of board members</td>
<td>.109</td>
<td>.045</td>
<td>.202</td>
<td>2.396</td>
</tr>
<tr>
<td>Average age</td>
<td>-.025</td>
<td>.010</td>
<td>-.179</td>
<td>-2.469</td>
</tr>
<tr>
<td>Percentage of men (%)</td>
<td>.010</td>
<td>.003</td>
<td>.268</td>
<td>3.625</td>
</tr>
<tr>
<td>Presence of CEO in a board of directors</td>
<td>.090</td>
<td>.074</td>
<td>.073</td>
<td>1.207</td>
</tr>
</tbody>
</table>

a. Dependent Variable: TER, %

The regression analysis confirmed significant relation between total expense ratio and gender of boards of directors of equity group funds with the level of error of 0.0%. That means increasing the percentage of men in a board of directors by 1% leads to an increase in total expense ratio by 0.010 points on average while all the other variables are held constant. The influence of 1% change in “percentage of men” variable has been clarified above.
Except proof of relation between TER and gender of board of directors, we got the results that were hidden during correlation analysis\textsuperscript{11}: the relation between TER and size of boards of directors (significant level is equal to 1.7%) and TER and age of boards of directors (1.4%). The last one we can observe on the scatter plot to the left without the influence of other variables. Relation is very weak (R square coefficient is equal 0.01). But according to regression analysis the beta coefficient for this relation is -0.025, which means the decrease of TER on 0.025 points on average with the increase of average age of a fund by 1 year.

The situation with the size of board members is different: each additional member can cause the increase in TER by 0.109 points.

This implies that we do not accept the first, second and third hypotheses. However, our fourth hypothesis is accepted, because the regression test results have not detected any significant relation between total expense ratio and presence of CEO in a board of directors.

Table 18: ANOVA test results for equity funds regression model, Management fee as dependent variable

\begin{table}
\centering
\begin{tabular}{|c|c|c|c|c|c|}
\hline
Model & Sum of Squares & df & Mean Square & F & Sig. \\
\hline
Regression & 4,388 & 4 & 1,097 & 3,756 & .005\textsuperscript{a} \\
Residual & 75,636 & 259 & .292 &  &  \\
Total & 80,024 & 263 &  &  &  \\
\hline
\end{tabular}
\caption{ANOVA results for equity funds regression model, Management fee as dependent variable.}
\end{table}

\textsuperscript{a} Predictors: (Constant), Presence of CEO in a board of directors, Percentage of men (%), Average age, Number of board members

\textsuperscript{b} Dependent Variable: Fixed management fee, %

\textsuperscript{11} We mostly rely on the results of the regression analysis because it is recognized as more flexible and more powerful than correlation (Brooks, 2008, p 28).
The model was considered to be useful. P-value was equal to 0.5% and did not exceed settled level of significance of 5%. Since the p-value was less than 0.05 we did not accept the null hypothesis that the regression parameters are zero at significance level 0.05. We conclude that at least one variable was not equal to zero. Therefore the variables were jointly statistically significant at significance level 0.05.

Table 19: Coefficients for the independent variables for the fixed management fee model

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>1,482</td>
<td>.489</td>
<td>3,033</td>
</tr>
<tr>
<td></td>
<td>Number of board members</td>
<td>.123</td>
<td>.044</td>
<td>.236</td>
</tr>
<tr>
<td></td>
<td>Average age</td>
<td>-.028</td>
<td>.010</td>
<td>-.201</td>
</tr>
<tr>
<td></td>
<td>Percentage of men (%)</td>
<td>.009</td>
<td>.003</td>
<td>.239</td>
</tr>
<tr>
<td></td>
<td>Presence of CEO in a board of directors</td>
<td>.049</td>
<td>.073</td>
<td>.042</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Fixed management fee, %

The table above provided us the information about significant relation between fixed management fee and size, age and gender of boards of directors with the levels of significance of 0.6%, 0.6% and 0.1% respectively. The most influential of them was number of boards of directors (size) with the beta coefficient of 0.123. That means each new member increases rate of fixed management fee by 0.123 points.

In this way we do not accepted the ninth, tenth and eleventh hypotheses for the equity group of funds. However the twelfth was accepted. There was no relation found between presence of CEO in a board of directors and company’s management fee.

*Correlation and regression analyses of fixed income, mixed and others, special (equity), special (fixed income) and special (mixed and others) groups of funds.*

Based on the scheme presented above we conducted correlation and regression analyses of the left groups of funds. The main results of these analyses we summarized in the tables below.

Table 20: Results of correlation analysis for five categories of funds

<table>
<thead>
<tr>
<th>Group of funds</th>
<th>Number of board members</th>
<th>Average age</th>
<th>Percentage of men (%)</th>
<th>Presence of CEO in a board of directors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pearson Correlation</td>
<td>Sig. (2-tailed)</td>
<td>Pearson Correlation</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Fixed</td>
<td>0.079</td>
<td>0.528</td>
<td>0.106</td>
<td>0.394</td>
</tr>
<tr>
<td>Mixed and others</td>
<td>0.106</td>
<td>0.331</td>
<td>-0.048</td>
<td>0.660</td>
</tr>
</tbody>
</table>
The significant correlations were marked in yellow. Then we checked all the relationships by means of regression analysis and found out how they changed under simultaneous influence of the other variables.

The significant correlations were also marked in yellow.

The main results of correlation (Table 20) and regression analyses (Table 21) are follows:

The most important issue of the regression analysis became the absence of any relations between rates of return and board structure of these five categories of mutual funds in Sweden. All the built regression models had no value.

For the “fixed income” and “special (fixed income)” groups of funds, we also revealed no relations between structure of boards of directors (size, age, gender and presence of CEO) of mutual funds and its performance (measured by total expense ratio and rate of return), as well as the relation between structure of boards of directors and its management fee.

For the “mixed and others” group of fund, the results of correlation and regression analyses have shown positive significant relation between TER and presence of CEO in a board of directors (Pearson coefficient is 0.327, significance (2-tailed) figure is 0.002, regression coefficient of significance is 0.004) and management fee and percentage of men and presence of CEO in a board of directors (0.234, 0.030 and regression coefficient of significance is 0.030).

The significant relation between gender structure and management fee was also found during both correlation (Pearson number is 0.397 with the level of error of 0.000%) and regression (Beta coefficient is 0.014 with the significance level of 0.2%) analyses.

That is why we did not accept the fourth, eleventh and twelfth hypotheses for the “mixed and others” group of fund. Other hypotheses were accepted.

<table>
<thead>
<tr>
<th></th>
<th>Special (equity)</th>
<th>Special (fixed)</th>
<th>Special (mixed and others)</th>
<th>RoR</th>
<th>Fixed mgmt fee, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special (equity)</td>
<td>-0.206</td>
<td>0.083</td>
<td>0.192</td>
<td>0.106</td>
<td>0.318</td>
</tr>
<tr>
<td>Special (fixed)</td>
<td>-0.079</td>
<td>0.779</td>
<td>-0.627</td>
<td>0.012</td>
<td>0.546</td>
</tr>
<tr>
<td>Special (mixed and others)</td>
<td>0.136</td>
<td>0.179</td>
<td>-0.293</td>
<td>0.003</td>
<td>-0.077</td>
</tr>
<tr>
<td>Fixed</td>
<td>-0.132</td>
<td>0.287</td>
<td>-0.227</td>
<td>0.065</td>
<td>-0.002</td>
</tr>
<tr>
<td>Mixed and others</td>
<td>0.000</td>
<td>0.999</td>
<td>-0.113</td>
<td>0.301</td>
<td>-0.176</td>
</tr>
<tr>
<td>Special (equity)</td>
<td>0.178</td>
<td>0.134</td>
<td>-0.013</td>
<td>0.914</td>
<td>-0.182</td>
</tr>
<tr>
<td>Special (fixed)</td>
<td>0.212</td>
<td>0.448</td>
<td>0.151</td>
<td>0.590</td>
<td>-0.248</td>
</tr>
<tr>
<td>Special (mixed and others)</td>
<td>0.018</td>
<td>0.858</td>
<td>-0.090</td>
<td>0.376</td>
<td>0.043</td>
</tr>
<tr>
<td>Fixed</td>
<td>0.033</td>
<td>0.789</td>
<td>0.100</td>
<td>0.420</td>
<td>-0.036</td>
</tr>
<tr>
<td>Mixed and others</td>
<td>-0.174</td>
<td>0.109</td>
<td>0.109</td>
<td>0.317</td>
<td>0.397</td>
</tr>
<tr>
<td>Special (equity)</td>
<td>0.154</td>
<td>0.196</td>
<td>-0.020</td>
<td>0.865</td>
<td>-0.165</td>
</tr>
<tr>
<td>Special (fixed)</td>
<td>-0.143</td>
<td>0.610</td>
<td>-0.455</td>
<td>0.088</td>
<td>0.413</td>
</tr>
<tr>
<td>Special (mixed and others)</td>
<td>0.295</td>
<td>0.003</td>
<td>-0.105</td>
<td>0.300</td>
<td>-0.424</td>
</tr>
</tbody>
</table>

The significant correlation between gender structure and management fee was also found during both correlation (Pearson number is 0.397 with the level of error of 0.000%) and regression (Beta coefficient is 0.014 with the significance level of 0.2%) analyses.
Table 21: Results of regression analysis for five categories of funds

<table>
<thead>
<tr>
<th>Group of funds</th>
<th>ANOVA significance</th>
<th>Number of board members</th>
<th>Average age</th>
<th>Percentage of men (%)</th>
<th>Presence CEO in a board of directors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sign. level</td>
<td>β</td>
<td>Sign. level</td>
<td>β</td>
</tr>
<tr>
<td>TER, %</td>
<td>Fixed</td>
<td>0.762</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mixed and others</td>
<td>0.020</td>
<td>0.134</td>
<td>0.094</td>
<td>0.581</td>
</tr>
<tr>
<td></td>
<td>Special (equity)</td>
<td>0.020</td>
<td>0.553</td>
<td>-0.120</td>
<td>0.018</td>
</tr>
<tr>
<td></td>
<td>Special (fixed)</td>
<td>0.063</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Special (mixed and others)</td>
<td>0.003</td>
<td>0.023</td>
<td>0.270</td>
<td>0.001</td>
</tr>
<tr>
<td>RoR</td>
<td>Fixed</td>
<td>0.112</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mixed and others</td>
<td>0.054</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Special (equity)</td>
<td>0.392</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Special (fixed)</td>
<td>0.934</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Special (mixed and others)</td>
<td>0.754</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed mngmt fee, %</td>
<td>Fixed</td>
<td>0.837</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mixed and others</td>
<td>0.001</td>
<td>0.972</td>
<td>-0.002</td>
<td>0.335</td>
</tr>
<tr>
<td></td>
<td>Special (equity)</td>
<td>0.307</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Special (fixed)</td>
<td>0.508</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Special (mixed and others)</td>
<td>0.000</td>
<td>0.848</td>
<td>0.012</td>
<td>0.030</td>
</tr>
</tbody>
</table>

For the “special (equity)” group of funds, the results of correlation analysis have shown positive significant relations between total expense ratio of a fund and gender of its board of directors (Pearson coefficient is equal to 0.318 and significance (2-tailed) figure is 0.007, which is less than our 5% level of significance) and total expense ratio and presence CEO in a board of directors (Pearson coefficient is 0.355 and significance (2-tailed) figure is 0.002).
Figure 15: Relation between TER and presence of CEO in boards of directors of the “special (equity)” group of funds

The results of regression analysis of these variables in interconnection with other independent variables have showed there was no significant relation between total expense ratio and gender (level of significance of given was 30.4%, which is much higher than 5% settled by us).

The regression analysis also revealed significant relation between total expense ratio and age of boards of directors (significance level was 1.9%, beta coefficient was 0.900) that was not identified as significant during correlation analysis (Pearson correlation 0.192 with level of error of 10.6%). That means with the increase of average age by one year the total expense ratio increases by 0.9 points in “special (equity)” group of funds.
Thus, our second and forth hypotheses were not accepted and with the probability of 95% there were positive relations between TER of a fund and average age of a board of directors and presence of CEO in it. Other hypotheses related to this group of funds were accepted.

And finally for the “special (mixed and others)” group of funds we found that size and age of boards of directors had significant influence on total expense ratio of the funds as well as age and gender had influence on fixed management fee.
Figure 17: Relation between TER and average age of boards of directors for the “special (mixed and others)” group of funds

As we can observe there results absolutely different results related to age for “special (equity)” group of funds (Figure 14) and “special (mixed and others)” group of funds (Figure 15).

For the “special (mixed and others)” group of funds we rejected our first, second, tenth and eleventh hypotheses with the probability of 95%. The summary of test results can be viewed in Table 19.
Table 22: Summary of regression test results, fund level

<table>
<thead>
<tr>
<th>Null hypotheses</th>
<th>Group of funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is no significant relation between total expense</td>
<td><strong>Equity</strong></td>
</tr>
<tr>
<td>ratio and size of board of directors</td>
<td><strong>Fixed income</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Mixed and others</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Special (equity)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Special (fixed income)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Special (mixed and others)</strong></td>
</tr>
<tr>
<td><strong>rejected</strong></td>
<td>accepted</td>
</tr>
<tr>
<td><strong>accepted</strong></td>
<td>accepted</td>
</tr>
<tr>
<td><strong>accepted</strong></td>
<td>accepted</td>
</tr>
<tr>
<td><strong>accepted</strong></td>
<td>accepted</td>
</tr>
<tr>
<td><strong>accepted</strong></td>
<td><strong>rejected</strong></td>
</tr>
<tr>
<td>There is no significant relation between total expense</td>
<td><strong>rejected</strong></td>
</tr>
<tr>
<td>ratio and age of board of directors</td>
<td>accepted</td>
</tr>
<tr>
<td></td>
<td>accepted</td>
</tr>
<tr>
<td></td>
<td>accepted</td>
</tr>
<tr>
<td></td>
<td>accepted</td>
</tr>
<tr>
<td></td>
<td>accepted</td>
</tr>
<tr>
<td><strong>rejected</strong></td>
<td><strong>rejected</strong></td>
</tr>
<tr>
<td>There is no significant relation between total expense</td>
<td><strong>rejected</strong></td>
</tr>
<tr>
<td>ratio and gender of board of directors</td>
<td>accepted</td>
</tr>
<tr>
<td></td>
<td>accepted</td>
</tr>
<tr>
<td></td>
<td>accepted</td>
</tr>
<tr>
<td></td>
<td>accepted</td>
</tr>
<tr>
<td></td>
<td>accepted</td>
</tr>
<tr>
<td><strong>accepted</strong></td>
<td><strong>rejected</strong></td>
</tr>
<tr>
<td>There is no significant relation between total expense</td>
<td>accepted</td>
</tr>
<tr>
<td>ratio and presence CEO in a board of directors</td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td>accepted</td>
</tr>
<tr>
<td></td>
<td><strong>rejected</strong></td>
</tr>
<tr>
<td></td>
<td><strong>rejected</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td>There is no significant relation between rate of return and size of board of</td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td>directors</td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td>There is no significant relation between rate of return and age of board of</td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td>directors</td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td>There is no significant relation between rate of return and gender of board</td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td>of directors</td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td>There is no significant relation between rate of return and presence CEO in a</td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td>board of directors</td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td>There is no significant relation between management fee</td>
<td><strong>rejected</strong></td>
</tr>
<tr>
<td>and size of board of directors</td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td><strong>rejected</strong></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td>There is no significant relation between management fee</td>
<td><strong>rejected</strong></td>
</tr>
<tr>
<td>and age of board of directors</td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td><strong>rejected</strong></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td>There is no significant relation between management fee</td>
<td><strong>rejected</strong></td>
</tr>
<tr>
<td>and gender of board of directors</td>
<td><strong>rejected</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td><strong>rejected</strong></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td>There is no significant relation between management fee</td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td>and presence CEO in a board of directors</td>
<td><strong>rejected</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td></td>
<td><strong>accepted</strong></td>
</tr>
<tr>
<td><strong>rejected</strong></td>
<td><strong>accepted</strong></td>
</tr>
</tbody>
</table>
5. CONCLUSION

In this final chapter we summarize our findings, and provide some suggestions that are consistent with our research purpose and the previous academics studies. We evaluate the contribution of our study to existing knowledge and estimate the quality of our research with providing suggestions to future studies.

5.1 Discussion of the results

The purpose of this study was to analyze relation between structure of boards of directors of mutual funds in Sweden and funds management fee, expense ratio and rate of return. Looking for an answer we studied 68 management companies (each includes several mutual funds) and in total 603 mutual funds of those management companies separately.

On the company level we used expense ratios and rates of return weighted to NAVs of funds as two measures of board effectiveness. While on the fund level we used management fee in addition to expense ratios and rates of returns as measure of board effectiveness. For both company and fund levels analysis, we failed to find any relation between board structures and rates of returns. This indicates that board of directors does not have direct impact on rate of return. Instead, rate of return may be more related to managers’ skills and abilities. Thus, we conclude that board of directors may be effective in monitoring funds but that does not guarantee better returns on investments.

On the company level analysis apart from rate of return we tested relationships between weighted-average expense ratios and set of independent variables related to the board structure (size, average age, percentage of men and presence of CEO on board). We failed to find relationships between weighted average expense ratios and board size and average board age. But our statistical analysis show that there is relationship between weighted average expense ratios and proportion of men and presence of CEO on board.

As our results on board size shows no relation to expense ratio we do not agree that large boards are less effective (Tufano and Sevick, 1997). This is probably because of the differences in number of funds each board oversees. Management company that has many funds under its management requires larger size of board to effectively monitor all the funds. But company that has less number of funds may not need too many members to monitor all funds.

We do not find any support to Cochran, Wartick and Wood (1984) and Core, Holtausen, and Larcker (1999) who argue that older directors associated with weak effectiveness. While they studied corporate boards our study shows similar results found by Khorana & Tufano (2006) who studied mutual funds. We conclude that both older and younger boards are similarly effective in monitoring managers.

We find that the presence of CEO on board weakens the effectiveness of the board in monitoring management. This finding is similar to the studies on corporate boards where CEO holding boards chair fails in their fiduciary duty (Bliss, 2011; Tyggle et al., 2010). CEO may execute influence on other board members to approve for example higher management fees. This result also shows that board independence is diminished by CEOs presence on board. We believe this is a very strong finding and suggest
shareholders to consider the presence of CEO on board before choosing to invest in that fund.

As to the results of relationship of the percentage of men to expense ratio, we might find it difficult to have a straightforward interpretation. Results show that with increase of men members the expense ratio increases. This finding should not be interpreted as women directors perform better than men directors. These findings may only indicate that women directors are able to bring some independence to the board (Simpson et al., 2010). Our findings may also be helpful for Swedish regulators to promote gender equality in governance of mutual funds industry.

On the fund level analysis we had interesting different results for all six groups of funds. These differences in results make it difficult to interpret. Analysis of fixed income funds and special fixed income funds did not show for any relationships between effective’s measures and board characteristics. This may indicate that boards of directors are not relevant in funds that concentrate on fixed income securities and individual investors are able to discipline management by redeeming their shares (Coates IV and Hubbard, 2007, p. 1). It is probably because fixed income securities are more liquid thus funds do not charge redemption fees or charge very low redemption fees compared to other types of funds.

In overall fund level analysis show following results:

1. Board size is significant and positively related to TER and management fee of equity funds and to TER of special mixed funds.
2. Average age is significant and negatively related to TER and management fee of equity and special mixed funds but positively related to TER of special equity funds.
3. Percentage of men is significant and positively related to TER and management fee of equity funds and to management fee of mixed funds but significant and negatively related to management fee of special mixed funds.
4. Presence of CEO is significant and positively related to TER and management fee of equity and mixed funds also positively related to TER of special equity funds.

These results indicated that board structure that is effective depends on the type of the fund. Thus we may say that for a management company whose majority of funds is equity may have different board structure than that of the mixed funds (e.g. hedge funds).

Finally, R squared of our regression models ranges from 0.055 to 0.227. This shows that independent variable has less than 22.7% of prediction power. This indicates for little influence of the board of directors characteristics on the effectiveness measures (TER and management fee). Other factors that may affect TER and management fees can be total assets, turnover (Dahlquiest et al., 2000), managers’ background (Golec, 1996), trading activity and many other factors that we were not able to observe.

Summarizing all above said, on one hand we got some positive results about relation between our dependent variables and independent ones on the fund level analysis. On other hand, they could be recognized as accidents, because there was no proof of rejecting the same hypothesis for more than three fund groups. Thus, we are not able to
spread the results on the whole variety of mutual funds in Sweden. The exceptions were only two of twelve hypotheses: there were not found any relations in each of six fund groups between rate of return and size of board of directors and management fee and size of board of directors.

5.3 Contribution to existing knowledge

Board structure of corporations had been extensively studied by researchers, while they largely ignored board of directors of mutual funds industry. Only few studies, related to this topic were found, but mostly they were focused on US mutual funds industry. We did not recognize any researches about effectiveness of board structures in mutual funds in Sweden. That is why we hope our research will fill in this gap.

This research is created to contribute to knowledge about structures of boards of directors and their influence on companies’ performance (measured by total expense ratio and rate of return) and management compensation. The main purpose was to define optimal composition of board of directors for mutual funds in Sweden. In this way we find out what are the most powerful board characteristics to which fund management companies have to pay attention. The unusual thing is that we conducted our analysis as on the company level as well as on the fund level, also tried to consider different measures of board members age estimation (by means of average age and specially worked out age coefficient, which is presented in Appendix B).

5.4 Quality criteria

It is very important to overview the research with the purpose of estimating its quality. For the quantitative study the main criteria are validity and reliability, because only reliable and valid data can provide truthful results for the research with the primary purpose of analyzing gathered information without creation new theory.

5.4.1 Validity

According to Messick (1989) validity is the process of evaluating the degree to which the empirical evidence and theoretical rationales support interpretations and actions based on a score or other indicator. For our analysis we introduced three dependent and four independent variables with the purpose to find, first, regression between them and, then, regression. Performance of the funds was measured by total expense ratio and rate of return. The structure of boards of directors implied size, age and gender of boards of directors as well as presence of CEO in them. All the gathered empirical data has been tested in SPSS, the most suitable statistical software for this type of data. The hypotheses were settled in accordance to our set of variables and studied the relations between them. Thus, we are absolutely sure that our measurement attitudes were correct, appropriate and measured what we needed to measure with them and results that we got would be valid at any other types of analysis.

5.4.2 Reliability

Reliability measures a degree to which the research can be repeated in the future (Bryman & Bell, 2007, p. 40). Conducting this research we used widely spread methods of gathering data (we used annual reports of the companies as the main source, asked for the help of Swedish financial authorities to get reliable information and cross-checked missing data with different sources). We found relations by means of well-
known correlation and regression analyses. So, the study can be easily replicated with the due diligence and tenacity. The only thing that could seem new was age coefficient, but it was introduced in detail during our empirical analysis. As well as all the steps we took doing this research.

5.5 Recommendations for further studies

The study covered only 2010 year. It could be more representative if it was conducted on 3 or 5 year period taking into account all the changes in the structures of board of directors. Measurement of performance on the company level analysis can be performed based on total net assets instead of net asset value. All the other fees except management fees may be regarded as independent variables. For example, there could be regarded the relation between absence of management fee and presence of starting fee and redemption fee. Also, such independent variable as education of members of board of directors could be considered during assessing company performance.
REFERENCE LIST


Core, J. E., Holthausen, R. W., & Larcker, D. F. (1999). Corporate governance, chief


58


Appendix A. List of 68 analyzed management companies

Adrigo Asset Management AB
Agenta Investment Management AB
Aktie-Ansvar AB
Alfred Berg Fonder AB
AMF Fonder AB
Arbor Asset Management AB
Archipel Asset Management AB
Atlant Fonder AB
Avanza Fonder AB
Brummer Multi-Strategy AB
Capinordic Asset Management AB
Caprifol AB
Carlson Fonder Aktiebolag
Carlsson Norén Asset Management AB
Carnegie Fonder AB
Catella Fondförvaltning AB
Cicero Fonder AB
Coeli AB
Danckwardt-Lillieström & Germer Fonder AB
Danske Capital AB
Didner & Gerge Fonder Aktiebolag
E. Öhman J:or Fonder AB
East Capital Asset Management AB
Eldsjäl Fond AB
Enter Fonder AB
Evli Fonder Aktiebolag
Excalibur Värdepappersfond AB
Futuris Asset Management AB
GodFond i Sverige AB
GustaviaDavegårdh Fonder Aktiebolag
Handelsbanken Fonder AB
Healthinvest Partners AB
Humle Kapitalförvaltning AB
IKC Fonder AB
Lancelot Asset Management Aktiebolag
Lannebo Fonder AB
Lundmark & Co Fondförvaltning AB
Lynx Asset Management AB
Länsförälskningar Fondförvaltning AB
Manticore Capital AB
Markedskraft Fonder AB
Nektar Asset Management AB
Nordea Fonder Aktiebolag
Nordic Equities Kapitalförvaltning Aktiebolag
Optimized Portfolio Management Stockholm AB
Petersson & Wagner Fonder AB
Prior & Nilsson Fond- och Kapitalförvaltning Aktiebolag
PSG Capital AB
Remium Aktiv Förvaltning AB
Scientia Fund Management AB
SEB Investment Management AB
Svenska Lärarfonder Aktiebolag
Sentat Asset Management AB
Simplicity AB
Skandia Fonder AB
Spiltan Fonder AB
SPP Fonder AB
Stella Asset Management AB
Strand Kapitalförvaltning AB
Swedbank Robur Fonder AB
Systematiska Fonder JPA AB
Tanglin Asset Management AB
Traction Fonder AB
Wiborg Kapitalförvaltning AB
Västra Hamnen Fondkommission AB
XACT Fonder AB
Zenit Asset Management AB
Ålandsbanken Fonder AB
Appendix B. Age representation different from classical average age and analysis results using this measure

Age representation

Inspecting studies about boards of directors we found out researches take simple average age (for example, the study “The average age of board and financial performance” of Cochran, Wartick & Wood, 1984) for estimating an influence of the whole group. In our case it can cause significant bias. The least size of board of directors in our sample is 3, the maximum is 7. If we, for instance, take average age in the group of 3 people with ages equal to 25, 30 and 70 we will receive 41,67. This could be the same as 3 people of 41 years old. So, we won’t see what structure is better- to have only one experienced man, which demands bigger salary or to have several middle-age persons with probably less wage requests. That is why, after consulting with Department of Statistics of Umea University we decided to enter our own age coefficient, which theoretically covers all above mentioned omissions.

First of all, we divided all the population of board members into 4 groups by means of Mean Variance Analysis.

Figure 1: Distribution of age of board members in the sample

![Figure 1: Distribution of age of board members in the sample](image_url)

According to Statistical methods for the social science, fourth edition, textbook written by A. Agresti and B. Finlay, normal distribution is symmetric, bell shaped, and characterized by its mean and standard deviation. On the graph above we observe that the age of whole population of board members is almost normally distributed with the slight shift to the left. The average age of all the board members (mean) was equal to 51
year. Standard deviation from mean was 9.23. So, our groups were organized as: two groups with majority of representatives with the age 51 plus and minus 9 years and two more groups on the both sides outside this interval.

Table 1: Age groups

<table>
<thead>
<tr>
<th>Age interval</th>
<th>Age group</th>
<th>Quantity of people</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=42</td>
<td>1</td>
<td>63</td>
<td>0.001</td>
</tr>
<tr>
<td>43-51</td>
<td>2</td>
<td>106</td>
<td>0.01</td>
</tr>
<tr>
<td>52-60</td>
<td>3</td>
<td>79</td>
<td>0.1</td>
</tr>
<tr>
<td>&gt;60</td>
<td>4</td>
<td>57</td>
<td>1</td>
</tr>
</tbody>
</table>

The main idea of our approach is to assign a coefficient to each group with the aim to obtain single, less biased indicator for age presentation of board of directors of each fund or company. We chose decimal figures which range from 0.001 (the youngest group) to 1 (the oldest one).

Therefore each board of 68 boards of directors received single age coefficient according to quantity of members in each age group. For example, the board of directors of company “A” has 5 members with the ages equal to 40, 46, 52 58 and 61 year. Their age coefficient would be calculated as follows:

\[ \text{Age coefficient of company “A”} = 1 \times 0.001 + 1 \times 0.01 + 2 \times 0.1 + 1 \times 1 = 1.211. \]

The major findings

Conducting the same analysis as it was performed for the main model with the average age we got absolutely identical results for the company level analysis. Therefore only gender of a board of directors and presence of CEO in it were able to influence performance of management companies (measured by TER in this case).

As for the fund level analysis we also received almost the same outcomes. The picture did not get clearer and we were not able to find out any general dependence of performance and management fee on a board structure for all of the groups of funds as well.

Limitation of this indicator

The main problem of this coefficient was that we had to imply that we valued the oldest members of boards of directors 1000 times higher than the youngest ones. Surely, it could not be so and it probably created bias during using regression model. The change in the fourth (the oldest) group would affect incomparably more on the other variables than replacing some members in the first (the youngest) group.
Appendix C. Descriptive statistics of the independent variables

Figure 1: Frequency for number of board members

![Frequency for number of board members](chart1)

Figure 2: Frequency of percentage of men

![Frequency of percentage of men](chart2)
Appendix D. Multicollinearity of the independent variables

Multiple linear regression implies little or no multicollinearity in the data. Multicollinearity occurs when the independent variables are not independent from each other. We checked all the relations between the independent variables. The results are presented below:

Table 1: Multicollinearity coefficients between size of a board of directors and other independent variables

<table>
<thead>
<tr>
<th>Coefficients⁴</th>
<th>Model</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>1 Average age</td>
<td></td>
<td>.889</td>
</tr>
<tr>
<td>Percentage of men (%)</td>
<td></td>
<td>.867</td>
</tr>
<tr>
<td>Presence of CEO in a board of directors</td>
<td></td>
<td>.823</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Number of board members

Table 2: Multicollinearity coefficients between average age of a board of directors and other independent variables

<table>
<thead>
<tr>
<th>Coefficients⁴</th>
<th>Model</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>1 Number of board members</td>
<td></td>
<td>.838</td>
</tr>
<tr>
<td>Percentage of men (%)</td>
<td></td>
<td>.764</td>
</tr>
<tr>
<td>Presence of CEO in a board of directors</td>
<td></td>
<td>.878</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Average age

Table 3: Multicollinearity coefficients between percentage of men in a board of directors and other independent variables

<table>
<thead>
<tr>
<th>Coefficients⁴</th>
<th>Model</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>1 Number of board members</td>
<td></td>
<td>.943</td>
</tr>
<tr>
<td>Average age</td>
<td></td>
<td>.882</td>
</tr>
<tr>
<td>Presence of CEO in a board of directors</td>
<td></td>
<td>.888</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Percentage of men (%)
Table 4: Multicollinearity coefficients between percentage of men in a board of directors and other independent variables

<table>
<thead>
<tr>
<th>Model</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>1 Number of board members</td>
<td>0.827</td>
</tr>
<tr>
<td>Average age</td>
<td>0.936</td>
</tr>
<tr>
<td>Percentage of men (%)</td>
<td>0.820</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Presence of CEO in a board of directors

The Variance inflation factors (VIF) is defined as 1/Tolerance, where Tolerance equals to $1 - R^2$. It is considered, that if we have VIF is above 3 we probably have multicollinearity, if it is above 5 we very likely do have multicollinearity, and if it is above 10 we definitely do.

As we can observe, all the VIF values are a little bit higher than 1. So, we do not have any multicollinearity issues, the VIF values are low and therefore there is no relation between our independent variables.